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PROCESS AUTOMATION

Products for Process Instrumentation

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Catalog
FI 01

Edition
9/2026

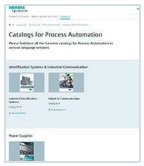


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Products for Process Instrumentation

Process Automation



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Supersedes:
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Flow Measurement 3
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Condition Monitoring 5
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Services for Process Instrumentation 10

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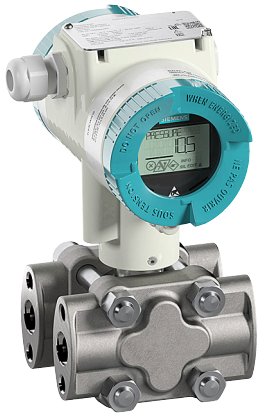
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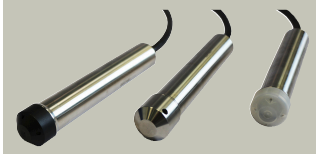
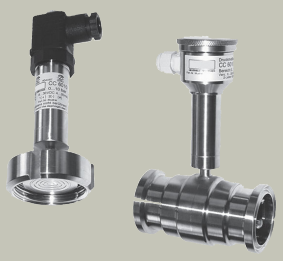
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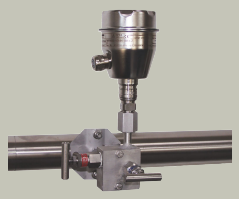
Overview

SITRANS P single-range transmitters for general applications			
	Area of application	**Device description**	**Software for parameterization**
SITRANS P2xx 	2-wire or 3-wire transmitters for measuring gauge and absolute pressure	**SITRANS P200** • Single-range transmitters for gauge and absolute pressure • Ceramic measuring cell • For general applications **SITRANS P210** • Single-range transmitters for gauge pressure • Stainless steel measuring cell • For low-pressure applications **SITRANS P220** • Single-range transmitters for gauge pressure • Stainless steel measuring cell, fully welded version • For high-pressure applications and refrigeration technology	– – –
SITRANS LH100 	2-wire transmitter for measuring hydrostatic level	• For measuring liquid levels in wells, vessels, channels, dams etc. • With ceramic diaphragm, Ø 23.4 mm (0.92 inch)	
SITRANS LH300 	2-wire transmitter for measuring hydrostatic level	• For measuring liquid levels in wells, vessels, channels, dams etc. • With ceramic diaphragm, Ø 30 mm (1.18 inches) • Suitable for small measuring ranges	–
SITRANS P Compact 	Transmitters for gauge and absolute pressure for food, pharmaceuticals and biotechnology CERTIFIED HYGIENIC ENGINEERING & DESIGN EHEDG EUROPEAN GROUP TYPE EL CLASS I January 2019	• Single-range transmitters with 2-wire system • Hygienic design with various aseptic connections in accordance with EHEDG, FDA and GMP recommendations	–

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Overview (continued)

SITRANS P transmitters for food, pharmaceuticals and biotechnology

	Area of application	Device description	Software for parameterization
SITRANS P300 	2-wire transmitter for measuring gauge and absolute pressure	• Hygiene-based design according to EHEDG, 3A, FDA and GMP • Parameterization using 3 buttons and communication over HART, PROFIBUS PA or FOUNDATION Fieldbus • Standard process connection G½", ½-NPT and flush-mounted process connections available • Measuring range adjustment 100: 1	SIMATIC PDM
Factory mounting of valve manifolds 		Factory-mounting of valve manifolds on SITRANS P300 gauge or absolute pressure transmitters • Simplified assembly • With pressure test • Stainless steel valve manifolds	–

SITRANS P transmitters for the paper industry

	Area of application	Device description	Software for parameterization
SITRANS P300 with PMC connection 	2-wire transmitter for measuring gauge pressure	• Measuring range adjustment 100: 1 • Process connections for the paper industry • Parameterization using 3 pushbuttons and HART, PROFIBUS PA or FOUNDATION Fieldbus	SIMATIC PDM

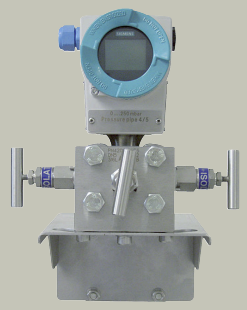
SITRANS P transmitters for applications with advanced requirements

	Area of application	Device description	Software for parameterization
SITRANS P320/P420 	2-wire transmitter for measuring: • Gauge pressure, • Absolute pressure, • Differential pressure and • Flow or • Level	• Measuring accuracy - SITRANS P320: 0.055% - SITRANS P420: 0.04% • Fast step response time of up to 105 ms • Developed according to IEC 61508, SIL2/3 applications • SIL validation remotely • Diagnostics according to Namur NE107 • 4-button operation	SIMATIC PDM

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Overview (continued)

Remote seal for SITRANS P transmitters			
	**Area of application** Remote seals for measuring viscous, corrosive or fibrous media (as well as media at extreme temperatures)	**Device description** Remote seal for SITRANS P300 and SITRANS P320/420 • Remote seal in sandwich and flange designs • Remote seal with quick-release for the food and beverages industry • Wide range of diaphragm materials and filling liquid available	**Software for parameterization** –

Valves			
	Area of application	**Device description**	**Software for parameterization**
Shut-off valves and valve manifolds 	Shutting off the medium and differential pressure lines Mounting of transmitter on valve manifold or shut-off valve	Shut-off valves and valve manifolds available in steel, brass or stainless steel Valve manifolds available for the various process connections of the SITRANS P transmitters	–
Accessories for valves 		The following parts are available as accessories for valves: • Oval flange • Connection pieces • Connection glands • Connection parts G½ • Water traps • Sealing rings acc. to EN 837-1 • Pressure surge reducers • Primary shut-off valves • Compensation vessels • Connection parts	–

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Overview



The SITRANS P200 pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

- With ceramic measuring cell
- Gauge and absolute measuring ranges 1 to 60 bar (15 to 1000 psi)
- For general applications

Benefits

- High measurement accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For corrosive and non-corrosive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

Application

The SITRANS P200 pressure transmitter for gauge and absolute pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug to EN 175301-803-A (IP65), an M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67). The output signal is 4 to 20 mA, 0 to 10 V or is available as an IO-Link signal.

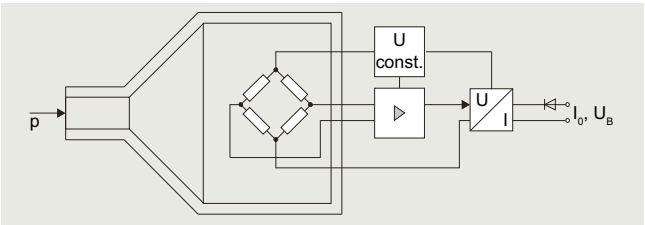
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug fulfilling EN 175301-803-A (IP65) or an M12 device plug (IP67). The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

Mode of operation



SITRANS P200 pressure transmitters (7MF1565-...), functional diagram

The ceramic measuring cell has a thick-film resistance bridge, to which the operating pressure p is transmitted through a ceramic diaphragm.

The measuring cell output voltage is fed to the amplifier and converted into a 4 to 20 mA output current, a DC 0 to 10 V output voltage or an IO-Link output signal.

Output current, output voltage or IO-Link signal are linearly proportional to the input pressure.

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Selection and ordering data

SITRANS P200 pressure transmitter, for pressure and absolute pressure for general applications				Article No. 7MF1565-											Order code		
				●	●	●	●	●	-	●	●	●	●		●	●	●
Characteristic curve deviation typ. 0.25% Material of wetted parts: Ceramic and stainless steel + gasket material Material of non-wetted parts: Stainless steel																	
Click the article number for online configuration in the PIA Life Cycle Portal.																	
Gauge pressure																	
Measuring range	**Minimum overload limit**	**Maximum overload limit**	**Burst pressure**														
0 ... 1 bar	-1 bar	3 bar	> 3 bar	**3**	**B**	**A**											
0 ... 1.6 bar	-1 bar	4.8 bar	> 4.8 bar	**3**	**B**	**B**											
0 ... 2.5 bar	-1 bar	7.5 bar	> 7.5 bar	**3**	**B**	**D**											
0 ... 4 bar	-1 bar	12 bar	> 12 bar	**3**	**B**	**E**											
0 ... 6 bar	-1 bar	15 bar	> 15 bar	**3**	**B**	**G**											
0 ... 10 bar	-1 bar	25 bar	> 25 bar	**3**	**C**	**A**											
0 ... 16 bar	-1 bar	40 bar	> 40 bar	**3**	**C**	**B**											
0 ... 25 bar	-1 bar	62.5 bar	> 62.5 bar	**3**	**C**	**D**											
0 ... 40 bar	-1 bar	100 bar	> 100 bar	**3**	**C**	**E**											
0 ... 60 bar	-1 bar	150 bar	> 150 bar	**3**	**C**	**G**											
Other version; Add order code and plain text: Measuring range: ... to ... bar (psi) Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible.				**9**	**A**	**A**									**H**	**1**	**Y**
Absolute pressure																	
Measuring range	**Minimum overload limit**	**Maximum overload limit**	**Burst pressure**														
0 ... 0.6 bar a	0 bar a	2.5 bar a	> 2.5 bar a	**5**	**A**	**G**											
0 ... 1 bar a	0 bar a	3 bar a	> 3 bar a	**5**	**B**	**A**											
0 ... 1.6 bar a	0 bar a	4.8 bar a	> 4.8 bar a	**5**	**B**	**B**											
0 ... 2.5 bar a	0 bar a	7.5 bar a	> 7.5 bar a	**5**	**B**	**D**											
0 ... 4 bar a	0 bar a	12 bar a	> 12 bar a	**5**	**B**	**E**											
0 ... 6 bar a	0 bar a	15 bar a	> 15 bar a	**5**	**B**	**G**											
0 ... 10 bar a	0 bar a	25 bar a	> 25 bar a	**5**	**C**	**A**											
0 ... 16 bar a	0 bar a	40 bar a	> 40 bar a	**5**	**C**	**B**											
Other version; Add order code and plain text: Measuring range: ... to ... mbar a (psi a). Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible. See input for the free measuring range under "Technical specifications".				**9**	**A**	**A**									**H**	**2**	**Y**
Measuring ranges for gauge pressure																	
0 ... 15 psi	-14.5 psi	45 psi a	> 45 psi a	**4**	**B**	**B**											
3 ... 15 psi	-14.5 psi	35 psi a	> 35 psi a	**4**	**B**	**C**											
0 ... 20 psi	-14.5 psi	60 psi a	> 60 psi a	**4**	**B**	**D**											
0 ... 30 psi	-14.5 psi	90 psi a	> 90 psi a	**4**	**B**	**E**											
0 ... 60 psi	-14.5 psi	150 psi a	> 150 psi a	**4**	**B**	**F**											
0 ... 100 psi	-14.5 psi	250 psi a	> 250 psi a	**4**	**B**	**G**											
0 ... 150 psi	-14.5 psi	375 psi a	> 375 psi a	**4**	**C**	**A**											
0 ... 200 psi	-14.5 psi	500 psi	> 500 psi	**4**	**C**	**B**											
0 ... 300 psi	-14.5 psi	750 psi	> 750 psi	**4**	**C**	**D**											
0 ... 500 psi	-14.5 psi	1250 psi	> 1250 psi	**4**	**C**	**E**											
0 ... 750 psi	-14.5 psi	1875 psi	> 1875 psi	**4**	**C**	**F**											
0 ... 1 000 psi	-14.5 psi	2 000 psi	> 2 000 psi	**4**	**C**	**G**											
Other version; Add order code and plain text: Measuring range: ... to ... psi Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible.				**9**	**A**	**A**									**H**	**1**	**Y**
Measuring ranges for absolute pressure																	
0 ... 10 psi a	0 psi a	35 psi a	> 35 psi a	**6**	**A**	**G**											
0 ... 15 psi a	0 psi a	45 psi a	> 45 psi a	**6**	**B**	**A**											
0 ... 20 psi a	0 psi a	60 psi a	> 60 psi a	**6**	**B**	**B**											

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Selection and ordering data (continued)

SITRANS P200 pressure transmitter, for pressure and absolute pressure for general applications				Article No. 7MF1565-										Order code		
				●	●	●	●	●	-	●	●	●	●		●	●	●
0 ... 30 psi a	0 psi a	90 psi a	> 90 psi a	6	B	D											
0 ... 60 psi a	0 psi a	150 psi a	> 150 psi a	6	B	E											
0 ... 100 psi a	0 psi a	250 psi a	> 250 psi a	6	B	G											
0 ... 150 psi a	0 psi a	375 psi a	> 375 psi a	6	C	A											
0 ... 200 psi a	0 psi a	500 psi a	> 500 psi a	6	C	B											
0 ... 300 psi a	0 psi a	800 psi a	> 800 psi a	6	C	C											
Other version; Add order code and plain text: Measuring range: ... to ... psi a Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible.				9	A	A								H	2	Y
Output signal																
4 ... 20 mA; 2-wire system; auxiliary power DC 7 ... 33 V (DC 10 ... 30 V for explosion protection)							0									
0 ... 10 V; 3-wire system; auxiliary power 12 ... 33 V DC							1	0								
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC							2	0								
Ratiometric 10 ... 90%; 3-wire system; auxiliary power 5 V DC ± 10%							3	0								
IO-Link interface (only with M12 plug, measuring range bar and without explosion protection)							7	0								
Explosion protection (only 4 ... 20 mA)																
None								0								
With explosion protection Ex ia IIC T4								1								
Electrical connection																
Plug according to EN 175301-803-A, stuffing box thread M16 (with coupling)										1						
M12 device plug according to IEC 61076-2-101										2						
Connection via permanently installed cable, 2 m (6.6 ft); not for "Intrinsic safety" type of protection								0		3						
Quick-screw cable gland Quickon PG9; not for "Intrinsic safety" type of protection								0		4						
Plug according to EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)										5						
Plug according to EN 175301-803-A, stuffing box thread PG11 (with coupling)										6						
Permanently installed cable, length 5 m (16.4 ft)								0		7						
Process connection																
G½" male according to EN 837-1 (½" BSP male): Standard for metric pressure ranges mbar, bar											A					
G½" male and G1/8" female											B					
G¼" male according to EN 837-1 (¼" BSP male)											C					
7/16"-20 UNF male											D					
¼"-18 NPT male: Standard for pressure ranges inH_2O and psi											E					
¼"-18 NPT female											F					
½"-14 NPT male											G					
½"-14 NPT female											H					
7/16"-20 UNF female											J					
M20×1.5 male											P					
G¼" according to EN ISO 1179-2 (formerly DIN 3852 form E)											Q					
G½" according to EN ISO 1179-2 (formerly DIN 3852 form E)											R					
Schrader nipple											U					
Gasket material between sensor and enclosure																
Viton (FPM, standard)												A				
MVQ												B				
Perbunan (NBR)												C				
EPDM												D				
Version																
Standard version													1			

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Selection and ordering data (continued)

Options	Order code
Add **"-Z"** to article number and specify order code.	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	**C11**
Oxygen version, free of oil and degreased, max. operating pressure 60 bar (870.2 psi), max. medium temperature +85 °C (185 °F) Notice Only with Viton gasket material between sensor and enclosure, and not with explosion protection version!	**E10**

Technical specifications

SITRANS P200 for gauge and absolute pressure	
Area of application	
Gauge and absolute pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)
Measured variable	Gauge and absolute pressure
Input	
Measuring range	
• Gauge pressure	
- Metric	1 ... 60 bar (15 ... 870 psi)
- US measuring range	15 ... 1000 psi
• Absolute pressure	
- Metric	0.6 ... 16 bar a (10 ... 232 psi a)
- US measuring range	10 ... 300 psi a
Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible. Input for the free measuring range 9AA H1Y/H2Y: In the case of overlaps, the sensor with the smallest measurement deviation is always selected as the standard sensor. The atmospheric pressure must always be within the selected measuring range. - Highest measured value: Max. ±50% of the standard sensor. - Lowest measured value: -1 bar and absolute 0 bar to 50% of the sensor measuring range. - Measuring span: At least 50% of the sensor measuring range gauge pressure -1.0 ... 60.0 bar, absolute pressure 0.0 ... 16.0 bar	
Output	
Current signal	4 ... 20 mA
• Load	(U_B - 10 V)/0.02 A
• Auxiliary power U_B	7 ... 33 V DC (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U_B	12 ... 33 V DC
• Current consumption	< 7 mA at 10 kΩ
Radiometric output	10 ... 90%
• Load	≥ 10 kΩ
• Auxiliary power U_B	DC 5 V ± 10%
• Current consumption	< 7 mA at 10 Ω
• Characteristic curve	Linear rising
IO-Link interface	L+: 18 ... 33 V DC L-: GND C/Q: IO-Link / Switching output DI/DQ: Switching output Pressure transmitter is only approved for port class A
• Auxiliary power	UB 18-33 V
• Port class	A

Technical specifications (continued)

SITRANS P200 for gauge and absolute pressure	
• Characteristic curve	Linear rising
Measuring accuracy	
Measurement deviation at limit setting including hysteresis and reproducibility	• Typical: 0.25% of measuring span • Maximum: 0.5% of measuring span
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25% of measuring span/year
Effect of ambient temperature	
• Lower range value and measuring span	0.2%/10 K of measuring span
• Influence of power supply	0.005%/V
Operating conditions	
Process temperature with sealing ring made of:	
• FPM (standard)	-15 ... +125 °C (5 ... 257 °F)
• MVQ	-40 ... +125 °C (-40 ... +257 °F) Explosion protection: -30 ... +120 °C (-22 ... +248 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-40 ... +125 °C (-40 ... +257 °F), usable for drinking water
Ambient temperature	-30 ... +85 °C (-22 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection according to IEC 60529	• IP00 with RAST 2.5 plug • IP65 with plug according to EN 175301-803-A • IP67 with M12 device plug • IP67 with cable • IP67 with cable quick screw connection
Electromagnetic compatibility	• According to IEC 61326-1/-2/-3 • According to NAMUR NE21 for ATEX devices only, and with a max. measurement error of ≤ 1% • CE-compliant in accordance with EN 61326-2-3
Structural design	
Weight	Approx. 0.090 kg (0.198 lbs)
Process connections	See dimension drawings
Electrical connections	• Plug according to EN 175301-803-A Form A with cable entry M16x1.5 or ½-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm^2) cable (Ø ± 5.4 mm) • Quickon cable quick screw connection
Material of wetted parts	
• Measuring cell	Al_2O_3 - 96%
• Process connection	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Sealing ring	• FPM (standard) • MVQ • Perbunan • EPDM
Material of non-wetted parts	
• Enclosure	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Connector housing	Plastic
• Cable	PVC

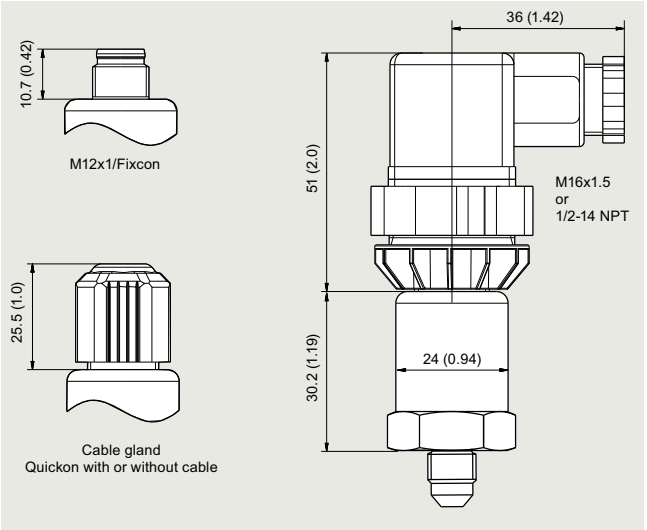
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Technical specifications (continued)

SITRANS P200 for gauge and absolute pressure	
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Lloyd's Register of Shipping (LR)[1)]	12/20010
Germanischer Lloyd (GL)[1)]	GL19740 11 HH00
American Bureau of Shipping (ABS)[1)]	ABS_11_HG 789392_PDA
Bureau Veritas (BV)[1)]	BV 271007A0 BV
Det Norske Veritas (DNV)[1)]	A 12553
Drinking water approval (ACS)[1)]	NSF/ANSI 61/372 according to MH60087
EAC[1)]	№ TC RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
Underwriters Laboratories (UL)[1)]	
• For the USA and Canada	UL 20110217 - E34453
• Worldwide	IEC UL DK 21845
Explosion protection	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
EC type-examination certificate	SEV 15 ATEX 0173
Connection to certified intrinsically safe ohmic circuits with maximum values	For ratiometric 10 ... 90%: Ui < 15 V DC; Ii < 200 mA; Pi < 750 mW
Effective internal inductance and capacity for versions with plugs according to EN 175301-803-A and M12	For ratiometric 10 ... 90%: Li = 0 nH; Ci < 150 nF

[1)] For variants with output signal 0 ... 5 V and radiometric output available soon.

Dimensional drawings

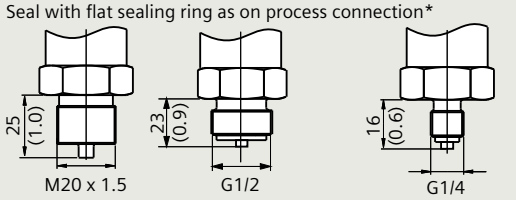


SITRANS P200, electrical connections, dimensions in mm (inch)

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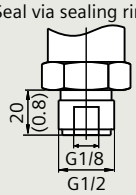
Dimensional drawings (continued)

Seal with flat sealing ring as on process connection*



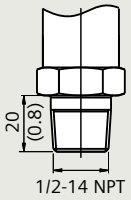
max. 30 Nm max. 20 Nm

Seal via sealing ring on flange below hexagon*

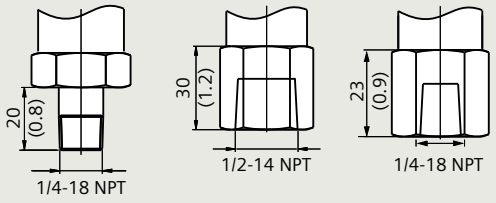


max. 30 Nm

Seal with sealing tape in the thread*

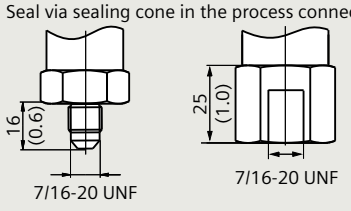


max. 30 Nm



max. 20 Nm

Seal via sealing cone in the process connection

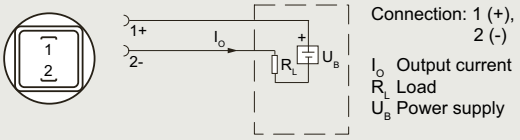


max. 20 Nm

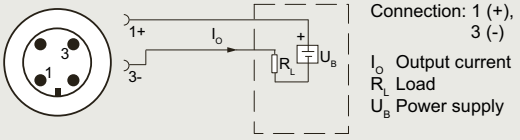
* Not included in product package

SITRANS P200, process connections, dimensions in mm (inch)

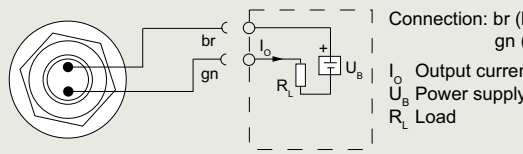
Circuit diagrams



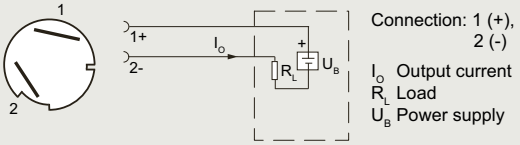
Connection with current output and plug according to EN 175301



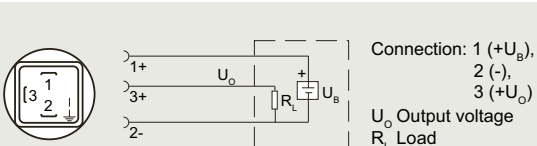
Connection with current output and M12x1 device plug



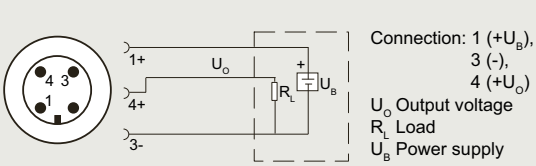
Connection with current output and cable



Connection with current output and Quickon cable quick screw connection



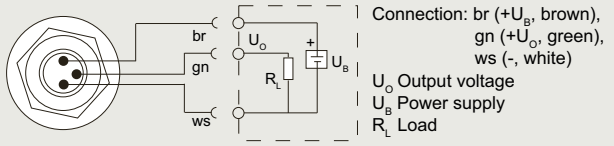
Connection with voltage output, ratiometric output and plug according to EN 175301



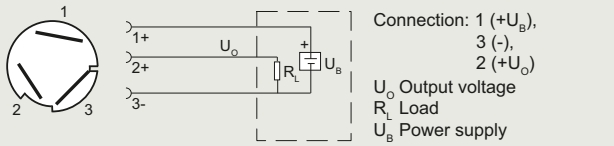
Connection with voltage output, ratiometric output and M12x1 device plug

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Circuit diagrams (continued)



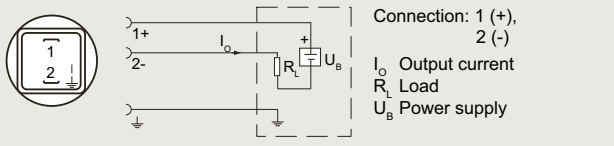
Connection with voltage output, ratiometric output and cable



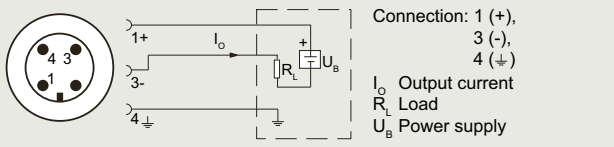
Connection with voltage output, ratiometric output and Quickon fast cable termination

Device design with explosion protection: 4 to 20 mA

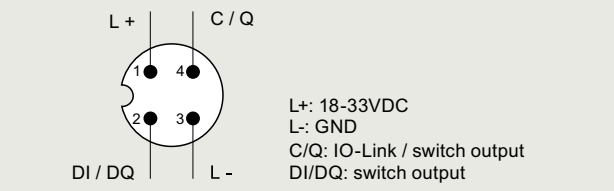
The grounding connection is conductively bonded to the transmitter enclosure.



Connection with current output and plug according to EN 175301 (Ex)



Connection with current output and M12x1 (Ex) device plug



Connection with IO-Link interface, only possible with M12 plug

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Overview



The SITRANS P210 pressure transmitter measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell
- Measuring ranges 100 to 600 mbar (1.45 to 8.7 psi) relative
- For low-pressure applications

Benefits

- High measurement accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For corrosive and non-corrosive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

Application

The SITRANS P210 pressure transmitter for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Energy development
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug to EN 175301-803-A (IP65), an M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67). The output signal is between 4 and 20 mA or 0 and 10 V

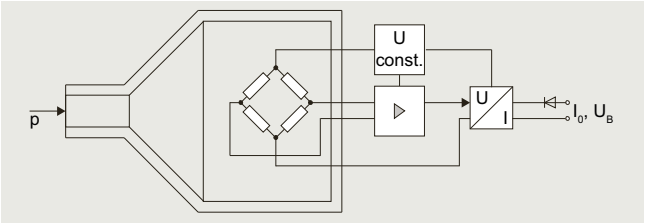
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug fulfilling EN 175301-803-A (IP65) or an M12 device plug (IP67). The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P210 pressure transmitter (7MF1566-...), functional diagram

The stainless steel measuring cell with silicone oil filling has a thin-film resistance bridge to which the operating pressure p is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

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Selection and ordering data

SITRANS P210 pressure transmitter for gauge pressure, for low-pressure applications	Article No. 7MF1566-	Order code
Measurement deviation typ. 0.25% Material of wetted parts: Stainless steel + gasket material Material of non-wetted parts: Stainless steel		
Click the article number for online configuration in the PIA Life Cycle Portal.		
Gauge pressure		
Measuring range / **Minimum overload limit** / **Maximum overload limit** / **Burst pressure**		
0...100 mbar (1.45 psi) / -300 mbar (-4.35 psi) / 2 bar (29 psi) / 2 bar (29 psi)	● ● ● ● ● -	3 A A
0...160 mbar (2.32 psi) / -300 mbar (-4.35 psi) / 2 bar (29 psi) / 2 bar (29 psi)		3 A B
0...250 mbar (3.63 psi) / -300 mbar (-4.35 psi) / 2 bar (29 psi) / 2 bar (29 psi)		3 A C
0...400 mbar (5.8 psi) / -300 mbar (-4.35 psi) / 2 bar (29 psi) / 2 bar (29 psi)		3 A D
0...600 mbar (8.7 psi) / -300 mbar (-4.35 psi) / 2 bar (29 psi) / 2 bar (29 psi)		3 A G
Other version; Add order code and plain text: Measuring range: ... to ... mbar (psi). Note: See input for the free measuring range under "Technical specifications".		9 A A H 1 Y
Output signal		
4 ... 20 mA; 2-wire system; auxiliary power DC 10 ... 33 V (DC 10 ... 30 V for ATEX devices)		0
0 ... 10 V; 3-wire system; auxiliary power 12 ... 33 V DC		1 0
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC		2 0
Ratiometric 10 ... 90%; 3-wire system; auxiliary power 5 V DC ± 10%		3 0
Explosion protection (only 4 ... 20 mA)		
None		0
With explosion protection Ex ia IIC T4		1
Electrical connection		
Plug according to EN 175301-803-A, stuffing box thread M16 (with coupling)		1
M12 device plug according to IEC 61076-2-101		2
Connection via permanently installed cable, 2 m (6.6 ft); not for "Intrinsic safety" type of protection		0 3
Quick-screw cable gland Quickon PG9; not for "Intrinsic safety" type of protection		0 4
Plug according to EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)		5
Plug according to EN 175301-803-A, stuffing box thread PG11 (with coupling)		6
Permanently installed cable, length 5 m (16.4 ft)		0 7
Process connection		
G½" male according to EN 837-1 (½" BSP male): Standard for metric pressure ranges mbar, bar		A
G½" male and G1/8" female		B
G¼" male according to EN 837-1 (¼" BSP male)		C
7/16"-20 UNF male		D
¼"-18 NPT male: Standard for pressure ranges inH_2O and psi		E
¼"-18 NPT female		F
½"-14 NPT male		G
½"-14 NPT female		H
7/16"-20 UNF female		J
M20×1.5 male		P
G¼" according to EN ISO 1179-2 (formerly DIN 3852 form E)		Q
G½" according to EN ISO 1179-2 (formerly DIN 3852 form E)		R
Gasket material between sensor and enclosure		
Viton (FPM, standard)		A
Neoprene (CR)		B
Perbunan (NBR)		C
EPDM		D
Special design		Z Q 1 Y
Version		
Standard version		1

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Selection and ordering data (continued)

Options	Order code
Add **"-Z"** to article number and specify order code.	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	**C11**

Technical specifications

SITRANS P210 for gauge pressure	
Area of application	
Gauge pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable	Gauge pressure
Input	
Measuring range	
• Gauge pressure	100 ... 600 mbar (1.45 ... 8.7 psi)
Note: Input for the free measuring range 9AA H1Y/H2Y: In the case of overlaps, the sensor with the smallest measurement deviation is always selected as the standard sensor. The atmospheric pressure must always be within the selected measuring range. - Highest measured value: Max. ±50% of the standard sensor. - Lowest measured value: -300 bar to 50% of the sensor measuring range. - Measuring span: At least 50% of the sensor measuring range -600 ... 600 mbar	
Output	
Current signal	4 ... 20 mA
• Load	$(U_B - 10\ V)/0.02\ A$
• Auxiliary power U_B	DC 10 ... 33 V (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U_B	12 ... 33 V DC
• Current consumption	< 5 mA at 10 kΩ
Radiometric output	10 ... 90%
• Load	≥ 10 kΩ
• Auxiliary power U_B	DC 5 V ± 10%
• Current consumption	< 5 mA at 10 kΩ
Characteristic curve	Linear rising
Measuring accuracy	
Measurement deviation at limit setting including hysteresis and reproducibility	• Typical: 0.35% of measuring span • Maximum: 0.5% of measuring span
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25% of measuring span/year
Effect of ambient temperature	
• Lower range value and measuring span	• 0.25%/10 K of measuring span • 0.5%/10 K of measuring span for a measuring range 100 ... 400 mbar (40 ... 240 inH_2O)
• Influence of power supply	0.005%/V
Operating conditions	
Process temperature with sealing ring made of:	
• FPM (standard)	-15 ... +125 °C (5 ... 257 °F)
• Neoprene	-35 ... +100 °C (-31 ... +212 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-25 ... +85 °C (-13 ... +185 °F), usable for drinking water
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
Storage temperature	-40 ... +85 °C (-40 ... +185 °F)

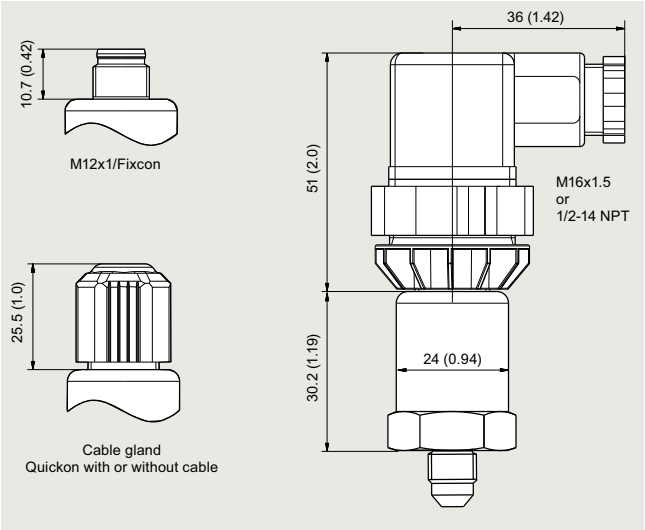
Technical specifications (continued)

SITRANS P210 for gauge pressure	
Degree of protection according to IEC 60529	• IP65 with plug according to EN 175301-803-A • IP67 with M12 device plug • IP67 with cable • IP67 with cable quick screw connection
Electromagnetic compatibility	CE-compliant in accordance with EN 61326-2-3
Mounting position	Vertical, facing up
Structural design	
Weight	Approx. 120 g (0.264 lb)
Process connections	See dimension drawings
Electrical connections	• Plug according to EN 175301-803-A Form A with cable entry M16x1.5 or ½-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm^2) cable (Ø ± 5.4 mm) • Quickon cable quick screw connection
Material of wetted parts	
• Measuring cell	Stainless steel, mat. no. 1.4435
• Process connection	Stainless steel 1.4404 / AISI 316L
• Sealing ring	• FPM (standard) • Neoprene • Perbunan • EPDM
Material of non-wetted parts	
• Enclosure	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Connector housing	Plastic
• Cable	PVC
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; meets requirements as per article 4, paragraph 3 (sound engineering practice)
Lloyd's Register of Shipping (LR)[1)]	12/20010
Germanischer Lloyd (GL)[1)]	GL19740 11 HH00
American Bureau of Shipping (ABS)[1)]	ABS_11_HG 789392_PDA
Bureau Veritas (BV)[1)]	BV 271007A0 BV
Det Norske Veritas (DNV)[1)]	A 12553
Drinking water approval (ACS)[1)]	ACS 15 ACC NY 360
EAC[1)]	№ ТС RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
Underwriters Laboratories (UL)[1)]	
• For the USA and Canada	UL 20110217 - E34453
• Worldwide	IEC UL DK 21845
Explosion protection	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II ½ D Ex ia IIIC T120°C Da/Db
EC type-examination certificate	SEV 10 ATEX 0146
Connection to certified intrinsically safe ohmic circuits with maximum values	$U_i \leq$ DC 30 V; $I_i \leq$ 100 mA; $P_i \leq$ 0.75 W
Effective internal inductance and capacity for versions with plugs according to EN 175301-803-A and M12	L_i = 0 nH; C_i = 0 nF

[1)] For variants with output signal 0 ... 5 V and radiometric output available soon.

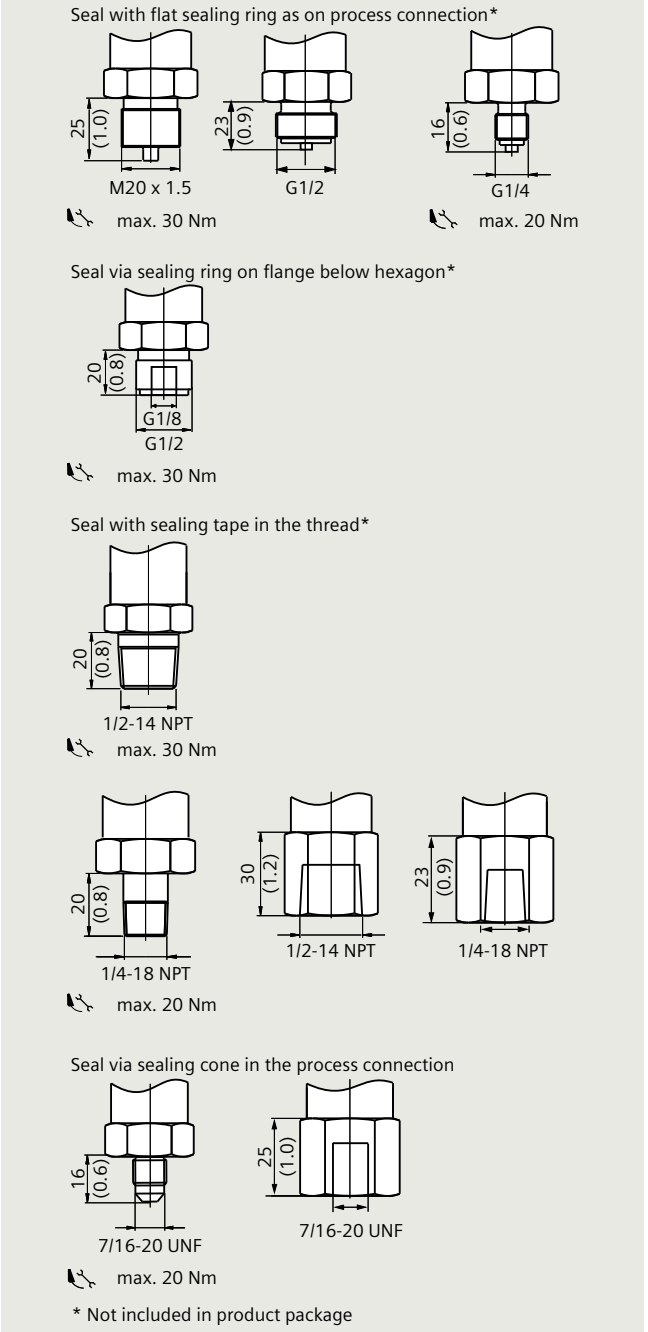
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Dimensional drawings



SITRANS P210, electrical connections, dimensions in mm (inch)

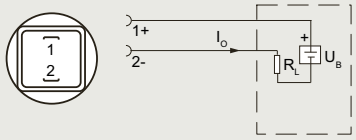
Dimensional drawings (continued)



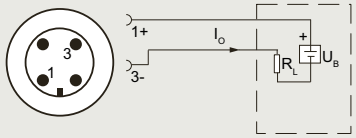
SITRANS P210, process connections, dimensions in mm (inch)

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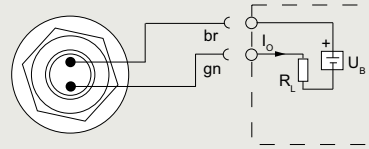
Circuit diagrams



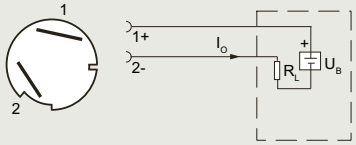
Connection with current output and plug according to EN 175301



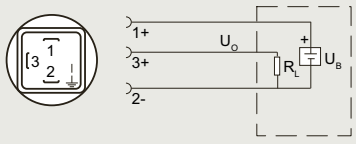
Connection with current output and M12x1 device plug



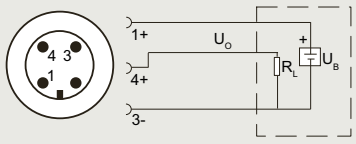
Connection with current output and cable



Connection with current output and Quickon cable quick screw connection

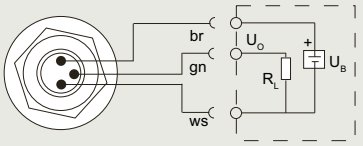


Connection with voltage output, ratiometric output and plug according to EN 175301

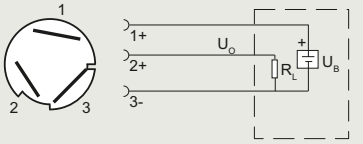


Connection with voltage output, ratiometric output and M12x1 device plug

Circuit diagrams (continued)



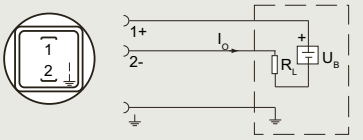
Connection with voltage output, ratiometric output and cable



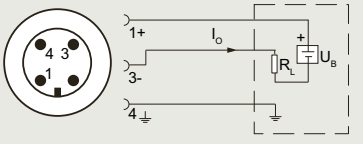
Connection with voltage output, ratiometric output and Quickon fast cable termination

Device design with explosion protection: 4 to 20 mA

The grounding connection is conductively bonded to the transmitter enclosure.



Connection with current output and plug according to EN 175301 (Ex)



Connection with current output and M12x1 (Ex) device plug

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Overview



The SITRANS P220 pressure transmitter measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell, fully welded
- Measuring ranges 2.5 to 1 000 bar (36.3 to 14 500 psi) relative
- For high-pressure applications and refrigeration technology

Benefits

- High measurement accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For corrosive and non-corrosive media
- For measuring the pressure of liquids, gases and vapors
- Compact design
- Gasket-less

Application

The SITRANS P220 pressure transmitter for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Energy development
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug to EN 175301-803-A (IP65), an M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67). The output signal is 4 to 20 mA, 0 to 10 V or is available as an IO-Link signal.

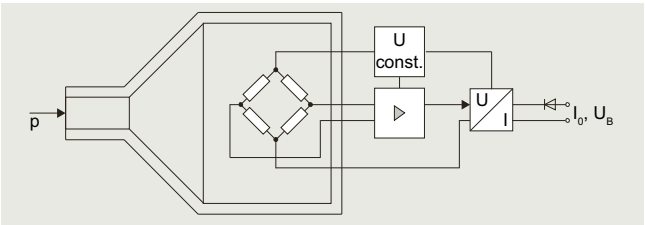
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug fulfilling EN 175301-803-A (IP65) or an M12 device plug (IP67). The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P220 pressure transmitters (7MF1567-...), functional diagram

The stainless steel measuring cell has a thick-film resistance bridge to which the operating pressure p is transmitted through a stainless steel diaphragm.

The measuring cell output voltage is fed to the amplifier and converted into a 4 to 20 mA output current, a DC 0 to 10 V output voltage or an IO-Link output signal.

Output current, output voltage or IO-Link signal are linearly proportional to the input pressure.

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Selection and ordering data

SITRANS P220 pressure transmitter for gauge pressure, for high-pressure and cold applications, fully-welded version				Article No. 7MF1567-												Order code		
				●	●	●	●	●	-	●	●	A	●			●	●	●
Measurement deviation typ. 0.25% Material of wetted parts: Stainless steel Material of non-wetted parts: Stainless steel																		
Click the article number for online configuration in the PIA Life Cycle Portal.																		
Gauge pressure																		
Measuring range	**Minimum overload limit**	**Maximum overload limit**	**Burst pressure**															
0 ... 2.5 bar	-1 bar	12.5 bar	25 bar	**3**	**B**	**D**												
0 ... 4 bar	-1 bar	20 bar	40 bar	**3**	**B**	**E**												
0 ... 6 bar	-1 bar	30 bar	60 bar	**3**	**B**	**G**												
0 ... 10 bar	-1 bar	30 bar	60 bar	**3**	**C**	**A**												
0 ... 16 bar	-1 bar	48 bar	96 bar	**3**	**C**	**B**												
0 ... 25 bar	-1 bar	75 bar	150 bar	**3**	**C**	**D**												
0 ... 40 bar	-1 bar	120 bar	240 bar	**3**	**C**	**E**												
0 ... 60 bar	-1 bar	180 bar	360 bar	**3**	**C**	**G**												
0 ... 100 bar	-1 bar	300 bar	600 bar	**3**	**D**	**A**												
0 ... 160 bar	-1 bar	480 bar	960 bar	**3**	**D**	**B**												
0 ... 250 bar	-1 bar	750 bar	1 500 bar	**3**	**D**	**D**												
0 ... 400 bar	-1 bar	1 200 bar	2 400 bar	**3**	**D**	**E**												
0 ... 600 bar	-1 bar	1 500 bar	2 500 bar	**3**	**D**	**G**												
0 ... 1000 bar	-1 bar	1 500 bar	2 500 bar	**3**	**E**	**A**												
Other version; Add order code and plain text: Measuring range: ... to ... bar (psi) Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible.				**9**	**A**	**A**										**H**	**1**	**Y**
Measuring ranges for gauge pressure																		
0 ... 30 psi	-14.5 psi	150 psi	300 psi	**4**	**B**	**E**	1)											
0 ... 60 psi	-14.5 psi	300 psi	600 psi	**4**	**B**	**F**	1)											
0 ... 100 psi	-14.5 psi	300 psi	600 psi	**4**	**B**	**G**	1)											
0 ... 150 psi	-14.5 psi	375 psi	870 psi	**4**	**C**	**A**	1)											
0 ... 200 psi	-14.5 psi	600 psi	1 200 psi	**4**	**C**	**B**	1)											
0 ... 300 psi	-14.5 psi	900 psi	1 800 psi	**4**	**C**	**D**	1)											
0 ... 500 psi	-14.5 psi	1 500 psi	3 000 psi	**4**	**C**	**E**	1)											
0 ... 750 psi	-14.5 psi	2 250 psi	4 500 psi	**4**	**C**	**F**	1)											
0 ... 1 000 psi	-14.5 psi	3 000 psi	6 000 psi	**4**	**C**	**G**	1)											
0 ... 1 500 psi	-14.5 psi	4 500 psi	9 000 psi	**4**	**D**	**A**	1)											
0 ... 2 000 psi	-14.5 psi	6 000 psi	12 000 psi	**4**	**D**	**B**	1)											
0 ... 3 000 psi	-14.5 psi	9 000 psi	18 000 psi	**4**	**D**	**D**	1)											
0 ... 5 000 psi	-14.5 psi	15 000 psi	30 000 psi	**4**	**D**	**E**	1)											
0 ... 6 000 psi	-14.5 psi	18 000 psi	36 000 psi	**4**	**D**	**F**	1)											
0 ... 8 700 psi	-14.5 psi	21 750 psi	36 250 psi	**4**	**D**	**G**	1)											
0 ... 14 500 psi	-14.5 psi	21 750 psi	36 250 psi	**4**	**E**	**A**												
Other version; Add order code and plain text: Measuring range: ... to ... psi Note: For transmitters with IO-Link output signal, no measuring range in the unit psi is possible. See input for the free measuring range under "Technical specifications"				**9**	**A**	**A**										**H**	**1**	**Y**
Output signal																		
4 ... 20 mA; 2-wire system, auxiliary power 7 ... 33 V DC (10 ... 30 V DC for ATEX devices)1)							**0**											
0 ... 10 V; 3-wire system; auxiliary power 12 ... 33 V DC							**1**	**0**										
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC							**2**	**0**										
Ratiometric 10 ... 90%; 3-wire system; auxiliary power 5 V DC ± 10%							**3**	**0**										
IO-Link interface For article number: 7MF1565-***70-2***																		
IO-Link interface (only with M12 plug, measuring range bar and without explosion protection)							**7**	**0**										

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Selection and ordering data (continued)

SITRANS P220 pressure transmitter for gauge pressure, for high-pressure and cold applications, fully-welded version	Article No. 7MF1567-											Order code		
	●	●	●	●	●	-	●	●	A	●		●	●	●
Explosion protection (only 4 ... 20 mA)														
None					0									
With explosion protection Ex ia IIC T4[1]					1									
Electrical connection														
Plug according to EN 175301-803-A, stuffing box thread M16 (with coupling)[1]							1							
M12 device plug according to IEC 61076-2-101							2							
Connection via permanently installed cable, 2 m (6.6 ft); not for "Intrinsic safety" type of protection					0		3							
Quick-screw cable gland Quickon PG9; not for "Intrinsic safety" type of protection					0		4							
Plug according to EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)[1]							5							
Plug according to EN 175301-803-A, stuffing box thread PG11 (with coupling)[1]							6							
Permanently installed cable, length 5 m (16.4 ft)					0		7							
Special design							9					N	1	Y
Process connection														
G½" external according to EN 837-1 (½" BSP external) (standard for metric pressure ranges mbar, bar)								A						
G½" external and G1/8" internal								B						
G¼" external according to EN 837-1 (¼" BSP external)								C						
7/16"-20 UNF external								D						
¼"-18 NPT external (standard for pressure ranges inH_2O and psi)[1]								E						
¼"-18 NPT internal								F						
½"-14 NPT external								G						
½"-14 NPT internal								H						
7/16"-20 UNF internal								J						
M20×1.5 external								P						
G¼" according to EN ISO 1179-2 (formerly DIN 3852 form E)								Q						
G½" according to EN ISO 1179-2 (formerly DIN 3852 form E)								R						
Process connection G1/2" with double seal and pointed pressure orifice								S						
Process connection G1/2 to DIN 3852, form E with pointed pressure orifice								T						
Process connection Schrader nipple								U						
Version														
Standard version[1]										1				

[1] Order code E21 required for complete configurations with CRN and $_cCSA_{us}$ Ex approval.

Options	Order code
Add **"-Z"** to article number and specify order code.	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2 (not possible for measuring ranges > 0 ... 600 bar/0 ... 8 702 psi)	**C11**
Oxygen version, free of oil and degreased (not in combination with explosion protection version!)	**E10**
With CRN and $_cCSA_{us}$ Ex approval (only for measuring ranges 0 ... 30 psi to 0 ... 8 700 psi)	**E21**

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Technical specifications

SITRANS P220 for gauge pressure	
Area of application	
Gauge pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable	Gauge pressure
Input	
Measuring range	
• Gauge pressure	
- Metric	2.5 ... 1 000 bar (36 ... 14 500 psi)
- US measuring range	30 ... 14 500 psi
Note: For transmitters with IO-Link output signal, no measuring range in the unit psi is possible. Input for the free measuring range 9AA H1Y/H2Y: In the case of overlaps, the sensor with the smallest measurement deviation is always selected as the standard sensor. The atmospheric pressure must always be within the selected measuring range. - Highest measured value: Max. ±50% of the standard sensor. - Lowest measured value: -1 bar to 50% of the sensor measuring range. - Measuring span: At least 50% of the sensor measuring range -1.0 ... 1050 mbar	
Output	
Current signal	4 ... 20 mA
• Load	(U_B - 7 V)/0.02 A (U_B - 10 V for Ex)
• Auxiliary power U_B	7 ... 33 V DC (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U_B	12 ... 33 V DC
• Current consumption	< 7 mA at 10 kΩ
Radiometric output	10 ... 90%
• Load	≥ 10 kΩ
• Auxiliary power U_B	DC 5 V ± 10%
• Current consumption	< 7 mA at 10 kΩ
• Characteristic curve	Linear rising
IO-Link interface	L+: 18 ... 33 V DC L-: GND C/Q: IO-Link / Switching output DI/DQ: Switching output Pressure transmitter is only approved for port class A
• Auxiliary power	UB 18-33 V
• Port class	A
• Characteristic curve	Linear rising
Measuring accuracy	
Measurement deviation at limit setting including hysteresis and reproducibility	• Typical: 0.25% of measuring span • Maximum: 0.5% of measuring span
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25% of measuring span/year
Effect of ambient temperature	
• Lower range value and measuring span	0.2%/10 K of measuring span
• Influence of power supply	0.005%/V
Operating conditions	
Process temperature	-40 ... +135 °C (-40 ... +275 °F) or -30 ... +120 °C (-22 ... +248 °F) for devices with explosion protection intrinsic safety "i"
Ambient temperature	-30 ... +85 °C (-22 ... +185 °F) or -25 ... +85 °C (-13 ... +185 °F) for devices with explosion protection intrinsic safety "i"
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)

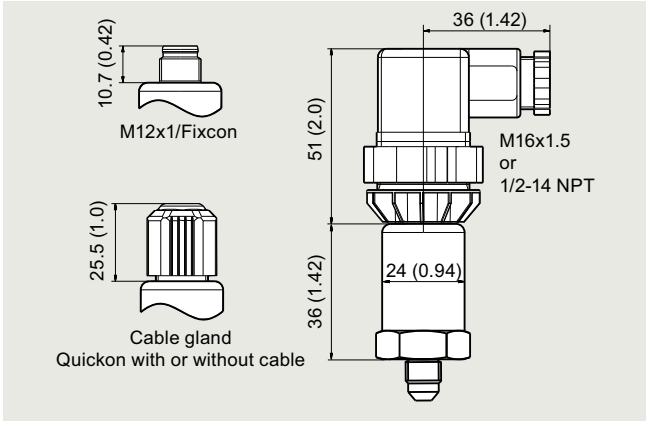
Technical specifications (continued)

SITRANS P220 for gauge pressure	
Degree of protection according to IEC 60529	• IP65 with plug according to EN 175301-803-A • IP67 with M12 device plug • IP67 with cable • IP67 with cable quick screw connection • IP00, RAST 2.5 plug (3-wire only)
Electromagnetic compatibility	CE-compliant in accordance with EN 61326-2-3
Structural design	
Weight	Approx. 0.090 kg (0.198 lbs)
Process connections	See dimension drawings
Electrical connections	• Plug according to EN 175301-803-A Form A with cable entry M16x1.5 or ½-14 NPT or PG 11 • Device plug M12 • 2 or 3-wire (0.5 mm²) cable (Ø ± 5.4 mm) • Quickon cable quick screw connection
Material of wetted parts	
• Measuring cell	Stainless steel, mat. no. 1.4016
• Process connection	Stainless steel 1.4404 / AISI 316L (internal thread Schrader 1.4305 / AISI 303 only)
Material of non-wetted parts	
• Enclosure	Stainless steel 1.4404 / AISI 316L (internal thread Schrader 1.4305 / AISI 303 only)
• Connector housing	Polyarylamide 50% GF UL 94 V-0
• Cable	PVC
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Lloyd's Register of Shipping (LR)[1]	12/20010
Germanischer Lloyd (GL)[1]	GL19740 11 HH00
American Bureau of Shipping (ABS)[1]	ABS_11_HG 789392_PDA
Bureau Veritas (BV)[1]	BV 271007A0 BV
Det Norske Veritas (DNV)[1]	A 12553
Note: Sensors for the Chinese market "Made in China" do not have marine approval.	
Drinking water approval (ACS)[1]	ACS 15 ACC NY 360
EAC[1]	№ ТС RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
CRN[2]	0F18659.5C
Underwriters Laboratories (UL)[1]	
• For the USA and Canada	UL 20110217 - E34453
• Worldwide	IEC UL DK 21845
Explosion protection	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
EC type-examination certificate	For ratiometric 10 ... 90%: SEV 15 ATEX 0173
Connection to certified intrinsically safe ohmic circuits with maximum values	For ratiometric 10 ... 90%: Ui < 15 V DC; Ii < 200 mA; Pi < 750 mW
Effective internal inductance and capacity for versions with plugs according to EN 175301-803-A and M12	For ratiometric 10 ... 90%: Li = 0 nH; Ci < 150 nF
CSA[2]	70006348 Class I, Division I, Groups A, B, C&D; Class II, Division 1, Groups E, F and G, Class III Class I, Division 2,Groups A, B, C and D; Class II, Division 2, Groups F and G, Class III A/Ex ia IIC T4 Ga/Gb A/Ex ia IIIC T125°C Da/Db

1) For variants with output signal 0 ... 5 V and radiometric output available soon.
2) See ordering data for available versions.

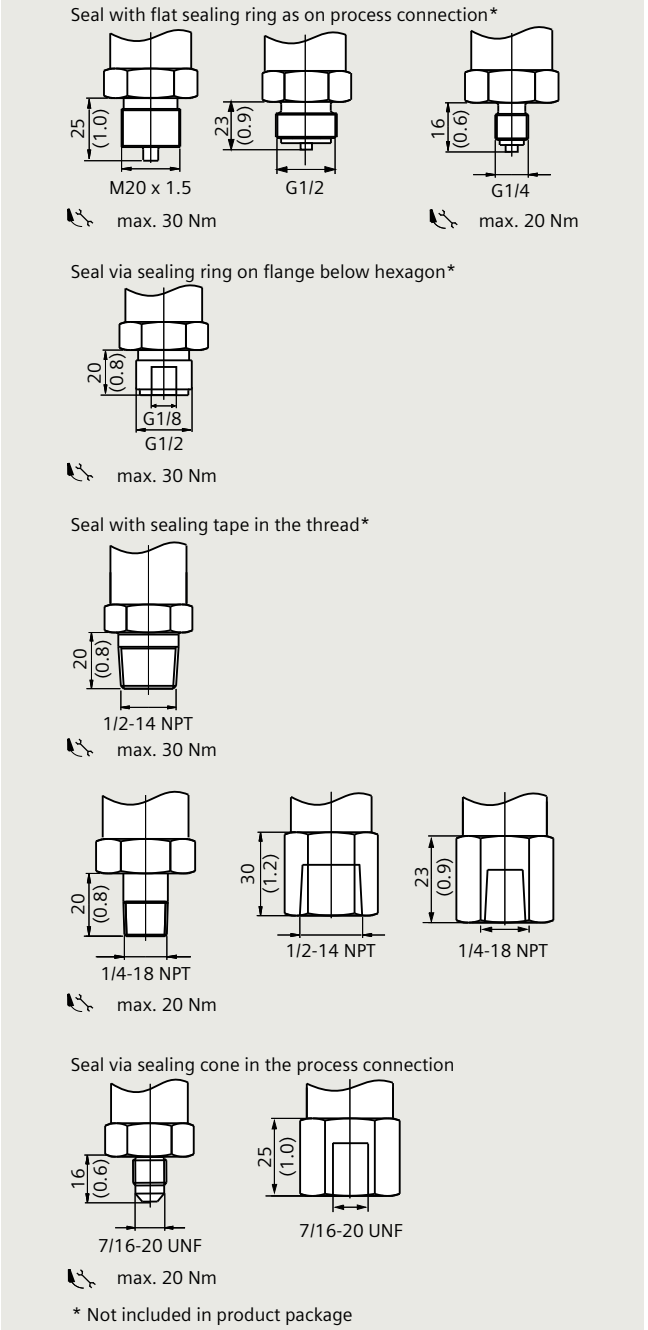
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Dimensional drawings



SITRANS P220, electrical connections, dimensions in mm (inch)

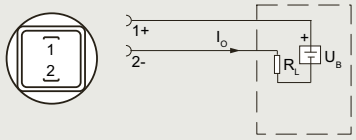
Dimensional drawings (continued)



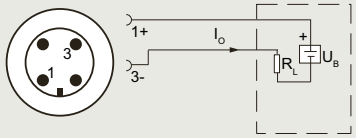
SITRANS P220, process connections, dimensions in mm (inch)

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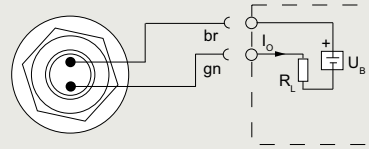
Circuit diagrams



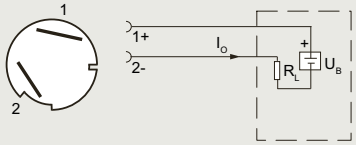
Connection with current output and plug according to EN 175301



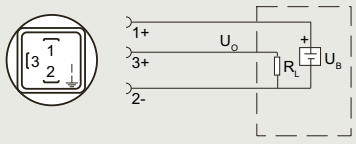
Connection with current output and M12x1 device plug



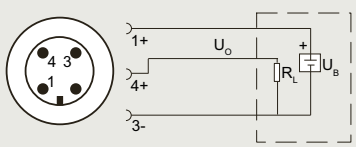
Connection with current output and cable



Connection with current output and Quickon cable quick screw connection

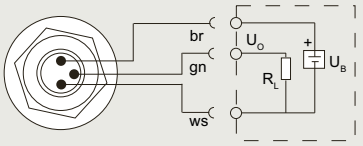


Connection with voltage output, ratiometric output and plug according to EN 175301

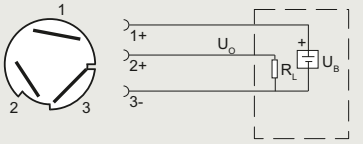


Connection with voltage output, ratiometric output and M12x1 device plug

Circuit diagrams (continued)



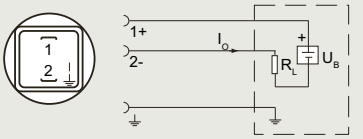
Connection with voltage output, ratiometric output and cable



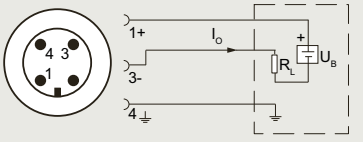
Connection with voltage output, ratiometric output and Quickon fast cable termination

Device design with explosion protection: 4 to 20 mA

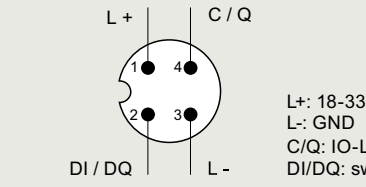
The grounding connection is conductively bonded to the transmitter enclosure.



Connection with current output and plug according to EN 175301 (Ex)



Connection with current output and M12x1 (Ex) device plug



Connection with IO-Link interface, only possible with M12 plug

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Overview



The pressure transmitter SITRANS LH100 is a submersible sensor for hydrostatic level measurement.

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH100 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A cable box and an anchoring clamp are available as accessories for simple installation.

Benefits

- Compact design
- Simple installation
- Small error in measurement (0.3 %)
- Degree of protection IP68

Application

SITRANS LH100 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- For use in unpressurized/open vessels and wells

Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

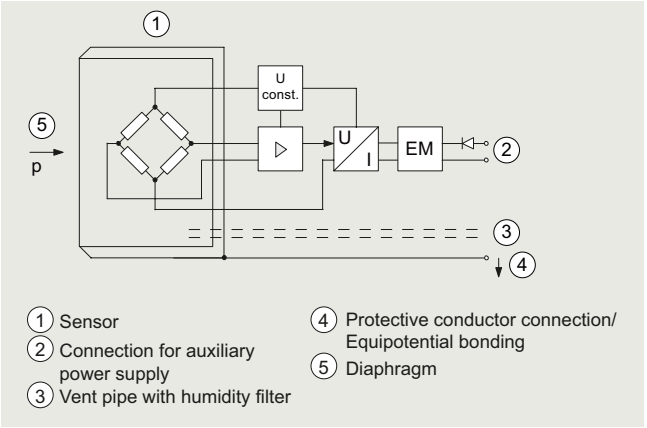
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

Function



SITRANS LH100 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

The output voltage signal of the sensor is applied to the electronic circuit where it is converted into an output current signal of 4 to 20 mA.

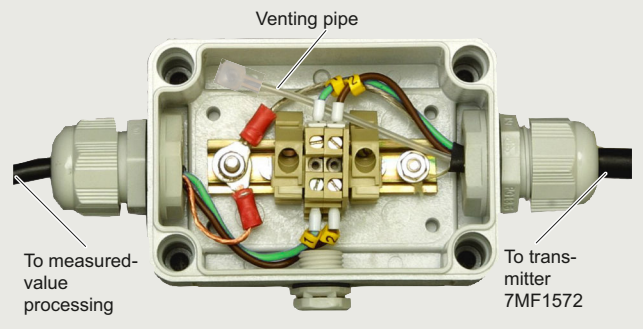
The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

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Integration

It is generally recommended that the connecting cable of the SITRANS LH100 transmitter is connected to the cable box, which can be ordered separately, and secured with the anchoring clamp, also available separately. The cable box has to be installed near the measuring point.

If the medium is anything other than water, it is also necessary to check compatibility with the specified materials of the transmitter.



Cable box 7MF1572-8AA, open, schematic diagram



Measuring point setup, generally with cable box 7MF1572-8AA and 7MF1572-8AB cable hanger

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Selection and ordering data

SITRANS LH100 pressure transmitter		Article No. 7MF1572-					Order code		
		●	●	A	●	●	●	●	●
For the measurement of the hydrostatic fill level through submersion 2-wire system, 4 ... 20 mA, enclosure material mat. no. 1.4404 (316 L) Measuring cell Al2O3 ceramic, with permanently mounted PE cable									
Click the article number for online configuration in the PIA Life Cycle Portal.									
Measuring range	**Cable length**								
0 ... 3 mH_2O	10 m (≈ 30 ft)	**1**	**C**						
0 ... 4 mH_2O	10 m (≈ 30 ft)	**1**	**D**						
0 ... 5 mH_2O	10 m (≈ 30 ft)	**1**	**E**						
0 ... 6 mH_2O	10 m (≈ 30 ft)	**1**	**F**						
0 ... 10 mH_2O	20 m (≈ 60 ft)	**1**	**H**						
0 ... 20 mH_2O	30 m (≈ 90 ft)	**1**	**K**						
0 ... 9 ftH_2O [1]	33 ft	**2**	**C**						
0 ... 12 ftH_2O	33 ft	**2**	**D**						
0 ... 15 ftH_2O	33 ft	**2**	**E**						
0 ... 18 ftH_2O	33 ft	**2**	**F**						
0 ... 30 ftH_2O	66 ft	**2**	**H**						
0 ... 60 ftH_2O	98 ft	**2**	**K**						
0 ... 0.3 bar [1]	10 m (≈ 30 ft)	**3**	**C**						
0 ... 0.4 bar	10 m (≈ 30 ft)	**3**	**D**						
0 ... 0.5 bar	10 m (≈ 30 ft)	**3**	**E**						
0 ... 0.6 bar	10 m (≈ 30 ft)	**3**	**F**						
0 ... 1 bar	20 m (≈ 60 ft)	**3**	**H**						
0 ... 2 bar	30 m (≈ 90 ft)	**3**	**K**						
Special designs Measuring ranges for special designs between: • 0 ... 3 mH_2O and 0 ... 30 mH_2O • 0 ... 9 ftH_2O and 0 ... 100 ftH_2O • 0 ... 0.3 bar and 0 ... 3 bar									
Special cable length/special measuring range Add "**-Z**" to article number, specify order code and plain text. Note: Specification of the measuring range Y01 is mandatory!		**9**	**A**				**H** **+** **Y**	**.** **0**	**.** **1**
The following applies to determining the maximum cable length for Ex versions: Transmitters: • C_i = 0 µF, L_i = 0 µH Cables: • C_k = 0.19 nF per meter cable • L_k = 1.5 µH per meter cable The max. permissible data of the transmitter infeed device must be taken into account!									
3 m (10 ft)							**H**	**1**	**A**
5 m (16 ft)							**H**	**1**	**B**
7 m (23 ft)							**H**	**1**	**C**
10 m (33 ft)							**H**	**1**	**D**
15 m (49 ft)							**H**	**1**	**E**
20 m (66 ft)							**H**	**1**	**F**
25 m (82 ft)							**H**	**1**	**G**
30 m (98 ft)							**H**	**1**	**H**
40 m (131 ft)							**H**	**1**	**J**
50 m (164 ft)							**H**	**1**	**K**
60 m (198 ft)							**H**	**1**	**L**
70 m (231 ft)							**H**	**1**	**M**
80 m (264 ft)							**H**	**1**	**N**
90 m (297 ft)							**H**	**1**	**P**
100 m (330 ft)							**H**	**1**	**Q**
Gasket material between sensor and enclosure									
FPM (standard)					**1**				
EPDM (for drinking water applications)					**2**				

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Selection and ordering data (continued)

SITRANS LH100 pressure transmitter	Article No. 7MF1572-						Order code		
	●	●	A	●	●		●	●	●
Explosion protection									
None					0				
With explosion protection ATEX II1 G Ex ia IIC T4 Ga and IECEx SEV 12.0006 Ex ia IIC T4 GaX					1				

Options Add "-Z" to article number and specify order code.	Order code
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	C11
Specification of measuring range (only with special cable lengths) in: "... to ... mH_2O" or "... to ... ftH_2O" or "... to ... bar"	Y01

Accessories/spare parts

	Article No.
Cable plug for connecting the transmitter cable	7MF1572-8AA
Anchoring clamp For mounting the pressure transmitter	7MF1572-8AB
Protective caps As a replacement (pack of 10)	7MF1572-8AD
Humidity filter As a replacement (pack of 10)	7MF1572-8AE

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Technical specifications

Pressure transmitter SITRANS LH100 (submersible sensor)	
Mode of operation	
Measuring principle	Piezo-resistive
Input	
Measured variable	Hydrostatic level
Measuring range	Max. permissible operating pressure
• 0 ... 3 mH_2O (0 ... 9 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 4 mH_2O (0 ... 12 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 5 mH_2O (0 ... 15 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 6 mH_2O (0 ... 18 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 10 mH_2O (0 ... 30 ftH_2O)	• 3.0 bar (43.5 psi) (corresponds to 30 mH2O (90 ftH2O))
• 0 ... 20 mH_2O (0 ... 60 ftH_2O)	• 5.0 bar (72.5 psi) (corresponds to 50 mH_2O (150 ftH_2O))
• 0 ... 0.3 bar	• 3.0 bar
• 0 ... 0.4 bar	• 3.0 bar
• 0 ... 0.5 bar	• 3.0 bar
• 0 ... 0.6 bar	• 3.0 bar
• 0 ... 1 bar	• 3.0 bar
• 0 ... 2.5 bar	• 7.5 bar
Output	
Output signal	4 ... 20 mA
Measuring accuracy	According to IEC 62828-1
Measurement deviation at limit setting including hysteresis and reproducibility	
Measuring range	
• 0 ... 3 mH_2O (0 ... 9 ftH_2O or 0 ... 0.3 bar)	• 0.5% measuring range end value (typical) • 1.0% of measuring range end value (maximum)
• For all other measuring ranges	• 0.3% of measuring range end value (typical) • 0.6% of measuring range end value (maximum)
Effect of ambient temperature	
Measuring range	Zero and span
• 3 mH_2O (9 ftH_2O or 0.3 bar)	0.45%/10 K of measuring range end value
• 4 ... 6 mH_2O (12 ... 18 ftH_2O or 0.4...0.6 bar)	0.45%/10 K of measuring range end value
• > 6 mH_2O (> 18 ftH_2O or > 0.6 bar)	0.3%/10 K of measuring range end value
Long-term stability	
Measuring range	Zero and span
• 3 mH_2O (9 ftH_2O or 0.3 bar)	0.4% of measuring range end value/year
• 4 ... 6 mH_2O (12 ... 18 ftH_2O or 0.4...0.6 bar)	0.25% of measuring range end value/year
• > 6 mH_2O (> 18 ftH_2O or > 0.6 bar)	0.2% of measuring range end value/year
Operating conditions	
Ambient conditions	
• Process temperature	-20 ... +80 °C (14 ... 176 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Degree of protection according to IEC 60529	IP68
Structural design	
Weight	
• Pressure transmitter	≈ 0.2 kg (≈ 0.44 lb)
• Cable; maximum cable length 100 m (330 ft)	0.025 kg/m (≈ 0.015 lb/ft)
Electrical connection	Cable with 3 conductors, vent pipe and integrated humidity filter
Material	
• Seal diaphragm	Al_2O_3 ceramic, 96%
• Enclosure	Stainless steel, mat. no. 1.4404/316L
• Sealing ring	• FPM (standard) • EPDM (optional)

Technical specifications (continued)

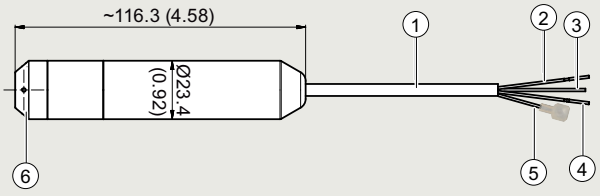
Pressure transmitter SITRANS LH100 (submersible sensor)	
• Connecting cable	• PE-HD (standard) • PE-LD (in the case of versions with EPDM seal, suitable for drinking water applications)
Auxiliary power	
Terminal voltage on pressure transmitter U_B	• 10 ... 33 V DC • 10 ... 30 V DC for transmitter with intrinsic safety explosion protection
Certificates and approvals	
Drinking water approval (ACS)	15 ACC NY 360
EAC	№ ТС RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
Underwriters Laboratories (UL)	2014-11-17 - E344532
The device is not subject to the pressure equipment directive (PED 2014/68/EU)	
Explosion protection	
• Intrinsic safety "i"	IECEx SEV 14.0003 SEV 14 ATEX 0109
- Marking	II 1 G Ex ia IIC T4 Ga
• EAC Ex	TC RU C-DE.AA87.B.00324

Cable box	
Area of application	For connecting the transmitter cable
Structural design	
Weight	0.2 kg (0.44 lb)
Electrical connection	2 x 3-way (28 to 18 AWG)
Cable entry	2 × Pg 9
Enclosure material	Polycarbonate
Vent valve for atmospheric pressure	
Operating conditions	
Degree of protection according to IEC 60529	IP65

Anchoring clamp	
Area of application	For mounting the transmitter
Structural design	
Weight	0.16 kg (0.35 lb)
Material	Zinc-plated steel, polyamide

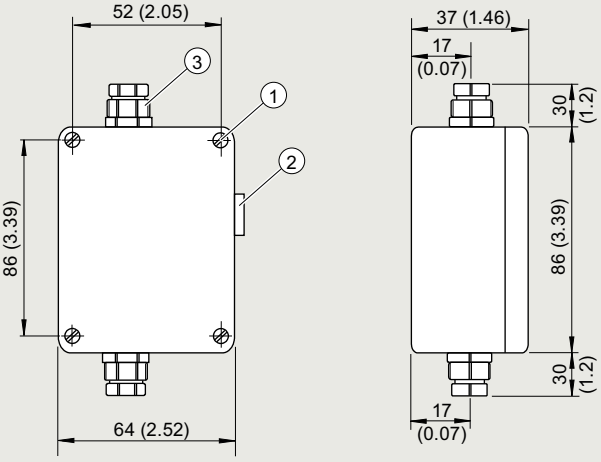
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Dimensional drawings



1. Cable, sheat Ø 4.8 (0.19) (black, PE)
2. - (green)
3. + (brown)
4. Protective conductor connection/Equipotential bonding (white)
5. Vent pipe with humidity filter
   Ø 1 (0.04) (inner diameter)
6. Protective cap with 4 x Ø 2.5 (0.10) holes (black, PPE)

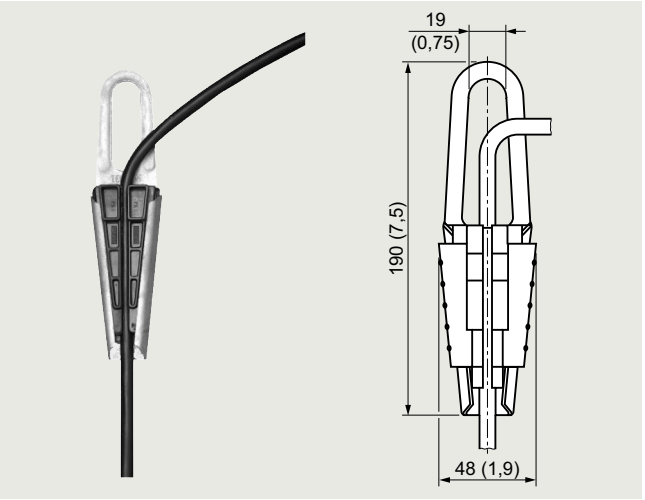
SITRANS LH100 pressure transmitter, dimensions in mm (inch)



1. Fastening hole
2. Vent valve
3. Cable gland Pg 9, cable diameter 4 ... 8 mm (0.16 ... 0.31)

Junction box, dimensions in mm (inch)

Dimensional drawings (continued)

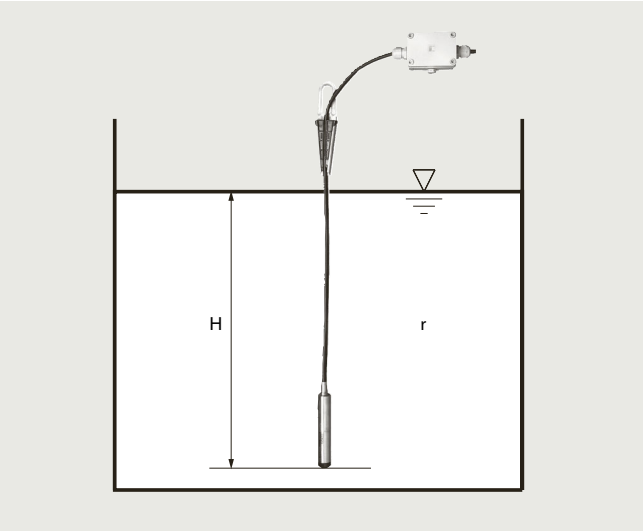


Anchoring clamp, dimensions in mm (inch)

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More information

Establishing the measuring range with water as process medium



Calculation of the measuring range

p = ρ x g x H

with:

ρ = density of medium
g = local gravitational acceleration
H = maximum level

Example:

Medium: Water, ρ = 1 000 kg/m^3
Gravitational acceleration: 9.81 m/s^2
Lower range value: 0 m
Maximum level: 6.0 m
Cable length: 10 m

Calculation:

p = 1 000 kg/m^{3}x 9.81 m/s^2 x 6.0 m
p = 58 860 N/m^2
p = 589 mbar

Transmitter to be ordered:

7MF1572-1FA10

Plus, if required, cable box 7MF1572-8AA and anchoring clamp 7MF1572-8AB

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Overview



The pressure transmitter SITRANS LH300 is a submersible sensor for hydrostatic level measurement with a protective capability made of PPE (left), stainless steel (center) and ETFE (right).

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH300 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A cable box and an anchoring clamp are available as accessories for simple installation.

Benefits

- Compact design
- Simple installation
- Small error in measurement (typically 0.15%)
- Degree of protection IP68

Application

SITRANS LH300 pressure transmitters are used in the following fields of industry, for example:

- Shipbuilding
- Water/waste water supply
- Drinking water treatment plants
- For use in unpressurized/open vessels and wells
- Desalinization plants

Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

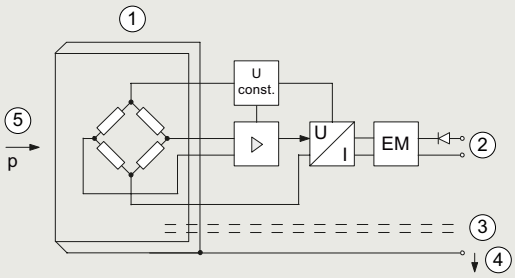
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

Function



1 Sensor
2 Connection for auxiliary power supply
3 Vent pipe with humidity filter
4 Protective conductor connection/ Equipotential bonding
5 Diaphragm

SITRANS LH300 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

The output voltage signal of the sensor is applied to the electronic circuit where it is converted into an output current signal of 4 to 20 mA.

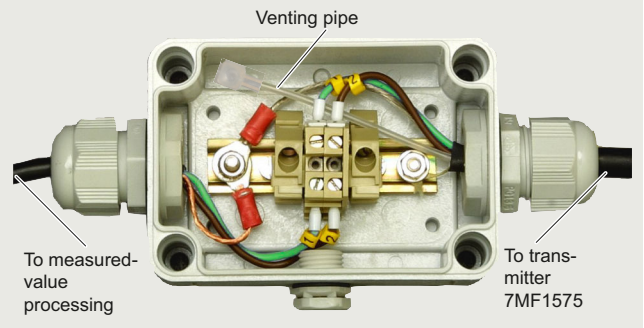
The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

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Integration

It is generally recommended that the connecting cable of the SITRANS LH300 transmitter is connected to the cable box, which can be ordered separately, and secured with an anchoring clamp, also available separately. The cable box is to be installed near the measuring point, but outside the process medium.

Likewise, in the case of process media other than water, the compatibility with the specified materials of the transmitter, cable and seal must be checked.



Cable box 7MF1575-8AA, opened, schematic representation



Measurement location setup, in principle with cable box 7MF1575-8AA and anchoring clamp 7MF1575-8AB

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Selection and ordering data

SITRANS LH300 pressure transmitter		Article No. 7MF1575-					Order code		
		●	●	●	●	●	●	●	●
For the measurement of the hydrostatic level, immersion probe, 2-wire system, 4 ... 20 mA, for enclosure material see ordering option, measuring cell Al_2O_3 ceramic (99.6% purity), with permanently mounted cable. Material of protective cap for PE cable: PPE (color: black). Material of protective cap for FEP cable: PPE (color: white) Note: Cable box and cable hanger must be ordered separately.									
Click the article number for online configuration in the PIA Life Cycle Portal.									
Measuring range	**Cable length (PE cable)**								
0 ... 1 mH_2O	5 m (≈ 15 ft)	**1**	**A**						
0 ... 2 mH_2O	5 m (≈ 15 ft)	**1**	**B**						
0 ... 3 mH_2O	10 m (≈ 30 ft)	**1**	**C**						
0 ... 4 mH_2O	10 m (≈ 30 ft)	**1**	**D**						
0 ... 5 mH_2O	10 m (≈ 30 ft)	**1**	**E**						
0 ... 6 mH_2O	10 m (≈ 30 ft)	**1**	**F**						
0 ... 10 mH_2O	20 m (≈ 60 ft)	**1**	**H**						
0 ... 20 mH_2O	30 m (≈ 90 ft)	**1**	**K**						
0 ... 40 mH_2O	50 m (≈ 150 ft)	**1**	**L**						
0 ... 3 ftH_2O	5 m (≈ 15 ft)	**2**	**A**						
0 ... 6 ftH_2O	5 m (≈ 15 ft)	**2**	**B**						
0 ... 9 ftH_2O	10 m (≈ 30 ft)	**2**	**C**						
0 ... 12 ftH_2O	10 m (≈ 30 ft)	**2**	**D**						
0 ... 15 ftH_2O	10 m (≈ 30 ft)	**2**	**E**						
0 ... 18 ftH_2O	10 m (≈ 30 ft)	**2**	**F**						
0 ... 30 ftH_2O	20 m (≈ 60 ft)	**2**	**H**						
0 ... 60 ftH_2O	30 m (≈ 90 ft)	**2**	**K**						
0 ... 120 ftH_2O	50 m (≈ 150 ft)	**2**	**L**						
0 ... 0.1 bar	5 m (≈ 15 ft)	**3**	**A**						
0 ... 0.2 bar	5 m (≈ 15 ft)	**3**	**B**						
0 ... 0.3 bar	10 m (≈ 30 ft)	**3**	**C**						
0 ... 0.4 bar	10 m (≈ 30 ft)	**3**	**D**						
0 ... 0.5 bar	10 m (≈ 30 ft)	**3**	**E**						
0 ... 0.6 bar	10 m (≈ 30 ft)	**3**	**F**						
0 ... 1 bar	20 m (≈ 60 ft)	**3**	**H**						
0 ... 2 bar	30 m (≈ 90 ft)	**3**	**K**						
0 ... 4 bar	50 m (≈ 150 ft)	**3**	**L**						
Special designs Measuring ranges for special designs between: 0 ... 1 mH_2O and 0 ... 160 mH_2O or 0 ... 3 ftH_2O and 0 ... 530 ftH_2O or 0 ... 0.1 bar and 0 ... 16 bar possible.									
PE cable for general applications and drinking water applications									
Special cable length Add "**-Z**" to article number, specify order code and plain text: Y01: Cable length		**9**	**X**				**H** **+** **Y**	**.** **0**	**.** **1**
3 m (≈ 10 ft)							**H**	**1**	**A**
5 m (≈ 16 ft)							**H**	**1**	**B**
7 m (≈ 23 ft)							**H**	**1**	**C**
10 m (≈ 33 ft)							**H**	**1**	**D**
15 m (≈ 50 ft)							**H**	**1**	**E**
20 m (≈ 65 ft)							**H**	**1**	**F**
25 m (≈ 80 ft)							**H**	**1**	**G**
30 m (≈ 100 ft)							**H**	**1**	**H**
40 m (≈ 130 ft)							**H**	**1**	**J**
50 m (≈ 160 ft)							**H**	**1**	**K**
60 m (≈ 200 ft)							**H**	**1**	**L**

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Selection and ordering data (continued)

SITRANS LH300 pressure transmitter	Article No. 7MF1575-					Order code		
	●	●	●	●	●	●	●	●
70 m (≈ 230 ft)						H	1	M
80 m (≈ 265 ft)						H	1	N
90 m (≈ 295 ft)						H	1	P
100 m (≈ 330 ft)						H	1	Q
125 m (≈ 410 ft)						H	1	R
150 m (≈ 495 ft)						H	1	S
175 m (≈ 575 ft)						H	1	T
200 m (≈ 650 ft)						H	1	U
225 m (≈ 740 ft)						H	1	V
250 m (≈ 820 ft)						H	1	W
275 m (≈ 900 ft)						H	1	X
300 m (≈ 990 ft)						H	2	A
350 m (≈ 1150 ft)						H	2	B
400 m (≈ 1320 ft)						H	2	C
450 m (≈ 1480 ft)						H	2	D
500 m (≈ 1650 ft)						H	2	E
550 m (≈ 1815 ft)						H	2	F
600 m (≈ 1980 ft)						H	2	G
650 m (≈ 2145 ft)						H	2	H
700 m (≈ 2310 ft)						H	2	J
750 m (≈ 2475 ft)						H	2	K
800 m (≈ 2640 ft)						H	2	L
850 m (≈ 2800 ft)						H	2	M
900 m (≈ 2970 ft)						H	2	N
950 m (≈ 3135 ft)						H	2	P
1 000 m (≈ 3300 ft)						H	2	Q
Additional special cable lengths Add **"-Z"** to article number, specify order code and plain text: H1Y: Cable length ..... Y01: Measuring range	9	X				H + Y	1 0	Y 1
FEP cable for corrosive process media								
Special cable length Add **"-Z"** to article number, specify order code and plain text: Y01: Cable length	9	X				H + Y	. 0	. 1
3 m (≈ 10 ft)						H	5	A
5 m (≈ 16 ft)						H	5	B
7 m (≈ 23 ft)						H	5	C
10 m (≈ 33 ft)						H	5	D
15 m (≈ 50 ft)						H	5	E
20 m (≈ 65 ft)						H	5	F
25 m (≈ 80 ft)						H	5	G
30 m (≈ 100 ft)						H	5	H
40 m (≈ 130 ft)						H	5	J
50 m (≈ 160 ft)						H	5	K
60 m (≈ 200 ft)						H	5	L
70 m (≈ 230 ft)						H	5	M
80 m (≈ 265 ft)						H	5	N
90 m (≈ 295 ft)						H	5	P
100 m (≈ 330 ft)						H	5	Q
125 m (≈ 410 ft)						H	5	R
150 m (≈ 495 ft)						H	5	S

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Selection and ordering data (continued)

SITRANS LH300 pressure transmitter		Article No. 7MF1575-					Order code		
		●	●	●	●	●	●	●	●
175 m (≈ 575 ft)							H	5	T
200 m (≈ 650 ft)							H	5	U
225 m (≈ 740 ft)							H	5	V
250 m (≈ 820 ft)							H	5	W
275 m (≈ 900 ft)							H	5	X
300 m (≈ 990 ft)							H	6	A
350 m (≈ 1150 ft)							H	6	B
400 m (≈ 1320 ft)							H	6	C
450 m (≈ 1480 ft)							H	6	D
500 m (≈ 1650 ft)							H	6	E
550 m (≈ 1815 ft)							H	6	F
600 m (≈ 1980 ft)							H	6	G
650 m (≈ 2145 ft)							H	6	H
700 m (≈ 2310 ft)							H	6	J
750 m (≈ 2475 ft)							H	6	K
800 m (≈ 2640 ft)							H	6	L
850 m (≈ 2800 ft)							H	6	M
900 m (≈ 2970 ft)							H	6	N
950 m (≈ 3135 ft)							H	6	P
1000 m (≈ 3300 ft)							H	6	Q
Additional special cable lengths Add "**-Z**" to article number, specify order code and plain text: H1Y: Cable length ..... Y01: Measuring range		9	X				H + Y	5 0	Y 1
Material of the enclosure	**Protective cap material**								
Stainless steel 316L (1.4404)	Protective cap made of PPE (recommended for PE cable)			A					
Stainless steel 316L (1.4404)	Protective cap made of ETFE (standard with FEP cable)			B					
Stainless steel 316L (1.4404)	Stainless steel 316L (1.4404)			C					
Stainless steel 904L (1.4539) for seawater applications	Protective cap made of PPE			D					
Stainless steel 904L (1.4539) for seawater applications	Protective cap made of ETFE			E					
Stainless steel 904L (1.4539) for seawater applications	Stainless steel 904L (1.4539) for seawater applications			F					
Gasket material between sensor and enclosure									
FPM (standard)					1				
EPDM (for drinking water applications)					2				
Explosion protection									
None						0			
With ATEX II1 G Ex ia IIC T4 Ga, IECEx Ex ia IIC T4 Ga and EAC Ex explosion protection (only possible for cable length ≤ 300 m (990 ft))						1			

Options	Order code
Quality test certificate (factory calibration) according to IEC 62828-2 (6 points upward)	C11

Accessories/spare parts

	Article No.
Cable box	7MF1575-8AA
Anchoring clamp	7MF1575-8AB
Protective cap, PPE As spare part (pack of 10)	7MF1575-8AD
Protective cap, ETFE As spare part (pack of 10)	7MF1575-8AE
Humidity filter As spare part (pack of 10)	7MF1575-8AF
Protective cap, stainless steel 316L (1.4404) For wastewater applications	7MF1575-8AG
Protective cap, stainless steel 904L (1.4539) For seawater applications	7MF1575-8AH

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Technical specifications

Pressure transmitter SITRANS LH300 (submersible sensor)	
Mode of operation	
Measuring principle	Piezo-resistive
Input	
Measured variable	Hydrostatic level
Measuring range	Max. permissible operating pressure
• 0 ... 1 mH_2O (0 ... 3 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 2 mH_2O (0 ... 6 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 3 mH_2O (0 ... 9 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 4 mH_2O (0 ... 12 ftH_2O)	• 2 bar (29 psi) (corresponds to 20 mH_2O (60 ftH_2O))
• 0 ... 5 mH_2O (0 ... 15 ftH_2O)	• 2 bar (29 psi) (corresponds to 20 mH_2O (60 ftH_2O))
• 0 ... 6 mH_2O (0 ... 18 ftH_2O)	• 2 bar (29 psi) (corresponds to 20 mH_2O (60 ftH_2O))
• 0 ... 10 mH_2O (0 ... 30 ftH_2O)	• 5 bar (72.5 psi) (corresponds to 50 mH_2O (150 ftH_2O))
• 0 ... 20 mH_2O (0 ... 60 ftH_2O)	• 10 bar (145 psi) (corresponds to 100 mH_2O (300 ftH_2O))
• 0 ... 40 mH_2O (0 ... 120 ftH_2O)	• 20 bar (290 psi) (corresponds to 200 mH_2O (600 ftH_2O))
Special measuring ranges	
• Up to 100 mH_2O (0 ... 300 ftH_2O)	• 20 bar (290 psi) (corresponds to 200 mH_2O (600 ftH_2O))
• Up to 160 mH_2O (0 ... 480 ftH_2O)	• 24 bar (348 psi) (corresponds to 240 mH_2O (720 ftH_2O))
Measuring range	
• 0 ... 0.1 bar	• 1.5 bar
• 0 ... 0.2 bar	• 1.5 bar
• 0 ... 0.3 bar	• 1.5 bar
• 0 ... 0.4 bar	• 2 bar
• 0 ... 0.5 bar	• 2 bar
• 0 ... 0.6 bar	• 2 bar
• 0 ... 1 bar	• 5 bar
• 0 ... 2 bar	• 10 bar
• 0 ... 4 bar	• 20 bar
Special measuring ranges	
• Up to 10 bar	• 20 bar
• Up to 16 bar	• 24 bar
Output	
Output signal	4 ... 20 mA
Measuring accuracy	According to IEC 62828-1
Measurement deviation at limit setting including hysteresis and reproducibility	• ≤ 0.15% of the measuring range end value (typical) • ≤ 0.3% of the measuring range end value (max.)
Effect of ambient temperature	≤ 0.05%/10 K of the measuring range end value (zero point and span)
Long-term stability	≤ 0.15% of the measuring range end value/year (zero point and span)
Operating conditions	
Ambient conditions	
• Process temperature	-10 ... +80 °C (14 ... 176 °F)
• Storage temperature	-20 ... +80 °C (-4 ... +176 °F)
Degree of protection according to IEC 60529	IP68
Structural design	
Weight	
• Pressure transmitter	≈ 0.375 kg (≈ 0.88 lb)
• Cable	0.08 kg/m (≈ 0.059 lb/ft)
Maximum of freely hanging length	300 m (990 ft)
Electrical connection	Cable with 2 wires, vent pipe and integrated humidity filters
Material	
• Seal diaphragm	Al_2O_3 ceramic, 99.6%

Technical specifications (continued)

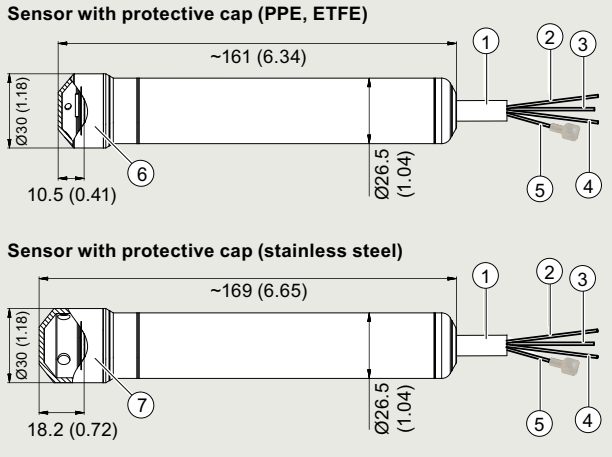
Pressure transmitter SITRANS LH300 (submersible sensor)	
• Enclosure	Stainless steel, mat. no. 1.4404/316L or 1.4539/904L for seawater applications
• Sealing ring	• FPM (standard) • EPDM (optional)
• Connecting cable	• PE (standard/drinking water applications) • FEP (for corrosive process media)
• Protective cap	Stainless steel, PPE or ETFE
Auxiliary power	
Terminal voltage on pressure transmitter U_B	• 10 ... 33 V DC for transmitter without explosion protection • 10 ... 30 V DC for transmitter with intrinsic safety explosion protection
Certificates and approvals	
Drinking water approval (ACS)	17 ACC NY 055
EAC	TC N RU Д-DE.ГА02.B.05092
Underwriters Laboratories (UL)	ML File No. E344532, issued 2017-08-17
Marine approval (LR)	LR_18/20074
Marine approval (DNV/GL)	TAA00000CE
Marine approval (BV)	56926/A0 BV
Marine approval (ABS)	HG1881314_P
Marine approval (RINA)	ELE067319XG
Pressure Equipment Directive	The transmitter is not subject to the Pressure Equipment Directive (DGRL 2014/68/EU)
Explosion protection	
• ATEX	SEV 16 ATEX 0121
• IEC Ex	IEC Ex SEV 16.0003
• EAC Ex	TC RU C-DE.AA87.B.00324
Intrinsic safety "i"	
• Marking	II 1 G Ex ia IIC T4 Ga

Cable box	
Area of application	For connecting the transmitter cable
Structural design	
Weight	0.2 kg (0.44 lb)
Electrical connection	2 x 3-way (28 to 18 AWG)
Cable entry	2 x PG 13.5
Enclosure material	Polycarbonate
Vent valve for atmospheric pressure	
Operating conditions	
Degree of protection according to IEC 60529	IP 68, continuous immersion up to max. gauge pressure

Anchoring clamp	
Area of application	For mounting the transmitter
Structural design	
Weight	0.16 kg (0.35 lb)
Material	Zinc-plated steel, polyamide
Terminal area	For cable with a diameter of 5.5 ... 9.5 mm

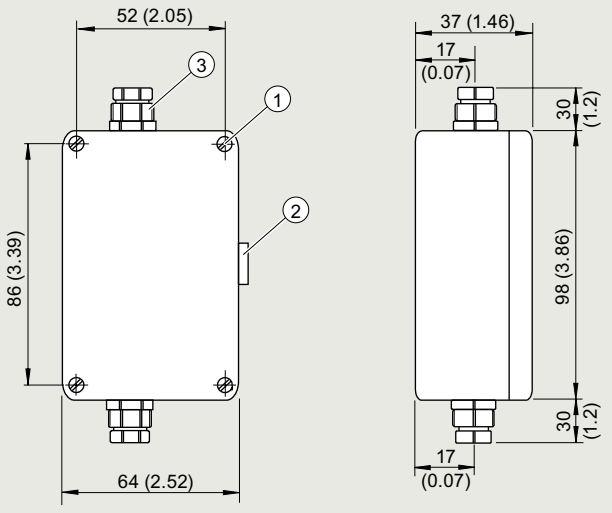
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Dimensional drawings



1 Cable, sheat Ø 8.3 (0.33)
2 - (blue)
3 + (brown)
4 Protective conductor connection/Equipotential bonding (black)
5 Vent pipe with humidity filter Ø 1 (0.04) (inner diameter)
6 Protective cap (PPE or PTFE) with 4 x Ø 2.5 (0.10) holes
7 Protective cap (stainless steel) with 4 x Ø 5 (0.20) holes

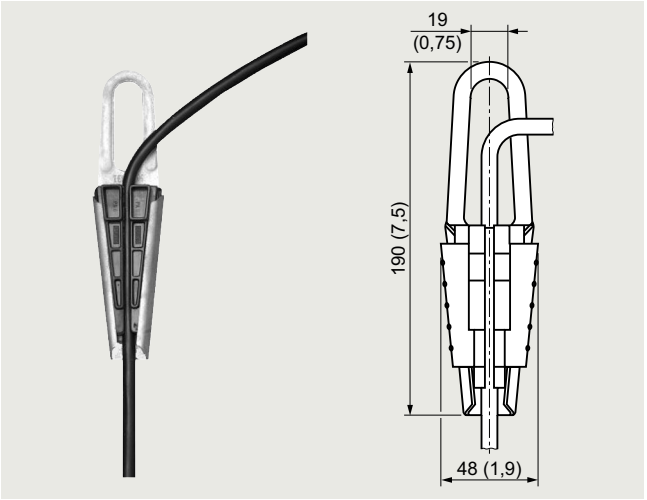
SITRANS LH300 pressure transmitter, dimensions in mm (inch)



1 Fastening hole
2 Vent valve
3 Cable gland Pg 13.5, cable diameter 6 ... 12 (0.23 ... 0.47)

Cable box, dimensions in mm (inch)

Dimensional drawings (continued)

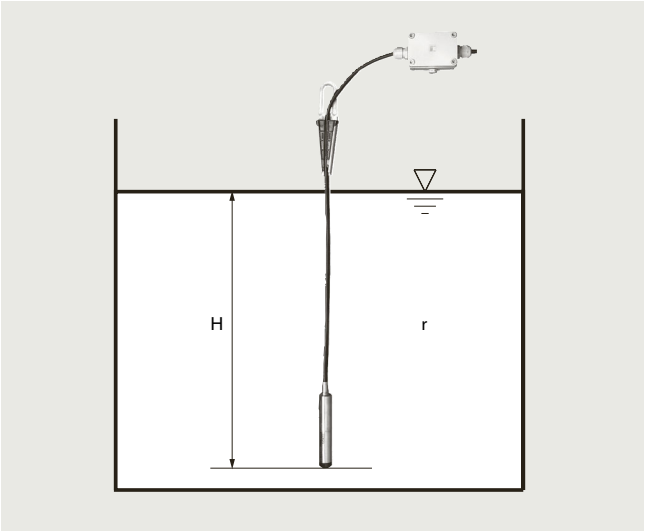


Anchoring clamp, dimensions in mm (inch)

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More information

Determination of the measuring range for water as process medium



Calculation of the measuring range:

p = ρ x g x H

with:

ρ = density of medium
g = local gravitational acceleration
H = maximum level

Example:

Medium: Water, ρ = 1 000 kg/m^3
Gravitational acceleration: 9.81 m/s^2
Lower range value: 0 m
Maximum level: 6.0 m
Cable length: 10 m

Calculation:

p = 1 000 kg/m^{3}x 9.81 m/s^2 x 6.0 m
p = 58 860 N/m^2
p = 589 mbar

Transmitter to be ordered:

7MF1575-1FA10

Plus, if required, cable box 7MF1575-8AA and anchoring clamp 7MF1575-8AB

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Overview



The SITRANS P Compact pressure transmitter is designed for the specific requirements of the food, pharmaceuticals and biotechnology industries.

The use of high-quality materials guarantees adherence to hygiene provisions.

Particular importance was placed on high surface quality. In addition, the system can be electropolished.

A further important feature is the hygienic design of the process connection with different aseptic connections.

The fully welded stainless steel enclosure can be designed with degree of protection up to IP67.

By means of corresponding cooling extensions, the SITRANS P Compact pressure transmitter can be used for temperatures up to 200 °C (392 °F).

Benefits

- Measuring ranges from 0 to 160 mbar (0 to 2.32 psi) to 0 to 40 bar (0 to 580 psi)
- Linearity error incl. hysteresis < +0.2% of the full-scale value
- Piezo-resistive measurement system, vacuum-proof and overload-proof
- Hygiene-based design according to EHEDG, FDA and GMP recommendations
- Material and surface quality according to hygiene requirements
- Wetted parts made of stainless steel; completely welded
- Signal output 4 to 20 mA (0 to 20 mA as option)
- Stainless steel enclosure with degree of protection IP65 (IP67 as option)
- Process temperature up to 200 °C (392 °F)
- Explosion protection II 2G EEx [ib] IIC T6 to ATEX
- Easy and safe to clean

Application

The SITRANS P Compact pressure transmitter is designed for the specific requirements of the food, pharmaceuticals and biotechnology industries.

The use of high-quality materials guarantees adherence to hygiene provisions.

The SITRANS P Compact pressure transmitter can be ordered in a large number of different variants. This enables precise adaptation of the pressure transmitter to the conditions of the usage location.

Design

The electronics are potted for protection against humidity, corrosive atmospheres and vibrations.

Operating instructions for the pressure transmitter

Atmospheric internal pressure compensation

The atmospheric internal pressure compensation of the SITRANS P Compact pressure transmitter is designed as follows in the overpressure measuring range:

- With connector designs via plug cable gland (IP65)
- In field enclosures via an integrated sinter filter (IP65) or a ventilated connecting cable (IP67)
- In versions with cable outlet via ventilated connecting cable (IP67)

In the absolute pressure area, no internal pressure compensation to the atmosphere is necessary.

Note: The degrees of protection specified above are only achieved under the following conditions:

- Proper mounting of the pressure transmitter
- Firmly tightened plug cable glands
- Cable diameters match nominal diameters of sealing inserts in the enclosure

Note: The integrated measures for EMC are only effective with a properly connected ground connection.

CE marking

The CE marking of the pressure transmitter certifies adherence with the guidelines of the European Council (9/336/EEC), the EMC legislation (13 Nov. 1992) and the applicable generic standards.

Problem-free operation in systems and plants is only achieved when the conditions for shielding, grounding, cable routing and electrical isolation are complied with during installation and mounting.

Hazardous areas

Note: In hazardous areas, electrical equipment can only be installed and operated by qualified expert personnel.

Changes at devices and connections void the Ex protection and the warranty.

In intrinsically safe circuits, equipotential bonding must be ensured over the entire course of the cable run, within and outside of the hazardous area. The limit values listed in the ATEX approval need to be considered.

Function

Process pressure acts on a piezo-resistive semi-conductor measuring bridge via a remote seal diaphragm by means of a transfer fluid. The pressure transmitter converts the measured pressure values into a load-independent current signal.

A compensation network achieves a large degree of independence of the output signal from the ambient temperature. With a specially adapted remote seal connection with minimized system volume, the influence of the process temperature on the output signal is reduced significantly as compared to a conventional screw connection.

The pressure transmitters can be supplied with an unregulated DC voltage of 10 to 30 V. The output signals common in measuring technology are available.

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Selection and ordering data

	Article No.											Order code		
SITRANS P Compact pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm	**7MF8010-**													
2-wire system, process temperature up to 140 °C (284 °F), measurement deviation: 0.2% of full-scale value, output 4 ... 20 mA	**1**	●	●	●	●	-	●	●	●	●		●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.														
Diaphragm seal with quick-release														
Milk pipe union acc. to DIN 11851 with slotted union nut														
• DN 25		**A**	**D**											
• DN 32		**A**	**E**											
• DN 40		**A**	**F**											
• DN 50		**A**	**G**											
• DN 65		**A**	**H**											
Dairy connection according to DIN 11851 with screwed connector														
• DN 25		**B**	**D**											
• DN 32		**B**	**E**											
• DN 40		**B**	**F**											
• DN 50		**B**	**G**											
• DN 65		**B**	**H**											
Clamp connection acc. to DIN 32676														
• DN 25		**C**	**D**											
• DN 40		**C**	**F**											
• DN 50		**C**	**G**											
Clamp connection acc. to ISO 2852														
• 1 inch		**D**	**M**											
• 1½ inches		**D**	**N**											
• 2 inches		**D**	**P**											
• 2½ inches		**D**	**Q**											
IDF standard with slotted union nut														
• 1 inch		**E**	**M**											
• 1½ inches		**E**	**N**											
• 2 inches		**E**	**P**											
IDF standard with screwed connector														
• 1 inch		**F**	**M**											
• 1½ inches		**F**	**N**											
• 2 inches		**F**	**P**											
SMS standard with slotted union nut														
• 1 inch		**G**	**M**											
• 1½ inches		**G**	**N**											
• 2 inches		**G**	**P**											
SMS standard with screwed connector														
• 1 inch		**H**	**M**											
• 1½ inches		**H**	**N**											
• 2 inches		**H**	**P**											
DRD flange without welded flange														
• DN 50, PN 40		**J**	**H**											
Varivent connection (Tuchenhagen Co.)														
• D = 50 for Varivent enclosure DN 25 and 1 inch		**K**	**F**											
• D = 68 for Varivent enclosure DN 40 ... DN 125 and 1½ ... 6 inches		**K**	**L**											
Special design (specify order code and plain text)		**Z**	**A**									**J**	**1**	**Y**
Filling liquid														
Food-grade oil, FDA-listed				**3**										
Special design (specify order code and plain text)				**9**								**L**	**1**	**Y**
Output signal														
4 ... 20 mA					**1**									

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Selection and ordering data (continued)

	Article No.											Order code		
SITRANS P Compact pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm	**7MF8010-**													
2-wire system, process temperature up to 140 °C (284 °F), measurement deviation: 0.2% of full-scale value, output 4 ... 20 mA	**1**	●	●	●	●	-	●	●	●	●		●	●	●
Special design (specify order code and plain text)					**9**							**M**	**1**	**Y**
Diaphragm seal with aseptic connection														
Aseptic screw gland according to DIN 11864-1, form A, with slotted union nut														
• 1 inch		**P**	**M**											
• 1½ inches		**P**	**N**											
• 2 inches		**P**	**P**											
• 2½ inches		**P**	**Q**											
Aseptic screw gland according to DIN 11864-1, form A, with screwed connector														
• 1 inch		**Q**	**M**											
• 1½ inches		**Q**	**N**											
• 2 inches		**Q**	**P**											
• 2½ inches		**Q**	**Q**											
NEUMO BioConnect aseptic screw gland with slotted union nut[1)]														
• DN 25		**R**	**D**											
• DN 32		**R**	**E**											
• DN 40		**R**	**F**											
• DN 50		**R**	**G**											
NEUMO BioConnect aseptic screw gland with screwed connector[1)]														
• DN 25		**S**	**D**											
• DN 32		**S**	**E**											
• DN 40		**S**	**F**											
• DN 50		**S**	**G**											
NEUMO BioConnect aseptic clamp connection, form R[1)]														
• DN 25		**T**	**D**											
• DN 32		**T**	**E**											
• DN 40		**T**	**F**											
• DN 50		**T**	**G**											
NEUMO BioConnect aseptic clamp connection, form V[1)]														
• DN 25		**U**	**D**											
• DN 32		**U**	**E**											
• DN 40		**U**	**F**											
• DN 50		**U**	**G**											
Male thread according to DIN 3852, form A														
• G1", min. measuring span. 0.4 bar (5.8 psi)		**X**	**C**											
• G1½", min. measuring span. 0.25 bar (3.63 psi)		**X**	**D**											
• G2", min. measuring span. 0.16 bar (2.32 psi)		**X**	**E**											
Special design (specify order code and plain text)		**Z**	**A**									**J**	**1**	**Y**
Filling liquid														
Food-grade oil, FDA-listed				**3**										
Special design (specify order code and plain text)				**9**								**L**	**1**	**Y**
Output signal														
4 ... 20 mA					**1**									
Special design (specify order code and plain text)					**9**							**M**	**1**	**Y**
Enclosure version (stainless steel, mat. no. 1.4404/316L) / electrical connection														
Enclosure with angled device plug according to DIN 43650, IP65							**1**							
Enclosure with M12 device plug, IP65, fastening union nut made of polyamide							**2**							
Enclosure with M12 device plug, IP65, fastening union nut made of stainless steel							**3**							
Field enclosure (small) made of stainless steel with cable gland, IP65							**4**							
Field enclosure (small) made of stainless steel with cable gland, IP67, internal ventilation for measuring ranges < 16 bar (< 232 psi)							**5**							

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Selection and ordering data (continued)

SITRANS P Compact pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm 2-wire system, process temperature up to 140 °C (284 °F), measurement deviation: 0.2% of full-scale value, output 4 ... 20 mA		Article No. 7MF8010- 1 ● ● ● ● - ● ● ● ●	Order code ● ● ●
Measuring range	**Overload pressure**		
0 ... 160 mbar (0 ... 2.32 psi)	1 bar (14.5 psi)	B B	
0 ... 250 mbar (0 ...3.63 psi)	1 bar (14.5 psi)	B C	
0 ... 400 mbar (0 ... 5.8 psi)	3 bar (43.5 psi)	B D	
0 ... 600 mbar (0 ... 8.7 psi)	3 bar (43.5 psi)	B E	
0 ... 1 bar (0 ... 14.5 psi)	3 bar (43.5 psi)	C A	
0 ... 1.6 bar (0 ... 23.2 psi)	10 bar (145 psi)	C B	
0 ... 2.5 bar (0 ... 36.3 psi)	10 bar (145 psi)	C C	
0 ... 4 bar (0 ... 58 psi)	20 bar (290 psi)	C D	
0 ... 6 bar (0 ... 87 psi)	60 bar (870 psi)	C E	
0 ... 10 bar (0 ... 145 psi)	60 bar (870 psi)	D A	
0 ... 16 bar (0 ... 232 psi)	60 bar (870 psi)	D B	
0 ... 25 bar (0 ... 363 psi)	60 bar (870 psi)	D C	
0 ... 40 bar (0 ... 580 psi)	100 bar (1450 psi)	D D	
-160 ... 0 mbar (-2.32 ... 0 inH_2O)	1 bar (14.5 psi)	E B	
-250 ... 0 mbar (-3.73 ... 0 inH_2O)	1 bar (14.5 psi)	E C	
-400 ... 0 mbar (-5.8 ... 0 inH_2O)	3 bar (43.5 psi)	E D	
-600 ... 0 mbar (-8.7 ... 0 inH_2O)	3 bar (43.5 psi)	E E	
-1 ... 0 bar (-14.5 ... 0 psi)	3 bar (43.5 psi)	F A	
-1 ... 0.6 bar (-14.5 ... 8.7 psi)	10 bar (145 psi)	F B	
-1 ... 1.5 bar (-14.5 ... 21.8 psi)	10 bar (145 psi)	F C	
-1 ... 3 bar (-14.5 ... 43.5 psi)	20 bar (290 psi)	F D	
-1 ... 5 bar (-14.5 ... 72.5 psi)	20 bar (290 psi)	F E	
-1 ... 9 bar (-14.5 ... 130.5 psi)	60 bar (870 psi)	G A	
-1 ... 15 bar (-14.5 ... 217.6 psi)	60 bar (870 psi)	G B	
0 ... 1 bar a (0 ... 14.5 psi a)	3 bar a (43.5 psi a)	H A	
0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar a (145 psi a)	H B	
0 ... 2.5 bar a (0 ... 36.3 psi a)	10 bar a (145 psi a)	H C	
0 ... 4 bar a (0 ... 58 psi a)	10 bar a (145 psi a)	H D	
0 ... 6 bar a (0 ... 87 psi a)	60 bar a (870 psi a)	H E	
0 ... 10 bar a (0 ... 145 psi a)	60 bar a (870 psi a)	J A	
Special design (specify order code and plain text)		Z A	P 1 Y
Explosion protection			
None		1	
With, according to ATEX 100a, II 2 G, Ex ib IIC T6		2	

[1] Please make sure to also specify: Connections for pipes: R01, R02 or R03, see "Options" table.

SITRANS P Compact pressure transmitter for gauge and absolute pressure, with inline seal 2-wire system, process temperature up to 140 °C (284 °F), measurement deviation: 0.2% of full-scale value, output 4 ... 20 mA	Article No. 7MF8010- 2 ● ● ● ● - ● ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Inline seal (screw gland at each end) with quick-release clamps		
Dairy connection according to DIN 11851 with screwed connector		
• DN 25	A D	
• DN 32	A E	
• DN 40	A F	
• DN 50	A G	

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Selection and ordering data (continued)

SITRANS P Compact pressure transmitter for gauge and absolute pressure, with inline seal 2-wire system, process temperature up to 140 °C (284 °F), measurement deviation: 0.2% of full-scale value, output 4 ... 20 mA	Article No. 7MF8010- 2 ● ● ● ● - ● ● ● ●	Order code ● ● ●
• DN 65	A H	
Clamp connection acc. to DIN 32676		
• DN 25	C D	
• DN 32	C E	
• DN 40	C F	
• DN 50	C G	
• DN 65	C H	
Clamp connection acc. to ISO 2852[1]		
• 1 inch	D M	
• 1½ inches	D N	
• 2 inches	D P	
• 2½ inches	D Q	
Special design (specify order code and plain text)	Z A	J 1 Y
Filling liquid		
Food-grade oil, FDA-listed	3	
Special design (specify order code and plain text)	9	L 1 Y
Output signal		
4 ... 20 mA	1	
Special design (specify order code and plain text)	9	M 1 Y
Inline seals with aseptic connection		
Aseptic screw gland according to DIN 11864-1, form A, with screwed connector		
• 1 inch	Q M	
• 1½ inches	Q N	
• 2 inches	Q P	
NEUMO BioConnect aseptic screw gland with screwed connector[2]		
• DN 25	S D	
• DN 32	S E	
• DN 40	S F	
• DN 50	S G	
• DN 65	S H	
NEUMO BioConnect aseptic clamp connection, form R[2]		
• DN 25	T D	
• DN 32	T E	
• DN 40	T F	
• DN 50	T G	
SÜDMO aseptic screw gland with W 501 screwed connector[2]		
• 1 inch	V M	
• 1½ inches	V N	
• 2 inches	V P	
SÜDMO aseptic screw gland with W 601 clamp connection[2]		
• 1 inch	W M	
• 1½ inches	W N	
• 2 inches	W P	
Special design (specify order code and plain text)	Z A	J 1 Y
Filling liquid		
Food-grade oil, FDA-listed	3	
Special design (specify order code and plain text)	9	L 1 Y
Output signal		
4 ... 20 mA	1	

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Selection and ordering data (continued)

SITRANS P Compact pressure transmitter for gauge and absolute pressure, with inline seal 2-wire system, process temperature up to 140 °C (284 °F), measurement deviation: 0.2% of full-scale value, output 4 ... 20 mA		Article No. 7MF8010- 2 ● ● ● ● - ● ● ● ●	Order code ● ● ●
Special design (specify order code and plain text)		9	M 1 Y
Enclosure version (stainless steel, mat. no. 1.4404/316L) / electrical connection			
Enclosure with angled device plug according to DIN 43650, IP65, securing union nut made of polyamide		1	
Enclosure with M12 device plug, IP65, fastening union nut made of polyamide		2	
Enclosure with M12 device plug, IP65, fastening union nut made of stainless steel		3	
Field enclosure (small) made of stainless steel with cable gland, IP65		4	
Field enclosure (small) made of stainless steel with cable gland, IP67, internal ventilation for measuring ranges < 16 bar (< 232 psi)		5	
Measuring range	**Overload pressure**		
0 ... 160 mbar (0 ... 2.32 psi)	1 bar (14.5 psi)	B B	
0 ... 250 mbar (0 ...3.63 psi)	1 bar (14.5 psi)	B C	
0 ... 400 mbar (0 ... 5.8 psi)	3 bar (43.5 psi)	B D	
0 ... 600 mbar (0 ... 8.7 psi)	3 bar (43.5 psi)	B E	
0 ... 1 bar (0 ... 14.5 psi)	3 bar (43.5 psi)	C A	
0 ... 1.6 bar (0 ... 23.2 psi)	10 bar (145 psi)	C B	
0 ... 2.5 bar (0 ... 36.3 psi)	10 bar (145 psi)	C C	
0 ... 4 bar (0 ... 58 psi)	20 bar (290 psi)	C D	
0 ... 6 bar (0 ... 87 psi)	60 bar (870 psi)	C E	
0 ... 10 bar (0 ... 145 psi)	60 bar (870 psi)	D A	
0 ... 16 bar (0 ... 232 psi)	60 bar (870 psi)	D B	
0 ... 25 bar (0 ... 363 psi)	60 bar (870 psi)	D C	
0 ... 40 bar (0 ... 580 psi)	100 bar (1450 psi)	D D	
-160 ... 0 mbar (-2.32 ... 0 psi)	1 bar (14.5 psi)	E B	
-250 ... 0 mbar (-3.63 ... 0 psi)	1 bar (14.5 psi)	E C	
-400 ... 0 mbar (-5.8 ... 0 psi)	3 bar (43.5 psi)	E D	
-600 ... 0 mbar (-8.7 ... 0 psi)	3 bar (43.5 psi)	E E	
-1 ... 0 bar (-14.5 ... 0 psi)	3 bar (43.5 psi)	F A	
-1 ... 0.6 bar (-14.5 ... 8.7 psi)	10 bar (145 psi)	F B	
-1 ... 1.5 bar (-14.5 ... 21.8 psi)	10 bar (145 psi)	F C	
-1 ... 3 bar (-14.5 ... 43.5 psi)	20 bar (290 psi)	F D	
-1 ... 5 bar (-14.5 ... 72.5 psi)	20 bar (290 psi)	F E	
-1 ... 9 bar (-14.5 ... 130.5 psi)	60 bar (870 psi)	G A	
-1 ... 15 bar (-14.5 ... 217.6 psi)	60 bar (870 psi)	G B	
0 ... 1 bar a (0 ... 14.5 psi a)	3 bar a (43.5 psi a)	H A	
0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar a (145 psi a)	H B	
0 ... 2.5 bar a (0 ... 36.3 psi a)	10 bar a (145 psi a)	H C	
0 ... 4 bar a (0 ... 58 psi a)	10 bar a (145 psi a)	H D	
0 ... 6 bar a (0 ... 87 psi a)	60 bar (870 psi a)	H E	
0 ... 10 bar a (0 ... 145 psi a)	60 bar (870 psi a)	J A	
Special design (specify order code and plain text)		Z A	P 1 Y
Explosion protection			
None		1	
With explosion protection according to ATEX 100a, II 2 G, Ex ib IIC T6		2	

1) Observe inside diameter of the pipe. Please specify pipe classes (see "Options").
2) Please make sure to also specify: Connections for pipes: R01, R02 or R03, see "Options" table.

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Selection and ordering data (continued)

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
Hygiene version Roughness process connection: Foil R_a < 0.8 µm (3.15 · 10^{-8} inches); welding seams R_a < 1.5 µm (5.9 · 10^{-8} inches)	**P01**
Integrated cooling element Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)	**K01**
Connections for pipes	
Pipes according to DIN 11850	**R01**
ISO pipes according to DIN 2463	**R02**
Pipes acc. to >>O. D. Tubing "BS 4825 Part 1"<<	**R03**

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
Certificates	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	**C11**
Inspection certificate according to EN 10204-3.1	**C12**
Use of FDA-listed remote seal filling liquids certified with a factory certificate according to EN 10204-2.2	**C17**
Roughness depth measurement R_a certified with a factory certificate according to EN 10204-3.1	**C18**
Certification according to EHEDG for inline seal with aseptic screw gland according to DIN 11864	**C19**

Technical specifications

Pressure transmitters for food, pharmaceuticals and biotechnology	
Mode of operation	
Measuring principle	Piezo-resistive
Input	
Measured variable	Gauge or absolute pressure
Measuring range	0 ... 160 mbar (0 ... 2.32 psi) ... 0 ... 40 bar (0 ... 580 psi)
Output	
Output signal	
• 2-wire system	4 ... 20 mA
• 3-wire system	0 ... 20 mA
Measuring accuracy	According to IEC 62828-1
Measurement deviation at limit setting including hysteresis and reproducibility	≤ 0.2% of full-scale value
Adjustment accuracy	≤ ±0.2% of full-scale value
Step response time	< 20 ms
Effect of ambient temperature	
On the enclosure	
• Zero point	< 0.2%/10 K of full-scale value
• Measuring span	< 0.2%/10 K of full-scale value
On the process connection (remote seals)	Zero-point error (dependent on design)[1]
• Flange remote seal	
- DN 25/1"	4.8 mbar/10 K (0.069 psi/10 K)
- DN 32/1¼"	2.3 mbar/10 K (0.033 psi/10 K)
- DN 40/1½"	1.6 mbar/10 K (0.023 psi/10 K)
- DN 50/2"	0.6 mbar/10 K (0.009 psi/10 K)
• Inline seal	
- DN 25/1"	9.5 mbar/10 K (0.138 psi/10 K)
- DN 32/1¼"	4.1 mbar/10 K (0.060 psi/10 K)
- DN 40/1½"	3.9 mbar/10 K (0.057 psi/10 K)
- DN 50/2"	3.9 mbar/10 K (0.057 psi/10 K)
Operating conditions	
Installation conditions	
• Mounting position	Any, vertical as standard
Ambient conditions	
• Ambient temperature	-10 ... +70 °C (14 ... 158 °F)
• Storage temperature	-10 ... +90 °C (14 ... 194 °F)
• Process temperature	Max. 200 °C (392 °F), depending on design
• Vacuum-resistant	0 mbar (0 psi) absolute at max. 50 °C. Higher process temperatures on request.
• Degree of protection according to IEC 60529	IP65, optional IP67
• Electromagnetic Compatibility	

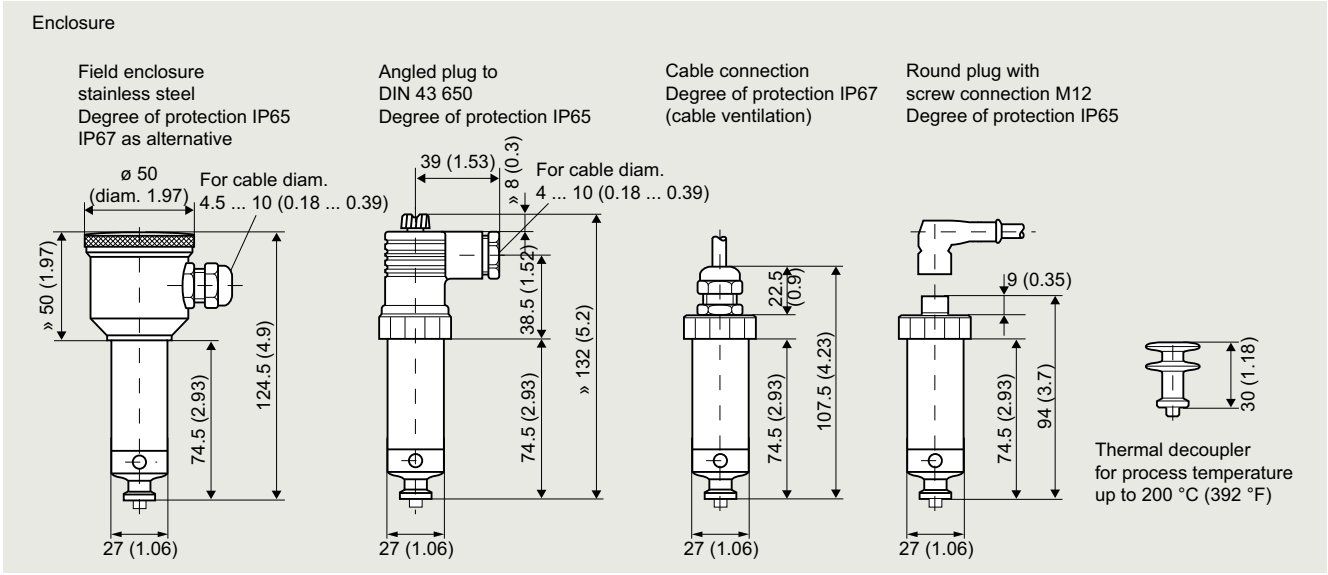
Technical specifications (continued)

Pressure transmitters for food, pharmaceuticals and biotechnology	
- Emitted interference	To EN 50081 Part 1, issue 1993 (residential and industrial areas). The device has no own emissions.
- Noise immunity to	EN 50082 Part 2, issue March 1995 (industrial areas)
Structural design	
Weight (without remote seal)	
• Field enclosure	≈ 460 G (≈ 1.01 lb)
• Enclosure with plug	≈ 200 g (≈ 0.44 lb)
Enclosure	
• Designs	• Field enclosure IP65 or IP67, with screw gland • Angled device plug DIN 43650, IP65 • Cable connection, IP67 • M12 device plug, IP65
• Material	Stainless steel, mat. no. 1.4404/316L/1.4305
Material of union nut	Polyamide (with electrical connection using plug or cable) Electronics unit potted with silicone Internal ventilation for measuring ranges < 16 bar (< 232 psi), through enclosure thread or connecting cable depending on design
Process connection	
• Versions	See ordering data
• Material of coupling	Stainless steel, mat. no. 1.4404/316L
Auxiliary power	
Terminal voltage on transmitter	10 ... 30 V DC
Nominal voltage	24 V DC
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	
• For 7MF8010-1... (with diaphragm seal)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
• For 7MF8010-2... (with inline seal)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (annex 1); assigned to category III, conformity evaluation module H by the TÜV Nord
Explosion protection	
• Intrinsic safety "i"	TÜV 03 ATEX 2099 X
- Marking	Ex II 2G EEx ib IIC T6

[1] The zero-point error specified for the process connection should be considered as a guide value for a standard design. We will make a detailed system calculation on request. Systems with reduced remote seal error are available on request.

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Dimensional drawings

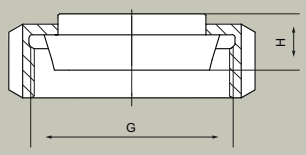


SITRANS P Compact, dimensions in mm (inch)

Process connections

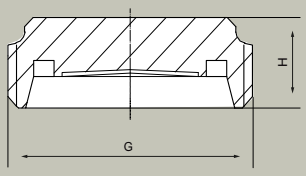
Quick-release diaphragm seals

Dairy connection according to DIN 11851 with slotted union nut



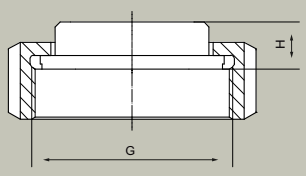
DN	PN	H mm (inch)	G
25	40	24 (0.95)	Radius 52 x 1/6 inch
32	40	24 (0.95)	Radius 58 x 1/6 inch
40	40	24 (0.95)	Radius 65 x 1/6 inch
50	25	25.1 (0.99)	Radius 78 x 1/6 inch
65	25	28.6 (1.13)	Radius 95 x 1/6 inch

Dairy connection according to DIN 11851 with screwed connector



DN	PN	H mm (inch)	G
25	40	-	Radius 52 x 1/6 inch
32	40	20 (0.79)	Radius 58 x 1/6 inch
40	40	20 (0.79)	Radius 65 x 1/6 inch
50	25	20 (0.79)	Radius 78 x 1/6 inch
65	25	22 (0.87)	Radius 95 x 1/6 inch

SMS standard with union nut

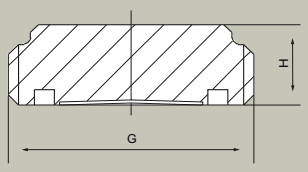


DN	PN	H mm (inch)	G
1 inch	40	16 (0.63)	Radius 40 x 1.6 inches
1½ inches	40	16 (0.63)	Radius 60 x 1.6 inches
2 inches	25	16 (0.63)	Radius 70 x 1.6 inches

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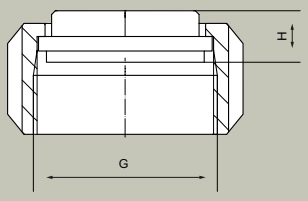
Dimensional drawings (continued)

SMS standard with threaded socket



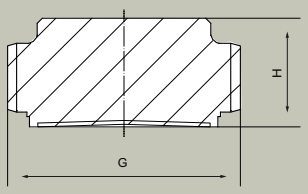
DN	PN	H mm (inch)	G
1 inch	40	16 (0.63)	Radius 40 x 1.6 inches
1½ inches	40	20 (0.79)	Radius 60 x 1.6 inches
2 inches	25	20 (0.79)	Radius 70 x 1.6 inches

IDF standard with union nut



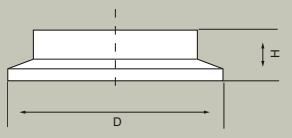
DN	PN	H mm (inch)	G
1 inch	40	21 (0.83)	1 inch
1½ inches	40	13.5 (0.53)	1½ inches
2 inches	25	15 (0.59)	2 inches

IDF standard with screwed connector



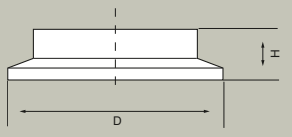
DN	PN	H mm (inch)	G
1 inch	40	21 (0.83)	1 inch
1½ inches	40	13.5 (0.53)	1½ inches
2 inches	25	15 (0.59)	2 inches

Clamp connection according to DIN 32676



DN	PN	H mm (inch)	D mm (inches)
25	16	14 (0.55)	50.5 (2)
40	16	14 (0.55)	50.5 (2)
50	16	14 (0.55)	64 (2.52)

Clamp connection according to ISO 2852

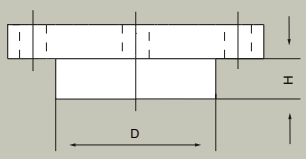


DN	PN	H mm (inch)	D mm (inches)
1 inch	16	14 (0.55)	50.5 (2)
1½ inches	16	12 (0.47)	50.5 (2)
2 inches	16	14 (0.55)	64 (2.52)
2½ inches	16	14 (0.55)	77.5 (3.05)

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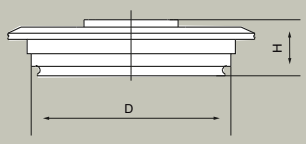
Dimensional drawings (continued)

DRD flange without welded flange



DN	PN	H mm (inch)	D mm (inches)
50	40	16.7 (0.66)	65.5 (2.58)

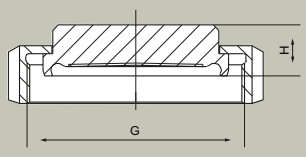
Varivent connection



DN	PN	H mm (inch)	D mm (inches)
25	25	19 (0.75)	50 (1.97)
40 ... 125	25/10	19 (0.75)	68 (2.68)

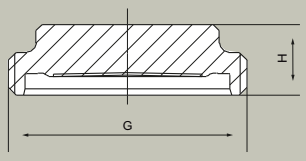
Diaphragm seal with aseptic connection

Aseptic screw gland according to DIN 11864-1, form A, with slotted union nut



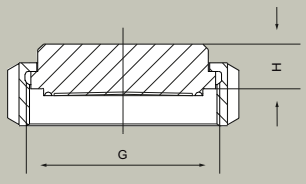
DN	PN	H mm (inch)	D mm (inches)
1 inch	40	20 (0.79)	Radius 52 x 1/6 inch
1½ inches	40	20 (0.79)	Radius 58 x 1/6 inch
2 inches	25	20 (0.79)	Radius 65 x 1/6 inch
2½ inches	25	20 (0.79)	Radius 78 x 1/6 inch

Aseptic screw gland according to DIN 11864-1, form A, with screwed connector



DN	PN	H mm (inch)	D mm (inches)
1 inch	40	15 (0.59)	Radius 52 x 1/6 inch
1½ inches	40	15 (0.59)	Radius 58 x 1/6 inch
2 inches	25	15 (0.59)	Radius 65 x 1/6 inch
2½ inches	25	15 (0.59)	Radius 78 x 1/6 inch

NEUMO BioConnect aseptic screw gland with slotted union nut

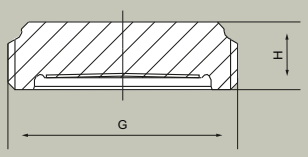


DN	PN	H mm (inch)	D mm (inches)
25	16	15 (0.59)	M 42 x 2
32	16	15 (0.59)	M 52 x 2
40	16	15 (0.59)	M 56 x 2
50	16	15 (0.59)	M 68 x 2

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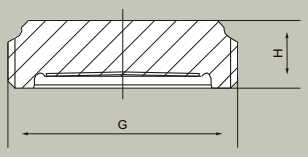
Dimensional drawings (continued)

NEUMO BioConnect aseptic screw gland with screwed connector



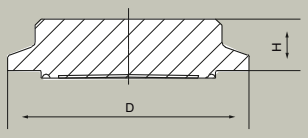
DN	PN	H mm (inch)	D mm (inches)
25	16	20 (0.79)	M 42 x 2
32	16	20 (0.79)	M 52 x 2
40	16	20 (0.79)	M 56 x 2
50	16	20 (0.79)	M 68 x 2

NEUMO BioConnect aseptic clamp connection, form R



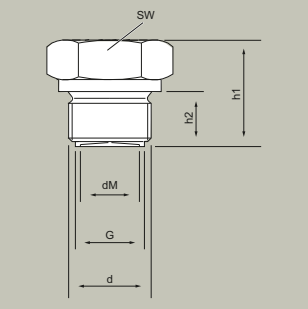
DN	PN	H mm (inch)	D mm (inches)
25	40	20 (0.79)	50.5 (2)
32	40	20 (0.79)	50.5 (2)
40	40	20 (0.79)	64 (2.52)
50	25	20 (0.79)	77.4 (3.05)

NEUMO BioConnect aseptic clamp connection, form V



DN	PN	H mm (inch)	D mm (inches)
25	40	15 (0.59)	50.5 (2)
32	40	15 (0.59)	50.5 (2)
40	40	20 (0.79)	64 (2.52)
50	25	20 (0.79)	77.4 (3.05)

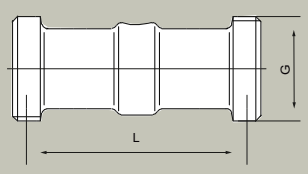
Connecting socket for screw-in thread according to DIN 3852, form A



G	d mm (inches)	d_M mm (inch)	h_1 mm (inch)	h_2 mm (inch)	SW mm (inch)
G½A	26 (1.02)	17.5 (0.69)	27 (1.06)	14 (0.55)	27 (1.06)
G¾A	32 (1.26)	22.6 (0.89)	31 (1.22)	16 (0.63)	32 (1.26)
G1A	39 (1.54)	27 (1.06)	33 (1.30)	18 (0.71)	51 (2.01)
G1½A	55 (2.17)	40 (1.57)	40 (1.57)	22 (0.87)	55 (2.17)
G2A	68 (2.68)	51 (2.00)	42 (1.65)	24 (0.94)	70 (2.76)

Inline seal (screw gland at each end) with quick-release clamps

Dairy connection according to DIN 11851 with screwed connector

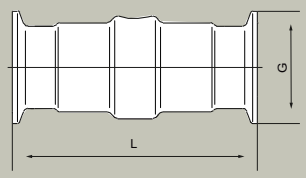


DN	PN	L mm (inch)	G
25	40	110 (4.33)	Radius 52 x 1/6 inch
32	40	110 (4.33)	Radius 58 x 1/6 inch
40	40	110 (4.33)	Radius 65 x 1/6 inch
50	25	110 (4.33)	Radius 78 x 1/6 inch
65	25	110 (4.33)	Radius 95 x 1/6 inch

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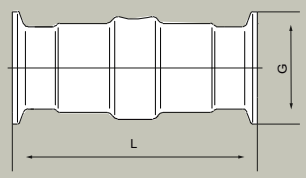
Dimensional drawings (continued)

Clamp connection according to DIN 32676



DN	PN	L mm (inch)	D mm (inches)
25	16	110 (4.33)	50.5 (2)
32	16	110 (4.33)	50.5 (2)
40	16	110 (4.33)	50.5 (2)
50	16	110 (4.33)	64 (2.52)
65	10	110 (4.33)	91 (3.58)

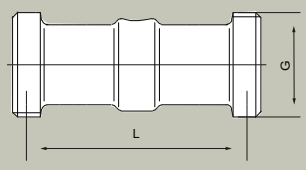
Clamp connection according to ISO 2852



DN	PN	L mm (inch)	D mm (inches)
1 inch	16	110 (4.33)	50.5 (2)
1½ inches	16	110 (4.33)	50.5 (2)
2 inches	16	110 (4.33)	64 (2.52)
2½ inches	16	110 (4.33)	91 (3.58)

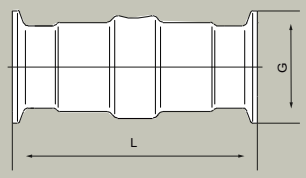
Inline seals with aseptic connection

Aseptic screwed gland according to DIN 11864-1, form A, with screwed connector



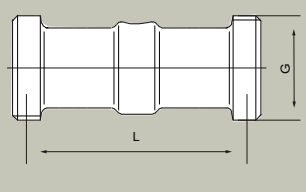
DN	PN	L mm (inch)	G
1 inch	40	110 (4.33)	Radius 52 x 1/6 inch
1½ inches	40	110 (4.33)	Radius 65 x 1/6 inch
2 inches	25	110 (4.33)	Radius 78 x 1/6 inch

NEUMO BioConnect aseptic screwed gland with screwed connector



DN	PN	L mm (inch)	G
25	16	110 (4.33)	M 42 x 2
32	16	110 (4.33)	M 52 x 2
40	16	110 (4.33)	M 56 x 2
50	16	110 (4.33)	M 68 x 2
65	16	110 (4.33)	M 90 x 3

SÜDMO aseptic screwed gland with W 501 screwed connector

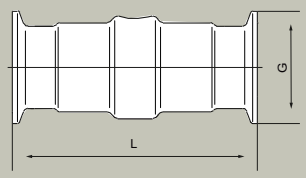


DN	PN	L mm (inch)	G
1 inch	25	110 (4.33)	Radius 44 x 1/6 inch
1½ inches	25	110 (4.33)	Radius 58 x 1/6 inch
2 inches	20	110 (4.33)	Radius 78 x 1/6 inch

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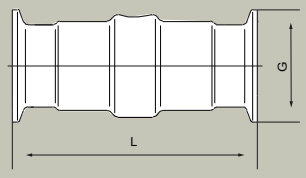
Dimensional drawings (continued)

NEUMO BioConnect aseptic screwed gland clamp connection, form R



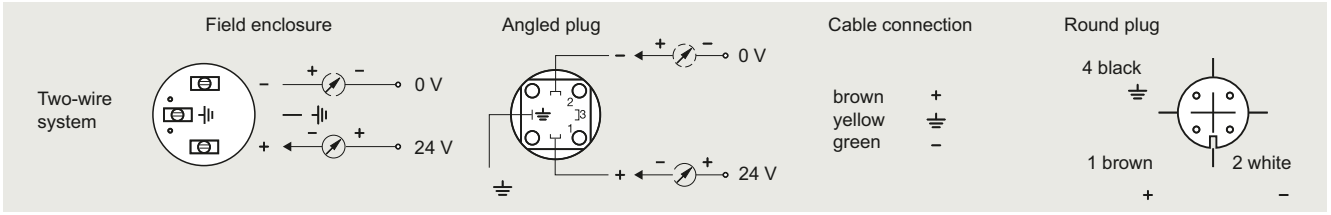
DN	PN	L mm (inch)	D mm (inches)
25	16	110 (4.33)	50.4 (2)
32	16	110 (4.33)	50.4 (2)
40	16	110 (4.33)	64 (2.52)
50	16	110 (4.33)	77.4 (3.05)

SÜDMO aseptic screwed gland with W 601 screwed connector



DN	PN	L mm (inch)	D mm (inches)
1 inch	16	110 (4.33)	50.5 (2)
1½ inches	16	110 (4.33)	64 (2.52)
2 inches	16	110 (4.33)	77.5 (3.05)

Circuit diagrams



SITRANS P Compact, connection diagram

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Overview



In today's demanding industrial environments, accurate and reliable pressure measurement is the foundation of safe and efficient operations. The SITRANS P310/410 is a comprehensive pressure transmitter platform that unites two powerful measuring cell technologies in a single product.

The SITRANS P310/410 gives the choice between an advanced ceramic measuring cell and a robust metallic measuring cell, allowing users to select the ideal configuration for their specific process requirements. The ceramic measuring cell offers outstanding abrasion resistance, wear-free operation, and exceptional resistance to thermal shock, making it the preferred choice for challenging media such as abrasive or highly viscous fluids. With an overload factor of up to 200 — unmatched in its class — and measurement accuracy down to 0.05%, it enables reliable measurement even of the smallest pressure ranges.

For applications involving extreme pressures, the metallic measuring cell variant of the SITRANS P310/410 rises to the challenge. Its fully welded, vacuum-resistant design handles process pressures up to 1 000 bar and temperatures ranging from -40 °C to +200 °C, while its inherent robustness ensures insensitivity to shock and vibration — even in the harshest industrial environments such as petrochemical plants, high-pressure steam systems, or offshore installations.

It is available with a wide range of hygienic process connections for food & beverage and pharmaceutical applications.

With its 4 ... 20 mA HART or PROFIBUS communication and the optional Bluetooth interface the most common communication types are given. With SIL 2/3 and Ex certifications the SITRANS P310/P410 can also be used in critical application or hazardous environments.

The SITRANS P310/410 is more than a pressure transmitter — it is a versatile, future-proof measurement platform designed to grow with your operational needs, minimize maintenance costs, and deliver the accuracy and reliability that modern industries demand.

SITRANS P310/410 is available in various versions for measuring:

- Gauge pressure
- Absolute pressure

Application

The SITRANS P310/P410 is a pressure transmitter designed for reliable process pressure measurement across virtually all industries. It measures gauge pressure, absolute pressure, and vacuum for a wide range of media, including gases, vapors, and liquids, as well as viscous, abrasive, or aggressive substances. With a measuring range spanning from –1 bar to 1 000 bar and a process temperature range of –40 °C to +200 °C, the SITRANS P310/P410 is built to handle even the most demanding process conditions.

A key strength of the SITRANS P310/410 lies in its choice of measuring cell technologies, each tailored to specific application requirements. The dry pressure ceramic measuring cell is the ideal solution for applications involving abrasive or chemically aggressive media. Its wear-free, highly overload-resistant design ensures long-term stability and high plant availability with minimal maintenance. The front-flush mounting eliminates the risk of product buildup and enables self-cleaning in flowing media, making it particularly well-suited for hygienic applications in the food, beverage, and pharmaceutical industries. Typical applications include level and pressure measurement in raw milk tanks, storage tanks for alcohol or ultrapure water, as well as pressurized batch vessels. Its resistance to thermal shock and compatibility with CIP and SIP cleaning cycles further extend its suitability to sterilization-critical processes. In abrasive environments such as mining, water treatment, or the paper industry, the ceramic measuring cell reliably handles media such as sand slurries, grit, or paper pulp in bleaching towers.

For applications involving high process pressures, viscous products, or elevated temperatures, the metallic measuring cell with its front-flush diaphragm provides outstanding performance. Its robust and diffusion-stable construction makes it the preferred choice in demanding industrial environments such as the chemical, oil and gas, and hydrogen industries. Typical applications include bitumen level measurement in asphalt mixing plants at temperatures up to 200 °C, pressure monitoring in high-pressure hydrogen compressors and storage facilities, turbine steam line supervision, as well as level and pressure measurement of viscous products such as in ice cream premix systems, jam cooking kettles, or pulpers for the dissolution of waste paper and cellulose.

The SITRANS P310/P410 is listed as a single unified device in the Siemens product portfolio, consolidating the full measurement capabilities of both instruments into one comprehensive solution for virtually any pressure measurement challenge in the process industry.

The difference between the SITRANS P310/P410 is in accuracy

For the high variety of applications two different variants are available:

Pressure transmitter with dry pressure ceramic cell	
Measured variable	• Gauge and absolute pressure of corrosive and non-corrosive gases, vapors and liquids
Measuring span (infinitely adjustable)	• For SITRANS P310/P410 with 4 ... 20 mA HART • PROFIBUS: 25 mbar ... 100 bar a (0.36 psi ... 1450.38 psi)
Accuracy	• SITRANS P310: 0.1% • SITRANS P410: 0.05%
There are two series	• Gauge pressure series • Absolute pressure series

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Application (continued)

Pressure transmitter with front flush metallic cell	
Measured variable	• Gauge and absolute pressure of corrosive and non-corrosive gases, vapors and liquids
Measuring span (infinitely adjustable)	• For SITRANS P310/P410 with 4 ... 20 mA HART • PROFIBUS: 100 mbar ... 1000 bar a (1.45 psi ... 14503.8 psi)
Accuracy	• SITRANS P310: 0.1% • SITRANS P410: 0.0075%
There are two series	• Gauge pressure series • Absolute pressure series

Dry pressure cell

The dry ceramic pressure measuring cell is the ideal choice whenever process purity, chemical resistance, and oil-free measurement are required. Unlike oil-filled metallic cells, its robust ceramic diaphragm directly contacts the medium — with no hydraulic fill fluid involved. This makes it the preferred solution for hygienic, food-grade, or chemically aggressive applications where contamination must be strictly avoided.

Benefits

- Oil-free & media-pure – No risk of process contamination through hydraulic fill fluid
- Outstanding chemical resistance – Alumina ceramic withstands a wide range of aggressive, corrosive, and abrasive media
- High overload resistance – Ceramic diaphragms tolerate significant pressure spikes without permanent damage
- Long-term stability – Minimal drift and excellent repeatability over extended service life
- Wide temperature range – Reliable performance across varying process and ambient temperatures
- Low maintenance – Robust and wear-resistant design reduces servicing requirements

Application

- Food & Beverage – Hygienic measurement of water, milk, juices, and other food-grade media
- Water & Wastewater – Pressure monitoring in water treatment, distribution, and sewage systems
- Chemical & Pharmaceutical Industry – Measurement of aggressive or corrosive liquids and gases where metallic cells are unsuitable
- HVAC & Building Automation – Monitoring of air, gases, and non-aggressive fluids in climate control systems
- Compressed Air & Pneumatics – Clean and accurate measurement of dry gases and compressed air
- General Industrial Processes – Wherever process purity, media compatibility, or hygienic standards are critical

Front flush metallic cell

The flush-mounted metallic pressure measuring cell is the ideal choice whenever viscous, highly viscous, or solid-laden media are involved in the measurement process. Its diaphragm sits perfectly flush with the process connection, eliminating any cavities or dead zones where media could accumulate or crystallize. This design makes it the preferred solution for challenging process conditions where conventional pressure ports would clog, block, or cause hygiene issues.

Application (continued)

Benefits

- Flush diaphragm design – No dead zones, cavities, or pressure ports that could trap or block media
- Self-cleaning effect – The smooth, flush surface prevents product build-up and simplifies cleaning
- Wide material selection – Available in various high-grade stainless steels and special alloys (e.g., Hastelloy, Tantalum) for maximum chemical compatibility
- CIP/SIP compatible – Suitable for clean-in-place and sterilize-in-place processes in hygienic applications
- High mechanical robustness – Metallic diaphragm withstands high pressures, pressure shocks, and demanding industrial environments
- Broad pressure range – Covers a wide measurement range from low to very high process pressures
- Oil-filled system – Ensures reliable signal transmission even under extreme process conditions

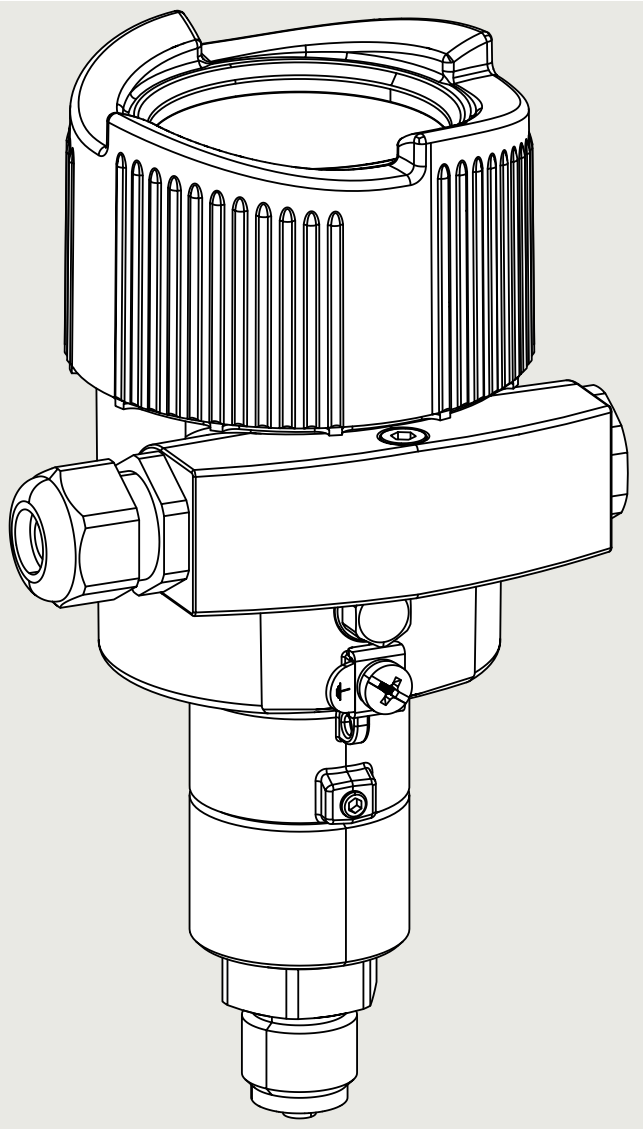
Application

- Food & Beverage – Measurement of viscous media such as syrups, sauces, pastes, and dairy products
- Chemical & Petrochemical Industry – Monitoring of aggressive, corrosive, or high-pressure media where robust metallic materials are essential
- Pharmaceutical & Biotech – Hygienic pressure measurement in sterile processes requiring CIP/SIP compatibility
- Pulp & Paper – Reliable measurement in fibrous, abrasive, or slurry-type media
- Wastewater & Sludge Treatment – Pressure monitoring in heavily contaminated or solid-laden fluids
- Oil & Gas – High-pressure and high-temperature applications in upstream and downstream processes
- General Process Industry – Wherever clogging, crystallization, or media build-up would compromise conventional pressure measurement

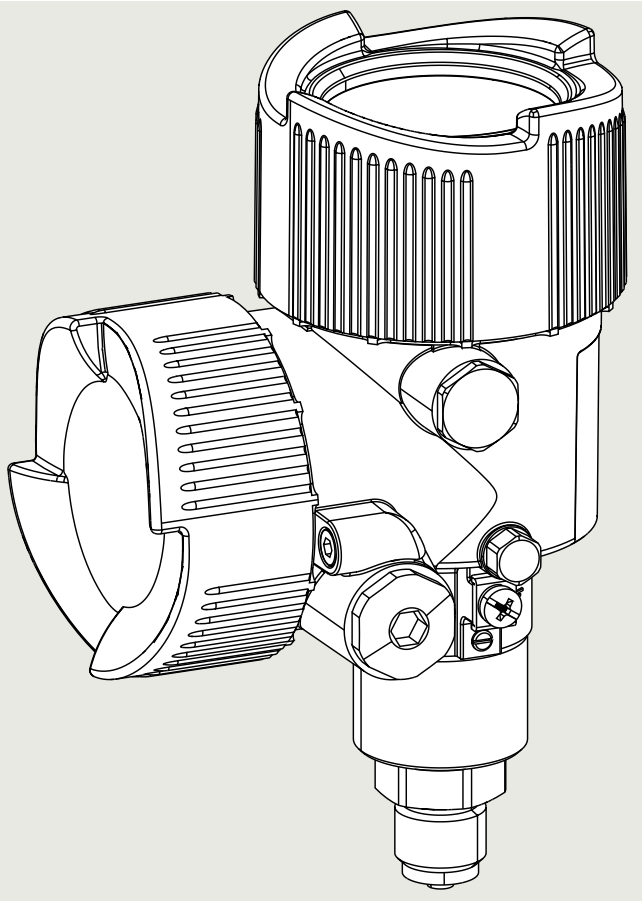
Further technical details you will find within technical data of SITRANS P310/P410.

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Design

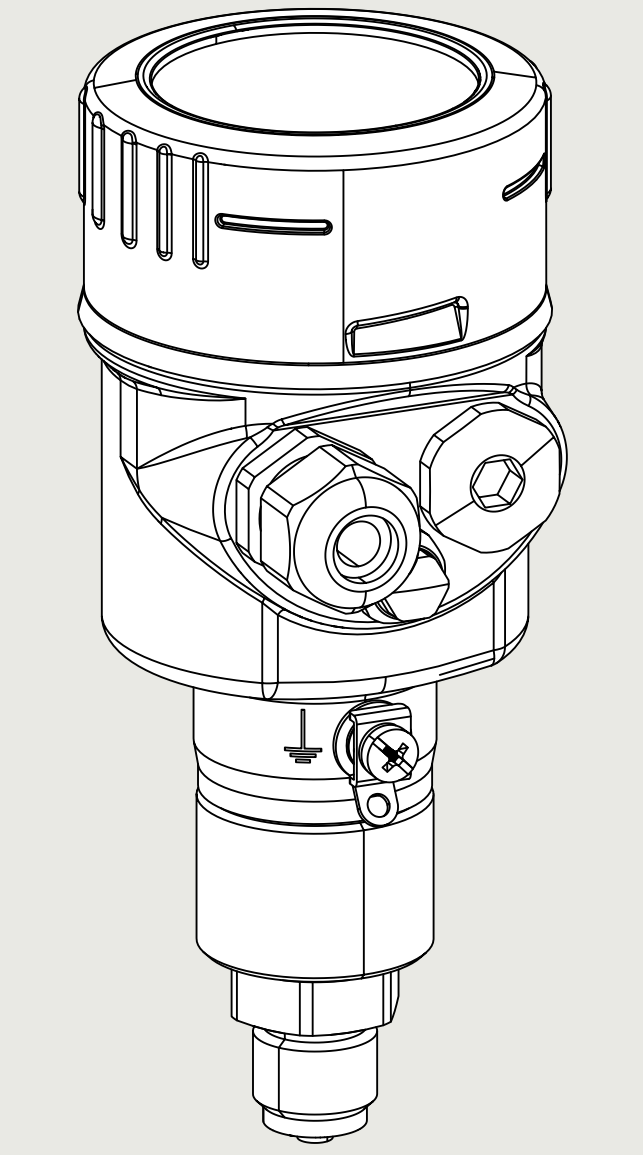


Design (continued)



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Design (continued)

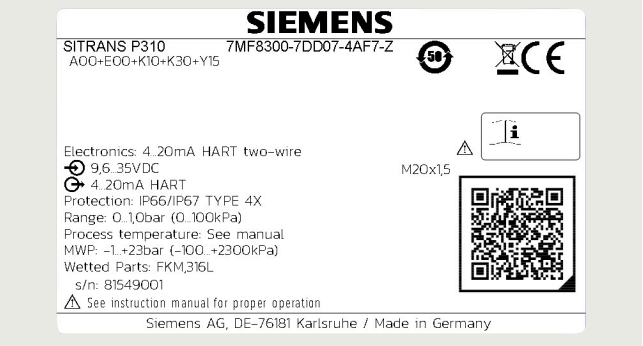


- The electronics enclosure is made of single or dual chamber die cast aluminum, precision cast stainless steel or plastic (according to the housing material the design could differ).
- The enclosure has a removable cover at the top and or side.
- Depending on the device design, the top cover may be designed with a glass pane.
- The cable inlet to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug.
- The ground terminal is located on the side.
- The electrical terminal compartment for the auxiliary power and shield is accessible when you remove the top cover (single chamber) or side cover (dual chamber).

Design (continued)

- The measuring cell with process connection is located in the bottom part of the enclosure.
- If the device is equipped with a display the buttons are located under the top cover.

Nameplates



The nameplate with the article no. and other important information, such as design details and technical data, is located on the side of the housing.

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Function

Adjustable parameters and diagnostics

SITRANS P310/P410 with 4 ... 20 mA HART communication

SETUP Menu item	Parameters	Input Buttons
Measurement loop name	19 alphanumeric characters/special characters	X
Application	• Level, process pressure	X
	• Secondary Device for electronic differential pressure	X
Units	• Adjustment unit (m, bar, Pa, psi ... user-defined)	X
	• Temperature unit (°C, °F)	X
Position correction	Offset	X
Adjustment	• Zero/Min. adjustment	X
	• Span/Max. adjustment	X
Damping	Integration time	X
Linearization	Linear, cylindrical tank, ... user-defined	X
Current output	• Current output - Mode	X
	• Output characteristics: 4 ... 20 mA, 20 ... 4 mA	X
	• Failure mode: ≤ 3.6 mA, ≥ 20 mA, last measured value	X
	• Current output - Min./Max.	X
	• Min. current: 3.8 mA, 4 mA	X
	• Max. current: 20 mA, 20.5 mA	X
Lock adjustment	Blocked, released	X

Display Menu item	Parameters	Input Buttons
Menu language	Selected language	X
Displayed value 1	Pressure	X
Displayed value 2	• Ceramic measuring cell: Measuring cell temperature in °C	X
	• Metallic measuring cell: Electronics temperature in °C	X
Display format	Number of positions after the decimal point, automatically	X
Backlight	Switched on	X

Diagnostics Menu item	Parameters	Input Buttons
Device status	-	X
Peak indicator	Pressure	X
Peak indicator temperature	Temperature	X
Simulation	Pressure, percent, current output, linearized percent, measuring cell temperature, electronics temperature	X
Additional adjustments Menu item	Parameters	Input Buttons
Date/Time	-	X
Reset	Delivery status, basic settings	X
Copy instrument settings	Read from sensor, write into sensor	X
Scaling	• Scaling size	X
	• Scaling format	
Current output	• Current output -Measuring variable	
	• Current output - Adjustment	
Current output 2	• Current output - Measuring variable	
	• Current output - Adjustment	
HART mode	HART address, current output	
Special parameters	Service-Login	

Function (continued)

Info Menu item	Parameters	Input Buttons
Device name	SITRANS P310/P410	X
Instrument version	Hardware and software version	X
Factory calibration date	Date	X
Sensor characteristics	Order-specific characteristics	X

Available physical units of display for SITRANS P310/P410

Physical variable	Physical units
Pressure	Pa, MPa, kPa, bar, mbar, psi, g/cm², kg/cm², inH_2O, inH_2O (4 °C), ftH_2O, mmH_2O, mmH_2O (4 °C), mH_2O (4 °C), mmHg, inHg, atm, torr
Temperature	°C / °F
Other	%, mA

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Selection and ordering data

Pressure transmitters with front flush ceramic dry cell	Article No.													
SITRANS P310	7MF83	●	●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P410	7MF84	●	●	-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Technology, sensor														
Gauge pressure		0												
Absolute pressure		1												
Communication														
HART (4 ... 20 mA			0											
PROFIBUS PA			1											
Measuring cell filling														
Dry pressure cell					7									
Maximum measuring span														
25 mbar (10.04 inH_2O)						A								
100 mbar (40.19 inH_2O)						B								
400 mbar (160.74 inH_2O)						C								
1000 mbar (481.87 inH_2O)						D								
2500 mbar (1004.66 inH_2O)						E								
5000 mbar (2009.32 inH_2O)						F								
10 bar (4018.65 inH_2O)						H								
25 bar (10046.60 inH_2O)						K								
60 bar (24111.90 inH_2O)						M								
100 bar (40186.50 inH_2O)						N								
Process connection														
Female thread M20 × 1.5							B							
Male thread G½ (DIN EN 837-1)							D							
Female thread ½-14 NPT							E							
Thread G½, inside G¼, ISO 228-1 / 316L							G							
Oval flange adapter according to IEC 61518							H							
Front-flush diaphragm (Options M-R)							K							
Wetted parts: Process connection, seal diaphragm														
Process connection: Stainless steel 316L/1.4404, Seal diaphragm: Ceramic								0						
Non-wetted parts														
Die-cast aluminum housing									1					
Housing made of stainless steel precision casting									2					
Housing made of stainless steel precision casting electrolytically polished									6					
PBT Plastic housing									7					
Enclosure														
Single chamber device											4			
Dual chamber device											5			
Type of protection														
Without Ex												A		
Intrinsic safety												B		
Flameproof enclosure												C		
Dust ignition proof												D		
Electrical connections/cable entries														
M20 × 1.5													F	
½"-14 NPT													M	
Local operation/display														
Without local display (lid closed)														0
With display (lid with glass window)														2
With display with Bluetooth functionality (lid with glass window)														7

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Selection and ordering data (continued)

Optionen	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Cable gland PA black Ø 5 ... 9 mm, standard	**A00**
Cable gland PA black Ø 6 ... 12 mm	**A01**
Cable gland PA black Ø 10 ... 14 mm	**A02**
Cable gland PA blue Ø 5 ... 9 mm	**A03**
Cable gland PA blue Ø 6 ... 12 mm	**A04**
Cable gland PA blue Ø 10 ... 14 mm	**A05**
Cable gland stainless steel Ø 7 ... 12 mm	**A10**
Cable gland nickel-plated brass Ø 6 ... 12 mm	**A11**
Cable gland nickel-plated brass Ø 5 ... 9 mm	**A12**
Cable gland nickel-plated brass, for armored cable (Ø 9 ... 13 mm)	**A14**
2 × sealing plug M20 × 1.5	**A20**
2 × sealing plug ½-14 NPT	**A21**
HAN plugs	
HAN 7D straight	**A30**
HAN 7D angled	**A31**
HAN 8D straight	**A34**
HAN 8D angled	**A35**
M12 plugs	
M20 × 1.5 / plug M12x1, pin assignment A	**A66**
M20 × 1.5 / plug M12x1, pin assignment B	**A67**
M20 × 1.5 / plug M12x1, pin assignment C	**A68**
Certificates	
Quality inspection certificate - 5 point factory calibration (IEC 62828-1)	**C11**
Inspection certificate (EN 10204-3.1) - material of pressure-containing and wetted parts	**C12**
Factory certificate - NACE (EN 10204, NACE MR 0175)	**C13**
Factory certificate (EN 10204-2.2) - wetted parts	**C14**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
Degree of protection IP66 / IP67	**D29**
Degree of protection IP66 / IP68	**D30**
Type plate made of stainless steel	**D43**
Oil and grease-free (incl. 3.1 Inspection certificate)	**D61**
Overvoltage protection	**D72**
General approval without Ex approval	
General approval without Ex approval: World (CE) except: CSA	**E00**
General approval without Ex approval: World (CE, CSA)	**E01**
General approval without Ex approval: CSA (USA & Canada)	**E06**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA & Canada)	**E21**
IECEx (World)	**E23**
NEPSI (China)	**E27**
Country specific approvals	
WHG overfill protection for fla mmable and non-flammable liquids	**E61**
Sealing concept	
Single seal	**K10**
Double seal	**K11**
Form seal	**K12**

Optionen	Order code
Measuring cell sealing / Processtemperature	
FKM (VP2/A) / -20 ... +130 °C	**K30**
FKM (VP2/A) / -20 ... +150 °C	**K31**
FKM (A+P 70.16) / -40 ... +130 °C	**K32**
EPDM (A+P 70.10-02/70.503-00) / -40 ... +130 °C	**K33**
EPDM (A+P 70.10-02/70.503-00) / -40 ... +150 °C	**K34**
FFKM (Perlast G74S) / -15 ... +130 °C	**K35**
FFKM (Perlast G74S) / -15 ... +150 °C	**K36**
FFKM (Perlast G75B) / -15 ... +130 °C	**K37**
FFKM (Perlast G75B) / -15 ... +150 °C	**K38**
FFKM (Kalrez 6375) / -20 ... +130 °C	**K39**
FFKM (Kalrez 6375) / -20 ... +150 °C	**K40**
FKM (ET 7067) / -20 ... +130 °C	**K41**
EPDM (E70Q) / -40 ... +130 °C	**K42**
FFKM (Chemraz 535) / -30 ... +130 °C	**K43**
FEPM (Fluoraz SD890) / -5 ... +130 °C	**K44**
FKM (V70SW) / -10 ... +150 °C	**K45**
EPDM (E70Q) / -40 ... +150 °C	**K46**
FKM (Endura V91A) / -40 ... +130 °C	**K47**
FKM (Endura V91A) / -40 ... +150 °C	**K48**
FFKM (Perlast G92E) / -15 ... +130 °C	**K49**
FFKM (Perlast G92E) / -15 ... +150 °C	**K50**
EPDM (E7502) / -40 ... +150 °C	**K51**
Flanges according to DIN EN 1092-1 Form B1 and ASME Standard B16.5	
Flange EN 1092-1 Form B1 DN 25 PN 40	**M00**
Flange EN 1092-1 Form B1 DN 40 PN 40	**M01**
Flange EN 1092-1 Form B1 DN 50 PN 40	**M02**
Flange EN 1092-1 Form B1 DN 80 PN 40	**M03**
Flange EN 1092-1 Form B1 DN 25 PN 100	**M04**
Flange EN 1092-1 Form B1 DN 50 PN 100	**M05**
ASME Flange B16.5 ½" Class 150 RF	**M30**
ASME Flange B16.5 ¾" Class 150 RF	**M31**
ASME Flange B16.5 1" Class 150 RF	**M32**
ASME Flange B16.5 1½" Class 150 RF	**M33**
ASME Flange B16.5 2" Class 150 RF	**M34**
ASME Flange B16.5 3" Class 150 RF	**M35**
ASME Flange B16.5 4" Class 150 RF	**M36**
ASME Flange B16.5 1" Class 300 RF	**M37**
ASME Flange B16.5 1½" Class 300 RF	**M38**
ASME Flange B16.5 2" Class 300 RF	**M39**
ASME Flange B16.5 3" Class 300 RF	**M40**
ASME Flange B16.5 4" Class 300 RF	**M41**
Hygienic process connections according to standards	
Hygienic flange DIN 11851 with slotted union nut DN 25 PN 40	**N00**
Hygienic flange DIN 11851 with slotted union nut DN 32 PN 40	**N01**
Hygienic flange DIN 11851 with slotted union nut DN 40 PN 40	**N02**
Hygienic flange DIN 11851 with slotted union nut DN 50 PN 25	**N03**
Hygienic flange DIN 11851 with slotted union nut DN 65 PN 25	**N04**
Hygienic flange DIN 11851 with slotted union nut DN 80 PN 25	**N05**

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Selection and ordering data (continued)

Optionen	Order code
Tri-Clamp DIN 32676 DN 20 PN 25	**N10**
Tri-Clamp DIN 32676 DN 65 PN 16	**N11**
Tri-Clamp DIN 32676 DN 80 PN 10	**N12**
Tri-Clamp ISO 2852 1½" PN 16	**N20**
Tri-Clamp ISO 2852 2" PN 16	**N21**
Tri-Clamp ISO 2852 3" PN 16	**N22**
Tri-Clamp ISO 2852 4" PN 10, 1.4435	**N23**
Aseptic threaded socket DIN 11864-1 Form A DN 25 PN 40 (R_a < 0.8 µm)	**N30**
Aseptic threaded socket DIN 11864-1 Form A DN 40 PN 40 (R_a < 0.8 µm)	**N31**
Aseptic threaded socket DIN 11864-1 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N32**
Aseptic flange with notch DIN 11864-2 Form A DN 25 PN 25 (1.4435)	**N40**
Aseptic flange with notch DIN 11864-2 Form A DN 32 PN 25 (R_a < 0.8 µm)	**N41**
Aseptic flange with notch DIN 11864-2 Form A DN 40 PN 25 (R_a < 0.8 µm)	**N42**
Aseptic flange with notch DIN 11864-2 Form A DN 50 PN 16 (R_a < 0.8 µm)	**N43**
Aseptic flange with notch DIN 11864-2 Form A DN 65 PN 16 (R_a < 0.8 µm)	**N44**
Aseptic flange with notch DIN 11864-2 Form A DN 80 PN 16 (R_a < 0.8 µm)	**N45**
Aseptic clamp with groove DIN 11864-3 Form A DN 32 PN 40 (R_a < 0.38 µm)	**N50**
Aseptic clamp with groove DIN 11864-3 Form A DN 40 PN 40 (R_a < 0.38 µm)	**N51**
Aseptic clamp with groove DIN 11864-3 Form A DN 65 PN 25 (R_a < 0.8 µm)	**N53**
Hygienic process connections manufacturer-specific	
Varivent Type F for pipes DN 25 - DN 32 PN 40	**P01**
Varivent Type N for pipes DN 40 - DN 125 PN 25	**P02**
NEUMO BioControl flange DN 25 PN 16	**P10**
NEUMO BioControl flange DN 50 PN 16	**P11**
NEUMO BioControl flange DN 65 PN 16	**P12**
NEUMO BioControl flange DN 80 PN 16	**P13**
NEUMO BioConnect screw connection DN 50 PN 16	**P20**
NEUMO BioConnect screw connection DN 80 PN 16	**P21**
Hygienic process connections special versions	
DRD Flange D = 65 mm DN 50 PN 40	**Q00**
SMS - threaded socket 1" PN 40 (R_a < 0.8 µm)	**Q10**
SMS - threaded socket 1½" PN 40 (R_a < 0.76 µm)	**Q11**
SMS - threaded socket 2" PN 25 (R_a < 0.76 µm)	**Q12**
Ingold socket DN 25 with union nut G1¼" PN 10	**Q20**
Connections for pulp ans paper industry	
Process connection PMC-Style Standard	**R00**
Process connection PMC-Style Minibolt	**R01**
Threatet connector	
External thread G ¾-A DIN 3852	**R10**
External thread G 1-A DIN 3852	**R11**
External thread G 1½-A DIN 3852	**R12**
External thread G 2-A DIN 3852	**R13**
External thread G 1/2 ISO 228-1	**R15**
External thread G 1 ISO 228-1	**R16**
External thread 1-11.5 NPT	**R17**
External thread 1½-11.5 NPT	**R18**
External thread 2-11.5 NPT	**R19**

Optionen	Order code
Device settings	
Measuring range setting: Lower range value (max. 5 characters), Upper range value (max. 5 characters), Unit (mbar, bar, kPa, MPa, psi, ...) Example: -0.5 ... 10.5 psi	**Y01**
Location designation (Tag) (stainless steel plate. device parameters. max. 32 characters)	**Y15**
Device address (PROFIBUS 1 ... 126)	**Y25**

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Selection and ordering data (continued)

Pressure transmitters with front flush metallic cell	Article No.													
SITRANS P310	7MF83	●	●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P410	7MF84	●	●	-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Technology, sensor														
Gauge pressure		4												
Absolute pressure		5												
Communication														
HART (4 ... 20 mA			0											
PROFIBUS PA			1											
Measuring cell filling														
Synthetic oil (-40 ... +105 °C)					0									
Inert liquid (-40 ... +105 °C)					1									
Neobee oil (FDA-listed) (-20 ... +105 °C)					2									
Medical white oil (FDA-listed) (-12 ... +150 °C)					3									
Dry pressure cell (-40 ... +105 °C)					7									
Maximum measuring span														
100 mbar (40.19 inH_2O)						B								
400 mbar (160.74 inH_2O)						C								
1000 mbar (481.87 inH_2O)						D								
2500 mbar (1004.66 inH_2O)						E								
5000 mbar (2009.32 inH_2O)						F								
10 bar (4018.65 inH_2O)						H								
25 bar (10046.60 inH_2O)						K								
40 bar (16074.60 inH_2O)						L								
100 bar (40186.50 inH_2O)						N								
250 bar (100466 inH_2O)						Q								
600 bar (241119 inH_2O)						S								
1000 bar (401865 inH_2O)						T								
Process connection														
Female thread M20 × 1.5							B							
Male thread G½ (DIN EN 837-1)							D							
Female thread ½-14 NPT							E							
Male thread ½-14 NPT							F							
Thread G½, inside G¼, ISO 228-1 / 316L							G							
Oval flange adapter according to IEC 61518							H							
Front-flush diaphragm (Options M-R)							K							
Wetted parts: Process connection, seal diaphragm														
Process connection: Stainless steel 316L/1.4404, Seal diaphragm: Stainless steel 316L/1.4404								0						
Non-wetted parts														
Die-cast aluminum housing									1					
Housing made of stainless steel precision casting									2					
Housing made of stainless steel precision casting electrolytically polished									6					
PBT Plastic housing									7					
Enclosure														
Single chamber device											4			
Dual chamber device											5			
Type of protection														
Without Ex												A		
Intrinsic safety												B		
Flameproof enclosure												C		
Dust ignition proof												D		
Electrical connections/cable entries														
M20 × 1.5													F	
½"-14 NPT													M	

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Selection and ordering data (continued)

Pressure transmitters with front flush metallic cell	Article No.															
SITRANS P310	7MF83	●	●	-	●	●	●	●	●	-	●	●	●	●		
SITRANS P410	7MF84	●	●	-	●	●	●	●	●	-	●	●	●	●		
Local operation/display																
Without local display (lid closed)																0
With display (lid with glass window)																2
With display with Bluetooth functionality (lid with glass window)																7

Optionen	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Cable gland PA black Ø 5 ... 9 mm, standard	**A00**
Cable gland PA black Ø 6 ... 12 mm	**A01**
Cable gland PA black Ø 10 ... 14 mm	**A02**
Cable gland PA blue Ø 5 ... 9 mm	**A03**
Cable gland PA blue Ø 6 ... 12 mm	**A04**
Cable gland PA blue Ø 10 ... 14 mm	**A05**
Cable gland stainless steel Ø 7 ... 12 mm	**A10**
Cable gland nickel-plated brass Ø 6 ... 12 mm	**A11**
Cable gland nickel-plated brass Ø 5 ... 9 mm	**A12**
Cable gland nickel-plated brass, for armored cable (Ø 9 ... 13 mm)	**A14**
2 × sealing plug M20 × 1.5	**A20**
2 × sealing plug ½-14 NPT	**A21**
HAN plugs	
HAN 7D straight	**A30**
HAN 7D angled	**A31**
HAN 8D straight	**A34**
HAN 8D angled	**A35**
M12 plugs	
M20 × 1.5 / plug M12x1, pin assignment A	**A66**
M20 × 1.5 / plug M12x1, pin assignment B	**A67**
M20 × 1.5 / plug M12x1, pin assignment C	**A68**
Certificates	
Quality inspection certificate - 5 point factory calibration (IEC 62828-1)	**C11**
Inspection certificate (EN 10204-3.1) - material of pressure-containing and wetted parts	**C12**
Factory certificate - NACE (EN 10204, NACE MR 0175)	**C13**
Factory certificate (EN 10204-2.2) - wetted parts	**C14**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
Degree of protection IP66 / IP67	**D29**
Degree of protection IP66 / IP68	**D30**
Type plate made of stainless steel	**D43**
Oil and grease-free (incl. 3.1 Inspection certificate)	**D61**
Oil and grease-free for oxygen (incl. 3.1 Inspection certificate)	**D62**
Overvoltage protection	**D72**
General approval without Ex approval	
General approval without Ex approval: World (CE) except: CSA	**E00**
General approval without Ex approval: World (CE, CSA)	**E01**
General approval without Ex approval: CSA (USA & Canada)	**E06**

Optionen	Order code
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA & Canada)	**E21**
IECEx (World)	**E23**
NEPSI (China)	**E27**
Country specific approvals	
WHG overfill protection for flammable and non-flammable liquids	**E61**
Flanges according to DIN EN 1092-1 Form B1 and ASME Standard B16.5	
Flange EN 1092-1 Form B1 DN 25 PN 40	**M00**
Flange EN 1092-1 Form B1 DN 40 PN 40	**M01**
Flange EN 1092-1 Form B1 DN 50 PN 40	**M02**
Flange EN 1092-1 Form B1 DN 80 PN 40	**M03**
Flange EN 1092-1 Form B1 DN 25 PN 100	**M04**
Flange EN 1092-1 Form B1 DN 50 PN 100	**M05**
ASME Flange B16.5 1" Class 150 RF	**M32**
ASME Flange B16.5 1½" Class 150 RF	**M33**
ASME Flange B16.5 2" Class 150 RF	**M34**
ASME Flange B16.5 3" Class 150 RF	**M35**
ASME Flange B16.5 4" Class 150 RF	**M36**
ASME Flange B16.5 1" Class 300 RF	**M37**
ASME Flange B16.5 1½" Class 300 RF	**M38**
ASME Flange B16.5 2" Class 300 RF	**M39**
ASME Flange B16.5 3" Class 300 RF	**M40**
ASME Flange B16.5 4" Class 300 RF	**M41**
Hygienic process connections according to standards	
Hygienic flange DIN 11851 with slotted union nut DN 25 PN 40	**N00**
Hygienic flange DIN 11851 with slotted union nut DN 32 PN 40	**N01**
Hygienic flange DIN 11851 with slotted union nut DN 40 PN 40	**N02**
Hygienic flange DIN 11851 with slotted union nut DN 50 PN 25	**N03**
Hygienic flange DIN 11851 with slotted union nut DN 65 PN 25	**N04**
Hygienic flange DIN 11851 with slotted union nut DN 80 PN 25	**N05**
Tri-Clamp DIN 32676 DN 65 PN 16 (R_a < 0.76 µm)	**N15**
Tri-Clamp DIN 32676 DN 80 PN 10 (R_a < 0.76 µm)	**N16**
Tri-Clamp ISO 2852 1½" PN 40 (R_a < 0.76 µm)	**N25**
Tri-Clamp ISO 2852 2" PN 16 (R_a < 0.76 µm)	**N26**
Tri-Clamp ISO 2852 3" PN 16 (R_a < 0.76 µm)	**N27**
Tri-Clamp ISO 2852 4" PN 10, 1.4435(R_a < 0.38 µm)	**N28**
Aseptic threaded socket DIN 11864-1 Form A DN 40 PN 40 (R_a < 0.8 µm)	**N31**
Aseptic threaded socket DIN 11864-1 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N32**

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Selection and ordering data (continued)

Optionen	Order code
Aseptic flange with notch DIN 11864-2 Form A DN 32 PN 25 (R_a < 0.8 µm)	**N41**
Aseptic flange with notch DIN 11864-2 Form A DN 40 PN 25 (R_a < 0.8 µm)	**N42**
Aseptic flange with notch DIN 11864-2 Form A DN 50 PN 16 (R_a < 0.8 µm)	**N43**
Aseptic flange with notch DIN 11864-2 Form A DN 65 PN 16 (R_a < 0.8 µm)	**N44**
Aseptic flange with notch DIN 11864-2 Form A DN 80 PN 16 (R_a < 0.8 µm)	**N45**
Aseptic clamp with groove DIN 11864-3 Form A DN 40 PN 40 (R_a < 0.38 µm)	**N51**
Aseptic clamp with groove DIN 11864-3 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N52**
Hygienic process connections manufacturer-specific	
Varivent Type F for pipes DN 25 - DN 32 PN 40	**P01**
Varivent Type N for pipes DN 40 - DN 125 PN 25	**P02**
NEUMO BioControl flange DN 50 PN 16	**P11**
NEUMO BioControl flange DN 65 PN 16	**P12**
NEUMO BioControl flange DN 80 PN 16	**P13**
Hygienic process connections special versions	
DRD Flange D = 65 mm DN 50 PN 40	**Q00**
SMS - threaded socket 1½" PN 40	**Q11**
SMS - threaded socket 2" PN 25	**Q12**
SMS - threaded socket 2½" PN 25	**Q13**
SMS - threaded socket 3" PN 25	**Q14**
Connections for pulp ans paper industry	
Process connection PMC-Style Standard	**R00**
Threatet connector	
External thread G 1½-A DIN 3852	**R12**
External thread G 2-A DIN 3852	**R13**
External thread G 1 ISO 228-1	**R16**
External thread 1½-11.5 NPT	**R18**
External thread 2-11.5 NPT	**R19**
Special options front-flush	
High temperature with screening shield (-12 ... +200 °C)	**R85**
Device settings	
Measuring range setting: Lower range value (max. 5 characters), Upper range value (max. 5 characters), Unit (mbar, bar, kPa, MPa, psi, ...) Example: -0.5 ... 10.5 psi	**Y01**
Location designation (Tag) (stainless steel plate. device parameters. max. 32 characters)	**Y15**
Device address (PROFIBUS 1 ... 126)	**Y25**

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Technical specifications

SITRANS P310/P410 Front flush ceramic DPC

Input	
Gauge pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +25 mbar 0 ... +2.5 kPa 0 ... +0.4 psi	-50 mbar ... +5 bar -5 ... +<500 kPa -0.7 ... +75 psi
0 ... +100 mbar 0 ... +10 kPA 0 ... +1.5 psi	-200 mbar ... +15 bar -20 ... +1500 kPa -3 ... +225 psi
0 ... +0.4 bar 0 ... +40 kPa 0 ... +5 psi	-0.8 ... +30 bar -80 ... +3000 kPa -11.50 ... +375 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +65 bar -100 ... +6500 kPa -14.51 ... +975 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +90 bar -100 ... +9000 kPa -14.51 ... +1350 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +125 bar -100 ... +12500 kPa -14.51 ... +1900 psi
0 ... +60 bar 0 ... +6000 kPa 0 ... +900 psi	-1 ... +200 bar -100 ... +20000 kPa -14.50 ... +2900 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450 psi	-1 ... +200 bar -100 ... +20000 kPa -14.51 ... +2900 psi
Measuring limits	
Lower measuring limits	For 25 mbar measuring cells, the lower measuring limit is 975 mbar abs For 100 mbar measuring cells, the lower measuring limit is 900 mbar abs For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +100 mbar 0 ... +10 kPa 0 ... +1.5 psi	-1 ... +15 bar -100 ... +1500 kPa -14.51 ... +225 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +65 bar -100 ... +6500 kPa -14.51 ... +975 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +90 bar -100 ... +9000 kPa -14.51 ... +1350 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +125 bar -100 ... +12500 kPa -14.51 ... +1900 psi
0 ... +60 bar 0 ... +6000 kPa 0 ... +900 psi	-1 ... +200 bar -100 ... +20000 kPa -14.50 ... +2900 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450.38 psi	0 ... +200 bar 0 ... +20000 kPa 0 ... +2900 psi

Input	
Adjustment	
Min./max. adjustment, percentage value	-10 ... 110%
Min./max. adjustment, pressure value	-20 ... 120%
Zero adjustment	-20 ... +95%
Span adjustment	-120 ... +120%
Max. zero/span difference	120% of nominal range
Adjustable pressure values	Values below -1 bar cannot be set

[1] The burst pressure depends on the process connection and is therefore not specified here.

Output		
Output 4 ... 20 mA HART		
Output signal max. range	3.8 ... 20.5 mA/HART	Factory setup
Lower saturation limit	3.6 mA	
Upper saturation limit	21.5 mA	
Failure mode	≤ 3.6 mA	
Failure mode max.	≥ 21 mA	Adjustable
Signal resolution	0.3 µA	
Load calculation	(U_B - U_{min})/0.022 A	Example – at U_B = 24 V DC: (24 V – 9.6 V) / 0.022 A = 655 Ω
Starting current	≤ 10 mA for 5 ms after switch-on, ≤ 3.6 mA	
Protection against polarity reversal	Yes	
Electrical damping (63% of the input value)	0 ... 999 s	Adjustable
Adjustment ranges and output behavior		
Parameter	**Technical data / Note**	
Max. permissible turn down	Unlimited; recommended 20:1	
Fault signal, adjustable	≤ 3.6 mA; ≥ 21 mA; last measured value	

Measuring accuracy		
Measurement error Values are valid for single transmitter		
Measuring range	> 25 mbar	
Measuring accuracy 0.1%	< 0.1%	1:1 until 1:5 > 25 mbar
	< 0.02% × TD	TD > 5:1
Measuring accuracy 0.05% - optional	< 0.05%	1:1 until 1:5
	< 0.01% × TD	TD > 5:1
Measuring range	0 ... 25 mbar and -25 ... 25 mbar	
Measuring accuracy 0.1%	< 0.1%	
Measuring accuracy 0.05% - optional	< 0.05%	

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Technical specifications (continued)

Measuring accuracy			
Reference conditions			
Conditions and stability			
Reference temperature	+15 ... +25 °C (59 ... 77 °F)		
Relative humidity	45 ... 75%		
Air pressure	860 ... 1060 mbar / 86 ... 106 kPa		
Characteristic determination	Limit point adjustment according to IEC 61298-2		
Characteristic curve	Linear		
Reference installation position	Upright, diaphragm points downward		
Influence of installation position	< 0.2 mbar / 20 Pa		
EMC influence on current output	< ±150 µA under strong high-frequency electromagnetic fields according to EN 61326-1		
Long-term stability			
	Measuring cell Ø 28 mm, at 0.1 bar	**Measuring cell Ø 28 mm, measuring range 0.025 bar**	**Measuring cell Ø 17.5 mm**
1 year	< 0.05% × TD	< 0.1% × TD	< 0.1% × TD
5 years	< 0.1% × TD	< 0.2% × TD	< 0.2% × TD
10 years	< 0.15% × TD	< 0.4% × TD	< 0.4% × TD
Temperature behavior			
Temperature influence			
Climate-compensated temperature range	0 ... +100 °C (32 ... 212 °F)		
Uncompensated temperature range	-40 ... 0 °C (-40 ... 32 °F) and +100 ... +130 °C (212 ... 266 °F)		
Turn-down factor	FTD = 0.5 × TD + 0.5		
Thermal change in current output	< 0.05% for 10 K		
Maximum thermal change in current output	< 0.15% for -40 ... +80 °C (-40 ... 176 °F)		

Operating conditions			
Ambient temperature			
Standard	-40 ... +80 °C (-40 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Storage temperature			
Standard	-60 ... +80 °C (-67 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Process temperature stainless steel connections			
Sealing material	**Type**	**Standard**	**Extended temperature range**
FKM	VP2/A	-20 ... +130 °C (-4 ... 266 °F)	-20 ... +150 °C (-4 ... 302 °F)
FKM	A+P 70.16	-40 ... +130 °C (-40 ... 266 °F)	Not specified
FKM	V70SW	Not specified	-10 ... +150 °C (14 ... 302 °F)
EPDM	A+P 70.10-02	-40 ... +130 °C (-40 ... 266 °F)	-40 ... +150 °C (-40 ... 302 °F)
EPDM	E70Q	Not specified	-40 ... +150 °C (-40 ... 302 °F)
EPDM	Fluoraz SD890	-5 ... +130 °C (23 ... 266 °F)	Not specified
FFKM	Kalrez 6375	-20 ... +130 °C (-4 ... 266 °F)	-20 ... +150 °C (-4 ... 302 °F)
FFKM	Perlast G74S	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
FFKM	Perlast G75B	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
FFKM	Perlast G92E	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
Mechanical stress			
Vibration resistance, standard	4 g at 5 ... 200 Hz according to EN 60068-2-6		
Shock resistance, standard	50 g, 2.3 ms according to EN 60068-2-27		
Degree of protection			
Housing material	**Version**	**Protection according to IEC 60529**	**NEMA**
Plastic	Single chamber / double chamber	IP66/IP67	Type 4X
Aluminium	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P
Stainless steel, electropolished	Single chamber	IP66/IP67	Type 4X
Stainless steel, precision casting	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P

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Technical specifications (continued)

Structural design	
Material and transmitter specification	
Weight (without options)	0.8 ... 8 kg depending on process connection and housing
Enclosure material	PBT-Kunststoff, Aluminium AlSi10Mg or 316L
Housing materials	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Cable gland materials	PA; stainless steel; brass
Wetted parts materials	
Process fitting	316L
Diaphragm materials	Sapphire ceramic®, > 99.9% Al_2O_3
Joining material of the measuring cell	Glass (not in contact with medium with double or form sealing)
Standard measuring cell seal	FKM, EPDM or FFKM
Process connection	
Surface quality, hygienic process fittings	R_a < 0.8 µm
Diaphragm	R_a < 0.5 µm
Electrical connection and electromechanical data	
Parameter	**Technical data**
Cable entry / gland / blind plug	M20 × 1.5; ½ NPT
Solid or stranded wire cross-section	0.2 ... 2.5 mm², AWG 24 ... 14
Stranded wire with end sleeve	0.2 ... 1.5 mm², AWG 24 ... 16
Connection between primary and secondary device	
Data transfer	Digital (I^2C-Bus)
Cable length	between 5 m and 70 m
Connection cable minimum bending radius at 25 °C (77 °F)	25 mm
Connection cable wire cross-section	0.34 mm², (AWG 22)
Connection cable wire resistance	< 0.05 ohm/m

Power supply		
Supply voltage and electrical data		
Power supply U_H (Master only)		
Terminal voltage on transmitter - U_B	9.6 ... 35 V DC	
Terminal voltage on transmitter light switched on - U_B	16 ... 35 V DC	
Permissible residual ripple	U_N 12 V DC (9.6 V < U_B < 18 V)	≤ 0.7 V_{eff} (16 ... 400 Hz)
	U_N 24 V DC (18 V < U_B < 35 V)	≤ 1 V_{eff} (16 ... 400 Hz)
Start-up time at U_B ≥ 12 V DC	≤ 9 s	
Start-up time at U_B < 12 V DC	≤ 22 s	
Reverse polarity protection	Yes	
Galvanic separation	Reference voltage 500 V AC	

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
SIL	
SIL 2/3	according to IEC 61508
Drinking water	
WHG	No.: Z-65.11-644
Explosion protection as per ATEX	TÜV 26 ATEX 423318 X
Intrinsic safety "i"	
Marking, intrinsic safety	II 1/2 G Ex ia IIC T6...T1 Ga/Gb
Permissible ambient temperature	-50 ... +70 °C (-58 ... 158 °F) for T5 -50 ... +39 °C (-58 ... 102 °F) for T6

Certificates and approvals	
Permissible medium temperature	-20 ... +60 °C (-4 ... 140 °F) for T5 -20 ... +23 °C (-4 ... 73.4 °F) for T6
Connection	To certified intrinsically safe circuits with peak values:
HART	U_i = 30 V, I_i = 131 mA, P_i = 983 mW
Profibus (FISCO)	U_i = 17.5 V, I_i = 500 mA, P_i = 5.5 W
Profibus (Barrier)	U_i = 24 V, I_i = 250 mA, P_i = 1.2 W

Communication	
HART	
Protocol	7.3
Profibus PA	
Output signal	Digital output signal, Profibus protocol
Transmission rate	31.25 Kbit/s
Instrument address	126 (default setting)
Damping (63% of the input variable)	0 ... 999 s, adjustable
Profibus PA profile	3.02
Number of FBs with AI (function blocks with analogue input)	3
Bluetooth	
Max. participants	1
Bluetooth standard	Bluetooth 5.x
Effective range	Typically 30 m (98 ft)
The Bluetooth range depends on the local conditions.	

SITRANS P310/P410 Front flush metal cell

Input for Piezo-/DMS measuring cell	
Gauge pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.4 bar 0 ... +40 kPa 0 ... +5.8 psi	-1 ... +1.2 bar -100 ... +120 kPa -14.50 ... +17.4 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +14.50 psi	-1 ... +3 bar -100 ... +300 kPa -14.50 ... +43.5 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +36.26 psi	-1 ... +7.5 bar -100 ... +750 kPa -14.50 ... +108.8 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +72.52 psi	-1 ... +15 bar -100 ... +1500 kPa -14.50 ... +217 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +145.04 psi	-1 ... +30 bar -100 ... +3000 kPa -14.50 ... +435 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +362.59 psi	-1 ... +75 bar -100 ... +7500 kPa -14.50 ... +1087 psi
0 ... +40 bar 0 ... +4000 kPa 0 ... +580.15 psi	-1 ... +120 bar -100 ... +12000 kPa -14.50 ... +1740 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450 psi	-1 ... +200 bar -100 ... +20000 kPa -14.51 ... +2900 psi
0 ... +250 bar 0 ... +25000 kPa 0 ... +3625.94 psi	-1 ... +500 bar -100 ... +50000 kPa -14.50 ... +7251.89 psi
0 ... +600 bar 0 ... +60000 kPa 0 ... +8702.26 psi	-1 ... +1200 bar -100 ... +120000 kPa -14.50 ... +17405 psi
0 ... 1000 bar 0 ... 100 MPa 0 ... 14500 psi	-1 ... +1500 bar -100 ... +150000 kPa -14.50 ... +21756 psi
Measuring limits	
Lower measuring limits	For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**

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Technical specifications (continued)

Input for Piezo-/DMS measuring cell	
0 ... +1 bar abs 0 ... +100 kPa abs 0 ... +14.50 psi abs	0 ... +3 bar abs 0 ... +300 kPa abs 0 ... +43.5 psi abs
0 ... +2.5 bar abs 0 ... +250 kPa abs 0 ... +36.26 psi abs	0 ... +7.5 bar abs 0 ... +750 kPa abs 0 ... +108.8 psi abs
0 ... +10 bar abs 0 ... +1000 kPa abs 0 ... +145.04 psi abs	0 ... +30 bar abs 0 ... +3000 kPa abs 0 ... +435 psi abs
0 ... +25 bar abs 0 ... +2500 kPa abs 0 ... +362.59 psi abs	0 ... +75 bar abs 0 ... +7500 kPa abs 0 ... +1087 psi abs
0 ... +40 bar abs 0 ... +4000 kPa abs 0 ... +580.15 psi abs	0 ... +120 bar abs 0 ... +12000 kPa abs 0 ... +1740 psi abs

1) The burst pressure depends on the process connection and is therefore not specified here.

Input for ceramic/metallic measuring cell	
Gauge pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.1 bar 0 ... +10 kPa 0 ... +1.5 psi	-1 ... +15 bar -100 ... +1500 kPa -14.51 ... +225 psi
0 ... +0.4bar 0 ... +40 kPa 0 ... +5 psi	-1 ... +30 bar -100 ... +3000 kPa -14.51 ... +375 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
Measuring limits	
Lower measuring limits	For 100 mbar measuring cells, the lower measuring limit is 900 mbar abs For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
Adjustment	
Min./max. adjustment, percentage value	-10 ... 110%
Min./max. adjustment, pressure value	-20 ... 120%
Zero adjustment	-20 ... +95%
Span adjustment	-120 ... +120%
Max. zero/span difference	120% of nominal range
Adjustable pressure values	Values below -1 bar cannot be set
Measuring cell concept	
For measuring ranges up to 40 bar	Piezoresistive sensor element with internal isolating liquid

Input for ceramic/metallic measuring cell	
For measuring ranges above 100 bar	Strain gauge (DMS) sensor element (dry system)
For measuring ranges ≤ 400 mbar or higher temperature ranges	Ceramic/ metallic measuring cell

1) The burst pressure depends on the process connection and is therefore not specified here.

Output		
Output 4 ... 20 mA		
Output signal max. range	3.8 ... 20.5 mA/HART	Factory setup
Lower saturation limit	3.6 mA	
Upper saturation limit	21.5 mA	
Failure mode	≤ 3.6 mA	
Failure mode max.	≥ 21 mA	Adjustable
Signal resolution	0.3 µA	
Load calculation	(U_B - U_{min})/0.022 A	Example – at U_B = 24 V DC: (24 V – 9.6 V) / 0.022 A = 655 Ω
Starting current	≤ 10 mA for 5 ms after switch-on, ≤ 3.6 mA	
Protection against polarity reversal	Yes	
Electrical damping (63% of the input value)	0 ... 999 s	Adjustable
Adjustment ranges and output behavior		
Parameter	**Technical data / Note**	
Max. permissible turn down	Unlimited; recommended 20:1	
Fault signal, adjustable	≤ 3.6 mA; ≥ 21 mA; last measured value	

Measuring accuracy		
Measurement error and reference conditions Values are valid for single transmitter		
Measuring accuracy (Turn-down)		
0.1%	< 0.1% < 0.002% × TD	1:1 until 1:5 TD > 5:1
0.075%	< 0.075% < 0.0015% × TD	1:1 until 1:5 TD > 5:1
Long-term stability DMS measuring cell	Measuring range > 1 bar	< 0.1% × TD/year
Piezoresistive measuring cell	Measuring range > 1 bar	< 0.1% × TD/year
Measuring range 1 bar	< 0.15% × TD/year	
Measuring range 0.4 bar	< 0.35% × TD/year	
Conditions and stability		
Reference temperature	+18 ... +30 °C (64.4 ...86 °F)	
Relative humidity	45 ... 75%	
Air pressure	860 ... 1060 mbar / 86 ... 106 kPa	
Characteristic determination	Limit point adjustment according to IEC 61298-2	
Characteristic curve	Linear	
Reference installation position	Upright, diaphragm points downward	
Influence of installation position	Piezoresistive/DMS cell	depending on process connection and diaphragm seal
	Ceramic/metal cell	< 5 mbar/0.5 kPa (0.07 psig)
EMC influence on current output	< ±150 µA under strong high-frequency electromagnetic fields according to EN 61326-1	

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Technical specifications (continued)

Operating conditions					
Ambient temperature	Observe the temperature class in hazardous areas.				
Standard	-40 ... +80 °C (-40 ... 176 °F)				
PUR cable	-20 ... +80 °C (-4 ... 176 °F)				
PE cable	-20 ... +60 °C (-4 ... 140 °F)				
Storage temperature					
Standard	-60 ... +80 °C (-76 ... 176 °F)				
PUR cable	-20 ... +80 °C (-4 ... 176 °F)				
PE cable	-20 ... +60 °C (-4 ... 140 °F)				
Process temperature piezoresistive/DMS measuring cell					
Process temperature					
Seal	**Standard**	**Extended temperature range**	**Hygienic process connections**		**Oxygen applications**
	Pabs ≥ 1 mbar		Pabs ≥ 1 mbar	Pabs ≥ 10 mbar	Pabs ≥ 10 mbar
Without regard to the seal	-20/-40 ... +105 °C (-4/-40 ... +221 °F)	-	-	-	-20 ... +60 °C (-4 ... +140 °F)
FKM (VP2/A)	-20 ... +105 °C (-4 ... +221 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +85 °C (-4 ... +185 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +60 °C (-4 ... +140 °F)
EPDM (A+P 70.10-02)	-20 ... +105 °C (-4 ... +221 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +85 °C (-4 ... +185 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +60 °C (-4 ... +140 °F)
FFKM (Perlast G74S)	-15 ... +105 °C (+5 ... +221 °F)	-15 ... +150 °C (+5 ... +302 °F)	-15 ... +85 °C (+5 ... +185 °F)	-15 ... +150 °C (+5 ... +302 °F)	-15 ... +60 °C (+5 ... +140 °F)
FEPM (Fluoraz SD890)	-5 ... +105 °C (+23 ... +221 °F)	-	-	-	-5 ... +60 °C (+23 ... +140 °F)
Process temperature ceramic/metal measuring cell					
	Pabs ≥ 50 mbar	**Pabs ≥ 10 mbar**	**Pabs ≥ 10 mbar**		
Standard	-12 ... +150 °C (+10 ... +284 °F)	-12 ... +150 °C (+10 ... +284 °F)	-12 ... +120 °C (+10 ... +248 °F)		
Extended temperature range	-12 ... +180 °C (+10 ... +284 °F)	-12 ... +160 °C (+10 ... +320 °F)	-12 ... +120 °C (+10 ... +248 °F)		
	-12 ... +200 °C (+10 ... +392 °F)	-12 ... +160 °C (+10 ... +320 °F)	-12 ... +120 °C (+10 ... +248 °F)		
Mechanical stress					
Parameter	**Technical data**				
	Without cooling section		**With cooling section**		
	All enclosure	**Two chamber stainless steel**	**All enclosure**	**Two chambers stainless steel**	
Vibration resistance 5 ... 200 Hz according to EN 60068-2-6	4 g	0.7 g	4 g	0.7 g	
Shock resistance 2.3 ms according to EN 60068-2-27	50 g	50 g	50 g	20 g	
Degree of protection					
Housing material	**Version**		**Protection according to IEC 60529**		**NEMA**
Plastic	Single chamber / double chamber		IP66/IP67		Type 4X
Aluminium	Single chamber / double chamber		IP66/IP67; IP66/IP68 (0.2 bar)		Type 4X; Type 6P
Stainless steel, electropolished	Single chamber		IP66/IP67/IP69		Type 4X
Stainless steel, precision casting	Single chamber / double chamber		IP66/IP67; IP66/IP68 (0.2 bar)		Type 6P

Structural design	
Material and transmitter specification	
Weight (without options)	0.8 ... 8 kg depending on process connection and housing
Enclosure material	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Housing materials	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Cable gland materials	PA; stainless steel; brass
Wetted parts materials	
Process fitting	
Diaphragm materials	316L
Seal for G½ (EN 837), G1½ (DIN 3852-A)	Klingersil C-4400

Structural design	
Process connection	
Surface quality, hygienic process fittings	R_a < 0.8 µm, typical
Diaphragm	316L
Electrical connection and electromechanical data	
Parameter	**Technical data**
Cable entry / gland / blind plug	M20 × 1.5; ½ NPT
Solid or stranded wire cross-section	0.2 ... 2.5 mm², AWG 24 ... 14
Stranded wire with end sleeve	0.2 ... 1.5 mm², AWG 24 ... 16

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Technical specifications (continued)

Power supply		
Supply voltage and electrical data		
Power supply U_H (Master only)		
Terminal voltage on transmitter - U_B	9.6 ... 35 V DC	
Terminal voltage on transmitter light switched on - U_B	16 ... 35 V DC	
Permissible residual ripple	U_N 12 V DC (9.6 V < U_B < 18 V)	≤ 0.7 V_{eff} (16 ... 400 Hz)
	U_N 24 V DC (18 V < U_B < 35 V)	≤ 1 V_{eff} (16 ... 400 Hz)
Start-up time at U_B ≥ 12 V DC	≤ 9 s	
Start-up time at U_B < 12 V DC	≤ 22 s	
Reverse polarity protection	Yes	
Galvanic separation	Reference voltage 500 V AC	

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
SIL	
SIL 2/3	according to 61508
Drinking water	
WHG	No.: Z-65.11-644
Explosion protection as per ATEX	TÜV 26 ATEX 423318 X
Intrinsic safety "i"	
Marking, intrinsic safety	II 1/2 G Ex ia IIC T6...T1 Ga/Gb
Permissible ambient temperature	-50 ... +70 °C (-58 ... 158 °F) for T5 -50 ... +39 °C (-58 ... 102 °F) for T6
Permissible medium temperature	-20 ... +60 °C (-4 ... 140 °F) for T5 -20 ... +23 °C (-4 ... 73.4 °F) for T6
Connection	To certified intrinsically safe circuits with peak values:

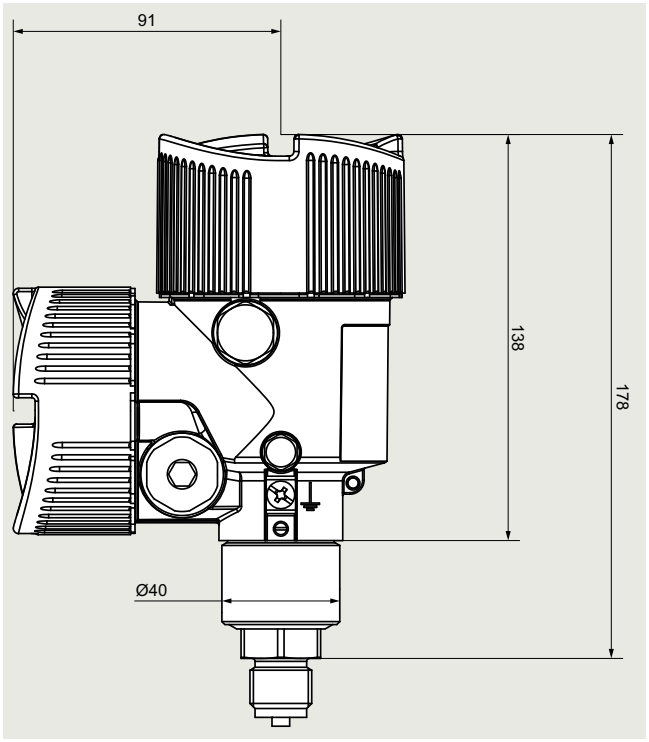
Certificates and approvals	
HART	U_i = 30 V, I_i = 131 mA, P_i = 983 mW
Profibus (FISCO)	U_i = 17.5 V, I_i = 500 mA, P_i = 5.5 W
Profibus (Barrier)	U_i = 24 V, I_i = 250 mA, P_i = 1.2 W

Communication	
HART	
Protocol	7.3
Profibus PA	
Output signal	Digital output signal, Profibus protocol
Transmission rate	31.25 Kbit/s
Instrument address	126 (default setting)
Damping (63% of the input variable)	0 ... 999 s, adjustable
Profibus PA profile	3.02
Number of FBs with AI (function blocks with analogue input)	3
Bluetooth	
Max. participants	1
Bluetooth standard	Bluetooth 5.x
Effective range	Typically 30 m (98 ft)
The Bluetooth range depends on the local conditions.	

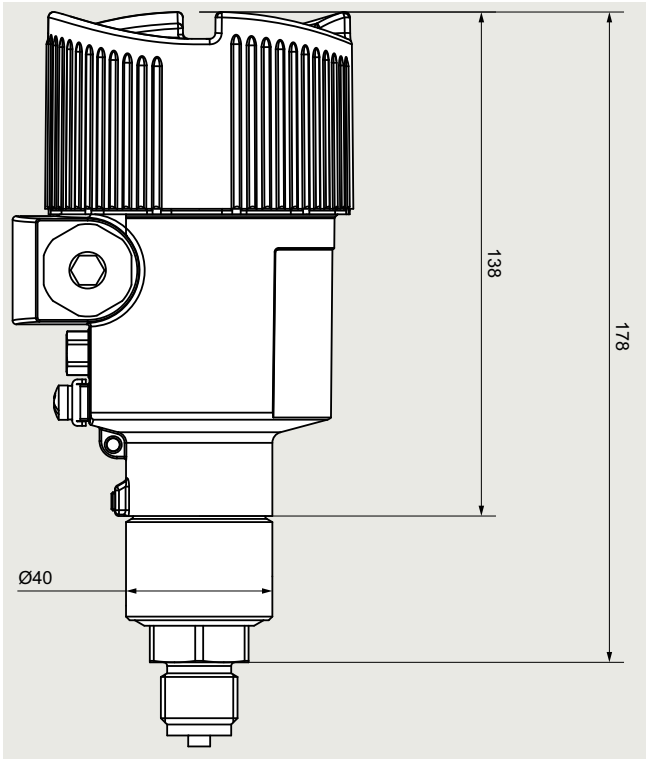
[1] The burst pressure depends on the process connection and is therefore not specified here.

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Dimensional drawings

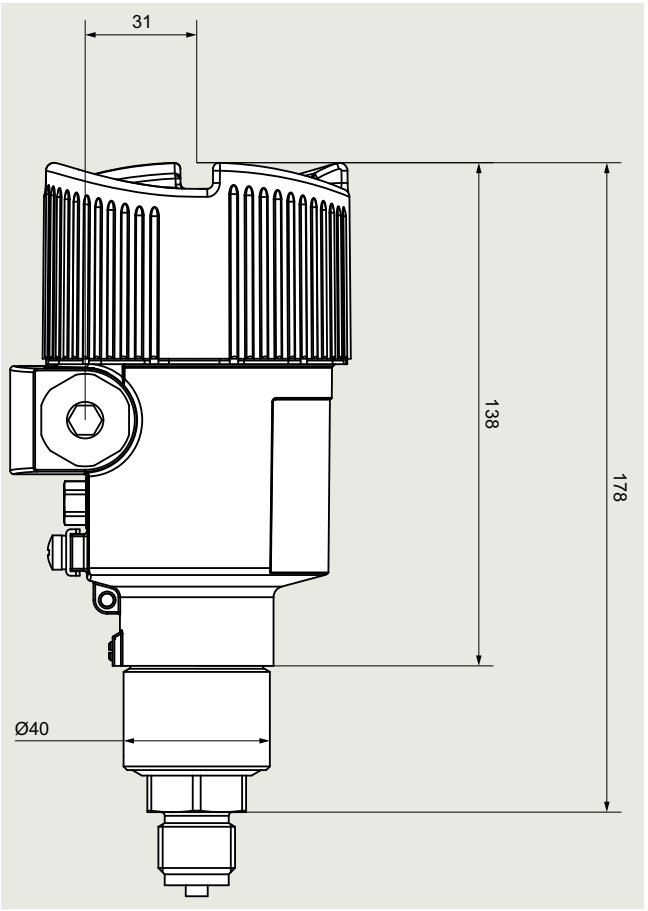


SITRANS P310/P410 aluminium dual chamber housing



SITRANS P310/P410 aluminium single chamber housing

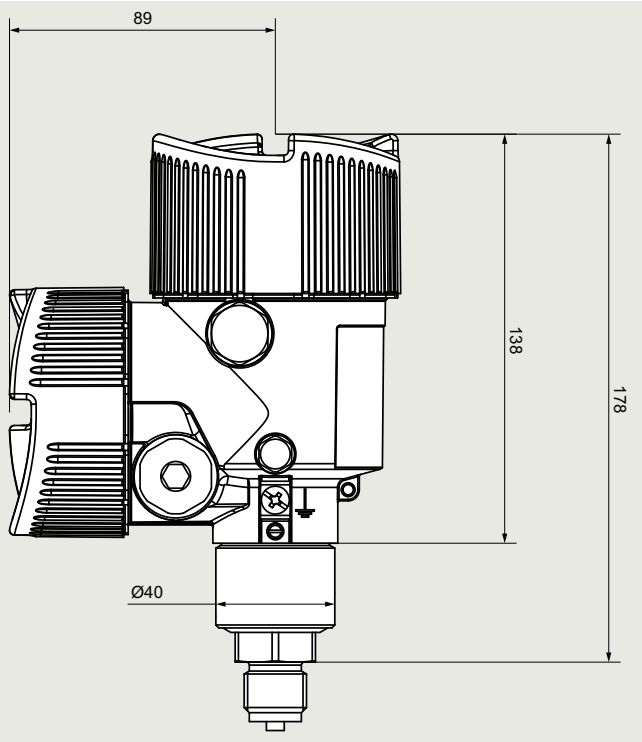
Dimensional drawings (continued)



SITRANS P310/P410 stainless steel single chamber housing

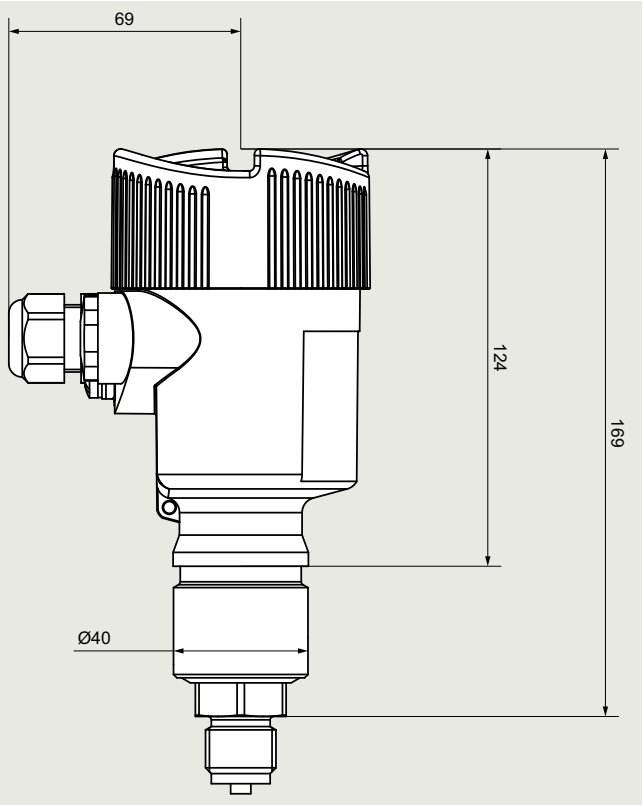
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Dimensional drawings (continued)



SITRANS P310/P410 stainless steel dual chamber housing

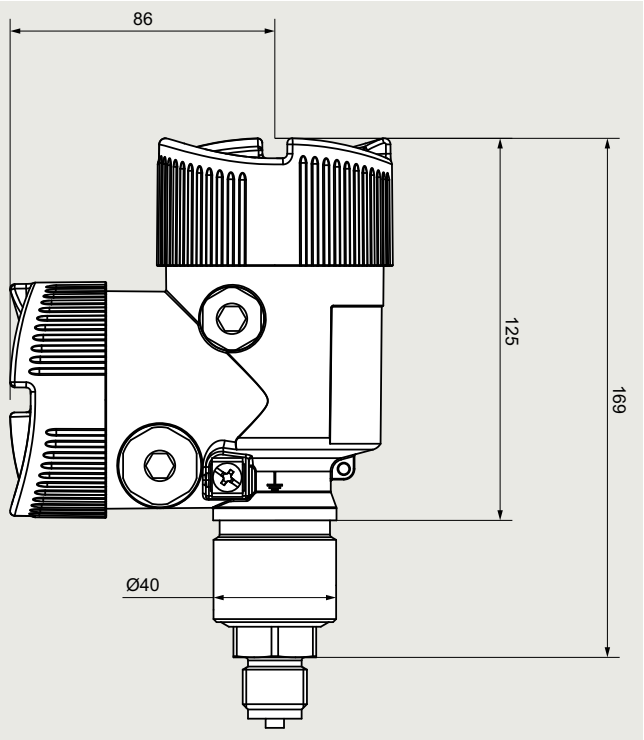
Dimensional drawings (continued)



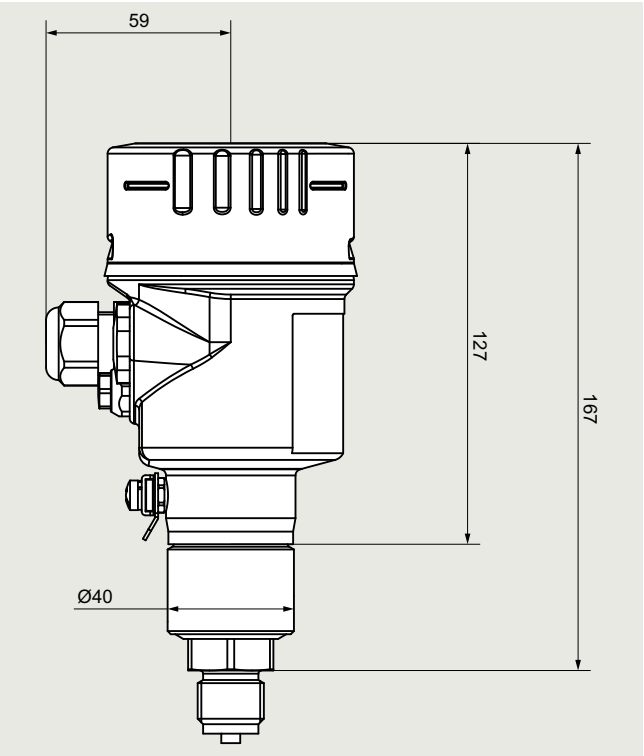
SITRANS P310/P410 plastic single chamber housing

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Dimensional drawings (continued)



SITRANS P310/P410 plastic dual chamber housing



SITRANS P310/P410 electropolished stainless steel housing

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Overview



The SITRANS P300 is a digital pressure transmitter for relative and absolute pressure. The conventional thread versions are available as process connections, as are flush-mounted versions. A large number of the flush-mounted versions are suitable for food and pharmaceutical applications, and satisfy the EHEDG and 3A hygiene requirements.

The output signal is a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION Fieldbus signal, which is linearly proportional to the input pressure. Communication is via HART protocol or PROFIBUS PA or FOUNDATION Fieldbus interface. The basic settings of the pressure transmitter can be made easily on-site by means of three buttons.

The SITRANS P300 has a single-chamber stainless steel enclosure. The pressure transmitter is approved for "intrinsically safe" type of protection. It can be used in zone 1 or zone 0.

Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- Extensive diagnostics and simulation functions
- Minimal conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (e.g., stainless steel, Hastelloy)
- Measuring range 0.008 bar to 400 bar (0.1 psi to 5802 psi)
- High measuring accuracy
- Parameterization using control keys and HART and/or PROFIBUS PA or FOUNDATION Fieldbus

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Application

The pressure transmitter is available in versions for gauge pressure and for absolute pressure. The output signal is always a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION Fieldbus signal, which is linearly proportional to the input pressure. The pressure transmitter measures corrosive, non-corrosive and hazardous gases, vapors and liquids.

It can be used for the following measurement types:

- Gauge pressure
- Absolute pressure

With appropriate parameter settings, it can also be used for the following additional measurement types:

- Level
- Volume
- Mass

The "intrinsically safe" Ex ia type of protection version of the transmitter can be installed in hazardous areas (Zone 1). The devices are provided with an EC type-examination certificate and comply with the respective harmonized European standards of ATEX.

Gauge pressure

This variant measures the gauge pressure of corrosive, non-corrosive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.01 bar (0.15 psi), the largest 400 bar (5802 psi).

Level

With appropriate parameter settings, the gauge pressure variant measures the level of corrosive, non-corrosive and hazardous liquids.

For level measurement in an open vessel, you require one device; for level measurement in a closed vessel, you require two devices and a process control system.

Absolute pressure

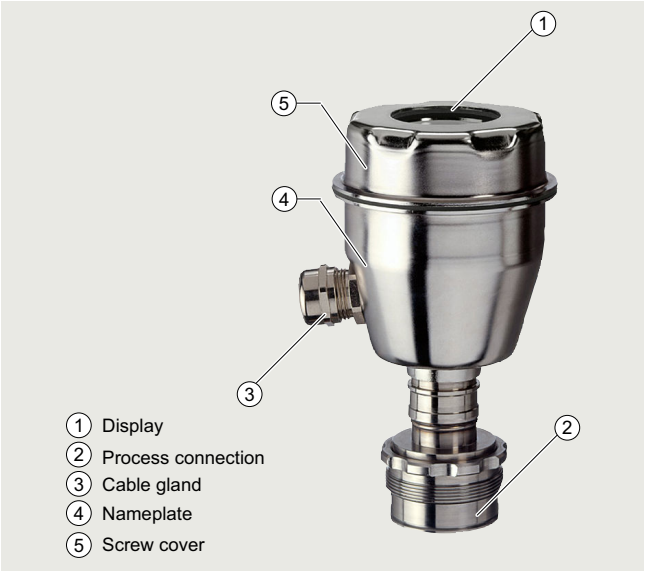
This variant measures the absolute pressure of corrosive, non-corrosive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.008 bar a (0.12 psi a), the largest is 30 bar a (435 psi a).

Design

The device comprises:

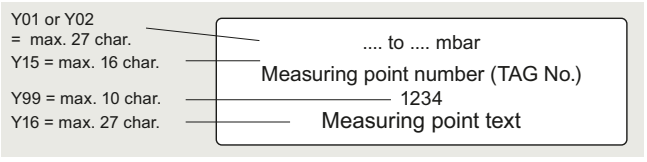
- electronics
- Enclosure
- Measuring cell



Perspective view of SITRANS P300

The enclosure has a screw-on cover (5) and, depending on the version, comes with or without an inspection window. The electrical terminal compartment, the buttons for operation of the device are located under this cover and, depending on the version, the display. The connections for the auxiliary power U_H and the shield are in the terminal compartment. The cable gland is mounted on the side of the enclosure. The measuring cell with the process connection (2) is located on the bottom of the enclosure. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

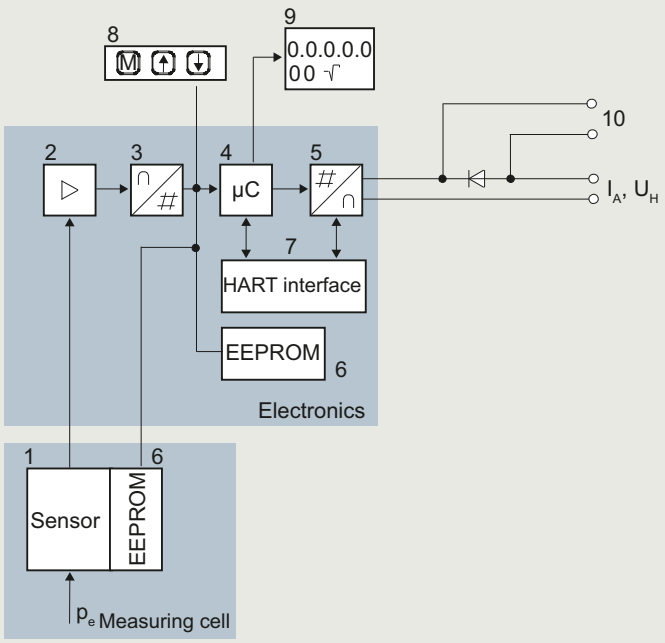
Example of attached measuring points sign



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Function

Mode of operation of electronics with HART communication



1 Measuring cell sensor
2 Instrument amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Digital-to-analog converter
6 One non-volatile memory each in the measuring cell and electronics
7 HART interface
8 Three input keys (local operation)
9 Digital display
10 Diode circuit and connection for external ammeter
I_A Output current 4 ... 20 mA
U_H Power supply
P_e Input variable

Function diagram of electronics

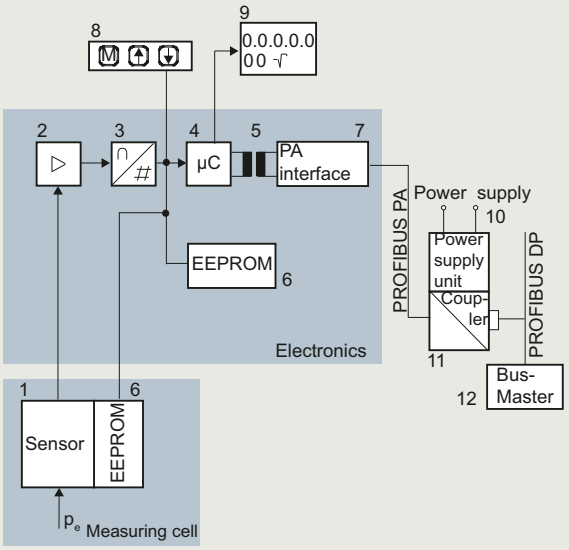
The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the instrument amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected for linearity and temperature response. In a digital-to-analog converter (5) it is then converted into the output current of 4 to 20 mA. A diode circuit provides reverse polarity protection. You can make an uninterrupted current measurement with a low-ohm ammeter at the connection (10). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first storage is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a local display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer via the HART modem (7).

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Function (continued)

Mode of operation of electronics with PROFIBUS PA communication



1	Measuring cell sensor	8	Three input keys (local operation)
2	Instrument amplifier	9	Digital display
3	Analog-to-digital converter	10	Power supply
4	Microcontroller	11	DP/PA coupler or link
5	Electrical isolation	12	Bus master
6	One non-volatile memory each in the measuring cell and electronics	p_e	Input variable
7	PROFIBUS PA interface		

Function diagram of electronics

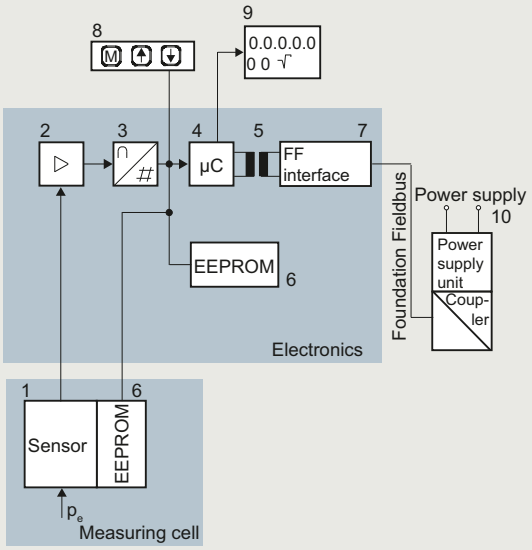
The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the instrument amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected for linearity and temperature response. It is then made available on the PROFIBUS PA via an electrically isolated PROFIBUS PA interface (7). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first storage is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a local display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer over the bus master (12).

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Function (continued)

Mode of operation of electronics with FOUNDATION Fieldbus communication



1	Measuring cell sensor	8	Three input keys (local operation)
2	Instrument amplifier	9	Digital display
3	Analog-to-digital converter	10	Power supply
4	Microcontroller		
5	Electrical isolation	p_e	Input variable
6	One non-volatile memory each in the measuring cell and electronics		
7	FOUNDATION Fieldbus interface		

Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitalized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, corrected for linearity and temperature response and made available on the FOUNDATION Fieldbus via an electrically isolated FOUNDATION Fieldbus interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). One memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8), you can assign parameters to the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the measurement results, the error messages and the operating modes on the local display (9).

The results with status values and diagnostics data are transferred by cyclic data transmission on the FOUNDATION Fieldbus.

Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

Mode of operation of the measuring cells

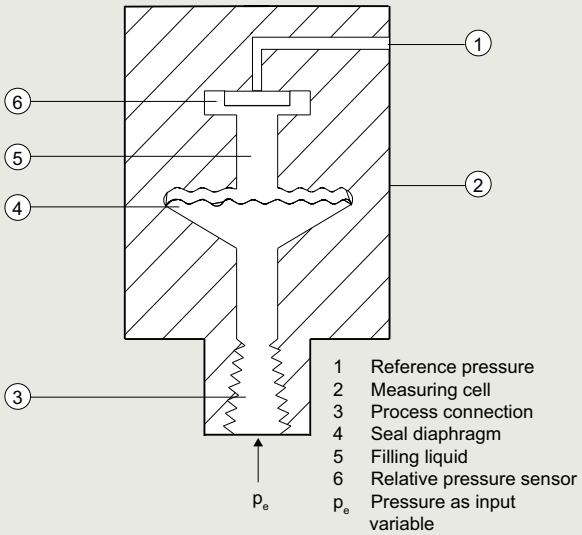
The process connections available include the following:

- G½
- ½-14 NPT
- Flush-mounted diaphragm:
  - Flanges according to EN
  - Flanges according to ASME
  - NuG and pharmaceutical connections

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Function (continued)

Measuring cell for gauge pressure

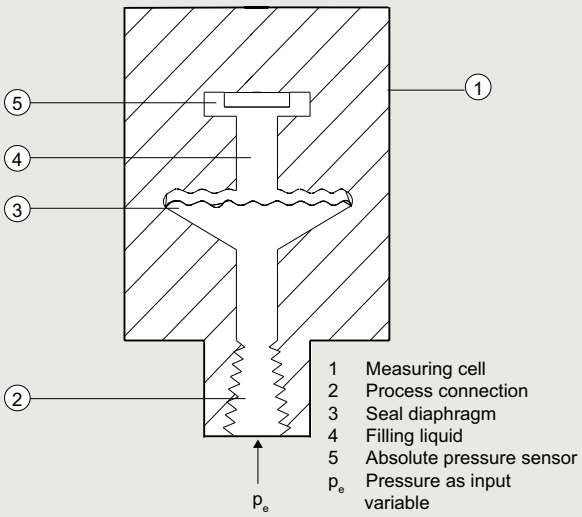


Measuring cell for gauge pressure, function diagram

The input pressure (p_e) is transferred via the seal diaphragm (4) and the filling liquid (5) to the gauge pressure sensor (6), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with measuring spans ≤ 63 bar (≤ 926.1 psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of ≥ 160 bar (≥ 2352 psi) compared to a vacuum.

Measuring cell for absolute pressure



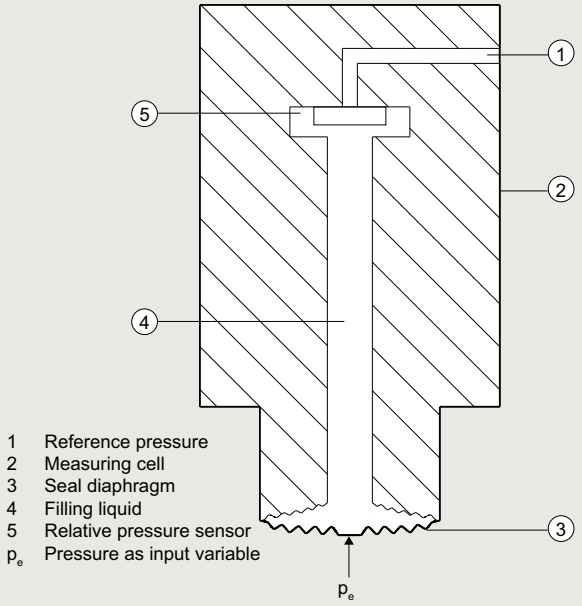
Measuring cell for absolute pressure, function diagram

The input pressure (p_e) is transferred via the seal diaphragm (3) and the filling liquid (4) to the absolute pressure sensor (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

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Function (continued)

Measuring cell for gauge pressure, flush-mounted diaphragm

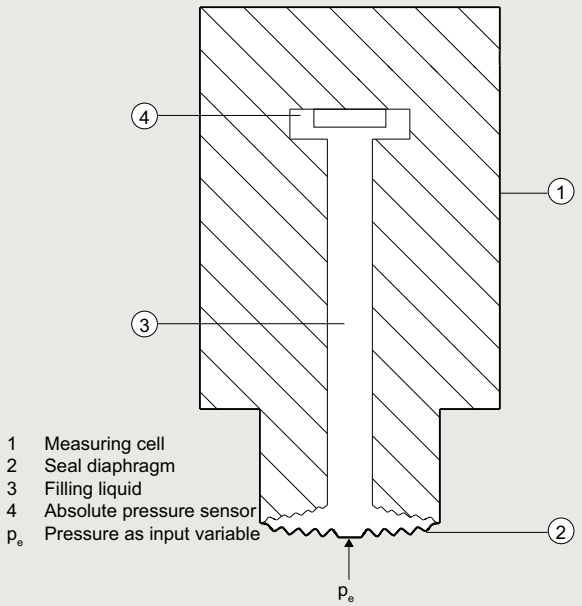


Measuring cell for gauge pressure, flush-mounted diaphragm, function diagram

The input pressure (p_e) is transferred via the seal diaphragm (3) and the filling liquid (4) to the gauge pressure sensor (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with measuring spans ≤ 63 bar (≤ 926.1 psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of ≥ 160 bar (≥ 2352 psi) compared to a vacuum.

Measuring cell for absolute pressure, flush-mounted diaphragm



Measuring cell for absolute pressure, flush-mounted diaphragm, function diagram

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Function (continued)

The input pressure (p_e) is transferred via the seal diaphragm (2) and the filling liquid (3) to the absolute pressure sensor (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Parameterization

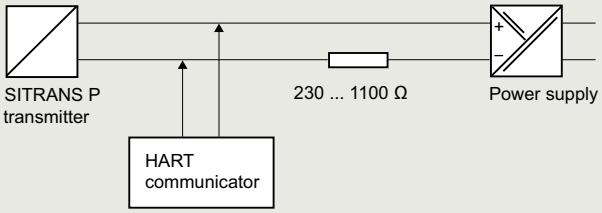
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

With the input buttons, you can easily set the most important parameters without any additional equipment.

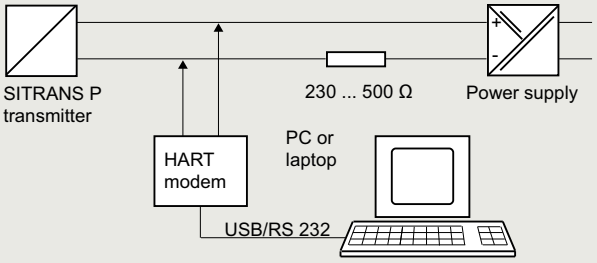
Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using FSK (Frequency Shift Keying).

Adjustable SITRANS P300 parameters with HART

Parameters	Input buttons	HART
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Blind adjustment of the lower range value	x	x
Blind adjustment of the upper range value	x	x
Zero adjustment	x	x
Current simulator	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x [1]
Type of unit, unit	x	x
Input of characteristic curve		x
Freely-programmable LCD		x
Diagnostic functions		x

[1] Except cancel write protection.

Diagnostic functions for SITRANS P300 with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Min/max pointer
- Simulation functions
- Maintenance timer

Available physical units of display for SITRANS P300 with HART

Physical variable	Physical units
Pressure (can also be preset in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm², kg/cm², in H_2O, in H_2O (4 °C), mmH_2O, ftH_2O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m³, dm³, hl, yd³, ft³, in³, US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Temperature	K, °C, °F, °R
Other	%, mA

Parameterization through PROFIBUS interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. PROFIBUS connects the SITRANS P300 PA to

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Function (continued)

a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a hazardous area.

For parameter assignment via PROFIBUS, you need suitable software, e.g. SIMATIC PDM (Process Device Manager)

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the P300 is connected to a process control system. Communication is possible even in a hazardous area.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

Adjustable parameters	Input buttons	PROFIBUS PA and FOUNDATION Fieldbus
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured value display	x	x
Physical unit of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic curve	x	x
Input of characteristic curve		x
Freely-programmable LCD		x
Diagnostic functions		x

Diagnostic functions for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Min/max pointer
- Maintenance timer
- Simulation functions
- Zero correction display
- Limit transmitter
- Saturation alarm

Physical units available for the local display

Physical variable	Physical units
Pressure (can also be preset in the factory)	Mpa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, mmH_2O, mmH_2O (4 °C), in H_2O, in H_20 (4 °C), ftH_2O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, US gallon, Imp. gallon, bushel, barrel, barrel liquid
Volume flow	m^3/s, m^3/min, m^3/h, m^3/d, l/s, l/min, l/h, l/ d, Ml/d, ft^3/s, ft^3/min, ft^3/h, ft^3/d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, /t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Temperature	K, °C, °F, °R
Other	%

Hygiene version

In the case of the SITRANS P300 with 7MF812.-... flush-mounted diaphragm, selected connections comply with the requirements of the EHEDG or 3A. You can find further details in the order form. Please note in particular that the seal materials used must comply with the requirements of 3A. Similarly, the filling liquids used must be FDA-compliant.

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Selection and ordering data

SITRANS P300 pressure transmitters for gauge pressure and absolute pressure, single chamber enclosure, nameplate inscription in English 4 ... 20 mA / HART PROFIBUS PA (PA) FOUNDATION Fieldbus (FF)		Article No. 7MF8023- 7MF8024- 7MF8025-									
		●	●	●	●	●	-	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.											
Measuring cell filling	Measuring cell cleaning										
Silicone oil	Normal	1									
Inert liquid	Cleanliness level 2 according to DIN 25410	3									
Measuring span (min. ... max.)											
8.3 ... 250 mbar (0.12 ... 3.63 psi)			A								
0.01 ... 1 bar (0.15 ... 14.5 psi)			B								
0.04 ... 4 bar (0.58 ... 58 psi)			C								
0.16 ...16 bar (2.32 ... 232 psi)			D								
0.63 ... 63 bar (9.14 ... 914 psi)			E								
1.6 ... 160 bar (23.2 ... 2320 psi)			F								
4 ... 400 bar (58 ... 5802 psi)			G								
8.34 ... 250 mbar a (0.13 ... 3.63 psi a)			Q								
43.34 ... 1300 mbar a (0.63 ... 18.86 psi a)			S								
0.17 ... 5 bar a (2.43 ... 72.5 psi a)			T								
1 ... 30 bar a (14.6 ... 435 psi a)			U								
Material of wetted parts											
Seal diaphragm	Measuring cell										
Stainless steel	Stainless steel			A							
Hastelloy	Stainless steel			B							
Hastelloy	Hastelloy			C							
Version for diaphragm seal in combination with "internal thread ½-14 NPT" process connection **(recommended version)**[1) 2) 3) 4) 5)]				Y	1						
Process connection											
Connection shank G½B according to EN 837-1					0						
Internal thread ½-14 NPT					1						
Oval flange with process connection out of stainless steel (oval flange has no internal thread)[6)]											
• Fastening thread $^{7}/_{16}$ 20 UNF according to EN 61518					2						
• Fastening thread M10 according to DIN 19213					3						
• Mounting thread M12 according to DIN 19213					4						
External thread M20 × 1.5					5						
External thread ½-14 NPT					6						
Material of non-wetted parts											
Stainless steel, deep-drawn and electrolytically polished						4					
Version											
Standard version								1			
Explosion protection											
None									A		
With ATEX, type of protection:											
"Intrinsic safety (Ex ia)"									B		
Zone 20/21/22[7)]									C		
Ex nA/nL (Zone 2)[8)]									E		
With FM "Intrinsic safety" (cFM_{US})									M		
Electrical connection/cable entry											
Screw gland M20×1.5 (polyamide)[9)]										A	
Screw gland M20×1.5 (metal)										B	
Screw gland M20×1.5 (stainless steel)										C	

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Selection and ordering data (continued)

SITRANS P300 pressure transmitters for gauge pressure and absolute pressure, single chamber enclosure, nameplate inscription in English	Article No.
4 ... 20 mA / HART	7MF8023-
PROFIBUS PA (PA)	7MF8024-
FOUNDATION Fieldbus (FF)	7MF8025-
	● ● ● ● ● - ● ● ● ●
Device plug M12 (stainless steel, without cable socket)	G
½-14 NPT gland threading metal[10]	H
½-14 NPT gland threading stainless steel[10]	J
Display	
Without local display, with buttons, closed lid	1
With local display and buttons, closed lid[11]	2
With local display and buttons, lid with polycarbonate pane (setting for HART devices: mA, for PROFIBUS PA and FOUNDATION Fieldbus devices: Pressure units[11]	4
With local display and buttons (setting acc. to specifications, order code "Y21" or "Y22" required), lid with polycarbonate pane[11]	5
With local display and buttons, lid with glass pane (setting for HART devices: mA, for PROFIBUS and FOUNDATION Fieldbus devices: Pressure units)[11]	6
With local display and buttons (setting acc. to specifications, order code "Y21" or "Y22" required), lid with glass pane[11]	7

Note:

See section "Supplementary components" for supply units. A quick-start guide is included in the scope of delivery of the device.

1) If the quality inspection certificate (factory calibration) according to IEC 60770-2 is to be ordered for transmitters with mounted diaphragm seals, it is recommended that this certificate be ordered exclusively for the remote seals. Here, the measuring accuracy of the entire combination is certified.
2) If Inspection Certificate 3.1. is to be ordered for transmitters with mounted diaphragm seals, this certificate must also be ordered with the respective remote seals.
3) The diaphragm seal is to be specified with a separate article number and must be included with the transmitter article number, for example 7MF802.-..Y..-.... and 7MF0810-.....-0...
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
5) Remote seal for direct mounting only available in combination with process connection ½-14 NPT.
6) M10 fastening thread: Max. measuring span 160 bar (2320 psi) fastening thread $^{7}/_{16}$-20 UNF and M12: Max. measuring span 400 bar (5802 psi)
7) Can only be ordered together with electrical connection option A.
8) Can only be ordered together with electrical connection option B, C or G.
9) Only together with HART electronics.
10) Without cable gland.
11) Local display cannot be rotated.

SITRANS P300 pressure transmitters for gauge pressure and absolute pressure with flush-mounted membrane, single chamber enclosure, nameplate inscription in English		Article No.
4 ... 20 mA / HART		7MF8123-
PROFIBUS PA (PA)		7MF8124-
FOUNDATION Fieldbus (FF)		7MF8125-
		● ● ● ● ● - ● ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Normal	1
Inert liquid		3
FDA compliant fill oil		
• Neobee oil	Normal	4
Measuring span (min. ... max.)		
0.01 ... 1 bar (0.15 ... 14.5 psi)		B
0.04 ... 4 bar (0.58 ... 58 psi)		C
0.16 ... 16 bar (2.32 ... 232 psi)		D
0.63 ... 63 bar (9.14 ... 914 psi)		E
43.34 ... 1300 mbar a (0.63 ... 18.86 psi a)[1]		S
0.17 ... 5 bar a (2.43 ... 72.5 psi a)[1]		T
1 ... 30 bar a (14.6 ... 435 psi a)[1]		U
Material of wetted parts		
Seal diaphragm	Measuring cell	
Stainless steel	Stainless steel	A

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Selection and ordering data (continued)

SITRANS P300 pressure transmitters for gauge pressure and absolute pressure with flush-mounted membrane, single chamber enclosure, nameplate inscription in English		Article No.										
4 ... 20 mA / HART		7MF8123-										
PROFIBUS PA (PA)		7MF8124-										
FOUNDATION Fieldbus (FF)		7MF8125-										
		●	●	●	●	●	-	●	●	●	●	
Hastelloy[2]	Stainless steel			B								
Process connection												
Flange version with order code M.., N.., R.. or Q.. (see "Options")					7							
Material of non-wetted parts												
Stainless steel, deep-drawn and electrolytically polished						4						
Version												
Standard version								1				
Explosion protection												
None									A			
With ATEX, type of protection:												
"Intrinsic safety (Ex ia)"									B			
Zone 20/21/22[3]									C			
Ex nA/nL (Zone 2)[4]									E			
With FM "Intrinsic safety" (cFM_{US})									M			
Electrical connection/cable entry												
Screw gland M20×1.5 (polyamide)[5]										A		
Screw gland M20×1.5 (metal)										B		
Screw gland M20×1.5 (stainless steel)										C		
Device plug M12 (stainless steel, without cable socket)										G		
Screw gland ½-14 NPT threading metal[6]										H		
½-14 NPT gland threading stainless steel[6]										J		
Display												
Without local display, with buttons, closed lid											1	
With local display and buttons, closed lid[7]											2	
With local display and buttons, lid with polycarbonate pane (setting for HART devices: mA, for PROFIBUS PA and FOUNDATION Fieldbus devices: Pressure units[7]											4	
With local display and buttons (setting acc. to specifications, order code "Y21" or "Y22" required), lid with polycarbonate pane[7]											5	
With local display and buttons, lid with glass pane (setting for HART devices: mA, for PROFIBUS and FOUNDATION Fieldbus devices: pressure units)[7]											6	
With local display and buttons (setting acc. to specifications, order code "Y21" or "Y22" required), lid with glass pane[7]											7	

Note:

See section "Supplementary components" for supply units. A quick-start guide is included in the scope of delivery of the device.

1) Not with temperature decoupler P00, not for process connections R01, R02, R04, R10 and R11 and can only be ordered together with silicone oil.
2) Only available for flanges with option M.., N.. and Q...
3) Can only be ordered together with electrical connection option A.
4) Can only be ordered together with electrical connection option B, C or G.
5) Only together with HART electronics.
6) Without cable gland.
7) Local display cannot be rotated.

Options Add "-Z" to article number and specify order code.	Order code	Communication
Pressure transmitter with mounting bracket (2 brackets, 4 nuts, 4 U washers, 1 angle) Completely of stainless steel, for wall and pipe mounting	A02	HART / PA / FF
Cable socket for M12 device plug, stainless steel	A51	HART / PA / FF
Nameplate inscription (in place of English)		HART / PA / FF
• German	B10	HART / PA / FF
• French	B12	HART / PA / FF
• Spanish	B13	HART / PA / FF
• Italian	B14	HART / PA / FF
English nameplate Pressure units in inH_20 or psi	B21	HART / PA / FF
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2[1]	C11	HART / PA / FF

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Selection and ordering data (continued)

Options **Add "-Z" to article number and specify order code.**	Order code	Communication
Inspection certificate according to EN 10204-3.1[2]	**C12**	HART / PA / FF
Factory certificate according to EN 10204-2.2	**C14**	HART / PA / FF
Degree of protection IP65/IP68, only for M20×1.5 and ½-14 NPT	**D12**	HART / PA / FF
Degree of protection IP6k9k, only for M20×1.5	**D46**	HART / PA / FF
CRN Approval Canada (Canadian Registration Number)	**E22**	HART / PA / FF
Export approval Korea	**E11**	HART / PA / FF
Explosion protection Ex ia according to EAC Ex (Russia)	**E80**	HART / PA / FF
Ex approval Ex ia/ib NEPSI	**E55**	HART / PA / FF
Only for SITRANS P300 with flush-mounted diaphragm (7MF81..-...)		
Flange according to EN 1092-1 form B1		
DN 25, PN 40[3]	**M11**	HART / PA / FF
DN 40, PN 40	**M13**	HART / PA / FF
DN 40, PN 100	**M23**	HART / PA / FF
DN 50, PN 16	**M04**	HART / PA / FF
DN 50, PN 40	**M14**	HART / PA / FF
DN 80, PN 16	**M06**	HART / PA / FF
DN 80, PN 40	**M16**	HART / PA / FF
Flange according to ASME B16.5		
1", Class 150[3]	**M40**	HART / PA / FF
1½", Class 150	**M41**	HART / PA / FF
2", Class 150	**M42**	HART / PA / FF
3", Class 150	**M43**	HART / PA / FF
4", Class 150	**M44**	HART / PA / FF
1½", Class 300	**M46**	HART / PA / FF
2", Class 300	**M47**	HART / PA / FF
3", Class 300	**M48**	HART / PA / FF
4", Class 300	**M49**	HART / PA / FF
Threaded connection according to DIN 3852-2 form A, thread according to ISO 228		
G ¾" A, flush mounted[4]	**R01**	HART / PA / FF
G 1" A, flush mounted[4]	**R02**	HART / PA / FF
G 2" A, flush mounted	**R04**	HART / PA / FF
Tank connection[5] Seal not included in scope of delivery		
TG 52/50, PN 40	**R10**	HART / PA / FF
TG 52/150, PN 40	**R11**	HART / PA / FF
Sanitary process connection according to DIN 11851 (dairy connection with slotted union nut)		
DN 50, PN 25	**N04**	HART / PA / FF
DN 80, PN 25	**N06**	HART / PA / FF
Tri-Clamp connection according to DIN 32676/ ISO 2852 3A compliant[6]		
DN 50/2", PN 16	**N14**	HART / PA / FF
DN 65/2.5", PN 10	**N15**	HART / PA / FF
Clamp 2" ISO 2852, PN 16	**N22**	HART / PA / FF
Clamp 3" ISO 2852, PN 10	**N23**	HART / PA / FF
Varivent connection 3A and EHEDG compliant[6]		
Type N = 68 for Varivent enclosure DN 40 ... 125 and 1½" ... 6", PN 40	**N28**	HART / PA / FF
Temperature decoupler up to 200 °C[7] For version with flush-mounted diaphragm	**P00**	HART / PA / FF

Options **Add "-Z" to article number and specify order code.**	Order code	Communication
Sanitary process connection according to DRD		
DN 50, PN 40	**M32**	HART / PA / FF
SMS screwed connector		
2"	**M73**	HART / PA / FF
2½"	**M74**	HART / PA / FF
3"	**M75**	HART / PA / FF
Sanitary process screw connection according to NEUMO BioConnect screw connection, 3A and EHEDG compliant[6]		
DN 50, PN 16	**Q05**	HART / PA / FF
DN 65, PN 16	**Q06**	HART / PA / FF
DN 80, PN 16	**Q07**	HART / PA / FF
DN 100, PN 16	**Q08**	HART / PA / FF
DN 2", PN 16	**Q13**	HART / PA / FF
DN 2½", PN 16	**Q14**	HART / PA / FF
DN 3", PN 16	**Q15**	HART / PA / FF
DN 4", PN 16	**Q16**	HART / PA / FF
Sanitary process flange connection according to NEUMO Connect S		
DN 2", PN 16	**Q72**	HART / PA / FF
Aseptic screwed connector according to DIN 11864-1 form A 3A compliant[6]		
DN 50, PN 25	**N33**	HART / PA / FF
DN 65, PN 25	**N34**	HART / PA / FF
DN 80, PN 25	**N35**	HART / PA / FF
DN 100, PN 25	**N36**	HART / PA / FF
Aseptic flange with notch according to DIN 11864-2 form A 3A compliant[6]		
DN 50, PN 16	**N43**	HART / PA / FF
DN 65, PN 16	**N44**	HART / PA / FF
DN 80, PN 16	**N45**	HART / PA / FF
DN 100, PN 16	**N46**	HART / PA / FF
Aseptic flange with groove according to DIN 11864-2 form A 3A compliant[6]		
DN 50, PN 16	**N43 + P11**	HART / PA / FF
DN 65, PN 16	**N44 + P11**	HART / PA / FF
DN 80, PN 16	**N45 + P11**	HART / PA / FF
DN 100, PN 16	**N46 + P11**	HART / PA / FF
Aseptic clamp with groove according to DIN 11864-3 form A 3A compliant[6]		
DN 50, PN 25	**N53**	HART / PA / FF
DN 65, PN 25	**N54**	HART / PA / FF
DN 80, PN 16	**N55**	HART / PA / FF
DN 100, PN 16	**N56**	HART / PA / FF
Additional information Add "**-Z**" to article number, specify order code and plain text.		
Measuring range to be set Specify in plain text (max. 5 digits): Y01: ... to ... mbar, bar, kPa, MPa, psi	**Y01**	HART / PQ[8]
Tag plate made of stainless steel and entry in the device variable (measuring point description) Max. 16 characters; specify in plain text: Y15:	**Y15**	HART / PA / FF

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Selection and ordering data (continued)

Options **Add "-Z" to article number and specify order code.**	Order code	Communic-ation
Measuring point text (entry in device variable) Max. 27 characters; specify in plain text: Y16:	**Y16**	HART / PA / FF
Entry of HART TAG Max. 8 characters; specify in plain text: Y17:	**Y17**	HART
Setting of the local display in pressure units Specify in plain text (default setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note The following pressure units can be selected: bar, mbar, mm H_2O[10], inH_2O[10], ftH_2O[10], mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or %	**Y21**	HART / PA / FF
Setting of the local display in non-pressure units[9] Specify in plain text: Y22: ..... to ..... l, m3, m, USg, ... (Specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	**Y22 + Y01**	HART
Preset bus address, possible range 1 ... 126 Specify in plain text: Y25:	**Y25**	PA / FF

Note:

Factory-mounting of valve manifolds, see Accessories. Only Y01, Y15, Y16, Y17, Y21, Y22 and Y25 are possible as factory preset.

1) If the quality inspection certificate (factory calibration) according to IEC 60770-2 is to be ordered for transmitters with mounted diaphragm seals, it is recommended that this certificate be ordered exclusively for the remote seals. Here, the measuring accuracy of the entire combination is certified.
2) If Inspection Certificate 3.1. is to be ordered for transmitters with mounted diaphragm seals, this certificate must also be ordered with the respective remote seals.
3) Special Viton seal included in scope of delivery (FKM; temperature range -20 ... +200 °C (-4 ... +392 °F))
4) Cannot be combined with order code P00. Can only be ordered together with silicon oil measuring cell filling.
5) Weld-in sockets can be ordered under Accessories.
6) 3A compliance ensured only when 3A compliant sealing rings are used.
7) Conformity according to 3A and EHEDG. The maximum permissible medium temperatures depend on the respective measuring cell fillings (see process conditions).
8) Measuring accuracies for PROFIBUS PA transmitters with option Y01 are calculated in the same way as for HART devices.
9) Preset value can only be change via SIMATIC PDM
10) 20 °C reference temperature.

Spare parts/accessories	Article number
Mounting bracket and fastening parts kit Made of stainless steel	**7MF8997-1AA**
Lid without inspection window Gasket not included	**7MF8997-1BA**
Lid with glass inspection window Gasket not included	**7MF8997-1BD**
NBR enclosure sealing	**7MF8997-1BG**
Measuring point label Unlabeled	**7MF8997-1CA**
Cable gland	
• Metal	**7MF8997-1EA**
• Plastic (blue)	**7MF8997-1EB**

Spare parts/accessories	Article number
Weldable sockets for PMC connection	
• PMC style Standard: Thread 1½"	**7MF4997-2HA**
• PMC style Minibolt: Flush mounted 1"	**7MF4997-2HB**
Gaskets for PMC connection (Packing unit: 5 units)	
• PTFE seal for PMC style standard: Thread 1½"	**7MF4997-2HC**
• Gasket made of Viton for PMC style minibolt: Flush mounted 1"	**7MF4997-2HD**
Weldable sockets for TG 52/50 and TG 52/150 connection	
• TG 52/50 connection	**7MF4997-2HE**
• TG 52/150 connection	**7MF4997-2HF**
Seals for TG 52/50 and TG 52/150 made of silicone	**7MF4997-2HG**
Seals for flange connection with flush-mounted diaphragm Material FKM (Viton); temperature range:-20 ... +200 °C (-4 ... +392 °F), 10 units	
• DN 25, PN 40 (M11)	**7MF4997-2HH**
• 1", Class 150 (M40)	**7MF4997-2HK**

Documentation	Article number
The entire documentation is available for download free of charge in various languages at: http://www.siemens.com/processinstrumentation/documentation	
Compact operating instructions	
• English, German, Spanish, French, Italian, Dutch	**A5E03434657**
HART modem	
With USB interface	**7MF4997-1DC**

Note:

See section "Supplementary components" for supply units.

Ordering example	
Item line:	7MF8023-1DB24-1AB7-Z
B line	A02 + Y01 + Y21
C-line	Y01: 1 ... 10 bar (14.5 ... 145 psi)
C-line	Y21: bar (psi)

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Technical specifications

SITRANS P300 for gauge and absolute pressure

Gauge pressure input

Measured variable: Gauge pressure

Measuring span (infinitely adjustable) or nominal measuring range, max. permissible operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. permissible test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)

HART	PROFIBUS PA/FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. permissible operating pressure MAWP (PS)	Max. permissible test pressure
8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 ... 3.6 psi	250 mbar 25 kPa 3.6 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 Mpa 102 psi	10 bar 1 MPa 145 psi
0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi
1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	160 bar 16 MPa 2321 psi	167 bar 16.7 MPa 2422 psi	250 bar 25 MPa 3626 psi
4 ... 400 bar 0.4 ... 40 MPa 58 ... 5802 psi	400 bar 40 MPa 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8702 psi

Lower measuring limit
For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.

- Measuring cell with silicone oil filling: 30 mbar a/3 kPa a/0.44 psi a
- Measuring cell with inert filling liquid: 30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit: 100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)

Absolute pressure input

Measured variable: Absolute pressure

Measuring span (continuously adjustable) or nominal measuring range, max. permissible operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. permissible test pressure (pursuant to DIN 16086)

HART	PROFIBUS PA/FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. permissible operating pressure MAWP (PS)	Max. permissible test pressure
8.34 ... 250 mbar a 0.83 ... 25 kPa a 3.35 ... 100 inH_2O a 0.13 ... 3.63 psi a	250 mbar a 25 kPa a 100 inH_2O a	1.5 bar a 150 kPa a 21.8 psi a	6 bar a 600 kPa a 87 psi a
43.34 ... 1300 mbar a 4.33 ... 130 kPa a 17.42 ... 522.4 inH_2O a 0.63 ... 18.86 psi a	1300 mbar a 130 kPa a 525 inH_2O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
0.17 ... 5 bar a 17 ... 500 kPa a 2.43 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
1 ... 30 bar a 0.1 ... 3 MPa a 14.6 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a

Lower measuring limit

- Measuring cell with silicone oil filling: 0 mbar a/3 kPa a/0.44 psi a
- Measuring cell with inert liquid
  - For medium temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F): 30 mbar a/0 kPa a/0 psi a
  - For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi)): 30 mbar a + 20 mbar a · (ϑ -60 °C)/°C
3 kPa a + 2 kPa a · (ϑ -60 °C)/°C
0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F

Upper measuring limit: 100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)

Lower range value: Between the measuring limits (continuously adjustable)

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Technical specifications (continued)

SITRANS P300 for gauge and absolute pressure				
Input of gauge pressure with flush-mounted diaphragm				
Measured variable	Gauge pressure, flush mounted			
Measuring span (continuously adjustable) or nominal measuring range, max. permissible operating pressure and max. permissible test pressure	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. permissible operating pressure MAWP (PS)	Max. permissible test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 Mpa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
	0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi
Lower measuring limit	100 mbar a (1.45 psi a)			
• Measuring cell with silicone oil	100 mbar a/10 kPa a/1.45 psi a			
• Measuring cell with inert liquid	100 mbar a/10 kPa a/1.45 psi a			
• Measuring cell with neobee	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. measuring span			
Input of absolute pressure, with flush-mounted diaphragm				
Measured variable	Absolute pressure, flush mounted			
Measuring span (continuously adjustable) or nominal measuring range and max. permissible test pressure	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. permissible operating pressure MAWP (PS)	Max. permissible test pressure
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17 ... 525 inH_2O a	1300 mbar a 130 kPa a 525 inH_2O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
	160 ... 5000 mbar a 16 ... 500 kPa a 2.32 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a
	Depending on the process connection, the measuring span may differ from these values			
Lower measuring limit	0 mbar a/0 kPa a/0 psi a			
Upper measuring limit	100% of max. measuring span			
Output	**HART**		**PROFIBUS PA/FOUNDATION Fieldbus**	
Output signal	4 ... 20 mA		Digital PROFIBUS PA signal	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.		Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)		Set to 2 s (0 ... 100 s)	
Measuring accuracy for gauge pressure	According to IEC 62828-1			
Reference conditions	• Rising characteristic curve • Lower range value 0 bar • Seal diaphragm stainless steel • Measuring cell with silicone oil • Room temperature 25 °C (77 °F)			
Measuring span ratio (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range			
Measurement deviation at limit setting including hysteresis and reproducibility				
• Linear characteristic curve				
- 250 mbar/25 kPa/3.6 psi	r ≤ 1.25: ≤ 0.075% 1.25 < r ≤ 30: ≤ (0.008 · r +0.065)%			
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	r ≤ 5: ≤ 0.075% 5 < r ≤ 100: ≤ (0.005 · r +0.05)%			

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Technical specifications (continued)

SITRANS P300 for gauge and absolute pressure		
- 400 bar/40 MPa/5802 psi	r ≤ 3: ≤ 0.075% 3 < r ≤ 10: ≤ (0.0029 · r +0.071)% 10 < r ≤ 100: ≤ (0.005 · r +0.05)%	
Influence of ambient temperature (in percent per 28 °C (50 °F))		
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r +0.1)%	
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.07 · r +0.08)%	
Long-term stability (temperature change ±30 °C (± 54 °F))		
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r)% per year	
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	≤ (0.25 · r)% in 5 years	
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.125 · r)% in 5 years	
Influence of mounting position	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in percent per voltage change)	0.005% per 1 V	
Measured value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range	
Measuring accuracy for absolute pressure	According to IEC 62828-1	
Reference conditions (All error information always refers to the set measuring span)	• Rising characteristic curve • Lower range value 0 bar • Seal diaphragm stainless steel • Silicone oil filling • Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range	
Measurement deviation at limit setting including hysteresis and reproducibility		
• Linear characteristic curve		
- r ≤ 10	≤ 0.1%	
- 10 < r ≤ 30	≤ 0.2%	
Influence of ambient temperature (in percent per 28 °C (50 °F))		
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r +0.1)%	
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a	≤ (0.08 · r +0.16)%	
Long-term stability (temperature change ±30 °C (± 54 °F))	≤ (0.25 · r)% in 5 years	
Effect of mounting position (in pressure per change of angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in percent per voltage change)	0.005% per 1 V	
Measured value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range	
Measuring accuracy for gauge and absolute pressure, with flush-mounted diaphragm	According to IEC 62828-1	
Reference conditions (All error information always refers to the set measuring span)	• Rising characteristic curve • Lower range value 0 bar • Seal diaphragm stainless steel • Silicone oil filling • Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range	
Measurement deviation at limit setting including hysteresis and reproducibility		
• Linear characteristic curve	**Gauge pressure with flush-mounted diaphragm**	**Absolute pressure with flush-mounted diaphragm**
- r ≤ 5	≤ 0.075%	-
- 5 < r ≤ 100	≤ (0.005 · r +0.05)%	-
- r ≤ 10	-	≤ 0.2%
- 10 < r ≤ 30	-	≤ 0.4%
Influence of ambient temperature (in percent per 28 °C (50 °F))	≤ (0.08 · r +0.16)%	≤ (0.16 · r +0.24)%

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Technical specifications (continued)

SITRANS P300 for gauge and absolute pressure	
Influence of the medium temperature (in pressure per temperature unit)	
• Temperature difference between medium temperature and ambient temperature	3 mbar/0.3 kPa/0.04 psi per 10 K
Long-term stability (temperature change ±30 °C (± 54 °F))	≤ (0.25 · r)% in 5 years
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 per 10° incline (zero offset is possible with position error compensation)
Effect of auxiliary power (in percent per voltage change)	0.005% per 1 V
Measured value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

Operating conditions	
Installation conditions	
Ambient temperature	Observe the temperature class in hazardous areas.
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)
• Measuring cell with Neobee oil (FDA compliant, with flush-mounted diaphragm)	-10 ... +85 °C (14 ... 185 °F)
• Measuring cell with inert liquid	-40 ... +85 °C (-40 ... +185 °F)
• Local display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) - For Neobee: -20 ... +85 °C (-4 ... +185 °F) - For high-temperature oil: -10 ... +85 °C (14 ... +185 °F)
• Climatic class	
- Condensation	Relative humidity 0 ... 100% Condensation permissible, suitable for use in the tropics
Degree of protection	
• According to IEC 60529	IP65, IP68
• According to NEMA 250	Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)
Electromagnetic compatibility	
• Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Process conditions	
Medium temperature	The max. medium temperature of the flush-mounted process connections is to be taken into account in accordance with the relevant connection standards (e.g. DIN 32676, DIN 11851, etc.).
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with silicone oil (with flush-mounted diaphragm)	-40 ... +150 °C (-40 ... +302 °F)
• Measuring cell with Neobee oil (FDA compliant, with flush-mounted diaphragm)	-10 ... +150 °C (14 ... 302 °F)
• Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-40 ... +200 °C (-40 ... +392 °F)
• Measuring cell with Neobee oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-10 ... +200 °C (14 ... 392 °F)
• Measuring cell with inert liquid	-20 ... +100 °C (-4 ... +212 °F)
Structural design (standard version)	
Weight (without options)	Approx. 800 g (1.8 lb)
Enclosure material	Stainless steel, mat. no. 1.4301/304
Material of wetted parts	

Operating conditions	
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
• Oval flange	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
• Measuring cell filling	• Silicone oil • Inert filling liquid
Process connection	• G½B according to EN 837-1 • Internal thread ½-14 NPT • Oval flange PN 160 (MAWP 2320 psi) with fastening thread: - $^{7}/_{16}$-20 UNF according to with IEC 61518/EN 61518 - M10 according to DIN 19213
Structural design (version with flush-mounted diaphragm)	
Weight (without options)	Approx. 1 ... 13 kg (2.2 ... 29 lb)
Enclosure material	Stainless steel, mat. no. 1.4301/304
Material of wetted parts	
• Process connection	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L
• Measuring cell filling	• Silicone oil • Inert filling liquid • FDA compliant fill oil (Neobee oil)
Process connection	• Flanges according to EN and ASME • F&B and pharmaceutical flanges
Surface quality touched-by-media	R_a values ≤ 0.8 µm (32 µ-inch)/welds R_a ≤ 1.6 µm (64 µ-inch) (Process connections according to 3A; R_a values ≤ 0.8 µm (32 µ inch)/welds R_a ≤ 0.8 µm (32 µ inch)

Auxiliary power U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 42 V DC 10.5 ... 30 V DC for intrinsically safe operation	-
Auxiliary power	-	Bus-powered
Separate supply voltage	-	Not necessary
Bus voltage		
• Without Ex	-	9 ... 32 V
• With intrinsically safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Starting current ≤ basic current	-	Yes
• Max. fault current in the event of an error	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

Certificates and approvals	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Classification according to pressure equipment directive (PED 2014/68/EU)	For gasses of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 4, Paragraph 3 (sound engineering practice)	
Water, waste water	Available soon	
Explosion protection		

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Technical specifications (continued)

Operating conditions		
Intrinsic safety "i"	PTB 05 ATEX 2048	
• Marking	II1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb	
• Permissible ambient temperature		
- Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
- Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
- Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
• Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	To certified intrinsically safe circuits with peak values: FISCO supply unit: U_i = 17.5 V, I_i = 380 mA, P_i = 5.32 W Linear barrier: U_i = 24 V, I_i = 250 mA, P_i = 1.2 W
• Effective internal capacitance	C_i = 6 nF	C_i = 1.1 nF
• Effective internal inductance	L_i = 0.4 mH	L_i = 7 µH
Explosion protection to FM for USA and Canada (cFM_{US})		
• Identification (DIP) or (IS); (NI)	Certificate of Compliance 3025099 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6 CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
• Identification (DIP) or (IS)	Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6 CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
Dust explosion protection for Zone 20/21/22	PTB 05 ATEX 2048	
• Marking	II 1 D Ex ia IIIC T_{200}122 °C Da II 1/2 D Ex ia IIIC T_{200} 122°C Da/Db II 2 D Ex ib IIIC T_{200}122 °C Db	
• Permissible ambient temperature		
- Temperature class T4	-40 ... +85 °C (-40 ... +185 °F) (for mineral glass window -20 ... +85 °C (-4 ... +185 °F))	
- Temperature class T5	-40 ... +70 °C (-40 ... +158 °F) (for mineral glass window -20 ... +70 °C (-4 ... +158 °F))	
- Temperature class T6	-40 ... +60 °C (-40 ... +140 °F) (for mineral glass window -20 ... +60 °C (-4 ... +140 °F))	
• Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, Ii = 100 mA, Pi = 750 mW	To certified intrinsically safe circuits with peak values: U_i = 24 V, Ii = 380 mA, P_i = 5.32 W
• Effective internal capacitance	C_i = 6 nF	C_i = 5 nF
• Effective internal inductance	L_i = 0.4 µH	L_i = 10 µH
Type of protection Ex nA/nL/ic (Zone 2)	PTB 05 ATEX 2048	
• Marking	II 3 G Ex ic IIC T6 ... T4 Gc II 3 G Ex ec IIC T6 ... T4 Gc II 3 G Ex ic IIC T6 ... T4 Gc	
• Permissible ambient temperature		
- Temperature class T4	-40 ... +85 °C (-40 ... +185 °F) (only for mineral glass window -20 ... +85 °C (-4 ... +185 °F))	
- Temperature class T5	-40 ... +70 °C (-40 ... +158 °F) (only for mineral glass window -20 ... +70 °C (-4 ... +158 °F))	
- Temperature class T6	-40 ... +60 °C (-40 ... +140 °F) (only for mineral glass window -20 ... +60 °C (-4 ... +140 °F))	
• Ex nA/nL connection	To certified intrinsically safe circuits with peak values: U_m = 45 V	To certified intrinsically safe circuits with peak values: U_m = 32 V
• Ex ic connection	To certified intrinsically safe circuits with peak values: U_i = 45 V	To certified intrinsically safe circuits with peak values: U_i = 32 V
• Effective internal capacitance	C_i = 6 nF	C_i = 5 nF
• Effective internal inductance	L_i = 0.4 mH	L_i = 20 µH

Communication

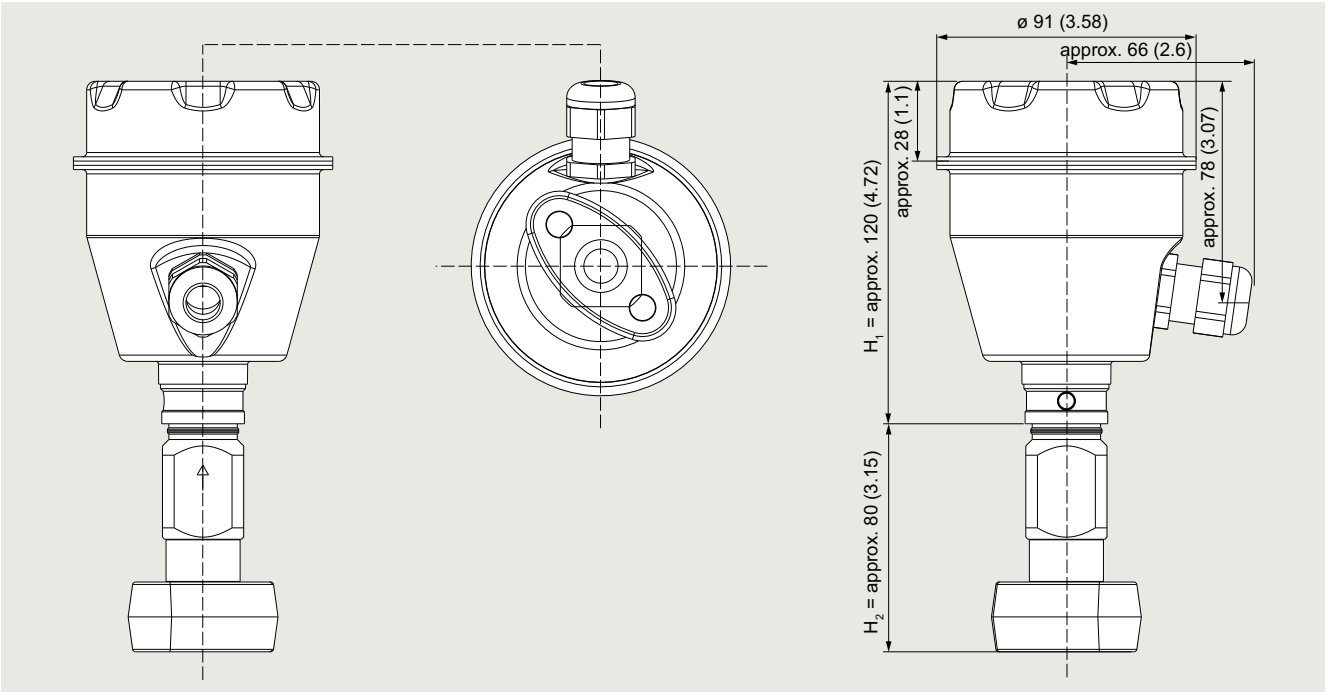
Communication	
HART	
HART	230 ... 1100 Ω
Protocol	HART version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting Address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1 or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure behavior	Parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function
FOUNDATION Fieldbus	
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard-FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	

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Technical specifications (continued)

Communication	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

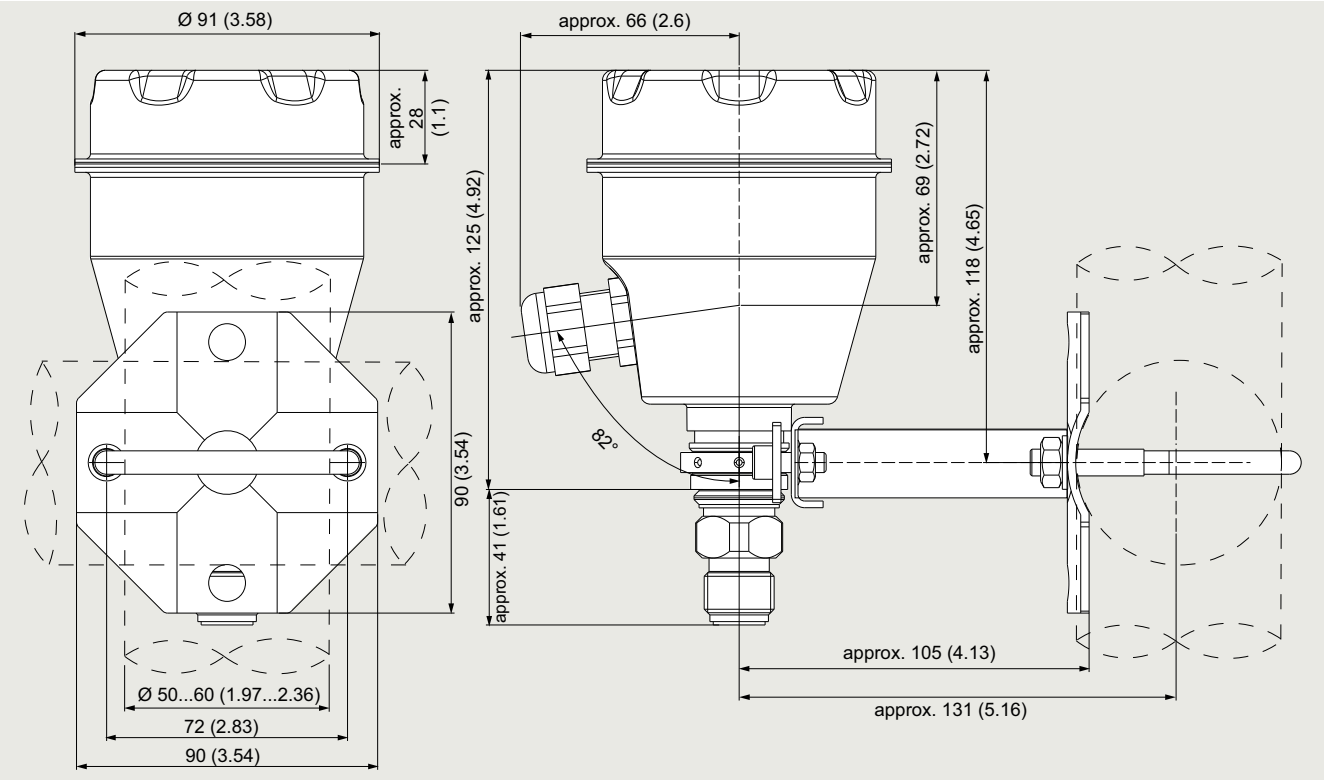
Dimensional drawings



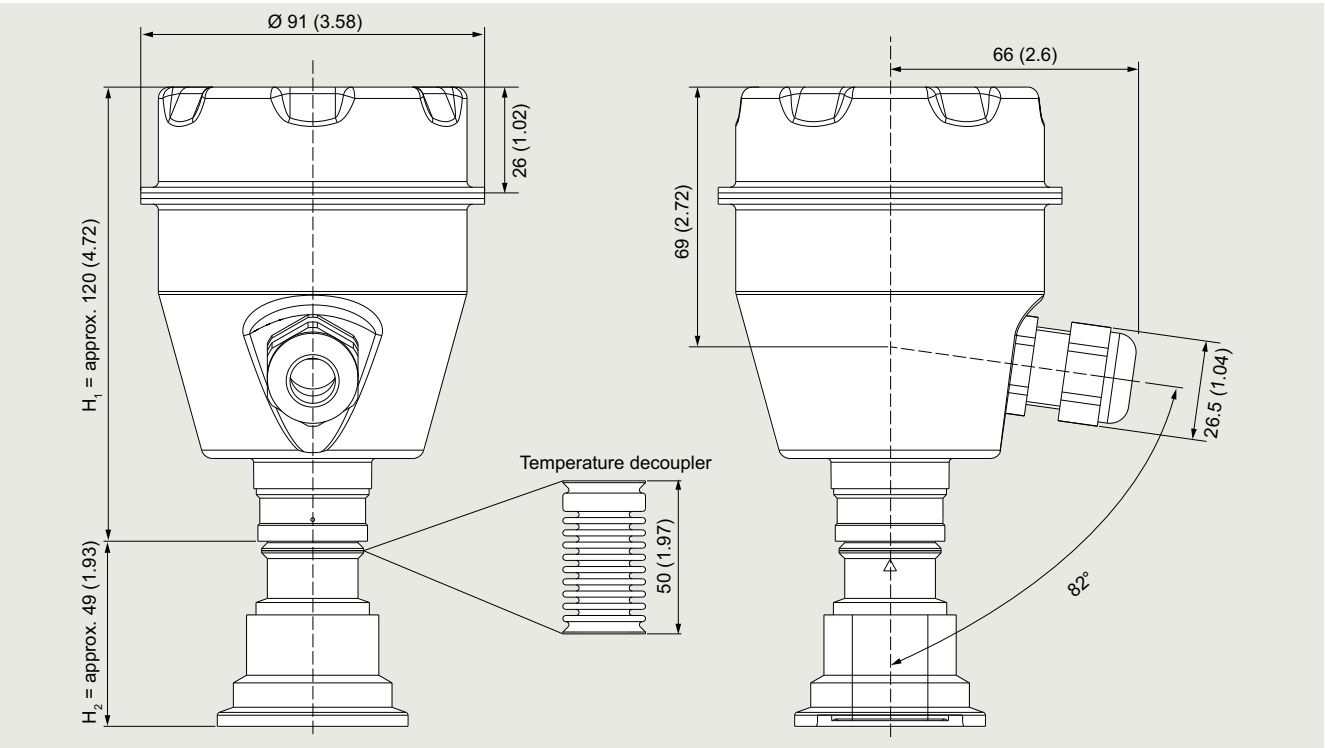
SITRANS P300, with oval flange, dimensions in mm (inch)

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Dimensional drawings (continued)



SITRANS P300, process connection M20 × 1.5, with built-in mounting bracket, dimensions in mm (inch)



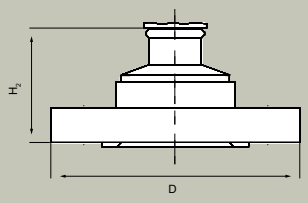
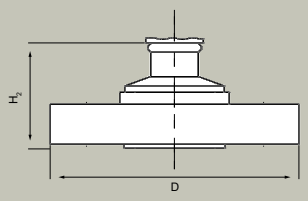
SITRANS P300, flush mounted, dimensions in mm (inch)

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Dimensional drawings (continued)

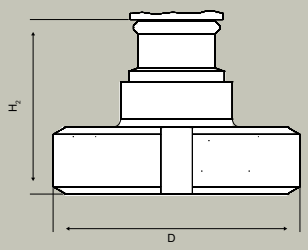
The figure shows a SITRANS P300 with an example flange. In this drawing the height is subdivided into H_1 and H_2.
H_1 = Height of the SITRANS P300 up to a defined cross-section
H_2 = Height of the flange up to this defined cross-section
Only the height H_2 is indicated in the dimensions of the flanges.

Flanges according to EN and ASME

Flange	Order code	DN	PN	ØD	H_2
EN 1092-1 	**M11**	25	40	115 mm (4.5 inches)	Approx. 52 mm (2 inches)
	M13	40	40	150 mm (5.9 inches)	
	M23	40	100	170 mm (6.7 inches)	
	M04	50	16	165 mm (6.5 inches)	
	M14	50	40	165 mm (6.5 inches)	
	M06	80	16	200 mm (7.9 inches)	
	M16	80	40	200 mm (7.9 inches)	
ASME B16.5 	**M40**	1 inch	150	110 mm (4.3 inches)	Approx. 52 mm (2 inches)
	M41	1½ inches	150	130 mm (5.1 inches)	
	M42	2 inches	150	150 mm (5.9 inches)	
	M43	3 inches	150	190 mm (7.5 inches)	
	M44	4 inches	150	230 mm (9.1 inches)	
	M45	1 inch	300	125 mm (4.9 inches)	
	M46	1½ inches	300	155 mm (6.1 inches)	
	M47	2 inches	300	165 mm (6.5 inches)	
	M48	3 inches	300	210 mm (8.1 inches)	
	M49	4 inches	300	255 mm (10.0 inches)	

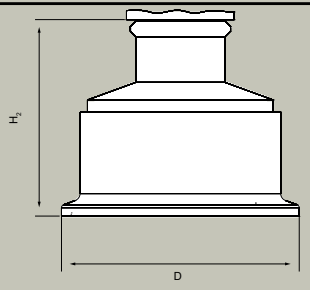
NuG and pharmaceutical connections

Connections according to DIN

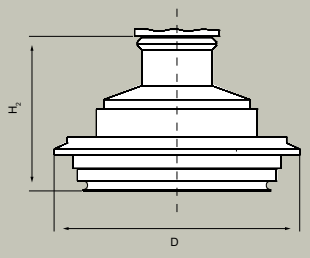
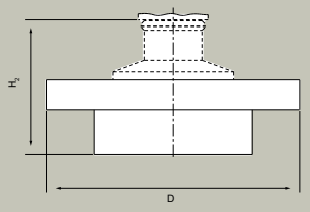
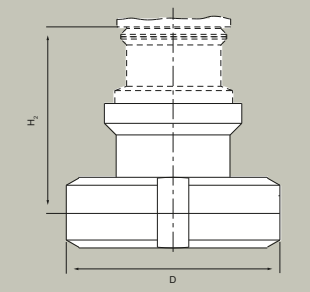
Connection	Order code	DN	PN	ØD	H_2
DIN 11851 (dairy connection with slotted union nut) 	**N04**	50	25	92 mm (3.6 inches)	Approx. 52 mm (2 inches)
	N06	80	25	127 mm (5.0 inches)	
Tri-Clamp acc. to DIN 32676	**N14**	50	16	64 mm (2.5 inches)	Approx. 52 mm

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Dimensional drawings (continued)

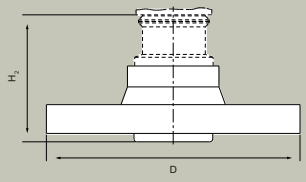
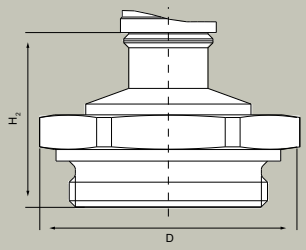
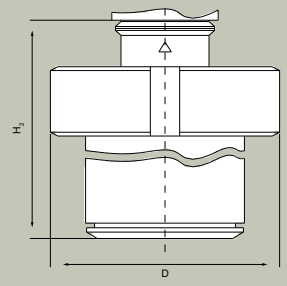
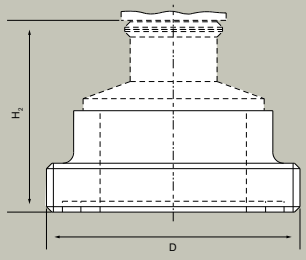
Connection	Order code	DN	PN	ØD	H_2
	**N15**	65	10	91 mm (3.6 inches)	(2 inches)

Other connections

Connection	Order code	DN	PN	ØD	H_2
Varivent connection					
	**N28**	40 ... 125	40	84 mm (3.3 inches)	Approx. 52 mm (2 inches)
Sanitary process connection according to DRD					
	**M32**	50	40	105 mm (4.1 inches)	Approx. 52 mm (2 inches)
Sanitary process screw connection according to NEUMO BioConnect					
	**Q05**	50	16	82 mm (3.2 inches)	Approx. 52 mm (2 inches)
	Q06	65	16	105 mm (4.1 inches)	
	Q07	80	16	115 mm (4.5 inches)	
	Q08	100	16	145 mm (5.7 inches)	
	Q13	2 inches	16	82 mm (3.2 inches)	
	Q14	2½ inches	16	105 mm (4.1 inches)	
	Q15	3 inches	16	105 mm (4.1 inches)	
	Q16	4 inches	16	145 mm (5.7 inches)	

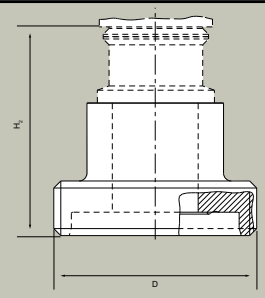
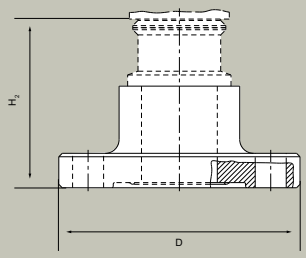
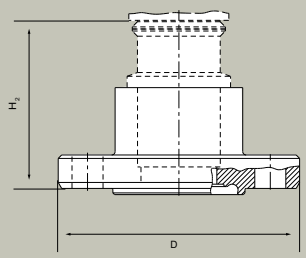
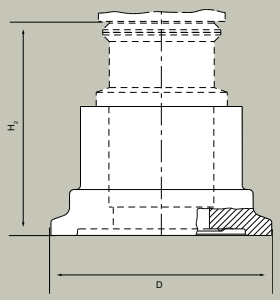
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Dimensional drawings (continued)

Connection	Order code	DN	PN	ØD	H_2
Sanitary process connection according to NEUMO BioConnect S flange connection 	**Q72**	2 inches	16	125 mm (4.9 inches)	Approx. 52 mm (2 inches)
Threaded connection G¾ inch, G1 inch and G2 inch according to DIN 3852-2 form A 	**R01**	¾ inch	60	37 mm (1.5 inches)	Approx. 45 mm (1.8 inches)
	R02	1 inch	60	48 mm (1.9 inches)	Approx. 47 mm (1.9 inches)
	R04	2 inches	60	78 mm (3.1 inches)	Approx. 52 mm (2 inches)
Tank connection TG 52/50 and TG 52/150 	**R10**	25	40	63 mm (2.5 inches)	Approx. 63 mm (2.5 inches)
	R11	25	40	63 mm (2.5 inches)	Approx. 170 mm (6.7 inches)
SMS screwed connector 	**M73**	2 inches	25	70 x 1/6 mm	Approx. 52 mm (2.1 inches)
	M74	2½ inches	25	85 x 1/6 mm	
	M75	3 inches	25	98 x 1/6 mm	
Aseptic screwed connector according to DIN 11864-1 form A	**N33**	50	25	78 x 1/6 inch	Approx. 52 mm (2.1 inches)
	N34	65	25	95 x 1/6 inch	
	N35	80	25	110 x ¼ inch	

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Dimensional drawings (continued)

Connection	Order code	DN	PN	ØD	H_2
	**N36**	100	25	130 x ¼ inch	Approx. 52 mm (2.1 inches)
Aseptic flange with notch according to DIN 11864-2 form A					
	**N43**	50	16	94	Approx. 52 mm (2.1 inches)
	N44	65	16	113	
	N45	80	16	133	
	N46	100	16	159	
Aseptic flange with groove according to DIN 11864-2 form A					
	**N43 + P11**	50	16	94	Approx. 52 mm (2.1 inches)
	N44 + P11	65	16	113	
	N45 + P11	80	16	133	
	N46 + P11	100	16	159	
Aseptic clamp with groove according to DIN 11864-3 form A					
	**N53**	50	25	77.5	Approx. 52 mm (2.1 inches)
	N54	65	25	91	
	N55	80	16	106	
	N56	100	16	130	

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Overview

The SITRANS P300 transmitter for gauge and absolute pressure can be delivered factory-fitted with the following valve manifold 7MF9011-4EA and 7MF9011-4FA.

Design

The 7MF9011-4EA valve manifolds are sealed with PTFE sealings between the transmitter and the valve manifold as standard. Soft iron, stainless steel and copper sealings are also available for sealing purposes if preferred.

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

The complete unit is checked for leaks under pressure after assembly (air pressure 6 bar (87 psi)) and certified with a factory certificate according to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

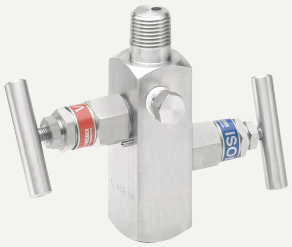
If you order a mounting bracket when choosing the option "Factory-mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an inspection certificate 3.1 to EN 10204 after choosing the option "Factory-mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

Selection and ordering data

Valve manifolds

7MF9011-4FA valve manifold on gauge and absolute pressure transmitters	
Add **-Z** to the article number of the transmitter and specify order codes	**Order code**
SITRANS P300 **7MF802.-...1.-...** with process connection internal thread ½-14 NPT, in-sealed with PTFE sealing tape Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2	**T03**
Additional versions:	
Delivery includes mounting bracket and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Inspection certificate according to EN 10204- 3.1 for transmitters and mounted valve manifold	**C12**



7MF9011-4EA valve manifold on gauge and absolute pressure transmitters	
Add **-Z** to the article number of the transmitter and specify order codes	**Order code**
SITRANS P300 **7MF802.-...0.-...** With process connection shank G½ A according to EN 837-1, gasket made of PTFE between valve manifold and transmitter	**T02**
Alternative gasket material:	
• Soft iron	**A70**
• Stainless steel, mat. no. 14571	**A71**
• Copper	**A72**
Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2	
Additional versions:	
Delivery includes mounting bracket and stainless steel mounting clips (instead of the mounting bracket supplied with the transmitter)	**A02**
Inspection certificate according to EN 10204- 3.1 for transmitters and mounted valve manifold	**C12**



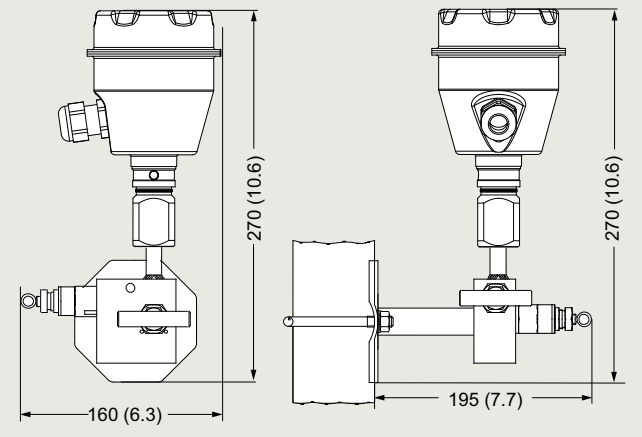
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Dimensional drawings

Valve manifolds mounted on SITRANS P300



7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters

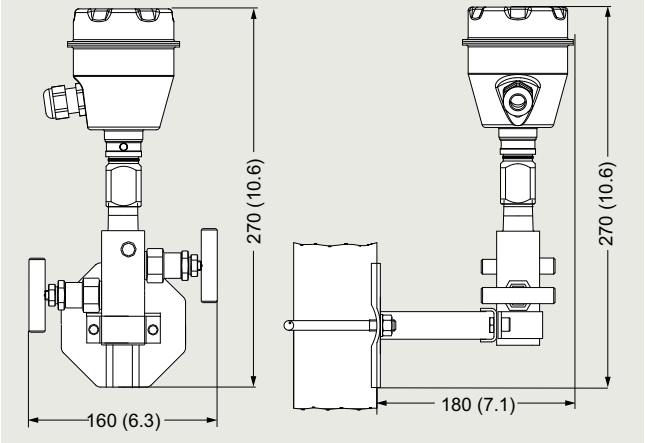


7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

Dimensional drawings (continued)



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

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Overview



SITRANS P300, pressure transmitter with PMC connection for paper industry

The SITRANS P300 pressure transmitter has been fitted with special process connections for the paper industry. With the two process connection threads 1½" and 1" flush mounted, the SITRANS P300 transmitter can be used in all processes of the paper industry.

The SITRANS P300 pressure transmitter is a digital pressure transmitter featuring extensive user-friendliness and high accuracy. The parameterization is performed using input buttons or via HART communication or via PROFIBUS PA or FOUNDATION Fieldbus interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very simple in spite of the numerous setting options.

Pressure transmitters of the "Intrinsic safety" and "Flameproof" type of protection can be installed within hazardous areas (Zone 1) or in Zone 0. The devices are provided with an EC type-examination certificate and comply with the corresponding harmonized European standards (ATEX).

Various versions of the pressure transmitters are available for measuring:

- Gauge pressure
- Level
- Volume level
- Mass level

Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads, e.g. abrasion
- For corrosive and non-corrosive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Minimal conformity error
- Small long-term drift
- Wetted parts made of Hastelloy
- Continuously adjustable measuring spans from 0.03 bar to 16 bar (0.43 psi to 232 psi) with HART interface
- Nominal measuring ranges from 1 bar to 16 bar (14.5 psi to 232 psi) with PROFIBUS PA interface
- High measuring accuracy
- Parameterization using control keys or HART and/or PROFIBUS PA or FOUNDATION Fieldbus

Application

The SITRANS P300 pressure transmitter for gauge pressure with PMC connection is used in the paper industry.

Pressure transmitters of the "Intrinsic safety" and "Flameproof" type of protection can be installed within hazardous areas (Zone 1) or in Zone 0. The pressure transmitters are provided with an EC type-examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in Zone 0 may be operated with power supply units of category "ia" and "ib".

The pressure transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 input buttons or programmed externally over HART or over PROFIBUS PA or FOUNDATION Fieldbus interface.

Measuring span (continuously adjustable)

P300 with HART: 0.01 to 16 bar (0.15 to 232 psi)

Nominal measuring range

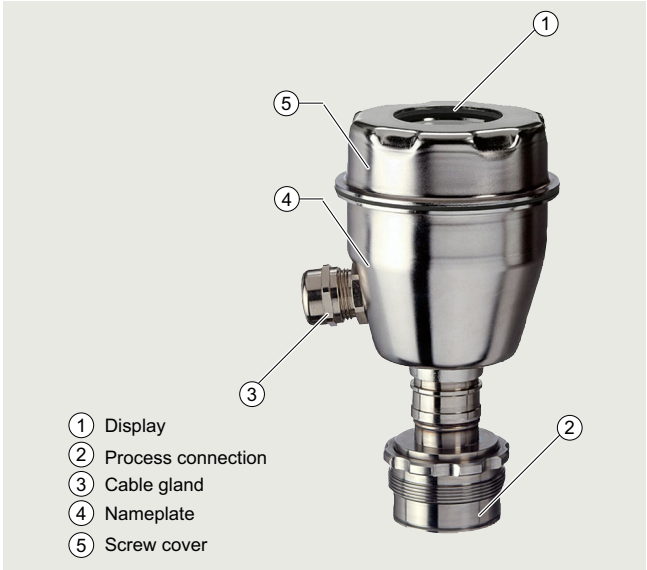
For P300 with PROFIBUS PA and FOUNDATION Fieldbus:
1 to 16 bar (14.5 to 232 psi)

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Design

The SITRANS P300 pressure transmitter consists of:

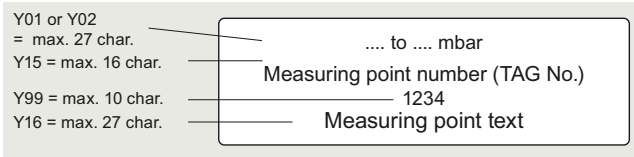
- electronics
- Enclosure
- Measuring cell



Perspective view of the SITRANS P300

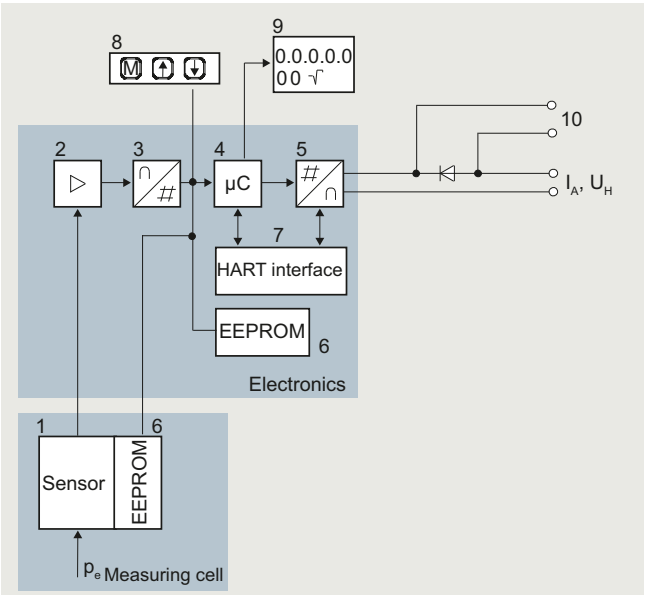
The enclosure has a screw-on cover (5) and, depending on the version, comes with or without an inspection window. The electrical terminal compartment, the buttons for operation of the device and, depending on the version, the display are located under this cover. The connections for the auxiliary power U_H and the shield are in the terminal compartment. The cable gland is on the side of the enclosure. The measuring cell with the process connection (2) is located on the bottom of the enclosure. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device design.

Example of attached measuring point label



Function

Mode of operation of electronics with HART communication



1 Measuring cell sensor
2 Instrument amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Digital-to-analog converter
6 One non-volatile memory each in the measuring cell and electronics
7 HART interface
8 Three input keys (local operation)
9 Digital display
10 Diode circuit and connection for external ammeter
I_A Output current 4 ... 20 mA
U_H Power supply
P_e Input variable

Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitalized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, corrected for linearity and temperature response, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). One memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input buttons (8), you can assign parameters to the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the measurement results, the error messages and the operating modes on the local display (9).

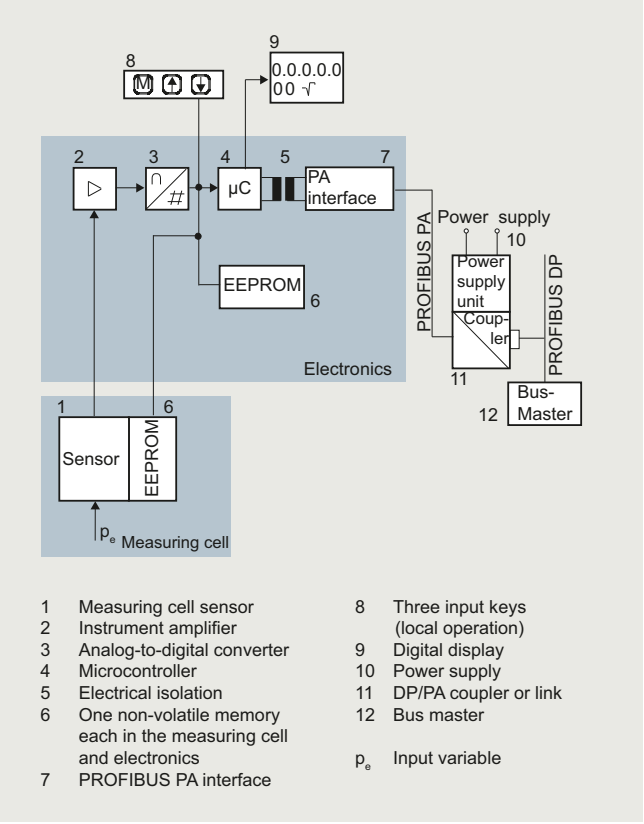
The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with measuring spans ≤ 63 bar measure the input pressure compared to atmosphere, transmitters with spans ≥ 160 bar the input pressure compared to vacuum.

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Function (continued)

Mode of operation of electronics with PROFIBUS PA communication



1	Measuring cell sensor	8	Three input keys (local operation)
2	Instrument amplifier	9	Digital display
3	Analog-to-digital converter	10	Power supply
4	Microcontroller	11	DP/PA coupler or link
5	Electrical isolation	12	Bus master
6	One non-volatile memory each in the measuring cell and electronics	p_e	Input variable
7	PROFIBUS PA interface		

Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitalized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, corrected for linearity and temperature response, and made available on the PROFIBUS PA via an electrically isolated PA interface (7).

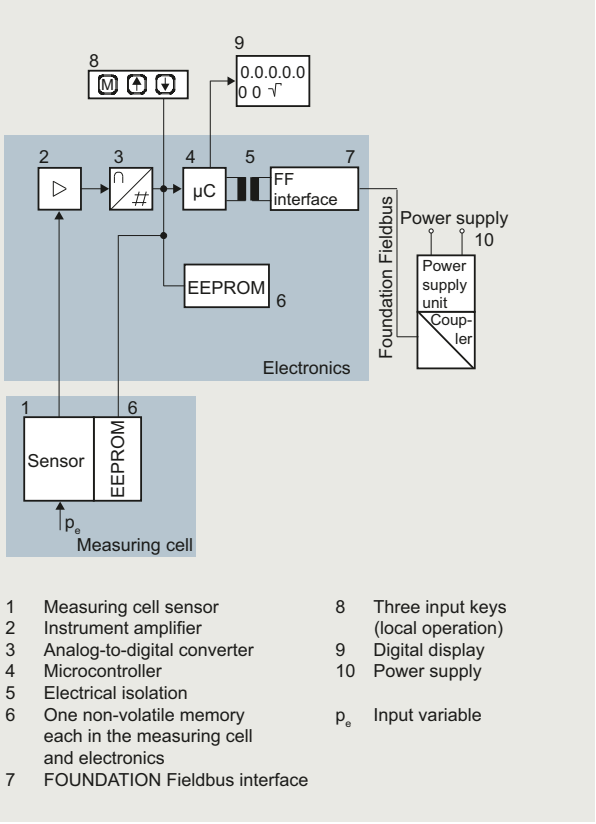
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). One memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8), you can assign parameters to the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the measurement results, the error messages and the operating modes on the local display (9).

The results with status values and diagnostics data are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

Function (continued)

Mode of operation of electronics with FOUNDATION Fieldbus communication



1	Measuring cell sensor	8	Three input keys (local operation)
2	Instrument amplifier	9	Digital display
3	Analog-to-digital converter	10	Power supply
4	Microcontroller	p_e	Input variable
5	Electrical isolation		
6	One non-volatile memory each in the measuring cell and electronics		
7	FOUNDATION Fieldbus interface		

Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitalized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, corrected for linearity and temperature response and made available on the FOUNDATION Fieldbus via an electrically isolated FOUNDATION Fieldbus interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). One memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8), you can assign parameters to the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the measurement results, the error messages and the operating modes on the local display (9).

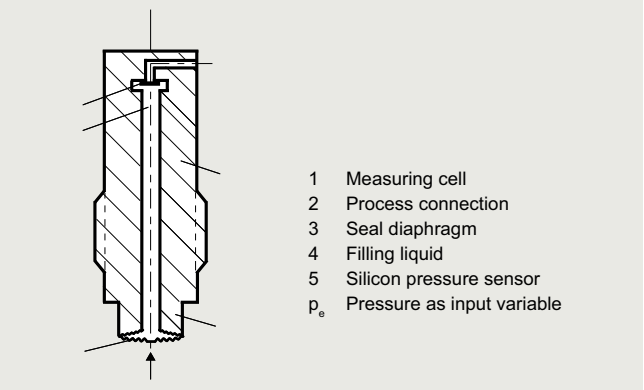
The results with status values and diagnostics data are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

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Function (continued)

Mode of operation of the measuring cell

Measuring cell for gauge pressure with flush-mounted diaphragm



Measuring cell for gauge pressure, with flush-mounted diaphragm for paper industry, function diagram

The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gauge pressure, with flush-mounted diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the input pressure.

Parameterization

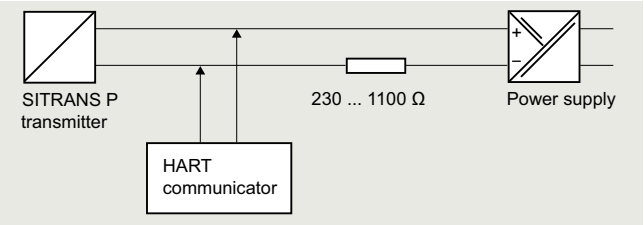
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

With the input buttons, you can easily set the most important parameters without any additional equipment.

Parameterization using HART

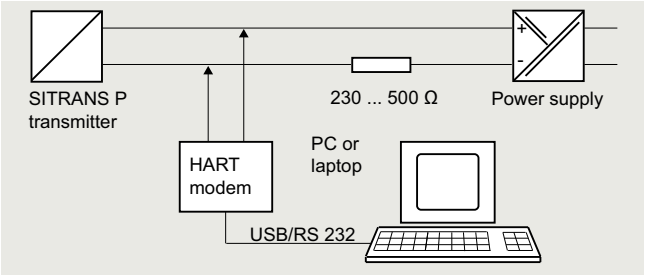
Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.

Function (continued)



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using FSK (Frequency Shift Keying).

Adjustable parameters for SITRANS P300 with HART

Parameters	Input buttons	HART
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Blind adjustment of the lower range value	x	x
Blind adjustment of the upper range value	x	x
Zero adjustment	x	x
Current simulator	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x [1]
Type of unit, unit	x	x
Characteristic curve (linear)	x	x
Input of characteristic curve		x
Freely-programmable LCD		x
Diagnostic functions		x

[1] Except cancel write protection.

Diagnostic functions for SITRANS P300 with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Min/max pointer
- Simulation functions
- Maintenance timer

Available physical units of display for SITRANS P300 with HART

Physical variable	Physical units
Pressure (can also be preset in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm², kg/cm², inH_2O, inH_2O (4 °C), mmH_2O, ftH_2O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m³, dm³, hl, yd³, ft³, in³, US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Temperature	K, °C, °F, °R
Other	%, mA

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Function (continued)

Parameterization through PROFIBUS interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. Communication is possible even in a hazardous area.

For parameter assignment via PROFIBUS, you need suitable software, e.g. SIMATIC PDM (Process Device Manager)

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Communication is possible even in a hazardous area.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

Adjustable parameters	Input buttons	PROFIBUS PA and FOUNDATION Fieldbus
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured value display	x	x
Physical unit of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic curve	x	x
Input of characteristic curve		x
Freely-programmable LCD		x
Diagnostic functions		x

Diagnostic functions for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Min/max pointer
- Maintenance timer
- Simulation functions
- Zero correction display
- Limit transmitter
- Saturation alarm

Physical units available for the local display

Physical variable	Physical units
Pressure (can also be preset in the factory)	MPa, hPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, mmH_2O, mmH_2O (4 °C), inH_2O, inH_2O (4 °C), ftH_2O, mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, US gallon, Imp. gallon, bushel, barrel, barrel liquid
Temperature	K, °C, °F, °R
Other	%

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Selection and ordering data

SITRANS P300 pressure transmitters with PMC connection, single chamber enclosure, nameplate inscription in English		Article No.									
4 ... 20 mA / HART		7MF8123-									
PROFIBUS PA		7MF8124-									
FOUNDATION Fieldbus (FF)		7MF8125-									
		●	●	●	●	●	-	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.											
Measuring cell filling	Measuring cell cleaning										
Silicone oil	Normal	1									
Inert liquid	Cleanliness level 2 according to DIN 25410	3									
Measuring span											
1 bar (14.5 psi)[1]			B								
4 bar (58 psi)			C								
16 bar (232 psi)			D								
Material of wetted parts											
Seal diaphragm	Measuring cell										
Hastelloy	Stainless steel			B							
Process connection											
PMC style Standard: Thread 1½"					2						
PMC style Minibolt: Flush mounted 1" (minimum measuring span: 500 mbar (200 inH_2O), cannot be ordered with 1 bar measuring cell (option B))					3						
Material of non-wetted parts											
Stainless steel, deep-drawn and electrolytically polished						4					
Version											
Standard version								1			
Explosion protection											
None									A		
With ATEX, type of protection:											
• "Intrinsic safety (Ex ia)"									B		
• Zone 20/21/22[2]									C		
• Ex nA/nL (Zone 2)[3]									E		
With FM + CSA, type of protection:											
• "Intrinsic Safe (is)" (planned)[4]									M		
Electrical connection/cable entry											
Screw gland M20×1.5 (polyamide)[5]										A	
Screw gland M20×1.5 (metal)										B	
Screw gland M20×1.5 (stainless steel)										C	
Device plug M12 (stainless steel, without cable socket)										G	
½-14 NPT threaded metal[6]										H	
½-14 NPT threaded stainless steel[6]										J	
Display											
Without local display, with buttons, closed lid											1
With local display and buttons, closed lid[7]											2
With local display and buttons, lid with polycarbonate pane (setting for HART devices: mA, for PROFIBUS PA and FOUNDATION Fieldbus devices: pressure units)[7]											4
With local display and buttons (setting acc. to specifications, order code "Y21" or "Y22" required), lid with polycarbonate pane[7]											5
With local display and buttons, lid with glass pane (setting for HART devices: mA, for PROFIBUS PA and FOUNDATION Fieldbus devices: pressure unit)[7]											6
With local display and buttons (setting acc. to specifications, order code "Y21" or "Y22" required), lid with glass pane[7]											7

Note

See section "Supplementary components" for supply units. The device's scope of delivery includes a brochure and a sealing ring.

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Selection and ordering data (continued)

1) Only with "Standard" process connection
2) Can only be ordered together with electrical connection option A.
3) Can only be ordered together with electrical connection option B, C or G.
4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505. 5) Only together with HART electronics.
6) Without cable gland.
7) Local display cannot be rotated.

Options Add "-Z" to article number and specify order code.	Order code	Communication
Cable socket for M12 device plug		
Stainless steel	**A51**	HART / PA / FF
Nameplate inscription (in place of English)		
• German	**B10**	HART / PA / FF
• French	**B12**	HART / PA / FF
• Spanish	**B13**	HART / PA / FF
• Italian	**B14**	HART / PA / FF
English nameplate, pressure units in in$H_2$0 or psi	**B21**	HART / PA / FF
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2[1]	**C11**	HART / PA / FF
Inspection certificate according to EN 10204-3.1[2]	**C12**	HART / PA / FF
Factory certificate according to EN 10204-2.2	**C14**	HART / PA / FF
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	HART / PA / FF
Degree of protection IP65/IP68 only for M20x1.5 and ½-14 NPT	**D12**	HART / PA / FF
Mounting		
Weld-in sockets for standard threaded connection 1½"	**P01**	HART / PA / FF
Weld-in sockets for minibolt connection 1" (including screw 5/16-18 UNC-2B and washer)	**P02**	HART / PA / FF
Additional information Add "**-Z**" to article number, specify order code and plain text.		

Options Add "-Z" to article number and specify order code.	Order code	Communication
Measuring range to be set Specify in plain text (max. 5 digits): Y01: ... to ... mbar, bar, kPa, MPa, psi	**Y01**	HART / PQ[1]
Tag plate made of stainless steel and entry in the device variable (measuring point description) Max. 16 characters; specify in plain text: Y15:	**Y15**	HART / PA / FF
Measuring point text (entry in device variable) Max. 27 characters; specify in plain text: Y16:	**Y16**	HART / PA / FF
Entry of HART TAG Max. 8 characters; specify in plain text: Y17:	**Y17**	HART
Setting of the local display in pressure units Specify in plain text (default setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... The following pressure units can be selected: bar, mbar, mm H_2O[3], inH_2O[3], ftH_2O[3], mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or %	**Y21**	HART / PA / FF
Setting of the local display in non-pressure units[9] Specify in plain text: Y22: ..... to ..... l, m3, m, USg, ... (Specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	**Y22 + Y01**	HART
Preset bus address, possible range 1 ... 126 Specify in plain text: Y25:	**Y25**	PA / FF

Note:

Only "Y01" and "Y21" can be factory preset.

1) Measuring accuracies for PROFIBUS PA transmitters with option Y01 are calculated in the same way as for HART devices.
2) Preset values can only be changed via SIMATIC PDM.
3) 20 °C reference temperature.

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Technical specifications

SITRANS P300 for gauge pressure with PMC connection for the paper industry				
Input				
Measured variable	Gauge pressure (flush mounted)			
	HART	**PROFIBUS PA/FOUNDATION Fieldbus**		
Measuring span (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Measuring span	Nominal measuring range	Max. permissible operating pressure MAWP (PS)	Max. permissible test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.71 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
Lower measuring limit (for PMC Style Minibolt, no measuring span < 500 mbar can be set)	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. measuring span			
Output	**HART**		**PROFIBUS PA/FOUNDATION Fieldbus**	
Output signal	4 ... 20 mA		Digital PROFIBUS PA signal	
• Lower limit (continuously adjustable)	3.55 mA, factory set to 3.84 mA		-	
• Upper limit (continuously adjustable)	23 mA, factory-set to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω U_H: Auxiliary power in V		-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)			
Measuring accuracy	According to IEC 62828-1			
Reference conditions	• Rising characteristic curve • Lower range value 0 bar • Seal diaphragm stainless steel • Silicone oil filling • Room temperature (25 °C (77 °F))			
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range			
Measurement deviation at limit setting including hysteresis and reproducibility				
• Linear characteristic curve				
- r ≤ 5	≤ 0.075%			
- 5 < r ≤ 100	≤ (0.005 · r +0.05)%			
Effect of ambient temperature	≤ (0.08 · r + 0.16)%			
Long-term stability (temperature change ±30 °C (± 54 °F))	≤ (0.25 · r)% in 5 years			
Influence of mounting position	≤ 0.1 mbar/0.01 kPa/0.00145 psi per 10° incline (zero offset is possible with position error compensation)			
Effect of auxiliary power (in percent per voltage change)	0.005% per 1 V			
Measured value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range			
Operating conditions				
Installation conditions				
Ambient temperature	Observe the temperature class in hazardous areas.			
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)			
• Local display readable	-30 ... +85 °C (-22 ... +185 °F)			
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)			
Climatic class				
Condensation	Relative humidity 0 ... 100% Condensation permissible, suitable for use in the tropics			
Degree of protection				
• According to EN 60529	IP65, IP68			
• According to NEMA 250	Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)			

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Technical specifications (continued)

SITRANS P300 for gauge pressure with PMC connection for the paper industry		
Electromagnetic compatibility		
• Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Process conditions		
Medium temperature		
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)	
Structural design		
Weight (without options)	Approx. 1 kg (2.2 lb)	
Enclosure material	Stainless steel, mat. no. 1.4301/304	
Material of wetted parts		
• Seal diaphragm	Hastelloy C276, mat. no. 2.4819	
• Measuring cell filling	Silicone oil	
Surface quality touched-by-media	R_a-values ≤ 0.8 µm (32 µ-inch)/welds Ra ≤ 1.6 µm (64 µ-inch)	
Auxiliary power U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	-
Auxiliary power	-	Bus-powered
Separate supply voltage	-	Not necessary
Bus voltage		
• Without EEx	-	9 ... 32 V
• With intrinsically safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Starting current ≤ basic current	-	Yes
• Max. fault current in the event of an error	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
Certificates and approvals	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
Intrinsic safety "i"	PTB 05 ATEX 2048	
Marking	II 1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb	
Permissible ambient temperature		
• Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
• Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
• Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	To certified intrinsically safe circuits with peak values: FISCO supply unit: U_i = 17.5 V, I_i = 380 mA, P_i = 5.32 W Linear barrier: U_i = 24 V, I_i = 250 mA, P_i = 1.2 W
Effective internal capacitance	C_i = 6 nF	C_i = 1.1 nF
Effective internal inductance	L_i = 0.4 mH	L_i = 7 µH
Explosion protection to FM for USA and Canada (cFM_{US})		
• Identification (DIP) or (IS); (NI)	Certificate of Compliance 3025099 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6 CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
• Identification (DIP) or (IS)	Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6 CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	

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Technical specifications (continued)

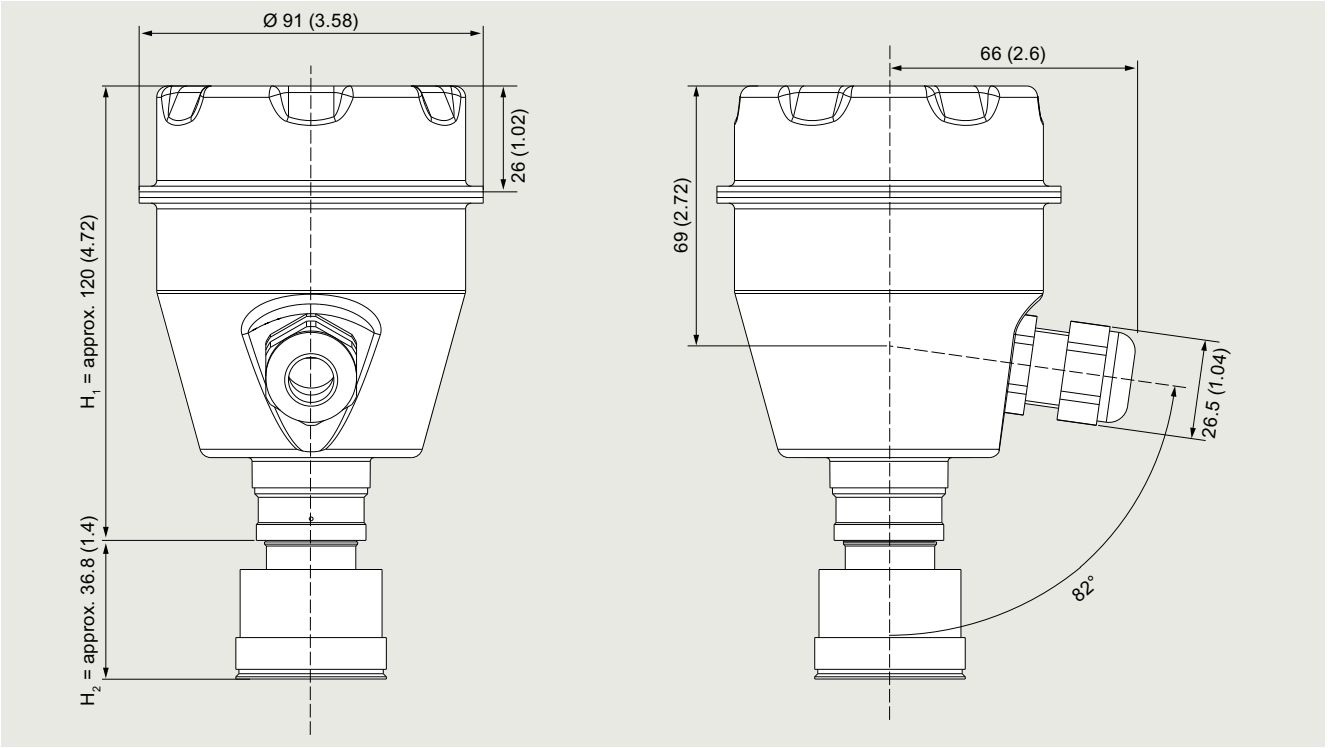
Communication

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (default setting address 126)
Cyclic data usage	
• Output byte	1 measured value: 5 bytes 2 measured values: 10 bytes
• Input byte	Register operation mode: 1 byte Reset function due to dosing: 1 byte
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to user-specific process variable	Linearly rising or falling characteristic curve
- Electrical damping	0 ... 100 s adjustable
- Simulation function	Output/input
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset and preset Selectable direction of counting Simulation function of the register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 31 nodes
- Characteristic curve	Linear

Communication	
- Simulation function	Available
• Transducer block "Electronics temperature"	
Simulation function	Available
FOUNDATION Fieldbus	
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

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Dimensional drawings



SITRANS P300 pressure transmitter for gauge pressure, with PMC connection, dimensions in mm (inch)

The figure shows a SITRANS P300 with an example flange. In this drawing, the height is subdivided into H_1 and H_2:

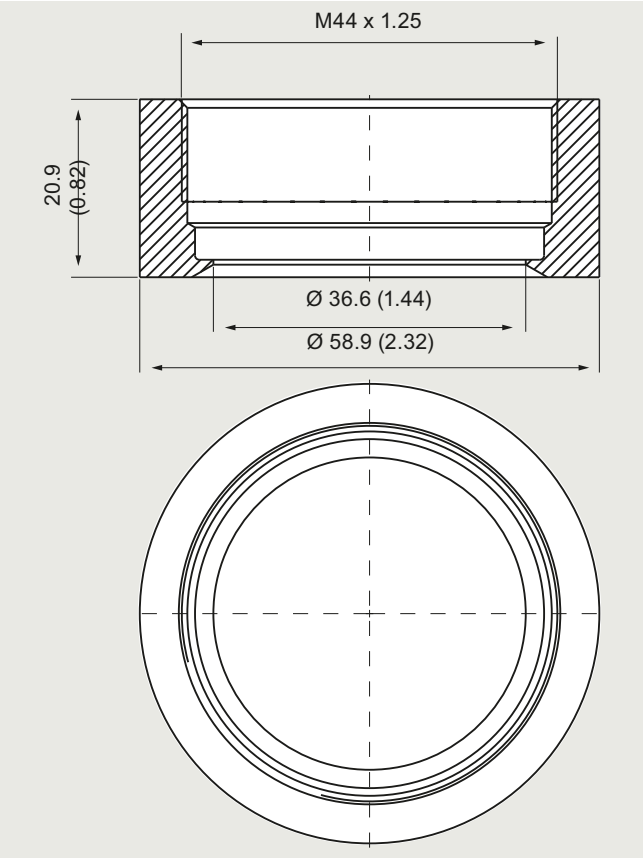
- H_1 = Height of the SITRANS P300 up to a defined cross-section
- H_2 = Height of the flange up to this defined cross-section

Only the height H_2 is indicated in the dimensions of the flanges.

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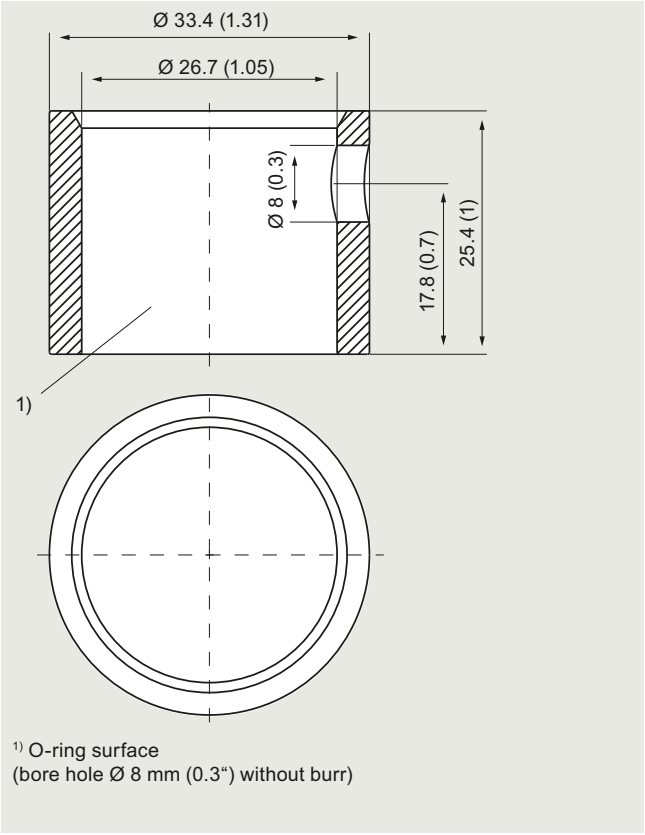
Dimensional drawings (continued)

PMC style standard weldable sockets

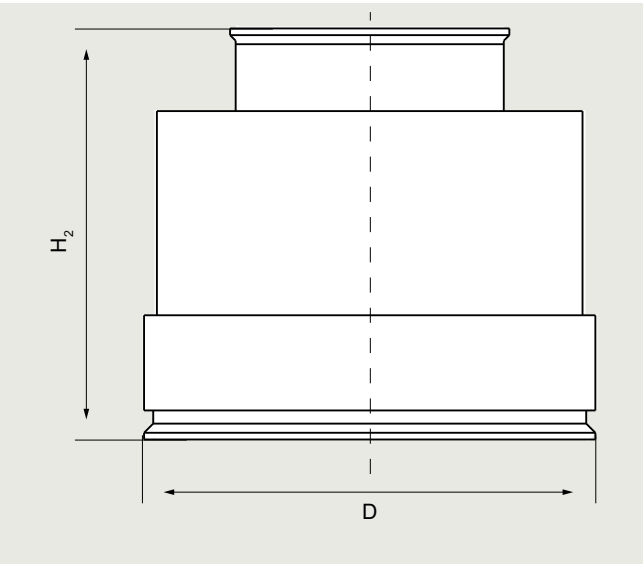


PMC style standard weldable sockets, dimensions in mm (inch)

PMC style minibolt weldable sockets



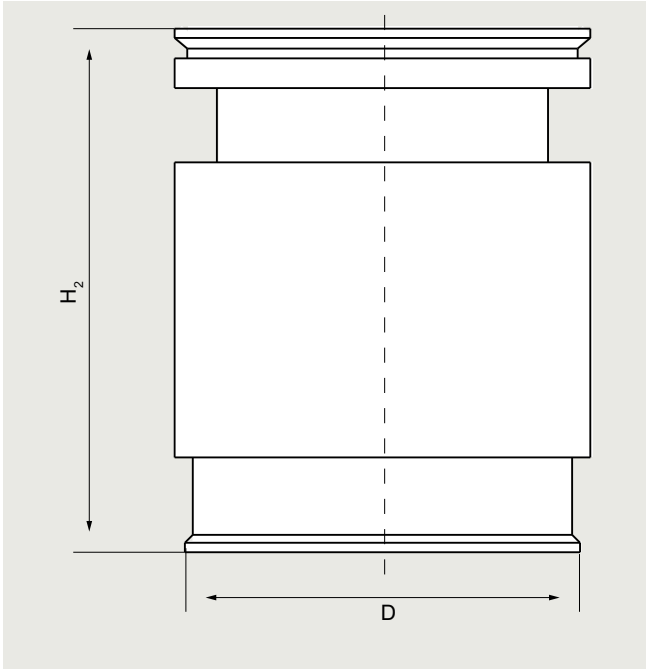
PMC style minibolt weldable sockets, dimensions in mm (inch)



Material: Stainless steel mat. no. 1.4404/316L
ØD = 40.9 mm (1.6")
H_2 = approx. 36.8 mm (1.4")

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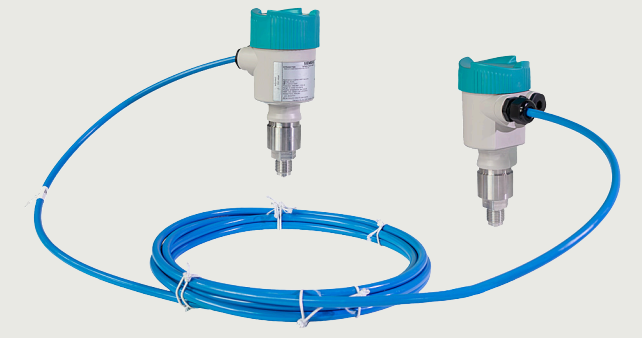
Dimensional drawings (continued)



ØD = 26.3 mm (1.0")
H_2 = approx. 33.1 mm (1.3")

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Overview



SITRANS P360 electronic remote differential pressure transmitter is a measurement system consisting out of two SITRANS P360 pressure transmitters. The differential pressure signal is derived from the digital signals of these two transmitters which are defined as primary and secondary. SITRANS P360 ERS (Electronic Remote System) can display parameters such as tank level height, level percentage, and current value, easily accessible through its menu settings.

Designed for a wide range of liquid level and density measurements, especially where classic remote sealing devices are unsuitable—the SITRANS P360 is ideal in applications with large distances between measurement points, difficult installation conditions or high fluctuation in ambient temperatures. With its 4 ... 20 mA HART or PPROFIBUS communication and the optional Bluetooth interface the most common communication types are given.

With SIL 2/3 and Ex certifications the SITRANS P360 can also be used in critical application or hazardous environments.

Benefits

- Reduced temperature influence because of electrical connection instead of oil filled capillary
- No risk of leakage or damage on the capillaries
- Low response time due to reduced shift of oil volume
- Easy installation and maintenance, no layout for capillary, flexible placement of the transmitters
- Cable length between master and slave up to 70 m
- High variety on process connections with and without direct mounted remote seal
- Infinitely adjustable spans from 25 mbar to 1000 bar
- For corrosive and non-corrosive gases, vapors and liquids

Application

The SITRANS P360 electronic differential pressure system is ideal for a wide range of industrial applications that require precise measurements. Because no capillary tubes are involved, these systems offer better temperature stability, reduced risk of leaks, and faster response times compared to traditional setups. They are especially suitable for measuring high tanks, handling corrosive or aggressive media, and ensuring reliable performance in environments where conventional, mechanically linked systems fall short.

Users can easily configure and manage the transmitter through intuitive menus or software, enabling quick adaptation to specific process requirements. In addition, the system's compact design simplifies installation and lowers maintenance costs, making it a practical choice for demanding applications in industries such as chemical processing, oil and gas, power generation, water treatment, and more.

For the high variety of applications three different variants with or without remote seal are available:

7MF85: Pressure transmitter with direct mounted remote seal	
Measured variable	• Gauge and absolute pressure of corrosive and non-corrosive gases, vapors and liquids
Measuring span (infinitely adjustable)	• For SITRANS P360 with 4 ... 20 mA HART and PROFIBUS: 0.4 ... 1000 bar (5.80 ... 14503.8 psi)
There are two series	• Gauge pressure series • Absolute pressure series

7MF86: Pressure transmitter with dry pressure ceramic cell	
Measured variable	• Gauge and absolute pressure of corrosive and non-corrosive gases, vapors and liquids
Measuring span (infinitely adjustable)	• For SITRANS P360 with 4 ... 20 mA HART and PROFIBUS: 25 mbar ... 100 bar a (0.36 ... 1450.38 psi)
There are two series	• Gauge pressure series • Absolute pressure series

7MF87: Pressure transmitter with front flush metallic cell	
Measured variable	• Gauge and absolute pressure of corrosive and non-corrosive gases, vapors and liquids
Measuring span (infinitely adjustable)	• For SITRANS P360 with 4 ... 20 mA HART and PROFIBUS: 100 mba ... 1000 bar a (1.45 psi ... 14503.8 psi)
There are two series	• Gauge pressure series • Absolute pressure series

For an ERS system you always must configure a primary and a secondary transmitter. Only if you order both within one order the order can be processed. For the mapping of primary and secondary within an order please use the same S** option code for corresponding master and slave transmitter.

Example:

Primary: 7MF8600-.....-....-Z S00

Secondary: 7MF8640-.....-....-Z S00

Out of primary and secondary a combination out of the three different variants is possible.

Please consider that a mix out of Gauge and absolute pressure is not allowed.

Dry pressure cell

The dry ceramic pressure measuring cell is the ideal choice whenever process purity, chemical resistance, and oil-free measurement are required. Unlike oil-filled metallic cells, its robust ceramic diaphragm directly contacts the medium — with no

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Application (continued)

hydraulic fill fluid involved. This makes it the preferred solution for hygienic, food-grade, or chemically aggressive applications where contamination must be strictly avoided.

Benefits

- Oil-free & media-pure – No risk of process contamination through hydraulic fill fluid
- Outstanding chemical resistance – Alumina ceramic withstands a wide range of aggressive, corrosive, and abrasive media
- High overload resistance – Ceramic diaphragms tolerate significant pressure spikes without permanent damage
- Long-term stability – Minimal drift and excellent repeatability over extended service life
- Wide temperature range – Reliable performance across varying process and ambient temperature
- Low maintenance – Robust and wear-resistant design reduces servicing requirements

Application

- Food & Beverage – Hygienic measurement of water, milk, juices, and other food-grade media
- Water & Wastewater – Pressure monitoring in water treatment, distribution, and sewage systems
- Chemical & Pharmaceutical Industry – Measurement of aggressive or corrosive liquids and gases where metallic cells are unsuitable
- HVAC & Building Automation – Monitoring of air, gases, and non-aggressive fluids in climate control systems
- Compressed Air & Pneumatics – Clean and accurate measurement of dry gases and compressed air
- General Industrial Processes – Wherever process purity, media compatibility, or hygienic standards are critical

Front flush metallic cell

The flush-mounted metallic pressure measuring cell is the ideal choice whenever viscous, highly viscous, or solid-laden media are involved in the measurement process. Its diaphragm sits perfectly flush with the process connection, eliminating any cavities or dead zones where media could accumulate or crystallize. This design makes it the preferred solution for challenging process conditions where conventional pressure ports would clog, block, or cause hygiene issues.

Benefits

- Flush diaphragm design – No dead zones, cavities, or pressure ports that could trap or block media
- Self-cleaning effect – The smooth, flush surface prevents product build-up and simplifies cleaning
- Wide material selection – Available in various high-grade stainless steels and special alloys (e.g., Hastelloy, Tantalum) for maximum chemical compatibility
- CIP/SIP compatible – Suitable for clean-in-place and sterilize-in-place processes in hygienic applications
- High mechanical robustness – Metallic diaphragm withstands high pressures, pressure shocks, and demanding industrial environments
- Broad pressure range – Covers a wide measurement range from low to very high process pressures
- Oil-filled system – Ensures reliable signal transmission even under extreme process conditions

Application (continued)

Application

- Food & Beverage – Measurement of viscous media such as syrups, sauces, pastes, and dairy products
- Chemical & Petrochemical Industry – Monitoring of aggressive, corrosive, or high-pressure media where robust metallic materials are essential
- Pharmaceutical & Biotech – Hygienic pressure measurement in sterile processes requiring CIP/SIP compatibility
- Pulp & Paper – Reliable measurement in fibrous, abrasive, or slurry-type media
- Wastewater & Sludge Treatment – Pressure monitoring in heavily contaminated or solid-laden fluids
- Oil & Gas – High-pressure and high-temperature applications in upstream and downstream processes
- General Process Industry – Wherever clogging, crystallization, or media build-up would compromise conventional pressure measurement

Remote seals

In many cases, the pressure transmitter and the measured medium have to be physically separated. In such cases the use of a remote seal is necessary. The SITRANS P360 (7MF85) offers a direct mounting of remote seals in flange design.

Benefits

- No direct contact between pressure transmitter and medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Enhanced variance of process connection
- Specially designed for difficult operating conditions

Application

Remote seal systems should be used when it is necessary or expedient to separate the medium and measuring instrument. Some examples of such cases:

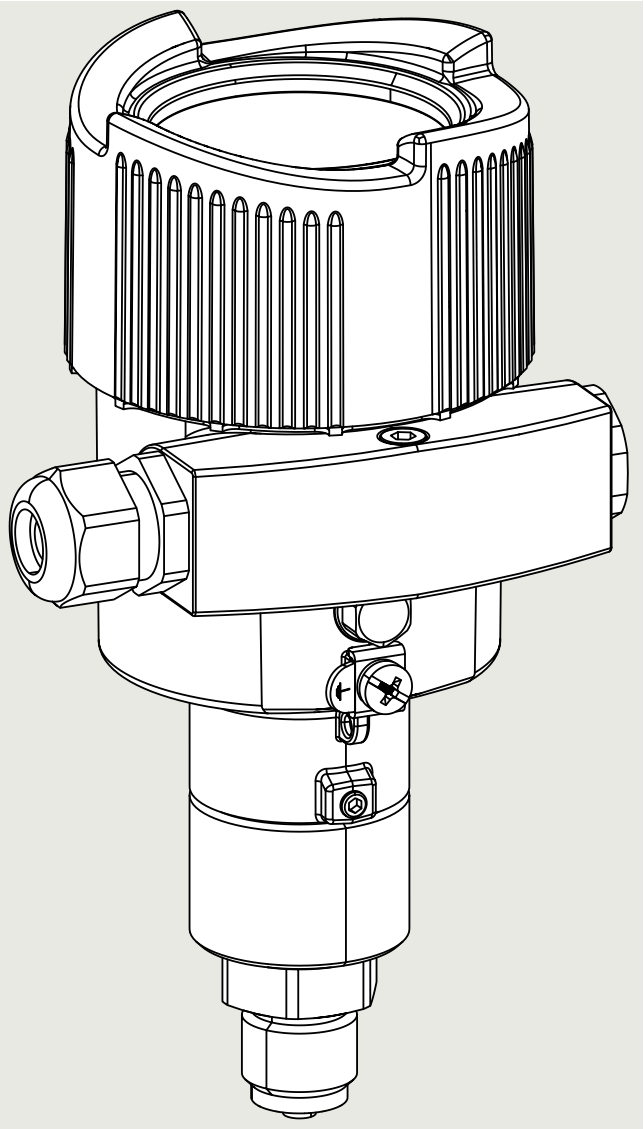
- The medium temperature is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials that are not available for the pressure transmitter.
- The medium is highly viscous or has a high solids content and would block the sample chambers of the pressure transmitter.
- The medium could freeze in the sample chambers or the pulse cable.
- The medium is heterogeneous or fibrous.
- The medium has a tendency towards polymerization or crystallization.
- The process requires cleaning of the measuring point, like in a batch process, for example.

For SITRANS P360 direct mounted flange design remote seals with and without diaphragm extension (tube) according to EN or ASME are available.

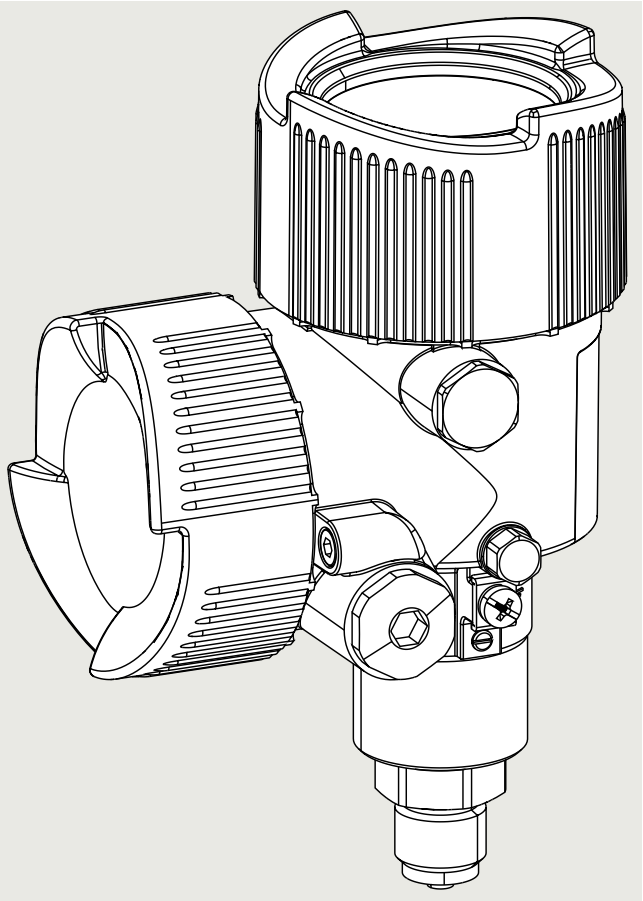
Further technical details you will find within technical data of SITRANS P360.

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Design

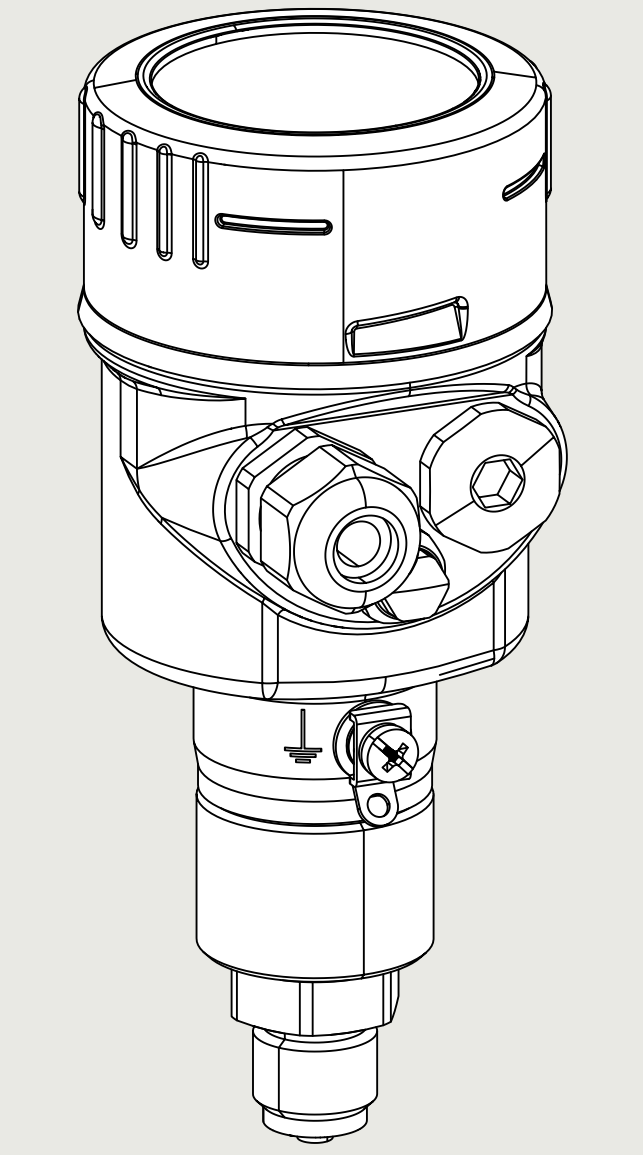


Design (continued)



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Design (continued)

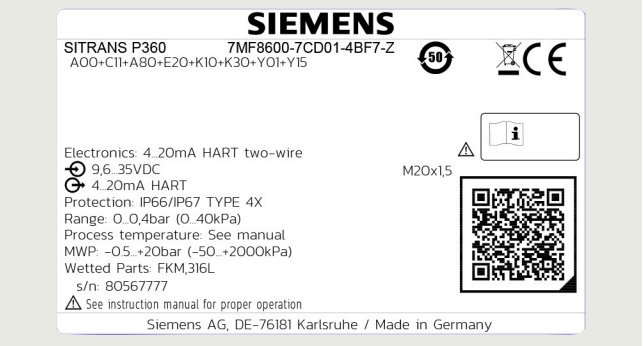


- The electronics enclosure is made of single or dual chamber die cast aluminum, precision cast stainless steel or plastic (according to the material the design could differ).
- The enclosure has a removable cover at the top and or side.
- Depending on the device design, the top cover may be designed with a glass pane.
- The cable inlet to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug.
- The ground terminal is located on the side.
- The electrical terminal compartment for the auxiliary power and shield is accessible when you remove the top cover (single chamber) or side cover (dua chamber).

Design (continued)

- The measuring cell with process connection is located in the bottom part of the enclosure.
- If the device is equipped with a display the buttons are located under the top cover.

Nameplates



The nameplate with the article no. and other important information, such as design details and technical data, is located on the side of the housing.

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Function

Adjustable parameters and diagnostics

SITRANS P360 with 4 ... 20 mA HART communication

SETUP Menu item	Parameters	Input Buttons
Measurement loop name	19 alphanumeric characters/special characters	X
Application	• Level, process pressure	X
	• Secondary Device for electronic differential pressure	X
Units	• Adjustment unit (m, bar, Pa, psi ... user-defined)	X
	• Temperature unit (°C, °F)	X
Position correction	Offset	X
Adjustment	• Zero/Min. adjustment	X
	• Span/Max. adjustment	X
Damping	Integration time	X
Linearization	Linear, cylindrical tank, ... user-defined	X
Current output	• Current output - Mode	X
	• Output characteristics: 4 ... 20 mA, 20 ... 4 mA	X
	• Failure mode: ≤ 3.6 mA, ≥ 20 mA, last measured value	X
	• Current output - Min./Max.	X
	• Min. current: 3.8 mA, 4 mA	X
	• Max. current: 20 mA, 20.5 mA	X
Lock adjustment	Blocked, released	X

Display Menu item	Parameters	Input Buttons
Menu language	Selected language	X
Displayed value 1	Pressure	X
Displayed value 2	• Ceramic measuring cell: Measuring cell temperature in °C	X
	• Metallic measuring cell: Electronics temperature in °C	X
Display format	Number of positions after the decimal point, automatically	X
Backlight	Switched on	X

Diagnostics Menu item	Parameters	Input Buttons
Device status	-	X
Peak indicator	Pressure	X
Peak indicator temperature	Temperature	X
Simulation	Pressure, percent, current output, linearized percent, measuring cell temperature, electronics temperature	X
Date/Time	-	X
Reset	Delivery status, basic settings	X
Copy instrument settings	Read from sensor, write into sensor	X
Scaling	• Scaling size	X
	• Scaling format	
Current output	• Current output - Measuring variable	
	• Current output - Adjustment	
Current output 2	• Current output - Measuring variable	
	• Current output - Adjustment	
HART mode	HART address, current output	
Special parameters	Service-Login	

Function (continued)

Info Menu item	Parameters	Input Buttons
Device name	SITRANS P360	X
Instrument version	Hardware and software version	X
Factory calibration date	Date	X
Sensor characteristics	Order-specific characteristics	X

Available physical units of display for SITRANS P360

Physical variable	Physical units
Pressure	Pa, MPa, kPa, bar, mbar, psi, g/cm², kg/cm², inH_2O, inH_2O (4 °C), ftH_2O, mmH_2O, mmH_2O (4 °C), mH_2O (4 °C), mmHg, inHg, atm, torr
Temperature	°C / °F
Other	%, mA

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Selection and ordering data

SITRANS P360 ERS with remote seal	Article No. 7MF85	● ● - ● ● ● ● ● - ● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Primary - Secondary / Technologie, Sensor		
Primary - Gauge pressure		0
Primary - Absolute pressure		1
Secondary - Gauge pressure		4
Secondary - Absolute pressure		5
Communication		
HART (4 ... 20 mA		0
PROFIBUS PA		1
Measuring cell filling / remote seal filling		
Measuring cell filling: Silicone oil / Remote seal filling: Silicone oil (-40 ... +150 °C)		3
Measuring cell filling: Silicone oil / Remote seal filling: low temp silicone oil (-90 ... +200 °C)		4
Measuring cell filling: Silicone oil / Remote seal filling: High temp silicone oil (-10 ... +300 °C)		5
Measuring cell filling: Silicone oil / Remote seal filling: Halocarbonoil (-40 ... +60 °C)		6
Measuring cell filling: Silicone oil / Remote seal filling: Food grade oil (-10 ... +150 °C)		7
Measuring cell filling: Fluorine oil / Remote seal filling: Neobeee M-20 (-20 ... +150 °C)		8
Maximum measuring span		
400 mbar (160.74 inH_2O)		C
1000 mbar (481.87 inH_2O)		D
2500 mbar (1004.66 inH_2O)		E
5000 mbar (2009.32 inH_2O)		F
10 bar (4018.65 inH_2O)		H
25 bar (10046.60 inH_2O)		K
40 bar (16074.60 inH_2O)		L
60 bar (24111.90 inH_2O)		M
100 bar (40186.50 inH_2O)		N
160 bar (64298.30 inH_2O)		P
Process connection		
Version for diaphragm seal pressure		U
Wetted parts		
Process connection: stainless steel 316L, Diaphragm: stainless steel 316L		0
Non-wetted parts		
Die-cast aluminum housing		1
Housing made of stainless steel precision casting		2
Housing made of stainless steel precision casting electrolytically polished		6
Plastic housing		7
Enclosure		
Single chamber device		4
Dual chamber device		5
Type of protection		
Without Ex		A
Intrinsic safety		B
Flameproof enclosure		C
Dust protection through housing		M
Electrical connections/cable entries		
M20 × 1.5		F
½"-14 NPT		M
Local operation/display		
Without local display (lid closed)		0
With display (lid with glass window)		2
With display with Bluetooth functionality (lid with glass window)		7

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Selection and ordering data (continued)

Optionen	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Cable gland PA black Ø 5 ... 9 mm, standard	**A00**
Cable gland PA black Ø 6 ... 12 mm	**A01**
Cable gland PA black Ø 10 ... 14 mm	**A02**
Cable gland PA blue Ø 5 ... 9 mm	**A03**
Cable gland PA blue Ø 6 ... 12 mm	**A04**
Cable gland PA blue Ø 10 ... 14 mm	**A05**
Cable gland stainless steel Ø 7 ... 12 mm	**A10**
Cable gland nickel-plated brass Ø 6 ... 12 mm	**A11**
Cable gland nickel-plated brass Ø 5 ... 9 mm	**A12**
Cable gland nickel-plated brass; for armored cable (Ø 9 ... 13 mm)	**A14**
2 × sealing plug M20 × 1.5	**A20**
2 × sealing plug ½-14 NPT	**A21**
HAN plugs	
HAN 7D straight	**A30**
HAN 7D angled	**A31**
HAN 8D straight	**A34**
HAN 8D angled	**A35**
M12 plugs	
M20 × 1.5 / plug M12x1, pin assignment A	**A66**
M20 × 1.5 / plug M12x1, pin assignment B	**A67**
M20 × 1.5 / plug M12x1, pin assignment C	**A68**
Connection cable Primary - Secondary	
Without (Please select cable length on Secondary transmitter only)	**A80**
5 m (PE cable)	**A81**
5 m (PUR cable)	**A82**
10 m (PE cable)	**A83**
10 m (PUR cable)	**A84**
25 m (PE cable)	**A85**
25 m (PUR cable)	**A86**
50 m (PE cable)	**A87**
50 m (PUR cable)	**A88**
70 m (PE cable)	**A89**
70 m (PUR cable)	**A90**
Certificates	
Quality inspection certificate - 5 point factory calibration (IEC 62828-1)	**C11**
Inspection certificate (EN 10204-3.1) - material of pressure-containing and wetted parts	**C12**
Factory certificate - NACE (EN 10204, NACE MR 0175)	**C13**
Factory certificate (EN 10204-2.2) - wetted parts	**C14**
Inspection certificate (EN 10204-3.1) – Pressure test	**C16**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
Degree of protection IP66 / IP67	**D29**
Degree of protection IP66 / IP68	**D30**
Type plate made of stainless steel	**D43**
Oil and grease-free (incl. 3.1 Inspection certificate)	**D61**
Oil and grease-free for oxygen (incl. 3.1 Inspection certificate)	**D62**
Overvoltage protection	**D72**

Optionen	Order code
General approval without Ex approval	
General approval without Ex approval: World (CE) except: CSA	**E00**
General approval without Ex approval: World (CE, CSA)	**E01**
General approval without Ex approval: CSA (USA & Canada)	**E06**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA & Canada)	**E21**
IECEx (World)	**E23**
NEPSI (China)	**E27**
Country specific approvals	
WHG overfill protection for flammable and non-flammable liquids	**E61**
Remote seal - EN 1092-1 / Nominal size / Nominal pressure / sealing face	
Flange EN 1092-1 Form B1 DN 40 PN 40	**M01**
Flange EN 1092-1 Form B1 DN 50 PN 40	**M02**
Flange EN 1092-1 Form B1 DN 80 PN 40	**M03**
Flange EN 1092-1 Form B1 DN 25 PN 100	**M04**
Flange EN 1092-1 Form B1 DN 50 PN 100	**M05**
Flange EN 1092-1 Form B2 DN 25 PN 160	**M06**
Flange EN 1092-1, Form B1, DN 40, PN 40	**M07**
Flange EN 1092-1, Form B2, DN 40, PN 40	**M08**
Flange EN 1092-1, Form B2, DN 40, PN 100	**M09**
Flange EN 1092-1, Form B1, DN 50, PN 40	**M10**
Flange EN 1092-1, Form B2, DN 50, PN 40	**M11**
Flange EN 1092-1, Form B1, DN 50, PN 63	**M12**
Flange EN 1092-1, Form B2, DN 50, PN 63	**M13**
Flange EN 1092-1, Form B2, DN 50, PN 100	**M14**
Flange EN 1092-1, Form B1, DN 50, PN 160	**M15**
Flange EN 1092-1, Form B1, DN 80, PN 40	**M16**
Flange EN 1092-1, Form B2, DN 80, PN 40	**M17**
Flange EN 1092-1, Form B1, DN 80, PN 63	**M18**
Flange EN 1092-1, Form B2, DN 80, PN 63	**M19**
Flange EN 1092-1, Form B1, DN 80, PN 100	**M20**
Flange EN 1092-1, Form B1, DN 80, PN 160	**M21**
Flange EN 1092-1, Form B2, DN 80, PN 160	**M22**
Flange EN 1092-1, Form B1, DN 100, PN 16	**M23**
Flange EN 1092-1, Form B1, DN 100, PN 40	**M24**
Flange EN 1092-1, Form B2, DN 100, PN 40	**M25**
Flange EN 1092-1, Form B2, DN 100, PN 63	**M26**
Flange EN 1092-1, Form B2, DN 100, PN 100	**M27**
Remote seal - ASME B16.5 / Nominal size / Nominal pressure / sealing face	
ASME B16.5, 1", Class 150, RF	**N01**
ASME B16.5, 1", Class 300, RF	**N02**
ASME B16.5, 1", Class 600, RF	**N03**
ASME B16.5, 1", Class 900, RF	**N04**
ASME B16.5, 1", Class 1500, RF	**N05**
ASME B16.5, 1 1/2", Class 150, RF	**N06**
ASME B16.5, 1 1/2", Class 300, RF	**N07**
ASME B16.5, 1 1/2", Class 600, RF	**N08**
ASME B16.5, 1 1/2", Class 1500, RF	**N09**
ASME B16.5, 2", Class 150, RF	**N10**
ASME B16.5, 2", Class 300, RF	**N11**

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Selection and ordering data (continued)

Optionen	Order code
ASME B16.5, 2", Class 600, RF	**N12**
ASME B16.5, 2", Class 900, RF	**N13**
ASME B16.5, 2", Class 1500, RF	**N14**
ASME B16.5, 3", Class 150, RF	**N15**
ASME B16.5, 3", Class 300, RF	**N16**
ASME B16.5, 3", Class 600, RF	**N17**
ASME B16.5, 3", Class 900, RF	**N18**
ASME B16.5, 3", Class 1500, RF	**N19**
ASME B16.5, 4", Class 150, RF	**N20**
ASME B16.5, 4", Class 300, RF	**N21**
ASME B16.5, 6", Class 150, RF	**N22**
Flange material, remote seal	
Stainless steel 316L without coating	**P01**
Stainless steel 316L with PFA coating	**P02**
Stainless steel 316L with PTFE coating	**P03**
Stainless steel 316L with ECTFE coating	**P04**
Monel 400, 2.4360	**P05**
Hastelloy C276, 2.4819	**P06**
Tantalum for flange up to 3"/DN80	**P07**
Tantalum for flange 4"/DN100	**P08**
Titanium, 3.7035	**P09**

Optionen	Order code
Nickel 201	**P10**
Stainless steel 316L with gold coating (25µm) up to 1"/DN25	**P11**
Stainless steel 316L with gold coating (25µm) up to 2"/DN50	**P12**
Stainless steel 316L with gold coating (25µm) up to 3"/DN80	**P14**
Hastelloy C22, 2.4602	**P15**
Options, remote seal	
Cooling element (for temperature ranges from -90 ... +300 °C (depending on filling fluid, see catalog)	**R01**
Cooling element 300 mm for high temperature oil (-10 ... +400 °C)	**R02**
Negative pressure service (Working pressure < 50 kPa abs)	**R03**
Primary/salve assignment number	
Primary/salve assignment number (use same code for associated primary and secondary)	**S00 ... S99**
Device settings	
Measuring range setting: Lower range value (max. 5 characters), Upper range value (max. 5 characters), Unit (mbar, bar, kPa, MPa, psi, ...) Example: -0.5 ... 10.5 psi	**Y01**
Location designation (Tag) (stainless steel plate. device parameters. max. 32 characters)	**Y15**
Device address (PROFIBUS 1 ... 126)	**Y25**

SITRANS P360 Front flush ceramic dry cell	Article No. 7MF86	●	●	-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Primary - Secondary / Technologie, Sensor														
Primary - Gauge pressure		**0**												
Primary - Absolute pressure		**1**												
Secondary - Gauge pressure		**4**												
Secondary - Absolute pressure		**5**												
Communication														
HART (4 ... 20 mA			**0**											
PROFIBUS PA			**1**											
Measuring cell filling														
Dry pressure cell					**7**									
Maximum measuring span														
25 mbar (10.04 inH_2O)						**A**								
100 mbar (40.19 inH_2O)						**B**								
400 mbar (160.74 inH_2O)						**C**								
1000 mbar (481.87 inH_2O)						**D**								
2500 mbar (1004.66 inH_2O)						**E**								
5000 mbar (2009.32 inH_2O)						**F**								
10 bar (4018.65 inH_2O)						**H**								
25 bar (10046.60 inH_2O)						**K**								
60 bar (24111.90 inH_2O)						**M**								
100 bar (40186.50 inH_2O)						**N**								
Process connection														
Female thread M20 × 1.5							**B**							
Male thread G½ (DIN EN 837-1)							**D**							
Female thread ½-14 NPT							**E**							
Thread G½, inside G¼, ISO 228-1 / 316L							**G**							
Oval flange adapter according to IEC 61518							**H**							

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Selection and ordering data (continued)

SITRANS P360 Front flush ceramic dry cell	Article No. 7MF86 ● ● - ● ● ● ● ● - ● ● ● ●
Front-flush diaphragm (Options M-R)	K
Wetted parts	
Process connection: Stainless steel 316L/1.4404, Seal diaphragm: Ceramic	0
Non-wetted parts	
Die-cast aluminum housing	1
Housing made of stainless steel precision casting	2
Housing made of stainless steel precision casting electrolytically polished	6
PBT Plastic housing	7
Enclosure	
Single chamber device	4
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Dust protection through housing	M
Electrical connections/cable entries	
M20 × 1.5	F
½"-14 NPT	M
Local operation/display	
Without local display (lid closed)	0
With display (lid with glass window)	2
With display with Bluetooth functionality (lid with glass window)	7

Optionen	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Cable gland PA black Ø 5 ... 9 mm, standard	**A00**
Cable gland PA black Ø 6 ... 12 mm	**A01**
Cable gland PA black Ø 10 ... 14 mm	**A02**
Cable gland PA blue Ø 5 ... 9 mm	**A03**
Cable gland PA blue Ø 6 ... 12 mm	**A04**
Cable gland PA blue Ø 10 ... 14 mm	**A05**
Cable gland stainless steel Ø 7 ... 12 mm	**A10**
Cable gland nickel-plated brass Ø 6 ... 12 mm	**A11**
Cable gland nickel-plated brass Ø 5 ... 9 mm	**A12**
Cable gland nickel-plated brass; for armored cable (Ø 9 ... 13 mm)	**A14**
2 × sealing plug M20 × 1.5	**A20**
2 × sealing plug ½-14 NPT	**A21**
HAN plugs	
HAN 7D straight	**A30**
HAN 7D angled	**A31**
HAN 8D straight	**A34**
HAN 8D angled	**A35**
M12 plugs	
M20 × 1.5 / plug M12x1, pin assignment A	**A66**
M20 × 1.5 / plug M12x1, pin assignment B	**A67**
M20 × 1.5 / plug M12x1, pin assignment C	**A68**
Connection cable Primary - Secondary	
Without (Please select cable length on Secondary transmitter only)	**A80**

Optionen	Order code
5 m (PE cable)	**A81**
5 m (PUR cable)	**A82**
10 m (PE cable)	**A83**
10 m (PUR cable)	**A84**
25 m (PE cable)	**A85**
25 m (PUR cable)	**A86**
50 m (PE cable)	**A87**
50 m (PUR cable)	**A88**
70 m (PE cable)	**A89**
70 m (PUR cable)	**A90**
Certificates	
Quality inspection certificate - 5 point factory calibration (IEC 62828-1)	**C11**
Inspection certificate (EN 10204-3.1) - material of pressure-containing and wetted parts	**C12**
Factory certificate - NACE (EN 10204, NACE MR 0175)	**C13**
Factory certificate (EN 10204-2.2) - wetted parts	**C14**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Accuracy	
0,05% instead of 0,10%	**D20**
Device options	
Degree of protection IP66 / IP67	**D29**
Degree of protection IP66 / IP68	**D30**
Type plate made of stainless steel	**D43**
Oil and grease-free (incl. 3.1 Inspection certificate)	**D61**
Overvoltage protection	**D72**

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Selection and ordering data (continued)

Optionen	Order code
General approval without Ex approval	
General approval without Ex approval: World (CE) except: CSA	**E00**
General approval without Ex approval: World (CE, CSA)	**E01**
General approval without Ex approval: CSA (USA & Canada)	**E06**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA & Canada)	**E21**
IECEx (World)	**E23**
NEPSI (China)	**E27**
Country specific approvals	
WHG overfill protection for flammable and non-flammable liquids	**E61**
Sealing concept	
Single sealing	**K10**
Double sealing	**K11**
Form sealing	**K12**
Measuring cell sealing / Processstemperature	
FKM (VP2/A) / -20 ... +130 °C	**K30**
FKM (VP2/A) / -20 ... +150 °C	**K31**
FKM (A+P 70.16) / -40 ... +130 °C	**K32**
EPDM (A+P 70.10-02/70.503-00) / -40 ... +130 °C	**K33**
EPDM (A+P 70.10-02/70.503-00) / -40 ... +150 °C	**K34**
FFKM (Perlast G74S) / -15 ... +130 °C	**K35**
FFKM (Perlast G74S) / -15 ... +150 °C	**K36**
FFKM (Perlast G75B) / -15 ... +130 °C	**K37**
FFKM (Perlast G75B) / -15 ... +150 °C	**K38**
FFKM (Kalrez 6375) / -20 ... +130 °C	**K39**
FFKM (Kalrez 6375) / -20 ... +150 °C	**K40**
FKM (ET 7067) / -20 ... +130 °C	**K41**
EPDM (E70Q) / -40 ... +130 °C	**K42**
FFKM (Chemraz 535) / -30 ... +130 °C	**K43**
FEPM (Fluoraz SD890) / -5 ... +130 °C	**K44**
FKM (V70SW) / -10 ... +150 °C	**K45**
EPDM (E70Q) / -40 ... +150 °C	**K46**
FKM (Endura V91A) / -40 ... +130 °C	**K47**
FKM (Endura V91A) / -40 ... +150 °C	**K48**
FFKM (Perlast G92E) / -15 ... +130 °C	**K49**
FFKM (Perlast G92E) / -15 ... +150 °C	**K50**
EPDM (E7502) / -40 ... +150 °C	**K51**
Remote seal - EN 1092-1 / Nominal size / Nominal pressure / sealing face	
Flange EN 1092-1 Form B1 DN 25 PN 40	**M00**
Flange EN 1092-1 Form B1 DN 40 PN 40	**M01**
Flange EN 1092-1 Form B1 DN 50 PN 40	**M02**
Flange EN 1092-1 Form B1 DN 80 PN 40	**M03**
Flange EN 1092-1 Form B1 DN 25 PN 100	**M04**
Flange EN 1092-1 Form B1 DN 50 PN 100	**M05**
ASME Flange B16.5 ½" Class 150 RF	**M30**
ASME Flange B16.5 ¾" Class 150 RF	**M31**
ASME Flange B16.5 1" Class 150 RF	**M32**
ASME Flange B16.5 1½" Class 150 RF	**M33**
ASME Flange B16.5 2" Class 150 RF	**M34**
ASME Flange B16.5 3" Class 150 RF	**M35**
ASME Flange B16.5 4" Class 150 RF	**M36**

Optionen	Order code
ASME Flange B16.5 1" Class 300 RF	**M37**
ASME Flange B16.5 1½" Class 300 RF	**M38**
ASME Flange B16.5 2" Class 300 RF	**M39**
ASME Flange B16.5 3" Class 300 RF	**M40**
ASME Flange B16.5 4" Class 300 RF	**M41**
Remote seal - ASME B16.5 / Nominal size / Nominal pressure / sealing face	
Hygienic flange DIN 11851 with slotted union nut DN 25 PN 40	**N00**
Hygienic flange DIN 11851 with slotted union nut DN 32 PN 40	**N01**
Hygienic flange DIN 11851 with slotted union nut DN 40 PN 40	**N02**
Hygienic flange DIN 11851 with slotted union nut DN 50 PN 25	**N03**
Hygienic flange DIN 11851 with slotted union nut DN 65 PN 25	**N04**
Hygienic flange DIN 11851 with slotted union nut DN 80 PN 25	**N05**
Tri-Clamp DIN 32676 DN 20 PN 25	**N10**
Tri-Clamp DIN 32676 DN 65 PN 16	**N11**
Tri-Clamp DIN 32676 DN 80 PN 10	**N12**
Tri-Clamp ISO 2852 1½" PN 16	**N20**
Tri-Clamp ISO 2852 2" PN 16	**N21**
Tri-Clamp ISO 2852 3" PN 16	**N22**
Tri-Clamp ISO 2852 4" PN 10, 1.4435	**N23**
Aseptic threaded socket DIN 11864-1 Form A DN 25 PN 40 (Ra < 0.8 µm)	**N30**
Aseptic threaded socket DIN 11864-1 Form A DN 40 PN 40 (R_a < 0.8 µm)	**N31**
Aseptic threaded socket DIN 11864-1 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N32**
Aseptic flange with notch DIN 11864-1 Form A DN 25 PN 25 (R_a < 0.8 µm)	**N40**
Aseptic flange with notch DIN 11864-2 Form A DN 32 PN 25 (R_a < 0.8 µm)	**N41**
Aseptic flange with notch DIN 11864-2 Form A DN 40 PN 25 (R_a < 0.8 µm)	**N42**
Aseptic flange with notch DIN 11864-2 Form A DN 50 PN 16 (R_a < 0.8 µm)	**N43**
Aseptic flange with notch DIN 11864-2 Form A DN 65 PN 16 (R_a < 0.8 µm)	**N44**
Aseptic flange with notch DIN 11864-2 Form A DN 80 PN 16 (R_a < 0.8 µm)	**N45**
Aseptic clamp with groove DIN 11864-3 Form A DN 32 PN 40 (R_a < 0.38 µm)	**N50**
Aseptic clamp with groove DIN 11864-3 Form A DN 40 PN 40 (R_a < 0.38 µm)	**N51**
Aseptic clamp with groove DIN 11864-3 Form A DN 65 PN 25 (R_a < 0.8 µm)	**N53**
Hygienic process connections manufacturer-specific	
Varivent Type F for pipes DN 25 - DN 32 PN 40	**P01**
Varivent Type N for pipes DN 40 - DN 125 PN 25	**P02**
NEUMO BioControl flange DN 25 PN 16	**P10**
NEUMO BioControl flange DN 50 PN 16	**P11**
NEUMO BioControl flange DN 65 PN 16	**P12**
NEUMO BioControl flange DN 80 PN 16	**P13**
NEUMO BioConnect screw connection DN 65 PN 16	**P20**
NEUMO BioConnect screw connection DN 80 PN 16	**P21**
Hygienic process connections special versions	
DRD Flange D = 65 mm DN 50 PN 40	**Q00**
SMS - threaded socket 1" PN 40 (R_a < 0.8 µm)	**Q10**
SMS - threaded socket 1½" PN 40 (R_a < 0.76 µm)	**Q11**
SMS - threaded socket 2" PN 25 (R_a < 0.76 µm)	**Q12**
Ingold socket DN 25 with union nut G1 ¼" PN 10	**Q20**

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Selection and ordering data (continued)

Optionen	Order code
Connections for pulp ans paper industry	
Process connection PMC-Style Standard	**R00**
Process connection PMC-Style Minibolt	**R01**
Threatet connector	
External thread G ¾-A DIN 3852	**R10**
External thread G 1-A DIN 3852	**R11**
External thread G 1½-A DIN 3852	**R12**
External thread G 2-A DIN 3852	**R13**
External thread G ½ ISO 228-1	**R15**
External thread G 1 ISO 228-1	**R16**
External thread 1-11.5 NPT	**R17**
External thread 1½-11.5 NPT	**R18**

Optionen	Order code
External thread 2-11.5 NPT	**R19**
Primary/salve assignment number	
Primary/salve assignment number (use same code for associated primary and secondary)	**S00 ... S99**
Device settings	
Measuring range setting: Lower range value (max. 5 characters), Upper range value (max. 5 characters), Unit (mbar, bar, kPa, MPa, psi, ...) Example: -0.5 ... 10.5 psi	**Y01**
Location designation (Tag) (stainless steel plate. device parameters. max. 32 characters)	**Y15**
Device address (PROFIBUS 1 ... 126)	**Y25**

SITRANS P360 Front flush metallic cell	Article No. 7MF87	●	●	-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Primary - Secondary / Technologie, Sensor														
Primary - Gauge pressure		**0**												
Primary - Absolute pressure		**1**												
Secondary - Gauge pressure		**4**												
Secondary - Absolute pressure		**5**												
Communication														
HART (4 ... 20 mA			**0**											
PROFIBUS PA			**1**											
Measuring cell filling														
Synthetic oil (-40 ... +105 °C)					**0**									
Inert liquid (-40 ... +105 °C)					**1**									
Neobee oil (FDA-listed) (-20 ... +105 °C)					**2**									
Medical white oil (FDA-listed) (-12 ... +150 °C)					**3**									
Dry pressure cell (-40 ... +105 °C)					**7**									
Maximum measuring span														
100 mbar (40.19 inH_2O)						**B**								
400 mbar (160.74 inH_2O)						**C**								
1000 mbar (481.87 inH_2O)						**D**								
2500 mbar (1004.66 inH_2O)						**E**								
5000 mbar (2009.32 inH_2O)						**F**								
10 bar (4018.65 inH_2O)						**H**								
25 bar (10046.60 inH_2O)						**K**								
40 bar (16074.60 inH_2O)						**L**								
100 bar (40186.50 inH_2O)						**N**								
250 bar (100466 inH_2O)						**Q**								
600 bar (241119 inH_2O)						**S**								
1000 bar (401865 inH_2O)						**T**								
Process connection														
Female thread M20 × 1.5							**B**							
Male thread G½ (DIN EN 837-1)							**D**							
Female thread ½-14 NPT							**E**							
Male thread ½-14 NPT							**F**							
Thread G½, inside G¼, ISO 228-1 / 316L							**G**							
Oval flange adapter according to IEC 61518							**H**							
Front-flush diaphragm (Options M-R)							**K**							

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Selection and ordering data (continued)

SITRANS P360 Front flush metallic cell	Article No. 7MF87 ● ● - ● ● ● ● ● - ● ● ● ●
Wetted parts	
Process connection: Stainless steel 316L/1.4404, Seal diaphragm: 316L/1.4404	0
Non-wetted parts	
Die-cast aluminum housing	1
Housing made of stainless steel precision casting	2
Housing made of stainless steel precision casting electrolytically polished	6
PBT Plastic housing	7
Enclosure	
Single chamber device	4
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Dust protection through housing	M
Electrical connections/cable entries	
M20 × 1.5	F
½"-14 NPT	M
Local operation/display	
Without local display (lid closed)	0
With display (lid with glass window)	2
With display with Bluetooth functionality (lid with glass window)	7

Optionen	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Cable gland PA black Ø 5 ... 9 mm, standard	**A00**
Cable gland PA black Ø 6 ... 12 mm	**A01**
Cable gland PA black Ø 10 ... 14 mm	**A02**
Cable gland PA blue Ø 5 ... 9 mm	**A03**
Cable gland PA blue Ø 6 ... 12 mm	**A04**
Cable gland PA blue Ø 10 ... 14 mm	**A05**
Cable gland stainless steel Ø 7 ... 12 mm	**A10**
Cable gland nickel-plated brass Ø 6 ... 12 mm	**A11**
Cable gland nickel-plated brass Ø 5 ... 9 mm	**A12**
Cable gland nickel-plated brass; for armored cable (Ø 9 ... 13 mm)	**A14**
2 × sealing plug M20 × 1.5	**A20**
2 × sealing plug ½-14 NPT	**A21**
HAN plugs	
HAN 7D straight	**A30**
HAN 7D angled	**A31**
HAN 8D straight	**A34**
HAN 8D angled	**A35**
M12 plugs	
M20 × 1.5 / plug M12x1, pin assignment A	**A66**
M20 × 1.5 / plug M12x1, pin assignment B	**A67**
M20 × 1.5 / plug M12x1, pin assignment C	**A68**
Connection cable Primary - Secondary	
Without (Please select cable length on Secondary transmitter only)	**A80**
5 m (PE cable)	**A81**

Optionen	Order code
5 m (PUR cable)	**A82**
10 m (PE cable)	**A83**
10 m (PUR cable)	**A84**
25 m (PE cable)	**A85**
25 m (PUR cable)	**A86**
50 m (PE cable)	**A87**
50 m (PUR cable)	**A88**
70 m (PE cable)	**A89**
70 m (PUR cable)	**A90**
Certificates	
Quality inspection certificate - 5 point factory calibration (IEC 62828-1)	**C11**
Inspection certificate (EN 10204-3.1) - material of pressure-containing and wetted parts	**C12**
Factory certificate - NACE (EN 10204, NACE MR 0175)	**C13**
Factory certificate (EN 10204-2.2) - wetted parts	**C14**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Accuracy	
0.075% instead of 0,10%	**D11**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
Degree of protection IP66 / IP67	**D29**
Degree of protection IP66 / IP68	**D30**
Type plate made of stainless steel	**D43**
Oil and grease-free (incl. 3.1 Inspection certificate)	**D61**
Oil and grease-free for oxygen (incl. 3.1 Inspection certificate)	**D62**

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Selection and ordering data (continued)

Optionen	Order code
General approval without Ex approval	
General approval without Ex approval: World (CE) except: CSA	**E00**
General approval without Ex approval: World (CE, CSA)	**E01**
General approval without Ex approval: CSA (USA & Canada)	**E06**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA & Canada)	**E21**
IECEx (World)	**E23**
NEPSI (China)	**E27**
Country specific approvals	
WHG overfill protection for flammable and non-flammable liquids	**E61**
Remote seal - EN 1092-1 / Nominal size / Nominal pressure / sealing face	
Flange EN 1092-1 Form B1 DN 25 PN 40	**M00**
Flange EN 1092-1 Form B1 DN 40 PN 40	**M01**
Flange EN 1092-1 Form B1 DN 50 PN 40	**M02**
Flange EN 1092-1 Form B1 DN 80 PN 40	**M03**
Flange EN 1092-1 Form B1 DN 25 PN 100	**M04**
Flange EN 1092-1 Form B1 DN 50 PN 100	**M05**
ASME Flange B16.5 1" Class 150 RF	**M32**
ASME Flange B16.5 1½" Class 150 RF	**M33**
ASME Flange B16.5 2" Class 150 RF	**M34**
ASME Flange B16.5 3" Class 150 RF	**M35**
ASME Flange B16.5 4" Class 150 RF	**M36**
ASME Flange B16.5 1" Class 300 RF	**M37**
ASME Flange B16.5 1½" Class 300 RF	**M38**
ASME Flange B16.5 2" Class 300 RF	**M39**
ASME Flange B16.5 3" Class 300 RF	**M40**
ASME Flange B16.5 4" Class 300 RF	**M41**
Remote seal - ASME B16.5 / Nominal size / Nominal pressure / sealing face	
Hygienic flange DIN 11851 with slotted union nut DN 25 PN 40	**N00**
Hygienic flange DIN 11851 with slotted union nut DN 32 PN 40	**N01**
Hygienic flange DIN 11851 with slotted union nut DN 40 PN 40	**N02**
Hygienic flange DIN 11851 with slotted union nut DN 50 PN 25	**N03**
Hygienic flange DIN 11851 with slotted union nut DN 65 PN 25	**N04**
Hygienic flange DIN 11851 with slotted union nut DN 80 PN 25	**N05**
Tri-Clamp DIN 32676 DN 65 PN 16 (R_a < 0.76 µm)	**N15**
Tri-Clamp DIN 32676 DN 80 PN 10 (R_a < 0.76 µm)	**N16**
Tri-Clamp ISO 2852 1½" PN 40 (R_a < 0.76 µm)	**N25**
Tri-Clamp ISO 2852 2" PN 16 (R_a < 0.76 µm)	**N26**
Tri-Clamp ISO 2852 3" PN 16 (R_a < 0.76 µm)	**N27**
Tri-Clamp ISO 2852 4" PN 10, 1.4435(R_a < 0.38 µm)	**N28**
Aseptic threaded socket DIN 11864-1 Form A DN 40 PN 40 (R_a < 0.8 µm)	**N31**
Aseptic threaded socket DIN 11864-1 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N32**
Aseptic flange with notch DIN 11864-2 Form A DN 32 PN 25 (R_a < 0.8 µm)	**N41**
Aseptic flange with notch DIN 11864-2 Form A DN 40 PN 25 (R_a < 0.8 µm)	**N42**
Aseptic flange with notch DIN 11864-2 Form A DN 50 PN 16 (R_a < 0.8 µm)	**N43**
Aseptic flange with notch DIN 11864-2 Form A DN 65 PN 16 (R_a < 0.8 µm)	**N44**
Aseptic flange with notch DIN 11864-2 Form A DN 80 PN 16 (R_a < 0.8 µm)	**N45**
Aseptic clamp with groove DIN 11864-3 Form A DN 40 PN 40 (R_a < 0.38 µm)	**N51**
Aseptic clamp with groove DIN 11864-3 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N52**
Hygienic process connections manufacturer-specific	
Varivent Type F for pipes DN 25 - DN 32 PN 40	**P01**
Varivent Type N for pipes DN 40 - DN 125 PN 25	**P02**
NEUMO BioControl flange DN 50 PN 16	**P11**
NEUMO BioControl flange DN 65 PN 16	**P12**
NEUMO BioControl flange DN 80 PN 16	**P13**
Hygienic process connections special versions	
DRD Flange D = 65 mm DN 50 PN 40	**Q00**
SMS - threaded socket 1" PN 40 (R_a < 0.8 µm)	**Q10**
SMS - threaded socket 1½" PN 40 (R_a < 0.76 µm)	**Q11**
SMS - threaded socket 2" PN 25 (R_a < 0.76 µm)	**Q12**
SMS - threaded socket 3" PN 25	**Q14**
Connections for pulp ans paper industry	
Process connection PMC-Style Standard	**R00**
Threatet connector	
External thread G 1½-A DIN 3852	**R12**
External thread G 2-A DIN 3852	**R13**
External thread G 1 ISO 228-1	**R16**
External thread 1½-11.5 NPT	**R18**
External thread 2-11.5 NPT	**R19**
Special options front-flush	
High temperature with screening shield (-12 ... +200 °C)	**R85**
Primary/salve assignment number	
Primary/salve assignment number (use same code for associated primary and secondary)	**S00 ... S99**
Device settings	
Measuring range setting: Lower range value (max. 5 characters), Upper range value (max. 5 characters), Unit (mbar, bar, kPa, MPa, psi, ...) Example: -0.5 ... 10.5 psi	**Y01**
Location designation (Tag) (stainless steel plate. device parameters. max. 32 characters)	**Y15**
Device address (PROFIBUS 1 ... 126)	**Y25**

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Technical specifications

SITRANS P360 Electronic remote seal system with direct mounted remote seal

Input	
Gauge pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.4 bar 0 ... +40 kPa 0 ... +5.8 psi	-1 ... +1.2 bar -100 ... +120 kPa -14.50 ... +17.4 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +14.50 psi	-1 ... +3 bar -100 ... +300 kPa -14.50 ... +43.5 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +36.26 psi	-1 ... +7.5 bar -100 ... +750 kPa -14.50 ... +108.8 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +72.52 psi	-1 ... +15 bar -100 ... +1500 kPa -14.50 ... +217 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +145.04 psi	-1 ... +30 bar -100 ... +3000 kPa -14.50 ... +435 psi
0 ... +16 bar 0 ... +1600 kPa 0 ... +232.06 psi	-1 ... +48 bar -100 ... +4800 kPa -14.50 ... +696 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +362.59 psi	-1 ... +75 bar -100 ... +7500 kPa -14.50 ... +1087 psi
0 ... +40 bar 0 ... +4000 kPa 0 ... +580.15 psi	-1 ... +120 bar -100 ... +12000 kPa -14.50 ... +1740 psi
0 ... +60 bar 0 ... +6000 kPa 0 ... +870.23 psi	-1 ... +180 bar -100 ... +18000 kPa -14.50 ... +2610 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450.38 psi	-1 ... +200 bar -100 ... +20000 kPa -14.50 ... +2900 psi
0 ... +160 bar 0 ... +16000 kPa 0 ... +2320.60 psi	-1 ... +320 bar -100 ... +32000 kPa -14.50 ... +4641 psi
Measuring limits	
Lower measuring limits	For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.4 bar abs 0 ... +40 kPa abs 0 ... +5.8 psi abs	0 ... +1.2 bar abs 0 ... +120 kPa abs 0 ... +17.4 psi abs
0 ... +1 bar abs 0 ... +100 kPa abs 0 ... +14.50 psi abs	0 ... +3 bar abs 0 ... +300 kPa abs 0 ... +43.5 psi abs
0 ... +2.5 bar abs 0 ... +250 kPa abs 0 ... +36.26 psi abs	0 ... +7.5 bar abs 0 ... +750 kPa abs 0 ... +108.8 psi abs
0 ... +5 bar abs 0 ... +500 kPa abs 0 ... +72.52 psi abs	0 ... +15 bar abs 0 ... +1500 kPa abs 0 ... +217 psi abs
0 ... +10 bar abs 0 ... +1000 kPa abs 0 ... +145.04 psi abs	0 ... +30 bar abs 0 ... +3000 kPa abs 0 ... +435 psi abs
0 ... +16 bar abs 0 ... +1600 kPa abs 0 ... +232.06 psi abs	0 ... +50 bar abs 0 ... +5000 kPa abs 0 ... +725 psi abs
0 ... +25 bar abs 0 ... +2500 kPa abs 0 ... +362.59 psi abs	0 ... +75 bar abs 0 ... +7500 kPa abs 0 ... +1087 psi abs
0 ... +40 bar abs 0 ... +4000 kPa abs 0 ... +580.15 psi abs	0 ... +120 bar abs 0 ... +12000 kPa abs 0 ... +1740 psi abs
Adjustment	
Min./max. adjustment, percentage value	-10 ... 110%
Min./max. adjustment, pressure value	-20 ... 120%
Zero adjustment	-20 ... +95%
Span adjustment	-120 ... +120%
Max. zero/span difference	120% of nominal range

[1] The burst pressure depends on the process connection and is therefore not specified here.

Output		
Output 4 ... 20 mA HART		
Output signal max range	3.8 ... 20.5 mA/HART	Factory setup
Lower saturation limit	3.6 mA	
Upper saturation limit	21.5 mA	
Failure mode min	≤ 3.6 mA	
Failure mode max	≥ 21 mA	Adjustable
Signal resolution	0.3 µA	
Load calculation	$(U_B - U_{min})/0.022$ A	Example – at U_B = 24 V DC: (24 V – 9.6 V) / 0.022 A = 655 Ω
Starting current	≤ 10 mA for 5 ms after switch-on, ≤ 3.6 mA	
Protection against polarity reversal	Yes	
Electrical damping (63% of the input value)	0 ... 999 s	Adjustable
Adjustment ranges and output behavior		
Parameter	**Technical data / Note**	
Max. permissible turn down	Unlimited; recommended 20:1	
Fault signal, adjustable	≤ 3.6 mA; ≥ 21 mA; last measured value	

Measuring accuracy		
Measurement error and reference conditions		
Values are valid for single transmitter		
Measuring accuracy (Turn-Down)	< 0.2%	1:1 until 1:5
	< 0.04% × TD	TD > 5:1
Long-term stability	< (0.1% × TD)/year	
Conditions and stability		
Reference temperature	+18 ... +30 °C (64.4 ...86 °F)	
Relative humidity	45 ... 75%	
Air pressure	860 ... 1060 mbar / 86 ... 106 kPa	
Characteristic determination	Limit point adjustment according to IEC 61298-2	
Characteristic curve	Linear	
Reference installation position	Upright, diaphragm points downward	
EMC influence on current output	< ±150 µA under strong high-frequency electromagnetic fields according to EN 61326-1	

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Technical specifications (continued)

Measuring accuracy			
Diaphragm seal: Temperature coefficient			
Version	**Temperature coefficient**		
Cooling element (depends on membrane diameter)	0.1 ... 15 mbar/10 K		
Additional diaphragm seal: Temperature error			
Remote seal design	**Nominal diameter**	**mbar abs/10K**	**Psi/10K**
Diaphragm seal temperature error (flange design according to EN 1092-1)	DN 50 PN 40	1.2	17.40
	DN 80 PN 40	0.25	3.62
Diaphragm seal temperature error (flange design according to ASME B16.5)	2″ class 150	1.2	17.40
	3″ class 150	0.25	3.62
Data for 316L membrane and silicone oil is for estimation only. Actual values depend on membrane specs and fluid.			

Operating conditions			
Ambient temperature			
Standard	-40 ... +80 °C (-40 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Storage temperature			
Standard	-60 ... +80 °C (-67 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Process temperature			
	Variant	**Pabs ≥ 1 bar/14.5 psi**	**Pabs < 1 bar/14.5 psi**
Silicone oil	Standard	-40 ... +150 °C (-40 ... +302 °F)	Please see charts in device manual chapter "Chemical seal with vacuum applications"
Low temperature silocone oil	Cooling element (R01)	-90 ... +200 °C (-130 ... +392 °F)	
High temperature silicone oil	Cooling element (R01)	-10 ... +320 °C (+14 ... +752 °F)	
	Cooling element (R02)	-10 ... +400 °C (+14 ... +608 °F)	
Halocarbon oil	Standard	-40 ... +60 °C (-40 ... +140 °F)	
Food grade oil	Standard	-10 ... +150 °C (+14 ... +302 °F)	
	Cooling element (R01)	-10 ... +250 °C (+14 ... +482 °F)	
Neobee M20	Standard	-20 ... +150 °C (+14 ... +302 °F)	
Mechanical stress			
Parameter	**Technical data**		
Vibration resistance, standard	1 ... 4 g at 5 ... 200 Hz according to EN 60068-2-6		
Vibration resistance, cooling element and metal housing	0.5 g at 5 ... 200 Hz according to EN 60068-2-6		
Shock resistance, standard	50 g, 2.3 ms according to EN 60068-2-27		
Shock resistance, stainless steel double chamber housing	2 g, 2.3 ms according to EN 60068-2-27		
Degree of protection[2)]			
Housing material	**Version**	**Protection according to IEC 60529**	**NEMA**
Plastic	Single chamber / double chamber	IP66/IP67	Type 4X
Aluminium	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P
Stainless steel, electropolished	Single chamber	IP66/IP67	Type 4X
Stainless steel, precision casting	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P

2) IP66/IP68 (0.2 bar) is applicable only in conjunction with absolute pressure, because atmospheric pressure compensation is not possible when the sensor is completely submerged.

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Technical specifications (continued)

Structural Design	
Material and transmitter specification	
Weight (without options)	0.8 ... 8 kg depending on processconnection and housing
Housing materials	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Cable gland materials	PA; stainless steel; brass
Wetted parts materials	
Process fitting	
Diaphragm materials (transmitter)	Stainless steel mat. No. 1.4404/316L
Wetted parts remote seal	316L; 316L PFA coated; Alloy C276 (2.4819); Alloy C22 (2.4602); Alloy 400 (2.4360); tantalum; titanium; 316L ECTFE coated; 1.4435 gold coated (25 µm); 316L with 0.25 mm PTFE coating; Nickel 201
Flange material	Stainless steel mat. No. 1.4404/316L
Seal for G½ (EN 837), G1½ (DIN 3852-A)	Klingersil C-4400
Process connection	
Surface quality, hygienic process fittings	R_a < 0.8 µm, typical
Steel	316L
Electrical connection and electromechanical data	
Parameter	**Technical data**
Cable entry / gland / blind plug	M20 × 1.5; ½ NPT
Solid or stranded wire cross-section	0.2 ... 2.5 mm², AWG 24 ... 14
Stranded wire with end sleeve	0.2 ... 1.5 mm², AWG 24 ... 16
Connection between Primary and secondary device	
Data transfer	Digital (I²C-Bus)
Cable length	5 ... 70 m
Connection cable minimum bending radius at 25 °C (77 °F)	25 mm
Connection cable wire cross-section	0.34 mm², (AWG 22)
Connection cable wire resistance	0.05 ohm/m

Power supply		
Supply voltage and electrical data		
Power supply U_H (Master only)		
Terminal voltage on transmitter - U_B	9.6 ... 35 V DC	
Terminal voltage on transmitter light switched on - U_B	16 ... 35 V DC	
Permissible residual ripple	U_N 12 V DC (9.6 V < U_B < 18 V)	≤ 0.7 V_{eff} (16 ... 400 Hz)
	U_N 24 V DC (18 V < U_B < 35 V)	≤ 1 V_{eff} (16 ... 400 Hz)
Start-up time at U_B ≥ 12 V DC	≤ 9 s	
Start-up time at U_B < 12 V DC	≤ 22 s	
Reverse polarity protection	Yes	
Galvanic separation	Reference voltage 500 V AC	

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
SIL	
SIL 2/3	according to IEC 61508
Drinking water	
WHG	No.: Z-65.11-644
Explosion protection as per ATEX intrinsic safety "i"	TÜV 26 ATEX 423318 X
Marking, intrinsic safety	II 1/2 G Ex ia IIC T6 ... T1 Ga/Gb
Permissible ambient temperature	-50 ... +70 °C (-58 ... 158 °F) for T5
	-50 ... +39 °C (-58 ... 102 °F) for T6

Certificates and approvals	
Permissible medium temperature	-20 ... +60 °C (-4 ... 140 °F) for T5
	-20 ... +23 °C (-4 ... 73.4 °F) for T6
Connection	To certified intrinsically safe circuits with peak values:
HART	U_i = 30 V, I_i = 131 mA, P_i = 983 mW
PROFIBUS (FISCO)	U_i = 17.5 V, I_i = 500 mA, P_i = 5.5 W
PROFIBUS (Barrier)	U_i = 24 V, I_i = 250 mA, P_i = 1.2 W

Communication	
HART	
Protocol	7.3
PROFIBUS PA	
Output signal	digital output signal, PROFIBUS protocol
Transmission rate	31.25 Kbit/s
Instrument address	126 (default setting)
Damping (63% of the input variable)	0 ... 999 s, adjustable
PROFIBUS PA profile	3.02
Number of FBs with AI (function blocks with analogue input)	3
Bluetooth	
Max. participants	1
Bluetooth standard	Bluetooth 5.x
Effective range	Typically 30 m (98 ft)
The Bluetooth range depends on the local conditions.	

SITRANS P360 Front flush ceramic DPC

Input	
Gauge pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**
0 ... +25 mbar 0 ... +2.5 kPa 0 ... +0.4psi	-50 mbar ... +5 bar -5 ... +<500 kPa -0.7 ... +75 psi
0 ... +100 mbar 0 ... +10 kPa 0 ... +1.5 psi	-200 mbar... +15 bar -20 ... +1500 kPa -3 ... +225 psi
0 ... +0.4 bar 0 ... +40 kPa 0 ... +5 psi	-0.8 ... +30 bar -80 ... +3000 kPa -11.50 ... +375 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +65 bar -100 ... +6500 kPa -14.51 ... +975 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +90 bar -100 ... +9000 kPa -14.51 ... +1350 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +125 bar -100 ... +12500 kPa -14.51 ... +1900 psi
0 ... +60 bar 0 ... +6000 kPa 0 ... +900 psi	-1 ... +200 bar -100 ... +20000 kPa -14.50 ... +2900 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450 psi	-1 ... +200 bar -100 ... +20000 kPa -14.51 ... +2900 psi
Measuring limits	
Lower mearuring limits	For 25 mbar measuring cells, the lower measuring limit is 975 mbar abs
	For 100 mbar measuring cells, the lower measuring limit is 900 mbar abs
	For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**

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Technical specifications (continued)

Input	
0 ... +100 mbar 0 ... +10 kPa 0 ... +1.5 psi	-1 ... +15 bar -100 ... +1500 kPa -14.51 ... +225 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +65 bar -100 ... +6500 kPa -14.51 ... +975 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +90 bar -100 ... +9000 kPa -14.51 ... +1350 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +125 bar -100 ... +12500 kPa -14.51 ... +1900 psi
0 ... +60 bar 0 ... +6000 kPa 0 ... +900 psi	-1 ... +200 bar -100 ... +20000 kPa -14.50 ... +2900 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450.38 psi	0 ... +200 bar 0 ... +20000 kPa 0 ... +2900 psi
Adjustment	
Min./max. adjustment, percentage value	-10 ... 110%
Min./max. adjustment, pressure value	-20 ... 120%
Zero adjustment	-20 ... +95%
Span adjustment	-120 ... +120%
Max. zero/span difference	120% of nominal range
Adjustable pressure values	Values below -1 bar cannot be set

[1] The burst pressure depends on the process connection and is therefore not specified here.

Output		
Output 4 ... 20 mA HART		
Output signal max range	3.8 ... 20.5 mA/HART	Factory setup
Lower saturation limit	3.6 mA	
Upper saturation limit	21.5 mA	
Failure mode min	≤ 3.6 mA	
Failure mode max	≥ 21 mA	Adjustable
Signal resolution	0.3 µA	
Load calculation	$(U_B - U_{min})/0.022$ A	Example – at U_B = 24 V DC: (24 V – 9.6 V) / 0.022 A = 655 Ω
Starting current	≤ 10 mA for 5 ms after switch-on, ≤ 3.6 mA	
Protection against polarity reversal	Yes	
Electrical damping (63% of the input value)	0 ... 999 s	Adjustable
Adjustment ranges and output behavior		
Parameter	**Technical data / Note**	
Max. permissible turn down	Unlimited; recommended 20:1	
Fault signal, adjustable	≤ 3.6 mA; ≥ 21 mA; last measured value	

Measuring accuracy			
Measurement error			
Values are valid for single transmitter			
Measuring range	> 25 mbar		
Measuring accuracy 0.1%	< 0.1%	1:1 until 1:5 > 25 mbar	
	< 0.02% × TD	TD > 5:1	
Measuring accuracy 0.05% - optional	< 0.05%	1:1 until 1:5	
	< 0.01% × TD	TD > 5:1	
Measuring range	0 ... 25 mbar and -25 ... 25 mbar		
Measuring accuracy 0.1%	< 0.1%		
Measuring accuracy 0.05 - optional%	< 0.05%		
Reference conditions			
Conditions and stability			
Reference temperature	+15 ... +25 °C (59 ... 77 °F)		
Relative humidity	45 ... 75%		
Air pressure	860 ... 1060 mbar / 86 ... 106 kPa		
Characteristic determination	Limit point adjustment according to IEC 61298-2		
Characteristic curve	Linear		
Reference installation position	Upright, diaphragm points downward		
Influence of installation position	< 0.2 mbar / 20 Pa		
EMC influence on current output	< ±150 µA under strong high-frequency electromagnetic fields according to EN 61326-1		
Long-term stability			
	Measuring cell Ø 28 mm, at 0.1 bar	**Measuring cell Ø 28 mm, measuring range 0.025 bar**	**Measuring cell Ø 17.5 mm**
1 year	< 0.05% × TD	< 0.1% × TD	< 0.1% × TD
5 years	< 0.1% × TD	< 0.2% × TD	< 0.2% × TD
10 years	< 0.15% × TD	< 0.4% × TD	< 0.4% × TD
Temperature behaviour			
Temperature influence			
Climate-compensated temperature range	0 ... +100 °C (32 ... 212 °F)		
Uncompensated temperature range	-40 ... 0 °C (-40 ... 32 °F) and +100 ... +130 °C (212 ... 266 °F)		
Turn-down factor	FTD = 0.5 × TD + 0.5		

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Technical specifications (continued)

Measuring accuracy	
Thermal change in current output	< 0.05% for 10 K
Maximum Thermal Change in Current Output	< 0.15% for -40 ... +80 °C (-40 ... 176 °F)

Operating conditions			
Ambient temperature	Observe the temperature class in hazardous areas.		
Standard	-40 ... +80 °C (-40 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Storage temperature			
Standard	-60 ... +80 °C (-67 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Process temperature stainless steel connections			
Sealing material	**Type**	**Standard**	**Extended temperature range**
FKM	VP2/A	-20 ... +130 °C (-4 ... 266 °F)	-20 ... +150 °C (-4 ... 302 °F)
FKM	A+P 70.16	-40 ... +130 °C (-40 ... 266 °F)	Not specified
FKM	V70SW	Not specified	-10 ... +150 °C (14 ... 302 °F)
EPDM	A+P 70.10-02	-40 ... +130 °C (-40 ... 266 °F)	-40 ... +150 °C (-40 ... 302 °F)
EPDM	E70Q	Not specified	-40 ... +150 °C (-40 ... 302 °F)
EPDM	Fluoraz SD890	-5 ... +130 °C (23 ... 266 °F)	Not specified
FFKM	Kalrez 6375	-20 ... +130 °C (-4 ... 266 °F)	-20 ... +150 °C (-4 ... 302 °F)
FFKM	Perlast G74S	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
FFKM	Perlast G75B	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
FFKM	Perlast G92E	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
Mechanical stress			
Parameter	**Technical data**		
Vibration resistance, standard	4 g at 5 ... 200 Hz according to EN 60068-2-6		
Shock resistance, standard	50 g, 2.3 ms according to EN 60068-2-27		
Degree of protection			
Housing material	**Version**	**Protection according to IEC 60529**	**NEMA**
Plastic	Single chamber / double chamber	IP66/IP67	Type 4X
Aluminium	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P
Stainless steel, electropolished	Single chamber	IP66/IP67	Type 4X
Stainless steel, precision casting	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P

Structual design	
Material and transmitter specification	
Weight (without options)	0.8 ... 8 kg depending on processconnection and housing
Enclosure material	PBT-Kunststoff, Aluminium AlSi10Mg or 316L
Housing materials	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Cable gland materials	PA; stainless steel; brass
Wetted parts materials	
Process fitting	316L
Diaphragm materials	Sapphire ceramic®, > 99.9% Al_2O_3
Joining material of the measuring cell	Glass (not in contact with medium with double or form sealing)
Standard measuring cell seal	FKM, EPDM or FFKM
Process connection	
Surface quality, hygienic process fittings	R_a < 0.8 µm
Diaphragm	R_a < 0.5 µm

Structual design	
Electrical connection and electromechanical data	
Parameter	**Technical data**
Cable entry / gland / blind plug	M20 × 1.5; ½ NPT
Solid or stranded wire cross-section	0.2 ... 2.5 mm², AWG 24 ... 14
Stranded wire with end sleeve	0.2 ... 1.5 mm², AWG 24 ... 16
Connection between primary and secondary device	
Data transfer	Digital (I^2C-Bus)
Cable length	5 ... 70 m
Connection cable minimum bending radius at 25 °C (77 °F)	25 mm
Connection cable wire cross-section	0.34 mm², (AWG 22)
Connection cable wire resistance	< 0.05 ohm/m

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Technical specifications (continued)

Power supply		
Supply voltage and electrical data		
Power supply U_H (Master only)		
Terminal voltage on transmitter - U_B	9.6 ... 35 V DC	
Terminal voltage on transmitter light switched on - U_B	16 ... 35 V DC	
Permissible residual ripple	U_N 12 V DC (9.6 V < U_B < 18 V)	≤ 0.7 V_{eff} (16 ... 400 Hz)
	U_N 24 V DC (18 V < U_B < 35 V)	≤ 1 V_{eff} (16 ... 400 Hz)
Start-up time at U_B ≥ 12 V DC	≤ 9 s	
Start-up time at U_B < 12 V DC	≤ 22 s	
Reverse polarity protection	Yes	
Galvanic separation	Reference voltage 500 V AC	

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
SIL	
SIL 2/3	according to 61508
Drinking water	
WHG	No.: Z-65.11-644
Explosion protection as per ATEX	TÜV 26 ATEX 423318 X
intrinsic safety "i"	
Marking, intrinsic safety	II 1/2 G Ex ia IIC T6...T1 Ga/Gb
Permissible ambient temperature	-50 ... +70 °C (-58 ... 158 °F) for T5
	-50 ... +39 °C (-58 ... 102 °F) for T6
Permissible medium temperature	-20 ... +60 °C (-4 ... 140 °F) for T5
	-20 ... +23 °C (-4 ... 73.4 °F) for T6
Connection	To certified intrinsically safe circuits with peak values:
HART	U_i = 30 V, I_i = 131 mA, P_i = 983 mW
PROFIBUS (FISCO)	U_i = 17.5 V, I_i = 500 mA, P_i = 5.5 W
PROFIBUS (Barrier)	U_i = 24 V, I_i = 250 mA, P_i = 1.2 W

Communication	
HART	
Protocol	7.3
PROFIBUS PA	
Output signal	digital output signal, PROFIBUS protocol
Transmission rate	31.25 Kbit/s
Instrument address	126 (default setting)
Damping (63% of the input variable)	0 ... 999 s, adjustable
PROFIBUS PA profile	3.02
Number of FBs with AI (function blocks with analogue input)	3
Bluetooth	
Max. participants	1
Bluetooth standard	Bluetooth 5.x
Effective range	Typically 30 m (98 ft)
The Bluetooth range depends on the local conditions.	

SITRANS P360 Front flush metal cell

Input for Piezo-/DMS measuring cell	
Gauge pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.4 bar 0 ... +40 kPa 0 ... +5.8 psi	-1 ... +1.2 bar -100 ... +120 kPa -14.50 ... +17.4 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +14.50 psi	-1 ... +3 bar -100 ... +300 kPa -14.50 ... +43.5 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +36.26 psi	-1 ... +7.5 bar -100 ... +750 kPa -14.50 ... +108.8 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +72.52 psi	-1 ... +15 bar -100 ... +1500 kPa -14.50 ... +217 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +145.04 psi	-1 ... +30 bar -100 ... +3000 kPa -14.50 ... +435 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +362.59 psi	-1 ... +75 bar -100 ... +7500 kPa -14.50 ... +1087 psi
0 ... +40 bar 0 ... +4000 kPa 0 ... +580.15 psi	-1 ... +120 bar -100 ... +12000 kPa -14.50 ... +1740 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450 psi	-1 ... +200 bar -100 ... +20000 kPa -14.51 ... +2900 psi
0 ... +250 bar 0 ... +25000 kPa 0 ... +3625.94 psi	-1 ... +500 bar -100 ... +50000 kPa -14.50 ... +7251.89 psi
0 ... +600 bar 0 ... +60000 kPa 0 ... +8702.26 psi	-1 ... +1200 bar -100 ... +120000 kPa -14.50 ... +17405 psi
0 ... 1000 bar 0 ... 100 MPa 0 ... 14500 psi	-1 ... +1500 bar -100 ... +150000 kPa -14.50 ... +21756 psi
Measuring limits	
Lower measuring limits	For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**
0 ... +1 bar abs 0 ... +100 kPa abs 0 ... +14.50 psi abs	0 ... +3 bar abs 0 ... +300 kPa abs 0 ... +43.5 psi abs
0 ... +2.5 bar abs 0 ... +250 kPa abs 0 ... +36.26 psi abs	0 ... +7.5 bar abs 0 ... +750 kPa abs 0 ... +108.8 psi abs
0 ... +10 bar abs 0 ... +1000 kPa abs 0 ... +145.04 psi abs	0 ... +30 bar abs 0 ... +3000 kPa abs 0 ... +435 psi abs
0 ... +25 bar abs 0 ... +2500 kPa abs 0 ... +362.59 psi abs	0 ... +75 bar abs 0 ... +7500 kPa abs 0 ... +1087 psi abs
0 ... +40 bar abs 0 ... +4000 kPa abs 0 ... +580.15 psi abs	0 ... +120 bar abs 0 ... +12000 kPa abs 0 ... +1740 psi abs

Note: The burst pressure depends on the process connection and is therefore not specified here.

Input for Ceramic/metalic measuring cell	
Gauge pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.1 bar 0 ... +10 kPa 0 ... +1.5 psi	-1 ... +15 bar -100 ... +1500 kPa -14.51 ... +225 psi
0 ... +0.4bar 0 ... +40 kPa 0 ... +5 psi	-1 ... +30 bar -100 ... +3000 kPa -14.51 ... +375 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi

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Technical specifications (continued)

Input for Ceramic/metalic measuring cell	
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
Measuring limits	
Lower measuring limits	For 100 mbar measuring cells, the lower measuring limit is 900 mbar abs
	For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
Adjustment	
Min./max. adjustment, percentage value	-10 ... 110%
Min./max. adjustment, pressure value	-20 ... 120%
Zero adjustment	-20 ... +95%
Span adjustment	-120 ... +120%
Max. zero/span difference	120% of nominal range
Adjustable pressure values	Values below -1 bar cannot be set
Measuring cell concept	
For measuring ranges up to 40 bar	piezoresistive sensor element with internal isolating liquid
For measuring ranges above 100 bar	strain gauge (DMS) sensor element (dry system)
For measuring ranges ≤ 400 mbar or higher temperature ranges	ceramic/metallic measuring cell

Output		
Output 4 ... 20 mA HART		
Output signal max range	3.8 ... 20.5 mA/HART	Factory setup
Lower saturation limit	3.6 mA	
Upper saturation limit	21.5 mA	
Failure mode min	≤ 3.6 mA	
Failure mode max	≥ 21 mA	Adjustable
Signal resolution	0.3 µA	
Load calculation	$(U_B - U_{min})/0.022$ A	Example – at U_B = 24 V DC: (24 V – 9.6 V) / 0.022 A = 655 Ω
Starting current	≤ 10 mA for 5 ms after switch-on, ≤ 3.6 mA	
Protection against polarity reversal	Yes	
Electrical damping (63% of the input value)	0 ... 999 s	Adjustable

Output	
Adjustment ranges and output behavior	
Parameter	**Technical data / Note**
Max. permissible turn down	Unlimited; recommended 20:1
Fault signal, adjustable	≤ 3.6 mA; ≥ 21 mA; last measured value

Measuring accuracy		
Measurement error and reference conditions		
Values are valid for single transmitter		
Measuring accuracy (Turn-down)		
0.1%	< 0.1%	1 :1 until 1:5
	< 0.002% × TD	TD > 5:1
0.075%	< 0.075%	1 :1 until 1:5
	< 0.0015% × TD	TD > 5:1
Long-term stability ceramic measuring cell	1 year	< 0.05% × TD
	5 years	< 0.1% × TD
	10 years	< 0.05% × TD
Long-term stability DMS measuring cell	Measuring range > 1 bar	< 0.1% × TD/year
Piezoresistive measuring cell	Measuring range > 1 bar	< 0.1% × TD/year
	Measuring range 1 bar	< 0.15% × TD/year
	Measuring range 0.4 bar	< 0.35% × TD/year
Conditions and stability		
Reference temperature	+18 ... +30 °C (64.4 ...86 °F)	
Relative humidity	45 ... 75 %	
Air pressure	860 ... 1060 mbar / 86 ... 106 kPa	
Characteristic determination	Limit point adjustment according to IEC 61298-2	
Characteristic curve	Linear	
Reference installation position	Upright, diaphragm points downward	
Influence installation position	Piezoresistive/DMS cell	depending on process connection and diaphragm seal
	Ceramic/metal cell	< 5 mbar/0.5 kPa (0.07 psig)
EMC influence on current output	< ±150 µA under strong high-frequency electromagnetic fields according to EN 61326-1	

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Technical specifications (continued)

Operating conditions				
Ambient temperature	Observe the temperature class in hazardous areas.			
Standard	-40 ... +80 °C (-40 ... 176 °F)			
PUR cable	-20 ... +80 °C (-4 ... 176 °F)			
PE cable	-20 ... +60 °C (-4 ... 140 °F)			
Storage temperature				
Standard	-60 ... +80 °C (-67 ... 176 °F)			
PUR cable	-20 ... +80 °C (-4 ... 176 °F)			
PE cable	-20 ... +60 °C (-4 ... 140 °F)			
Mechanical stress				
Parameter	**Technical data**			
	Without cooling section		**With cooling section**	
	All enclosure	**Two chamber stainless steel**	**All enclosure**	**Two chamber stainless steel**
Vibration resistance 5 ... 200 Hz according to EN 60068-2-6	4 g	0.7 g	4 g	0.7 g
Shock resistance 2.3 ms according to EN 60068-2-27	50 g	50 g	50 g	20 g
Degree of protection				
Housing material	**Version**		**Protection according to IEC 60529**	**NEMA**
Plastic	Single chamber / double chamber		IP66/IP67	Type 4X
Aluminium	Single chamber / double chamber		IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P
Stainless steel, electropolished	Single chamber		IP66/IP67/IP69	Type 4X
Stainless steel, precision casting	Single chamber / double chamber		IP66/IP67; IP66/IP68 (0.2 bar)	Type 6P
Process temperature piezoresistive/DMS measuring cell				
Process temperature				
Seal	**Standard**	**Extended temperature range**	**Hygienic process connections**	**Oxygen applications**
	Pabs ≥ 1 mbar		P_{abs} ≥ 1 mbar	P_{abs} ≥ 10 mbar	P_{abs} ≥ 10 mbar
Without regard to the seal	-20/-40 ... +105 °C (-4/-40 ... +221 °F)	-	-	-	-20 ... +60 °C (-4 ... +140 °F)
FKM (VP2/A)	-20 ... +105 °C (-4 ... +221 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +85 °C (-4 ... +185 °F)	-20 ... +150 °C (-4 ... +302 °F)	
EPDM (A+P 70.10-02)					
FFKM (Perlast G74S)	-15 ... +105 °C (+5 ... +221 °F)	-15 ... +150 °C (+5 ... +302 °F)	-15 ... +85 °C (+5 ... +185 °F)	-15 ... +150 °C (+5 ... +302 °F)	-15 ... +60 °C (+5 ... +140 °F)
FEPM (Fluoraz SD890)	-5 ... +105 °C (+23 ... +221 °F)	-	-	-	-5 ... +60 °C (+23 ... +140 °F)
Process temperature ceramic/metal measuring cell				
Process temperature				
	P_{abs} ≥ 50 mbar	P_{abs} ≥ 10 mbar	P_{abs} ≥ 10 mbar	
Standard	-12 ... +150 °C (+10 ... +284 °F)		-12 ... +120 °C (+10 ... +248 °F)	
Extended temperature range	-12 ... +180 °C (+10 ... +284 °F)	-12 ... +160 °C (+10 ... +320 °F)		
	-12 ... +200 °C (+10 ... +392 °F)			

Structural design	
Material and transmitter specification	
Weight (without options)	0.8 ... 8 kg depending on process connection and housing
Enclosure material	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Housing materials	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Cable gland materials	PA; stainless steel; brass
Wetted parts materials	
Process fitting	
Diaphragm materials	316L
Seal for G½ (EN 837), G1½ (DIN 3852-A)	Klingersil C-4400

Structural design	
Process connection	
Surface quality, hygienic process fittings	R_a < 0.8 µm, typical
Steel	316L
Electrical connection and electromechanical data	
Parameter	**Technical data**
Cable entry / gland / blind plug	M20 × 1.5; ½ NPT
Solid or stranded wire cross-section	0.2 ... 2.5 mm², AWG 24 ... 14
Stranded wire with end sleeve	0.2 ... 1.5 mm², AWG 24 ... 16
Connection between primary and secondary device	
Data transfer	Digital (I^2C-Bus)
Cable length	5 ... 70 m
Connection cable minimum bending radius at 25 °C (77 °F)	25 mm

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Technical specifications (continued)

Structural design	
Connection cable wire cross-section	0.34 mm², (AWG 22)
Connection cable wire resistance	< 0.05 ohm/m

Power supply		
Supply voltage and electrical data		
Power supply U_H (Master only)		
Terminal voltage on transmitter - U_B	9.6 ... 35 V DC	
Terminal voltage on transmitter light switched on - U_B	16 ... 35 V DC	
Permissible residual ripple	U_N 12 V DC (9.6 V < U_B < 18 V)	≤ 0.7 V_{eff} (16 ... 400 Hz)
	U_N 24 V DC (18 V < U_B < 35 V)	≤ 1 V_{eff} (16 ... 400 Hz)
Start-up time at U_B ≥ 12 V DC	≤ 9 s	
Start-up time at U_B < 12 V DC	≤ 22 s	
Reverse polarity protection	Yes	
Galvanic separation	Reference voltage 500 V AC	

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
SIL	
SIL 2/3	according to IEC 61508
Drinking water	
WHG	No.: Z-65.11-644
Explosion protection as per ATEX	TÜV 26 ATEX 423318 X
Intrinsic safety "i"	
Marking, intrinsic safety	II 1/2 G Ex ia IIC T6 ... T1 Ga/Gb
Permissible ambient temperature	-50 ... +70 °C (-58 ... 158 °F) for T5
	-50 ... +39 °C (-58 ... 102 °F) for T6

Certificates and approvals	
Permissible medium temperature	-20 ... +60 °C (-4 ... 140 °F) for T5
	-20 ... +23 °C (-4 ... 73.4 °F) for T6
Connection	To certified intrinsically safe circuits with peak values:
HART	U_i = 30 V, I_i = 131 mA, P_i = 983 mW
PROFIBUS (FISCO)	U_i = 17.5 V, I_i = 500 mA, P_i = 5.5 W
PROFIBUS (Barrier)	U_i = 24 V, I_i = 250 mA, P_i = 1.2 W

Communication	
HART	
Protocol	7.3
PROFIBUS PA	
Output signal	digital output signal, PROFIBUS protocol
Transmission rate	31.25 Kbit/s
Instrument address	126 (default setting)
Damping (63% of the input variable)	0 ... 999 s, adjustable
PROFIBUS PA profile	3.02
Number of FBs with AI (function blocks with analogue input)	3
Bluetooth	
Max. participants	1
Bluetooth standard	Bluetooth 5.x
Effective range	Typically 30 m (98 ft)
The Bluetooth range depends on the local conditions.	

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Overview



In today's demanding industrial environments, accurate and reliable pressure measurement is the foundation of safe and efficient operations. The SITRANS P310/410 is a comprehensive pressure transmitter platform that unites two powerful measuring cell technologies in a single product.

The SITRANS P310/410 gives the choice between an advanced ceramic measuring cell and a robust metallic measuring cell, allowing users to select the ideal configuration for their specific process requirements. The ceramic measuring cell offers outstanding abrasion resistance, wear-free operation, and exceptional resistance to thermal shock, making it the preferred choice for challenging media such as abrasive or highly viscous fluids. With an overload factor of up to 200 — unmatched in its class — and measurement accuracy down to 0.05%, it enables reliable measurement even of the smallest pressure ranges.

For applications involving extreme pressures, the metallic measuring cell variant of the SITRANS P310/410 rises to the challenge. Its fully welded, vacuum-resistant design handles process pressures up to 1 000 bar and temperatures ranging from -40 °C to +200 °C, while its inherent robustness ensures insensitivity to shock and vibration — even in the harshest industrial environments such as petrochemical plants, high-pressure steam systems, or offshore installations.

It is available with a wide range of hygienic process connections for food & beverage and pharmaceutical applications.

With its 4 ... 20 mA HART or PROFIBUS communication and the optional Bluetooth interface the most common communication types are given. With SIL 2/3 and Ex certifications the SITRANS P310/P410 can also be used in critical application or hazardous environments.

The SITRANS P310/410 is more than a pressure transmitter — it is a versatile, future-proof measurement platform designed to grow with your operational needs, minimize maintenance costs, and deliver the accuracy and reliability that modern industries demand.

SITRANS P310/410 is available in various versions for measuring:

- Gauge pressure
- Absolute pressure

Application

The SITRANS P310/P410 is a pressure transmitter designed for reliable process pressure measurement across virtually all industries. It measures gauge pressure, absolute pressure, and vacuum for a wide range of media, including gases, vapors, and liquids, as well as viscous, abrasive, or aggressive substances. With a measuring range spanning from –1 bar to 1 000 bar and a process temperature range of –40 °C to +200 °C, the SITRANS P310/P410 is built to handle even the most demanding process conditions.

A key strength of the SITRANS P310/410 lies in its choice of measuring cell technologies, each tailored to specific application requirements. The dry pressure ceramic measuring cell is the ideal solution for applications involving abrasive or chemically aggressive media. Its wear-free, highly overload-resistant design ensures long-term stability and high plant availability with minimal maintenance. The front-flush mounting eliminates the risk of product buildup and enables self-cleaning in flowing media, making it particularly well-suited for hygienic applications in the food, beverage, and pharmaceutical industries. Typical applications include level and pressure measurement in raw milk tanks, storage tanks for alcohol or ultrapure water, as well as pressurized batch vessels. Its resistance to thermal shock and compatibility with CIP and SIP cleaning cycles further extend its suitability to sterilization-critical processes. In abrasive environments such as mining, water treatment, or the paper industry, the ceramic measuring cell reliably handles media such as sand slurries, grit, or paper pulp in bleaching towers.

For applications involving high process pressures, viscous products, or elevated temperatures, the metallic measuring cell with its front-flush diaphragm provides outstanding performance. Its robust and diffusion-stable construction makes it the preferred choice in demanding industrial environments such as the chemical, oil and gas, and hydrogen industries. Typical applications include bitumen level measurement in asphalt mixing plants at temperatures up to 200 °C, pressure monitoring in high-pressure hydrogen compressors and storage facilities, turbine steam line supervision, as well as level and pressure measurement of viscous products such as in ice cream premix systems, jam cooking kettles, or pulpers for the dissolution of waste paper and cellulose.

The SITRANS P310/P410 is listed as a single unified device in the Siemens product portfolio, consolidating the full measurement capabilities of both instruments into one comprehensive solution for virtually any pressure measurement challenge in the process industry.

The difference between the SITRANS P310/P410 is in accuracy

For the high variety of applications two different variants are available:

Pressure transmitter with dry pressure ceramic cell	
Measured variable	• Gauge and absolute pressure of corrosive and non-corrosive gases, vapors and liquids
Measuring span (infinitely adjustable)	• For SITRANS P310/P410 with 4 ... 20 mA HART • PROFIBUS: 25 mbar ... 100 bar a (0.36 psi ... 1450.38 psi)
Accuracy	• SITRANS P310: 0.1% • SITRANS P410: 0.05%
There are two series	• Gauge pressure series • Absolute pressure series

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Application (continued)

Pressure transmitter with front flush metallic cell	
Measured variable	• Gauge and absolute pressure of corrosive and non-corrosive gases, vapors and liquids
Measuring span (infinitely adjustable)	• For SITRANS P310/P410 with 4 ... 20 mA HART • PROFIBUS: 100 mbar ... 1000 bar a (1.45 psi ... 14503.8 psi)
Accuracy	• SITRANS P310: 0.1% • SITRANS P410: 0.0075%
There are two series	• Gauge pressure series • Absolute pressure series

Dry pressure cell

The dry ceramic pressure measuring cell is the ideal choice whenever process purity, chemical resistance, and oil-free measurement are required. Unlike oil-filled metallic cells, its robust ceramic diaphragm directly contacts the medium — with no hydraulic fill fluid involved. This makes it the preferred solution for hygienic, food-grade, or chemically aggressive applications where contamination must be strictly avoided.

Benefits

- Oil-free & media-pure – No risk of process contamination through hydraulic fill fluid
- Outstanding chemical resistance – Alumina ceramic withstands a wide range of aggressive, corrosive, and abrasive media
- High overload resistance – Ceramic diaphragms tolerate significant pressure spikes without permanent damage
- Long-term stability – Minimal drift and excellent repeatability over extended service life
- Wide temperature range – Reliable performance across varying process and ambient temperatures
- Low maintenance – Robust and wear-resistant design reduces servicing requirements

Application

- Food & Beverage – Hygienic measurement of water, milk, juices, and other food-grade media
- Water & Wastewater – Pressure monitoring in water treatment, distribution, and sewage systems
- Chemical & Pharmaceutical Industry – Measurement of aggressive or corrosive liquids and gases where metallic cells are unsuitable
- HVAC & Building Automation – Monitoring of air, gases, and non-aggressive fluids in climate control systems
- Compressed Air & Pneumatics – Clean and accurate measurement of dry gases and compressed air
- General Industrial Processes – Wherever process purity, media compatibility, or hygienic standards are critical

Front flush metallic cell

The flush-mounted metallic pressure measuring cell is the ideal choice whenever viscous, highly viscous, or solid-laden media are involved in the measurement process. Its diaphragm sits perfectly flush with the process connection, eliminating any cavities or dead zones where media could accumulate or crystallize. This design makes it the preferred solution for challenging process conditions where conventional pressure ports would clog, block, or cause hygiene issues.

Application (continued)

Benefits

- Flush diaphragm design – No dead zones, cavities, or pressure ports that could trap or block media
- Self-cleaning effect – The smooth, flush surface prevents product build-up and simplifies cleaning
- Wide material selection – Available in various high-grade stainless steels and special alloys (e.g., Hastelloy, Tantalum) for maximum chemical compatibility
- CIP/SIP compatible – Suitable for clean-in-place and sterilize-in-place processes in hygienic applications
- High mechanical robustness – Metallic diaphragm withstands high pressures, pressure shocks, and demanding industrial environments
- Broad pressure range – Covers a wide measurement range from low to very high process pressures
- Oil-filled system – Ensures reliable signal transmission even under extreme process conditions

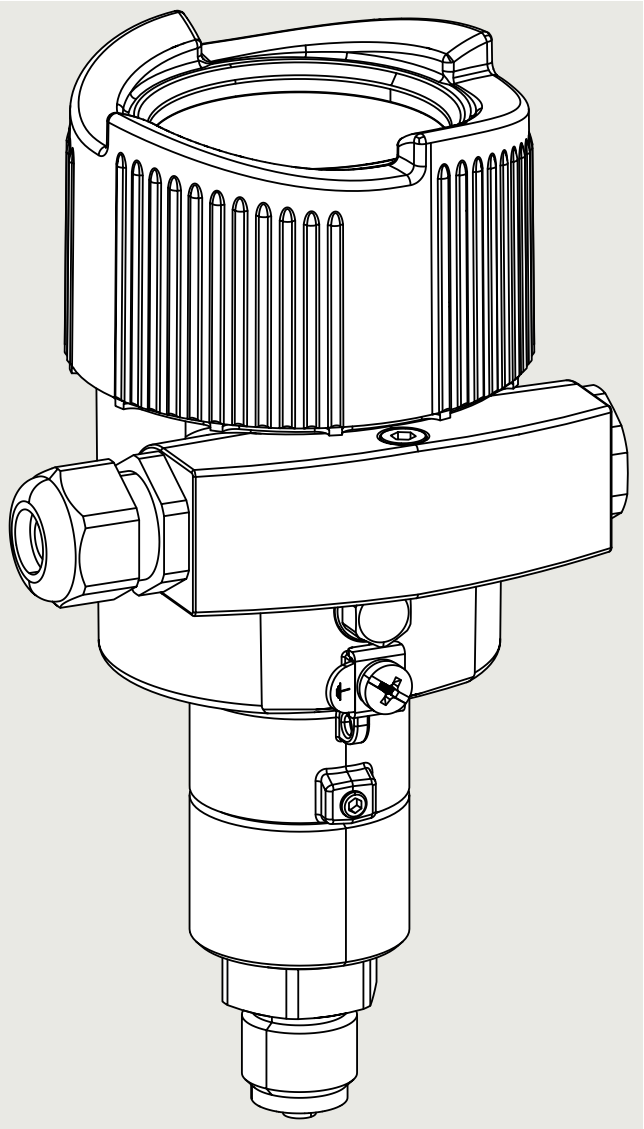
Application

- Food & Beverage – Measurement of viscous media such as syrups, sauces, pastes, and dairy products
- Chemical & Petrochemical Industry – Monitoring of aggressive, corrosive, or high-pressure media where robust metallic materials are essential
- Pharmaceutical & Biotech – Hygienic pressure measurement in sterile processes requiring CIP/SIP compatibility
- Pulp & Paper – Reliable measurement in fibrous, abrasive, or slurry-type media
- Wastewater & Sludge Treatment – Pressure monitoring in heavily contaminated or solid-laden fluids
- Oil & Gas – High-pressure and high-temperature applications in upstream and downstream processes
- General Process Industry – Wherever clogging, crystallization, or media build-up would compromise conventional pressure measurement

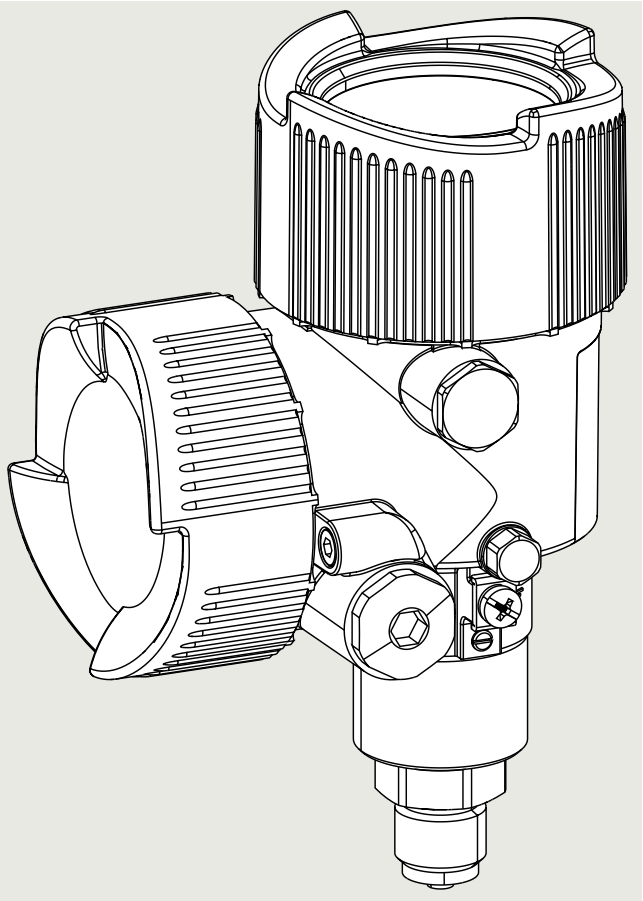
Further technical details you will find within technical data of SITRANS P310/P410.

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Design

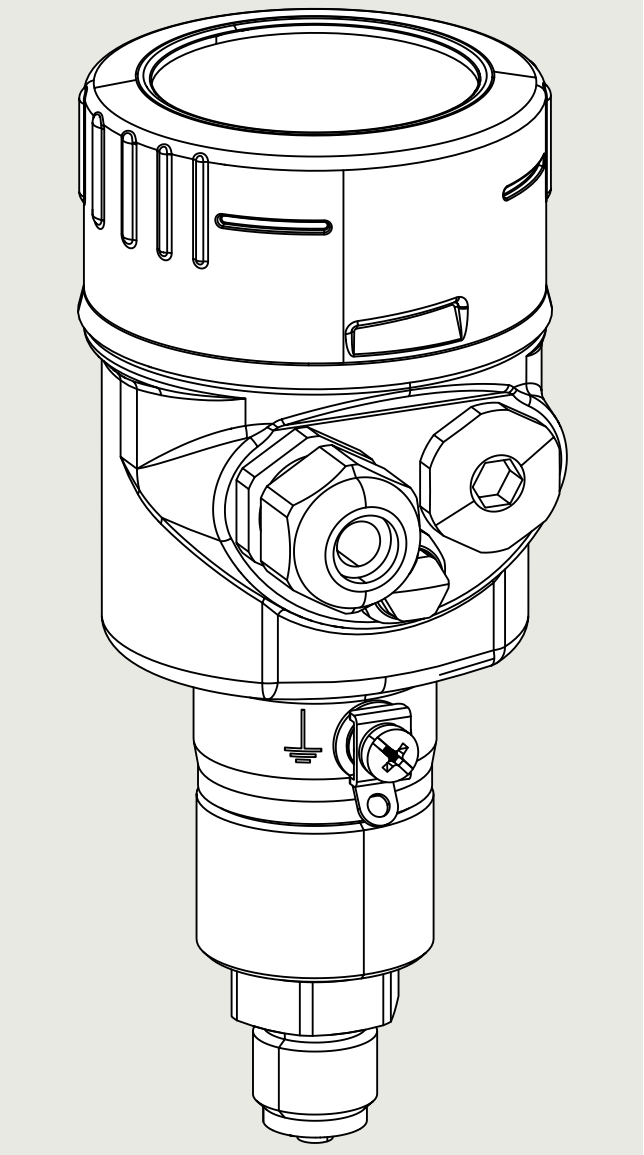


Design (continued)



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Design (continued)

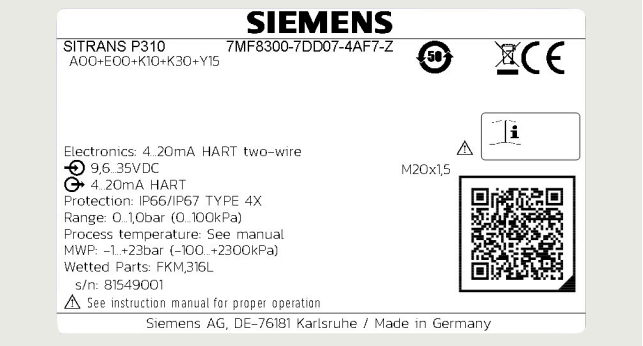


- The electronics enclosure is made of single or dual chamber die cast aluminum, precision cast stainless steel or plastic (according to the housing material the design could differ).
- The enclosure has a removable cover at the top and or side.
- Depending on the device design, the top cover may be designed with a glass pane.
- The cable inlet to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug.
- The ground terminal is located on the side.
- The electrical terminal compartment for the auxiliary power and shield is accessible when you remove the top cover (single chamber) or side cover (dual chamber).

Design (continued)

- The measuring cell with process connection is located in the bottom part of the enclosure.
- If the device is equipped with a display the buttons are located under the top cover.

Nameplates



The nameplate with the article no. and other important information, such as design details and technical data, is located on the side of the housing.

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Function

Adjustable parameters and diagnostics

SITRANS P310/P410 with 4 ... 20 mA HART communication

SETUP Menu item	Parameters	Input Buttons
Measurement loop name	19 alphanumeric characters/special characters	X
Application	• Level, process pressure	X
	• Secondary Device for electronic differential pressure	X
Units	• Adjustment unit (m, bar, Pa, psi ... user-defined)	X
	• Temperature unit (°C, °F)	X
Position correction	Offset	X
Adjustment	• Zero/Min. adjustment	X
	• Span/Max. adjustment	X
Damping	Integration time	X
Linearization	Linear, cylindrical tank, ... user-defined	X
Current output	• Current output - Mode	X
	• Output characteristics: 4 ... 20 mA, 20 ... 4 mA	X
	• Failure mode: ≤ 3.6 mA, ≥ 20 mA, last measured value	X
	• Current output - Min./Max.	X
	• Min. current: 3.8 mA, 4 mA	X
	• Max. current: 20 mA, 20.5 mA	X
Lock adjustment	Blocked, released	X

Display Menu item	Parameters	Input Buttons
Menu language	Selected language	X
Displayed value 1	Pressure	X
Displayed value 2	• Ceramic measuring cell: Measuring cell temperature in °C	X
	• Metallic measuring cell: Electronics temperature in °C	X
Display format	Number of positions after the decimal point, automatically	X
Backlight	Switched on	X

Diagnostics Menu item	Parameters	Input Buttons
Device status	-	X
Peak indicator	Pressure	X
Peak indicator temperature	Temperature	X
Simulation	Pressure, percent, current output, linearized percent, measuring cell temperature, electronics temperature	X
Additional adjustments Menu item	Parameters	Input Buttons
Date/Time	-	X
Reset	Delivery status, basic settings	X
Copy instrument settings	Read from sensor, write into sensor	X
Scaling	• Scaling size	X
	• Scaling format	
Current output	• Current output -Measuring variable	
	• Current output - Adjustment	
Current output 2	• Current output - Measuring variable	
	• Current output - Adjustment	
HART mode	HART address, current output	
Special parameters	Service-Login	

Function (continued)

Info Menu item	Parameters	Input Buttons
Device name	SITRANS P310/P410	X
Instrument version	Hardware and software version	X
Factory calibration date	Date	X
Sensor characteristics	Order-specific characteristics	X

Available physical units of display for SITRANS P310/P410

Physical variable	Physical units
Pressure	Pa, MPa, kPa, bar, mbar, psi, g/cm², kg/cm², inH_2O, inH_2O (4 °C), ftH_2O, mmH_2O, mmH_2O (4 °C), mH_2O (4 °C), mmHg, inHg, atm, torr
Temperature	°C / °F
Other	%, mA

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Selection and ordering data

Pressure transmitters with front flush ceramic dry cell	Article No.													
SITRANS P310	7MF83	●	●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P410	7MF84	●	●	-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Technology, sensor														
Gauge pressure		0												
Absolute pressure		1												
Communication														
HART (4 ... 20 mA			0											
PROFIBUS PA			1											
Measuring cell filling														
Dry pressure cell					7									
Maximum measuring span														
25 mbar (10.04 inH_2O)						A								
100 mbar (40.19 inH_2O)						B								
400 mbar (160.74 inH_2O)						C								
1000 mbar (481.87 inH_2O)						D								
2500 mbar (1004.66 inH_2O)						E								
5000 mbar (2009.32 inH_2O)						F								
10 bar (4018.65 inH_2O)						H								
25 bar (10046.60 inH_2O)						K								
60 bar (24111.90 inH_2O)						M								
100 bar (40186.50 inH_2O)						N								
Process connection														
Female thread M20 × 1.5							B							
Male thread G½ (DIN EN 837-1)							D							
Female thread ½-14 NPT							E							
Thread G½, inside G¼, ISO 228-1 / 316L							G							
Oval flange adapter according to IEC 61518							H							
Front-flush diaphragm (Options M-R)							K							
Wetted parts: Process connection, seal diaphragm														
Process connection: Stainless steel 316L/1.4404, Seal diaphragm: Ceramic								0						
Non-wetted parts														
Die-cast aluminum housing									1					
Housing made of stainless steel precision casting									2					
Housing made of stainless steel precision casting electrolytically polished									6					
PBT Plastic housing									7					
Enclosure														
Single chamber device											4			
Dual chamber device											5			
Type of protection														
Without Ex												A		
Intrinsic safety												B		
Flameproof enclosure												C		
Dust ignition proof												D		
Electrical connections/cable entries														
M20 × 1.5													F	
½"-14 NPT													M	
Local operation/display														
Without local display (lid closed)														0
With display (lid with glass window)														2
With display with Bluetooth functionality (lid with glass window)														7

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Selection and ordering data (continued)

Optionen	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Cable gland PA black Ø 5 ... 9 mm, standard	**A00**
Cable gland PA black Ø 6 ... 12 mm	**A01**
Cable gland PA black Ø 10 ... 14 mm	**A02**
Cable gland PA blue Ø 5 ... 9 mm	**A03**
Cable gland PA blue Ø 6 ... 12 mm	**A04**
Cable gland PA blue Ø 10 ... 14 mm	**A05**
Cable gland stainless steel Ø 7 ... 12 mm	**A10**
Cable gland nickel-plated brass Ø 6 ... 12 mm	**A11**
Cable gland nickel-plated brass Ø 5 ... 9 mm	**A12**
Cable gland nickel-plated brass, for armored cable (Ø 9 ... 13 mm)	**A14**
2 × sealing plug M20 × 1.5	**A20**
2 × sealing plug ½-14 NPT	**A21**
HAN plugs	
HAN 7D straight	**A30**
HAN 7D angled	**A31**
HAN 8D straight	**A34**
HAN 8D angled	**A35**
M12 plugs	
M20 × 1.5 / plug M12x1, pin assignment A	**A66**
M20 × 1.5 / plug M12x1, pin assignment B	**A67**
M20 × 1.5 / plug M12x1, pin assignment C	**A68**
Certificates	
Quality inspection certificate - 5 point factory calibration (IEC 62828-1)	**C11**
Inspection certificate (EN 10204-3.1) - material of pressure-containing and wetted parts	**C12**
Factory certificate - NACE (EN 10204, NACE MR 0175)	**C13**
Factory certificate (EN 10204-2.2) - wetted parts	**C14**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
Degree of protection IP66 / IP67	**D29**
Degree of protection IP66 / IP68	**D30**
Type plate made of stainless steel	**D43**
Oil and grease-free (incl. 3.1 Inspection certificate)	**D61**
Overvoltage protection	**D72**
General approval without Ex approval	
General approval without Ex approval: World (CE) except: CSA	**E00**
General approval without Ex approval: World (CE, CSA)	**E01**
General approval without Ex approval: CSA (USA & Canada)	**E06**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA & Canada)	**E21**
IECEx (World)	**E23**
NEPSI (China)	**E27**
Country specific approvals	
WHG overfill protection for fla mmable and non-flammable liquids	**E61**
Sealing concept	
Single seal	**K10**
Double seal	**K11**
Form seal	**K12**

Optionen	Order code
Measuring cell sealing / Processtemperature	
FKM (VP2/A) / -20 ... +130 °C	**K30**
FKM (VP2/A) / -20 ... +150 °C	**K31**
FKM (A+P 70.16) / -40 ... +130 °C	**K32**
EPDM (A+P 70.10-02/70.503-00) / -40 ... +130 °C	**K33**
EPDM (A+P 70.10-02/70.503-00) / -40 ... +150 °C	**K34**
FFKM (Perlast G74S) / -15 ... +130 °C	**K35**
FFKM (Perlast G74S) / -15 ... +150 °C	**K36**
FFKM (Perlast G75B) / -15 ... +130 °C	**K37**
FFKM (Perlast G75B) / -15 ... +150 °C	**K38**
FFKM (Kalrez 6375) / -20 ... +130 °C	**K39**
FFKM (Kalrez 6375) / -20 ... +150 °C	**K40**
FKM (ET 7067) / -20 ... +130 °C	**K41**
EPDM (E70Q) / -40 ... +130 °C	**K42**
FFKM (Chemraz 535) / -30 ... +130 °C	**K43**
FEPM (Fluoraz SD890) / -5 ... +130 °C	**K44**
FKM (V70SW) / -10 ... +150 °C	**K45**
EPDM (E70Q) / -40 ... +150 °C	**K46**
FKM (Endura V91A) / -40 ... +130 °C	**K47**
FKM (Endura V91A) / -40 ... +150 °C	**K48**
FFKM (Perlast G92E) / -15 ... +130 °C	**K49**
FFKM (Perlast G92E) / -15 ... +150 °C	**K50**
EPDM (E7502) / -40 ... +150 °C	**K51**
Flanges according to DIN EN 1092-1 Form B1 and ASME Standard B16.5	
Flange EN 1092-1 Form B1 DN 25 PN 40	**M00**
Flange EN 1092-1 Form B1 DN 40 PN 40	**M01**
Flange EN 1092-1 Form B1 DN 50 PN 40	**M02**
Flange EN 1092-1 Form B1 DN 80 PN 40	**M03**
Flange EN 1092-1 Form B1 DN 25 PN 100	**M04**
Flange EN 1092-1 Form B1 DN 50 PN 100	**M05**
ASME Flange B16.5 ½" Class 150 RF	**M30**
ASME Flange B16.5 ¾" Class 150 RF	**M31**
ASME Flange B16.5 1" Class 150 RF	**M32**
ASME Flange B16.5 1½" Class 150 RF	**M33**
ASME Flange B16.5 2" Class 150 RF	**M34**
ASME Flange B16.5 3" Class 150 RF	**M35**
ASME Flange B16.5 4" Class 150 RF	**M36**
ASME Flange B16.5 1" Class 300 RF	**M37**
ASME Flange B16.5 1½" Class 300 RF	**M38**
ASME Flange B16.5 2" Class 300 RF	**M39**
ASME Flange B16.5 3" Class 300 RF	**M40**
ASME Flange B16.5 4" Class 300 RF	**M41**
Hygienic process connections according to standards	
Hygienic flange DIN 11851 with slotted union nut DN 25 PN 40	**N00**
Hygienic flange DIN 11851 with slotted union nut DN 32 PN 40	**N01**
Hygienic flange DIN 11851 with slotted union nut DN 40 PN 40	**N02**
Hygienic flange DIN 11851 with slotted union nut DN 50 PN 25	**N03**
Hygienic flange DIN 11851 with slotted union nut DN 65 PN 25	**N04**
Hygienic flange DIN 11851 with slotted union nut DN 80 PN 25	**N05**

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Selection and ordering data (continued)

Optionen	Order code
Tri-Clamp DIN 32676 DN 20 PN 25	**N10**
Tri-Clamp DIN 32676 DN 65 PN 16	**N11**
Tri-Clamp DIN 32676 DN 80 PN 10	**N12**
Tri-Clamp ISO 2852 1½" PN 16	**N20**
Tri-Clamp ISO 2852 2" PN 16	**N21**
Tri-Clamp ISO 2852 3" PN 16	**N22**
Tri-Clamp ISO 2852 4" PN 10, 1.4435	**N23**
Aseptic threaded socket DIN 11864-1 Form A DN 25 PN 40 (R_a < 0.8 µm)	**N30**
Aseptic threaded socket DIN 11864-1 Form A DN 40 PN 40 (R_a < 0.8 µm)	**N31**
Aseptic threaded socket DIN 11864-1 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N32**
Aseptic flange with notch DIN 11864-2 Form A DN 25 PN 25 (1.4435)	**N40**
Aseptic flange with notch DIN 11864-2 Form A DN 32 PN 25 (R_a < 0.8 µm)	**N41**
Aseptic flange with notch DIN 11864-2 Form A DN 40 PN 25 (R_a < 0.8 µm)	**N42**
Aseptic flange with notch DIN 11864-2 Form A DN 50 PN 16 (R_a < 0.8 µm)	**N43**
Aseptic flange with notch DIN 11864-2 Form A DN 65 PN 16 (R_a < 0.8 µm)	**N44**
Aseptic flange with notch DIN 11864-2 Form A DN 80 PN 16 (R_a < 0.8 µm)	**N45**
Aseptic clamp with groove DIN 11864-3 Form A DN 32 PN 40 (R_a < 0.38 µm)	**N50**
Aseptic clamp with groove DIN 11864-3 Form A DN 40 PN 40 (R_a < 0.38 µm)	**N51**
Aseptic clamp with groove DIN 11864-3 Form A DN 65 PN 25 (R_a < 0.8 µm)	**N53**
Hygienic process connections manufacturer-specific	
Varivent Type F for pipes DN 25 - DN 32 PN 40	**P01**
Varivent Type N for pipes DN 40 - DN 125 PN 25	**P02**
NEUMO BioControl flange DN 25 PN 16	**P10**
NEUMO BioControl flange DN 50 PN 16	**P11**
NEUMO BioControl flange DN 65 PN 16	**P12**
NEUMO BioControl flange DN 80 PN 16	**P13**
NEUMO BioConnect screw connection DN 50 PN 16	**P20**
NEUMO BioConnect screw connection DN 80 PN 16	**P21**
Hygienic process connections special versions	
DRD Flange D = 65 mm DN 50 PN 40	**Q00**
SMS - threaded socket 1" PN 40 (R_a < 0.8 µm)	**Q10**
SMS - threaded socket 1½" PN 40 (R_a < 0.76 µm)	**Q11**
SMS - threaded socket 2" PN 25 (R_a < 0.76 µm)	**Q12**
Ingold socket DN 25 with union nut G1¼" PN 10	**Q20**
Connections for pulp ans paper industry	
Process connection PMC-Style Standard	**R00**
Process connection PMC-Style Minibolt	**R01**
Threatet connector	
External thread G ¾-A DIN 3852	**R10**
External thread G 1-A DIN 3852	**R11**
External thread G 1½-A DIN 3852	**R12**
External thread G 2-A DIN 3852	**R13**
External thread G 1/2 ISO 228-1	**R15**
External thread G 1 ISO 228-1	**R16**
External thread 1-11.5 NPT	**R17**
External thread 1½-11.5 NPT	**R18**
External thread 2-11.5 NPT	**R19**

Optionen	Order code
Device settings	
Measuring range setting: Lower range value (max. 5 characters), Upper range value (max. 5 characters), Unit (mbar, bar, kPa, MPa, psi, ...) Example: -0.5 ... 10.5 psi	**Y01**
Location designation (Tag) (stainless steel plate. device parameters. max. 32 characters)	**Y15**
Device address (PROFIBUS 1 ... 126)	**Y25**

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Selection and ordering data (continued)

Pressure transmitters with front flush metallic cell	Article No.													
SITRANS P310	7MF83	●	●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P410	7MF84	●	●	-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Technology, sensor														
Gauge pressure		4												
Absolute pressure		5												
Communication														
HART (4 ... 20 mA			0											
PROFIBUS PA			1											
Measuring cell filling														
Synthetic oil (-40 ... +105 °C)					0									
Inert liquid (-40 ... +105 °C)					1									
Neobee oil (FDA-listed) (-20 ... +105 °C)					2									
Medical white oil (FDA-listed) (-12 ... +150 °C)					3									
Dry pressure cell (-40 ... +105 °C)					7									
Maximum measuring span														
100 mbar (40.19 inH_2O)						B								
400 mbar (160.74 inH_2O)						C								
1000 mbar (481.87 inH_2O)						D								
2500 mbar (1004.66 inH_2O)						E								
5000 mbar (2009.32 inH_2O)						F								
10 bar (4018.65 inH_2O)						H								
25 bar (10046.60 inH_2O)						K								
40 bar (16074.60 inH_2O)						L								
100 bar (40186.50 inH_2O)						N								
250 bar (100466 inH_2O)						Q								
600 bar (241119 inH_2O)						S								
1000 bar (401865 inH_2O)						T								
Process connection														
Female thread M20 × 1.5							B							
Male thread G½ (DIN EN 837-1)							D							
Female thread ½-14 NPT							E							
Male thread ½-14 NPT							F							
Thread G½, inside G¼, ISO 228-1 / 316L							G							
Oval flange adapter according to IEC 61518							H							
Front-flush diaphragm (Options M-R)							K							
Wetted parts: Process connection, seal diaphragm														
Process connection: Stainless steel 316L/1.4404, Seal diaphragm: Stainless steel 316L/1.4404								0						
Non-wetted parts														
Die-cast aluminum housing									1					
Housing made of stainless steel precision casting									2					
Housing made of stainless steel precision casting electrolytically polished									6					
PBT Plastic housing									7					
Enclosure														
Single chamber device											4			
Dual chamber device											5			
Type of protection														
Without Ex												A		
Intrinsic safety												B		
Flameproof enclosure												C		
Dust ignition proof												D		
Electrical connections/cable entries														
M20 × 1.5													F	
½"-14 NPT													M	

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Selection and ordering data (continued)

Pressure transmitters with front flush metallic cell	Article No.															
SITRANS P310	7MF83	●	●	-	●	●	●	●	●	-	●	●	●	●		
SITRANS P410	7MF84	●	●	-	●	●	●	●	●	-	●	●	●	●		
Local operation/display																
Without local display (lid closed)																0
With display (lid with glass window)																2
With display with Bluetooth functionality (lid with glass window)																7

Optionen	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Cable gland PA black Ø 5 ... 9 mm, standard	**A00**
Cable gland PA black Ø 6 ... 12 mm	**A01**
Cable gland PA black Ø 10 ... 14 mm	**A02**
Cable gland PA blue Ø 5 ... 9 mm	**A03**
Cable gland PA blue Ø 6 ... 12 mm	**A04**
Cable gland PA blue Ø 10 ... 14 mm	**A05**
Cable gland stainless steel Ø 7 ... 12 mm	**A10**
Cable gland nickel-plated brass Ø 6 ... 12 mm	**A11**
Cable gland nickel-plated brass Ø 5 ... 9 mm	**A12**
Cable gland nickel-plated brass, for armored cable (Ø 9 ... 13 mm)	**A14**
2 × sealing plug M20 × 1.5	**A20**
2 × sealing plug ½-14 NPT	**A21**
HAN plugs	
HAN 7D straight	**A30**
HAN 7D angled	**A31**
HAN 8D straight	**A34**
HAN 8D angled	**A35**
M12 plugs	
M20 × 1.5 / plug M12x1, pin assignment A	**A66**
M20 × 1.5 / plug M12x1, pin assignment B	**A67**
M20 × 1.5 / plug M12x1, pin assignment C	**A68**
Certificates	
Quality inspection certificate - 5 point factory calibration (IEC 62828-1)	**C11**
Inspection certificate (EN 10204-3.1) - material of pressure-containing and wetted parts	**C12**
Factory certificate - NACE (EN 10204, NACE MR 0175)	**C13**
Factory certificate (EN 10204-2.2) - wetted parts	**C14**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
Degree of protection IP66 / IP67	**D29**
Degree of protection IP66 / IP68	**D30**
Type plate made of stainless steel	**D43**
Oil and grease-free (incl. 3.1 Inspection certificate)	**D61**
Oil and grease-free for oxygen (incl. 3.1 Inspection certificate)	**D62**
Overvoltage protection	**D72**
General approval without Ex approval	
General approval without Ex approval: World (CE) except: CSA	**E00**
General approval without Ex approval: World (CE, CSA)	**E01**
General approval without Ex approval: CSA (USA & Canada)	**E06**

Optionen	Order code
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA & Canada)	**E21**
IECEx (World)	**E23**
NEPSI (China)	**E27**
Country specific approvals	
WHG overfill protection for flammable and non-flammable liquids	**E61**
Flanges according to DIN EN 1092-1 Form B1 and ASME Standard B16.5	
Flange EN 1092-1 Form B1 DN 25 PN 40	**M00**
Flange EN 1092-1 Form B1 DN 40 PN 40	**M01**
Flange EN 1092-1 Form B1 DN 50 PN 40	**M02**
Flange EN 1092-1 Form B1 DN 80 PN 40	**M03**
Flange EN 1092-1 Form B1 DN 25 PN 100	**M04**
Flange EN 1092-1 Form B1 DN 50 PN 100	**M05**
ASME Flange B16.5 1" Class 150 RF	**M32**
ASME Flange B16.5 1½" Class 150 RF	**M33**
ASME Flange B16.5 2" Class 150 RF	**M34**
ASME Flange B16.5 3" Class 150 RF	**M35**
ASME Flange B16.5 4" Class 150 RF	**M36**
ASME Flange B16.5 1" Class 300 RF	**M37**
ASME Flange B16.5 1½" Class 300 RF	**M38**
ASME Flange B16.5 2" Class 300 RF	**M39**
ASME Flange B16.5 3" Class 300 RF	**M40**
ASME Flange B16.5 4" Class 300 RF	**M41**
Hygienic process connections according to standards	
Hygienic flange DIN 11851 with slotted union nut DN 25 PN 40	**N00**
Hygienic flange DIN 11851 with slotted union nut DN 32 PN 40	**N01**
Hygienic flange DIN 11851 with slotted union nut DN 40 PN 40	**N02**
Hygienic flange DIN 11851 with slotted union nut DN 50 PN 25	**N03**
Hygienic flange DIN 11851 with slotted union nut DN 65 PN 25	**N04**
Hygienic flange DIN 11851 with slotted union nut DN 80 PN 25	**N05**
Tri-Clamp DIN 32676 DN 65 PN 16 (R_a < 0.76 µm)	**N15**
Tri-Clamp DIN 32676 DN 80 PN 10 (R_a < 0.76 µm)	**N16**
Tri-Clamp ISO 2852 1½" PN 40 (R_a < 0.76 µm)	**N25**
Tri-Clamp ISO 2852 2" PN 16 (R_a < 0.76 µm)	**N26**
Tri-Clamp ISO 2852 3" PN 16 (R_a < 0.76 µm)	**N27**
Tri-Clamp ISO 2852 4" PN 10, 1.4435(R_a < 0.38 µm)	**N28**
Aseptic threaded socket DIN 11864-1 Form A DN 40 PN 40 (R_a < 0.8 µm)	**N31**
Aseptic threaded socket DIN 11864-1 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N32**

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Selection and ordering data (continued)

Optionen	Order code
Aseptic flange with notch DIN 11864-2 Form A DN 32 PN 25 (R_a < 0.8 µm)	**N41**
Aseptic flange with notch DIN 11864-2 Form A DN 40 PN 25 (R_a < 0.8 µm)	**N42**
Aseptic flange with notch DIN 11864-2 Form A DN 50 PN 16 (R_a < 0.8 µm)	**N43**
Aseptic flange with notch DIN 11864-2 Form A DN 65 PN 16 (R_a < 0.8 µm)	**N44**
Aseptic flange with notch DIN 11864-2 Form A DN 80 PN 16 (R_a < 0.8 µm)	**N45**
Aseptic clamp with groove DIN 11864-3 Form A DN 40 PN 40 (R_a < 0.38 µm)	**N51**
Aseptic clamp with groove DIN 11864-3 Form A DN 50 PN 25 (R_a < 0.8 µm)	**N52**
Hygienic process connections manufacturer-specific	
Varivent Type F for pipes DN 25 - DN 32 PN 40	**P01**
Varivent Type N for pipes DN 40 - DN 125 PN 25	**P02**
NEUMO BioControl flange DN 50 PN 16	**P11**
NEUMO BioControl flange DN 65 PN 16	**P12**
NEUMO BioControl flange DN 80 PN 16	**P13**
Hygienic process connections special versions	
DRD Flange D = 65 mm DN 50 PN 40	**Q00**
SMS - threaded socket 1½" PN 40	**Q11**
SMS - threaded socket 2" PN 25	**Q12**
SMS - threaded socket 2½" PN 25	**Q13**
SMS - threaded socket 3" PN 25	**Q14**
Connections for pulp ans paper industry	
Process connection PMC-Style Standard	**R00**
Threatet connector	
External thread G 1½-A DIN 3852	**R12**
External thread G 2-A DIN 3852	**R13**
External thread G 1 ISO 228-1	**R16**
External thread 1½-11.5 NPT	**R18**
External thread 2-11.5 NPT	**R19**
Special options front-flush	
High temperature with screening shield (-12 ... +200 °C)	**R85**
Device settings	
Measuring range setting: Lower range value (max. 5 characters), Upper range value (max. 5 characters), Unit (mbar, bar, kPa, MPa, psi, ...) Example: -0.5 ... 10.5 psi	**Y01**
Location designation (Tag) (stainless steel plate. device parameters. max. 32 characters)	**Y15**
Device address (PROFIBUS 1 ... 126)	**Y25**

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Technical specifications

SITRANS P310/P410 Front flush ceramic DPC

Input	
Gauge pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +25 mbar 0 ... +2.5 kPa 0 ... +0.4 psi	-50 mbar ... +5 bar -5 ... +<500 kPa -0.7 ... +75 psi
0 ... +100 mbar 0 ... +10 kPA 0 ... +1.5 psi	-200 mbar ... +15 bar -20 ... +1500 kPa -3 ... +225 psi
0 ... +0.4 bar 0 ... +40 kPa 0 ... +5 psi	-0.8 ... +30 bar -80 ... +3000 kPa -11.50 ... +375 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +65 bar -100 ... +6500 kPa -14.51 ... +975 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +90 bar -100 ... +9000 kPa -14.51 ... +1350 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +125 bar -100 ... +12500 kPa -14.51 ... +1900 psi
0 ... +60 bar 0 ... +6000 kPa 0 ... +900 psi	-1 ... +200 bar -100 ... +20000 kPa -14.50 ... +2900 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450 psi	-1 ... +200 bar -100 ... +20000 kPa -14.51 ... +2900 psi
Measuring limits	
Lower measuring limits	For 25 mbar measuring cells, the lower measuring limit is 975 mbar abs For 100 mbar measuring cells, the lower measuring limit is 900 mbar abs For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +100 mbar 0 ... +10 kPa 0 ... +1.5 psi	-1 ... +15 bar -100 ... +1500 kPa -14.51 ... +225 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +65 bar -100 ... +6500 kPa -14.51 ... +975 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +90 bar -100 ... +9000 kPa -14.51 ... +1350 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +125 bar -100 ... +12500 kPa -14.51 ... +1900 psi
0 ... +60 bar 0 ... +6000 kPa 0 ... +900 psi	-1 ... +200 bar -100 ... +20000 kPa -14.50 ... +2900 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450.38 psi	0 ... +200 bar 0 ... +20000 kPa 0 ... +2900 psi

Input	
Adjustment	
Min./max. adjustment, percentage value	-10 ... 110%
Min./max. adjustment, pressure value	-20 ... 120%
Zero adjustment	-20 ... +95%
Span adjustment	-120 ... +120%
Max. zero/span difference	120% of nominal range
Adjustable pressure values	Values below -1 bar cannot be set

[1] The burst pressure depends on the process connection and is therefore not specified here.

Output		
Output 4 ... 20 mA HART		
Output signal max. range	3.8 ... 20.5 mA/HART	Factory setup
Lower saturation limit	3.6 mA	
Upper saturation limit	21.5 mA	
Failure mode	≤ 3.6 mA	
Failure mode max.	≥ 21 mA	Adjustable
Signal resolution	0.3 µA	
Load calculation	(U_B - U_{min})/0.022 A	Example – at U_B = 24 V DC: (24 V – 9.6 V) / 0.022 A = 655 Ω
Starting current	≤ 10 mA for 5 ms after switch-on, ≤ 3.6 mA	
Protection against polarity reversal	Yes	
Electrical damping (63% of the input value)	0 ... 999 s	Adjustable
Adjustment ranges and output behavior		
Parameter	**Technical data / Note**	
Max. permissible turn down	Unlimited; recommended 20:1	
Fault signal, adjustable	≤ 3.6 mA; ≥ 21 mA; last measured value	

Measuring accuracy		
Measurement error Values are valid for single transmitter		
Measuring range	> 25 mbar	
Measuring accuracy 0.1%	< 0.1%	1:1 until 1:5 > 25 mbar
	< 0.02% × TD	TD > 5:1
Measuring accuracy 0.05% - optional	< 0.05%	1:1 until 1:5
	< 0.01% × TD	TD > 5:1
Measuring range	0 ... 25 mbar and -25 ... 25 mbar	
Measuring accuracy 0.1%	< 0.1%	
Measuring accuracy 0.05% - optional	< 0.05%	

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Technical specifications (continued)

Measuring accuracy			
Reference conditions			
Conditions and stability			
Reference temperature	+15 ... +25 °C (59 ... 77 °F)		
Relative humidity	45 ... 75%		
Air pressure	860 ... 1060 mbar / 86 ... 106 kPa		
Characteristic determination	Limit point adjustment according to IEC 61298-2		
Characteristic curve	Linear		
Reference installation position	Upright, diaphragm points downward		
Influence of installation position	< 0.2 mbar / 20 Pa		
EMC influence on current output	< ±150 µA under strong high-frequency electromagnetic fields according to EN 61326-1		
Long-term stability			
	Measuring cell Ø 28 mm, at 0.1 bar	**Measuring cell Ø 28 mm, measuring range 0.025 bar**	**Measuring cell Ø 17.5 mm**
1 year	< 0.05% × TD	< 0.1% × TD	< 0.1% × TD
5 years	< 0.1% × TD	< 0.2% × TD	< 0.2% × TD
10 years	< 0.15% × TD	< 0.4% × TD	< 0.4% × TD
Temperature behavior			
Temperature influence			
Climate-compensated temperature range	0 ... +100 °C (32 ... 212 °F)		
Uncompensated temperature range	-40 ... 0 °C (-40 ... 32 °F) and +100 ... +130 °C (212 ... 266 °F)		
Turn-down factor	FTD = 0.5 × TD + 0.5		
Thermal change in current output	< 0.05% for 10 K		
Maximum thermal change in current output	< 0.15% for -40 ... +80 °C (-40 ... 176 °F)		

Operating conditions			
Ambient temperature			
Standard	-40 ... +80 °C (-40 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Storage temperature			
Standard	-60 ... +80 °C (-67 ... 176 °F)		
PUR cable	-20 ... +80 °C (-4 ... 176 °F)		
PE cable	-20 ... +60 °C (-4 ... 140 °F)		
Process temperature stainless steel connections			
Sealing material	**Type**	**Standard**	**Extended temperature range**
FKM	VP2/A	-20 ... +130 °C (-4 ... 266 °F)	-20 ... +150 °C (-4 ... 302 °F)
FKM	A+P 70.16	-40 ... +130 °C (-40 ... 266 °F)	Not specified
FKM	V70SW	Not specified	-10 ... +150 °C (14 ... 302 °F)
EPDM	A+P 70.10-02	-40 ... +130 °C (-40 ... 266 °F)	-40 ... +150 °C (-40 ... 302 °F)
EPDM	E70Q	Not specified	-40 ... +150 °C (-40 ... 302 °F)
EPDM	Fluoraz SD890	-5 ... +130 °C (23 ... 266 °F)	Not specified
FFKM	Kalrez 6375	-20 ... +130 °C (-4 ... 266 °F)	-20 ... +150 °C (-4 ... 302 °F)
FFKM	Perlast G74S	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
FFKM	Perlast G75B	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
FFKM	Perlast G92E	-15 ... +130 °C (5 ...266 °F)	-15 ... +150 °C (5 ... 302 °F)
Mechanical stress			
Vibration resistance, standard	4 g at 5 ... 200 Hz according to EN 60068-2-6		
Shock resistance, standard	50 g, 2.3 ms according to EN 60068-2-27		
Degree of protection			
Housing material	**Version**	**Protection according to IEC 60529**	**NEMA**
Plastic	Single chamber / double chamber	IP66/IP67	Type 4X
Aluminium	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P
Stainless steel, electropolished	Single chamber	IP66/IP67	Type 4X
Stainless steel, precision casting	Single chamber / double chamber	IP66/IP67; IP66/IP68 (0.2 bar)	Type 4X; Type 6P

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Technical specifications (continued)

Structural design	
Material and transmitter specification	
Weight (without options)	0.8 ... 8 kg depending on process connection and housing
Enclosure material	PBT-Kunststoff, Aluminium AlSi10Mg or 316L
Housing materials	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Cable gland materials	PA; stainless steel; brass
Wetted parts materials	
Process fitting	316L
Diaphragm materials	Sapphire ceramic®, > 99.9% Al_2O_3
Joining material of the measuring cell	Glass (not in contact with medium with double or form sealing)
Standard measuring cell seal	FKM, EPDM or FFKM
Process connection	
Surface quality, hygienic process fittings	R_a < 0.8 µm
Diaphragm	R_a < 0.5 µm
Electrical connection and electromechanical data	
Parameter	**Technical data**
Cable entry / gland / blind plug	M20 × 1.5; ½ NPT
Solid or stranded wire cross-section	0.2 ... 2.5 mm², AWG 24 ... 14
Stranded wire with end sleeve	0.2 ... 1.5 mm², AWG 24 ... 16
Connection between primary and secondary device	
Data transfer	Digital (I^2C-Bus)
Cable length	between 5 m and 70 m
Connection cable minimum bending radius at 25 °C (77 °F)	25 mm
Connection cable wire cross-section	0.34 mm², (AWG 22)
Connection cable wire resistance	< 0.05 ohm/m

Power supply		
Supply voltage and electrical data		
Power supply U_H (Master only)		
Terminal voltage on transmitter - U_B	9.6 ... 35 V DC	
Terminal voltage on transmitter light switched on - U_B	16 ... 35 V DC	
Permissible residual ripple	U_N 12 V DC (9.6 V < U_B < 18 V)	≤ 0.7 V_{eff} (16 ... 400 Hz)
	U_N 24 V DC (18 V < U_B < 35 V)	≤ 1 V_{eff} (16 ... 400 Hz)
Start-up time at U_B ≥ 12 V DC	≤ 9 s	
Start-up time at U_B < 12 V DC	≤ 22 s	
Reverse polarity protection	Yes	
Galvanic separation	Reference voltage 500 V AC	

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
SIL	
SIL 2/3	according to IEC 61508
Drinking water	
WHG	No.: Z-65.11-644
Explosion protection as per ATEX	TÜV 26 ATEX 423318 X
Intrinsic safety "i"	
Marking, intrinsic safety	II 1/2 G Ex ia IIC T6...T1 Ga/Gb
Permissible ambient temperature	-50 ... +70 °C (-58 ... 158 °F) for T5 -50 ... +39 °C (-58 ... 102 °F) for T6

Certificates and approvals	
Permissible medium temperature	-20 ... +60 °C (-4 ... 140 °F) for T5 -20 ... +23 °C (-4 ... 73.4 °F) for T6
Connection	To certified intrinsically safe circuits with peak values:
HART	U_i = 30 V, I_i = 131 mA, P_i = 983 mW
Profibus (FISCO)	U_i = 17.5 V, I_i = 500 mA, P_i = 5.5 W
Profibus (Barrier)	U_i = 24 V, I_i = 250 mA, P_i = 1.2 W

Communication	
HART	
Protocol	7.3
Profibus PA	
Output signal	Digital output signal, Profibus protocol
Transmission rate	31.25 Kbit/s
Instrument address	126 (default setting)
Damping (63% of the input variable)	0 ... 999 s, adjustable
Profibus PA profile	3.02
Number of FBs with AI (function blocks with analogue input)	3
Bluetooth	
Max. participants	1
Bluetooth standard	Bluetooth 5.x
Effective range	Typically 30 m (98 ft)
The Bluetooth range depends on the local conditions.	

SITRANS P310/P410 Front flush metal cell

Input for Piezo-/DMS measuring cell	
Gauge pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.4 bar 0 ... +40 kPa 0 ... +5.8 psi	-1 ... +1.2 bar -100 ... +120 kPa -14.50 ... +17.4 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +14.50 psi	-1 ... +3 bar -100 ... +300 kPa -14.50 ... +43.5 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +36.26 psi	-1 ... +7.5 bar -100 ... +750 kPa -14.50 ... +108.8 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +72.52 psi	-1 ... +15 bar -100 ... +1500 kPa -14.50 ... +217 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +145.04 psi	-1 ... +30 bar -100 ... +3000 kPa -14.50 ... +435 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +362.59 psi	-1 ... +75 bar -100 ... +7500 kPa -14.50 ... +1087 psi
0 ... +40 bar 0 ... +4000 kPa 0 ... +580.15 psi	-1 ... +120 bar -100 ... +12000 kPa -14.50 ... +1740 psi
0 ... +100 bar 0 ... +10000 kPa 0 ... +1450 psi	-1 ... +200 bar -100 ... +20000 kPa -14.51 ... +2900 psi
0 ... +250 bar 0 ... +25000 kPa 0 ... +3625.94 psi	-1 ... +500 bar -100 ... +50000 kPa -14.50 ... +7251.89 psi
0 ... +600 bar 0 ... +60000 kPa 0 ... +8702.26 psi	-1 ... +1200 bar -100 ... +120000 kPa -14.50 ... +17405 psi
0 ... 1000 bar 0 ... 100 MPa 0 ... 14500 psi	-1 ... +1500 bar -100 ... +150000 kPa -14.50 ... +21756 psi
Measuring limits	
Lower measuring limits	For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1)]	
Measuring span	**Minimum and maximum pressure**

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Technical specifications (continued)

Input for Piezo-/DMS measuring cell	
0 ... +1 bar abs 0 ... +100 kPa abs 0 ... +14.50 psi abs	0 ... +3 bar abs 0 ... +300 kPa abs 0 ... +43.5 psi abs
0 ... +2.5 bar abs 0 ... +250 kPa abs 0 ... +36.26 psi abs	0 ... +7.5 bar abs 0 ... +750 kPa abs 0 ... +108.8 psi abs
0 ... +10 bar abs 0 ... +1000 kPa abs 0 ... +145.04 psi abs	0 ... +30 bar abs 0 ... +3000 kPa abs 0 ... +435 psi abs
0 ... +25 bar abs 0 ... +2500 kPa abs 0 ... +362.59 psi abs	0 ... +75 bar abs 0 ... +7500 kPa abs 0 ... +1087 psi abs
0 ... +40 bar abs 0 ... +4000 kPa abs 0 ... +580.15 psi abs	0 ... +120 bar abs 0 ... +12000 kPa abs 0 ... +1740 psi abs

1) The burst pressure depends on the process connection and is therefore not specified here.

Input for ceramic/metallic measuring cell	
Gauge pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +0.1 bar 0 ... +10 kPa 0 ... +1.5 psi	-1 ... +15 bar -100 ... +1500 kPa -14.51 ... +225 psi
0 ... +0.4bar 0 ... +40 kPa 0 ... +5 psi	-1 ... +30 bar -100 ... +3000 kPa -14.51 ... +375 psi
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +5 bar 0 ... +500 kPa 0 ... +75 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
Measuring limits	
Lower measuring limits	For 100 mbar measuring cells, the lower measuring limit is 900 mbar abs For 400 mbar measuring cells, the lower measuring limit is 600 mbar abs
Absolute pressure: Measuring range and permissible pressure[1]	
Measuring span	**Minimum and maximum pressure**
0 ... +1 bar 0 ... +100 kPa 0 ... +15 psi	-1 ... +35 bar -100 ... +3500 kPa -14.51 ... +525 psi
0 ... +2.5 bar 0 ... +250 kPa 0 ... +30 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +10 bar 0 ... +1000 kPa 0 ... +150 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
0 ... +25 bar 0 ... +2500 kPa 0 ... +300 psi	-1 ... +50 bar -100 ... +5000 kPa -14.51 ... +725 psi
Adjustment	
Min./max. adjustment, percentage value	-10 ... 110%
Min./max. adjustment, pressure value	-20 ... 120%
Zero adjustment	-20 ... +95%
Span adjustment	-120 ... +120%
Max. zero/span difference	120% of nominal range
Adjustable pressure values	Values below -1 bar cannot be set
Measuring cell concept	
For measuring ranges up to 40 bar	Piezoresistive sensor element with internal isolating liquid

Input for ceramic/metallic measuring cell	
For measuring ranges above 100 bar	Strain gauge (DMS) sensor element (dry system)
For measuring ranges ≤ 400 mbar or higher temperature ranges	Ceramic/ metallic measuring cell

1) The burst pressure depends on the process connection and is therefore not specified here.

Output		
Output 4 ... 20 mA		
Output signal max. range	3.8 ... 20.5 mA/HART	Factory setup
Lower saturation limit	3.6 mA	
Upper saturation limit	21.5 mA	
Failure mode	≤ 3.6 mA	
Failure mode max.	≥ 21 mA	Adjustable
Signal resolution	0.3 µA	
Load calculation	(U_B - U_{min})/0.022 A	Example – at U_B = 24 V DC: (24 V – 9.6 V) / 0.022 A = 655 Ω
Starting current	≤ 10 mA for 5 ms after switch-on, ≤ 3.6 mA	
Protection against polarity reversal	Yes	
Electrical damping (63% of the input value)	0 ... 999 s	Adjustable
Adjustment ranges and output behavior		
Parameter	**Technical data / Note**	
Max. permissible turn down	Unlimited; recommended 20:1	
Fault signal, adjustable	≤ 3.6 mA; ≥ 21 mA; last measured value	

Measuring accuracy		
Measurement error and reference conditions Values are valid for single transmitter		
Measuring accuracy (Turn-down)		
0.1%	< 0.1% < 0.002% × TD	1:1 until 1:5 TD > 5:1
0.075%	< 0.075% < 0.0015% × TD	1:1 until 1:5 TD > 5:1
Long-term stability DMS measuring cell	Measuring range > 1 bar	< 0.1% × TD/year
Piezoresistive measuring cell	Measuring range > 1 bar	< 0.1% × TD/year
Measuring range 1 bar	< 0.15% × TD/year	
Measuring range 0.4 bar	< 0.35% × TD/year	
Conditions and stability		
Reference temperature	+18 ... +30 °C (64.4 ...86 °F)	
Relative humidity	45 ... 75%	
Air pressure	860 ... 1060 mbar / 86 ... 106 kPa	
Characteristic determination	Limit point adjustment according to IEC 61298-2	
Characteristic curve	Linear	
Reference installation position	Upright, diaphragm points downward	
Influence of installation position	Piezoresistive/DMS cell	depending on process connection and diaphragm seal
	Ceramic/metal cell	< 5 mbar/0.5 kPa (0.07 psig)
EMC influence on current output	< ±150 µA under strong high-frequency electromagnetic fields according to EN 61326-1	

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Technical specifications (continued)

Operating conditions					
Ambient temperature	Observe the temperature class in hazardous areas.				
Standard	-40 ... +80 °C (-40 ... 176 °F)				
PUR cable	-20 ... +80 °C (-4 ... 176 °F)				
PE cable	-20 ... +60 °C (-4 ... 140 °F)				
Storage temperature					
Standard	-60 ... +80 °C (-76 ... 176 °F)				
PUR cable	-20 ... +80 °C (-4 ... 176 °F)				
PE cable	-20 ... +60 °C (-4 ... 140 °F)				
Process temperature piezoresistive/DMS measuring cell					
Process temperature					
Seal	**Standard**	**Extended temperature range**	**Hygienic process connections**		**Oxygen applications**
	Pabs ≥ 1 mbar		Pabs ≥ 1 mbar	Pabs ≥ 10 mbar	Pabs ≥ 10 mbar
Without regard to the seal	-20/-40 ... +105 °C (-4/-40 ... +221 °F)	-	-	-	-20 ... +60 °C (-4 ... +140 °F)
FKM (VP2/A)	-20 ... +105 °C (-4 ... +221 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +85 °C (-4 ... +185 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +60 °C (-4 ... +140 °F)
EPDM (A+P 70.10-02)	-20 ... +105 °C (-4 ... +221 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +85 °C (-4 ... +185 °F)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +60 °C (-4 ... +140 °F)
FFKM (Perlast G74S)	-15 ... +105 °C (+5 ... +221 °F)	-15 ... +150 °C (+5 ... +302 °F)	-15 ... +85 °C (+5 ... +185 °F)	-15 ... +150 °C (+5 ... +302 °F)	-15 ... +60 °C (+5 ... +140 °F)
FEPM (Fluoraz SD890)	-5 ... +105 °C (+23 ... +221 °F)	-	-	-	-5 ... +60 °C (+23 ... +140 °F)
Process temperature ceramic/metal measuring cell					
	Pabs ≥ 50 mbar	**Pabs ≥ 10 mbar**	**Pabs ≥ 10 mbar**		
Standard	-12 ... +150 °C (+10 ... +284 °F)	-12 ... +150 °C (+10 ... +284 °F)	-12 ... +120 °C (+10 ... +248 °F)		
Extended temperature range	-12 ... +180 °C (+10 ... +284 °F)	-12 ... +160 °C (+10 ... +320 °F)	-12 ... +120 °C (+10 ... +248 °F)		
	-12 ... +200 °C (+10 ... +392 °F)	-12 ... +160 °C (+10 ... +320 °F)	-12 ... +120 °C (+10 ... +248 °F)		
Mechanical stress					
Parameter	**Technical data**				
	Without cooling section		**With cooling section**		
	All enclosure	**Two chamber stainless steel**	**All enclosure**	**Two chambers stainless steel**	
Vibration resistance 5 ... 200 Hz according to EN 60068-2-6	4 g	0.7 g	4 g	0.7 g	
Shock resistance 2.3 ms according to EN 60068-2-27	50 g	50 g	50 g	20 g	
Degree of protection					
Housing material	**Version**		**Protection according to IEC 60529**		**NEMA**
Plastic	Single chamber / double chamber		IP66/IP67		Type 4X
Aluminium	Single chamber / double chamber		IP66/IP67; IP66/IP68 (0.2 bar)		Type 4X; Type 6P
Stainless steel, electropolished	Single chamber		IP66/IP67/IP69		Type 4X
Stainless steel, precision casting	Single chamber / double chamber		IP66/IP67; IP66/IP68 (0.2 bar)		Type 6P

Structural design	
Material and transmitter specification	
Weight (without options)	0.8 ... 8 kg depending on process connection and housing
Enclosure material	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Housing materials	PBT plastic; aluminium AlSi10Mg, powder coated; 316L
Cable gland materials	PA; stainless steel; brass
Wetted parts materials	
Process fitting	
Diaphragm materials	316L
Seal for G½ (EN 837), G1½ (DIN 3852-A)	Klingersil C-4400

Structural design	
Process connection	
Surface quality, hygienic process fittings	R_a < 0.8 µm, typical
Diaphragm	316L
Electrical connection and electromechanical data	
Parameter	**Technical data**
Cable entry / gland / blind plug	M20 × 1.5; ½ NPT
Solid or stranded wire cross-section	0.2 ... 2.5 mm², AWG 24 ... 14
Stranded wire with end sleeve	0.2 ... 1.5 mm², AWG 24 ... 16

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Technical specifications (continued)

Power supply		
Supply voltage and electrical data		
Power supply U_H (Master only)		
Terminal voltage on transmitter - U_B	9.6 ... 35 V DC	
Terminal voltage on transmitter light switched on - U_B	16 ... 35 V DC	
Permissible residual ripple	U_N 12 V DC (9.6 V < U_B < 18 V)	≤ 0.7 V_{eff} (16 ... 400 Hz)
	U_N 24 V DC (18 V < U_B < 35 V)	≤ 1 V_{eff} (16 ... 400 Hz)
Start-up time at U_B ≥ 12 V DC	≤ 9 s	
Start-up time at U_B < 12 V DC	≤ 22 s	
Reverse polarity protection	Yes	
Galvanic separation	Reference voltage 500 V AC	

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
SIL	
SIL 2/3	according to 61508
Drinking water	
WHG	No.: Z-65.11-644
Explosion protection as per ATEX	TÜV 26 ATEX 423318 X
Intrinsic safety "i"	
Marking, intrinsic safety	II 1/2 G Ex ia IIC T6...T1 Ga/Gb
Permissible ambient temperature	-50 ... +70 °C (-58 ... 158 °F) for T5 -50 ... +39 °C (-58 ... 102 °F) for T6
Permissible medium temperature	-20 ... +60 °C (-4 ... 140 °F) for T5 -20 ... +23 °C (-4 ... 73.4 °F) for T6
Connection	To certified intrinsically safe circuits with peak values:

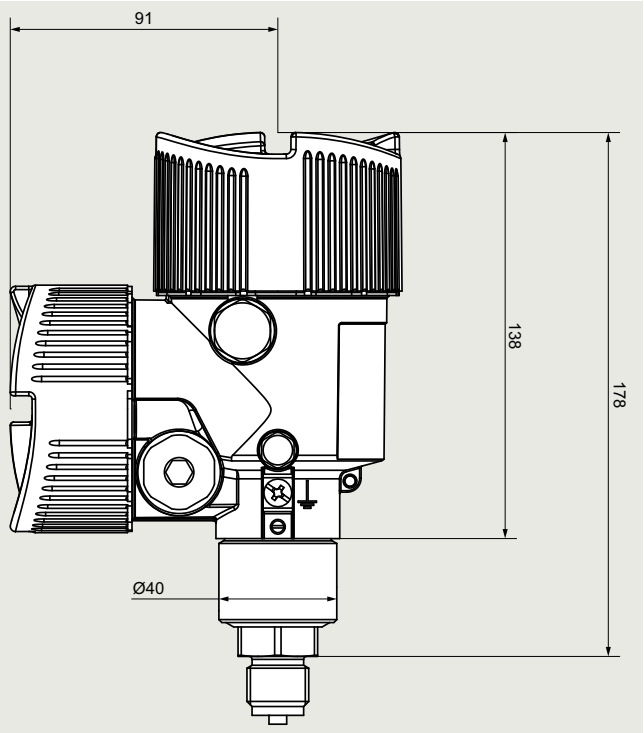
Certificates and approvals	
HART	U_i = 30 V, I_i = 131 mA, P_i = 983 mW
Profibus (FISCO)	U_i = 17.5 V, I_i = 500 mA, P_i = 5.5 W
Profibus (Barrier)	U_i = 24 V, I_i = 250 mA, P_i = 1.2 W

Communication	
HART	
Protocol	7.3
Profibus PA	
Output signal	Digital output signal, Profibus protocol
Transmission rate	31.25 Kbit/s
Instrument address	126 (default setting)
Damping (63% of the input variable)	0 ... 999 s, adjustable
Profibus PA profile	3.02
Number of FBs with AI (function blocks with analogue input)	3
Bluetooth	
Max. participants	1
Bluetooth standard	Bluetooth 5.x
Effective range	Typically 30 m (98 ft)
The Bluetooth range depends on the local conditions.	

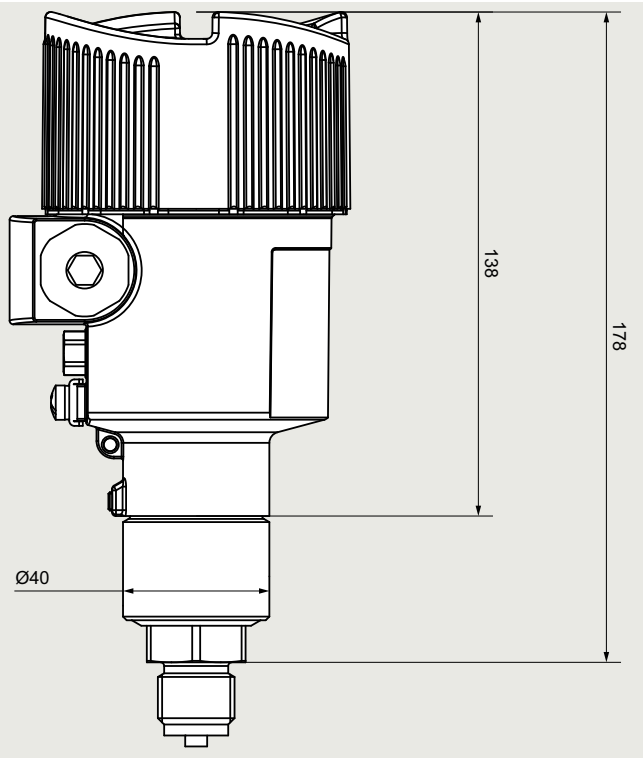
[1] The burst pressure depends on the process connection and is therefore not specified here.

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Dimensional drawings

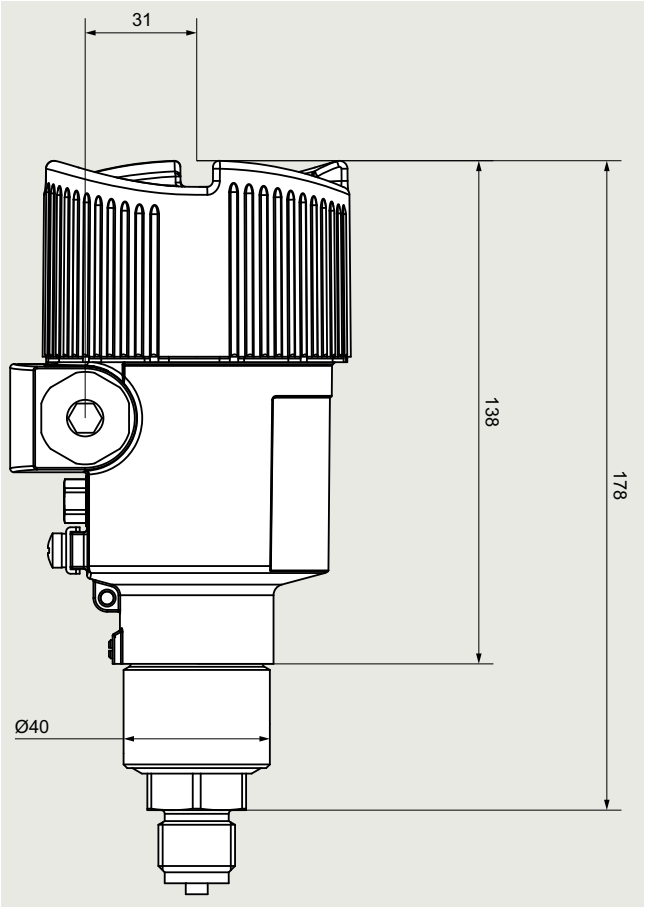


SITRANS P310/P410 aluminium dual chamber housing



SITRANS P310/P410 aluminium single chamber housing

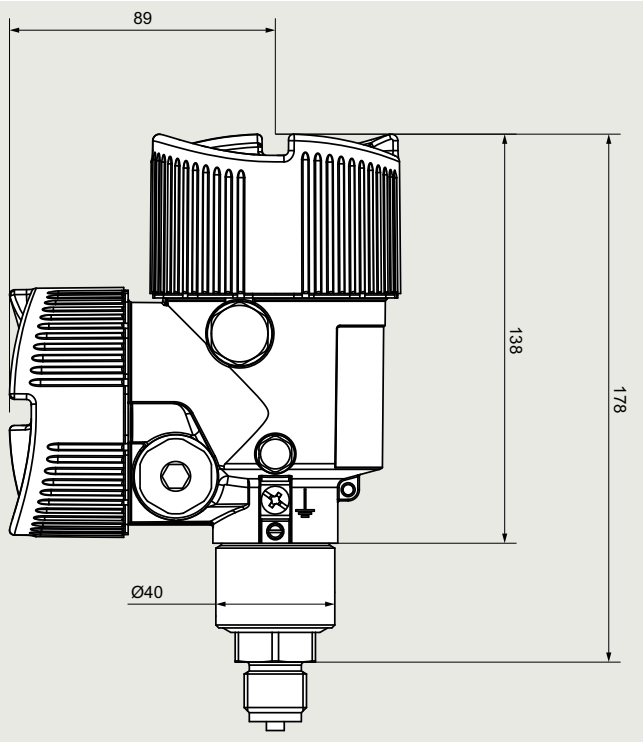
Dimensional drawings (continued)



SITRANS P310/P410 stainless steel single chamber housing

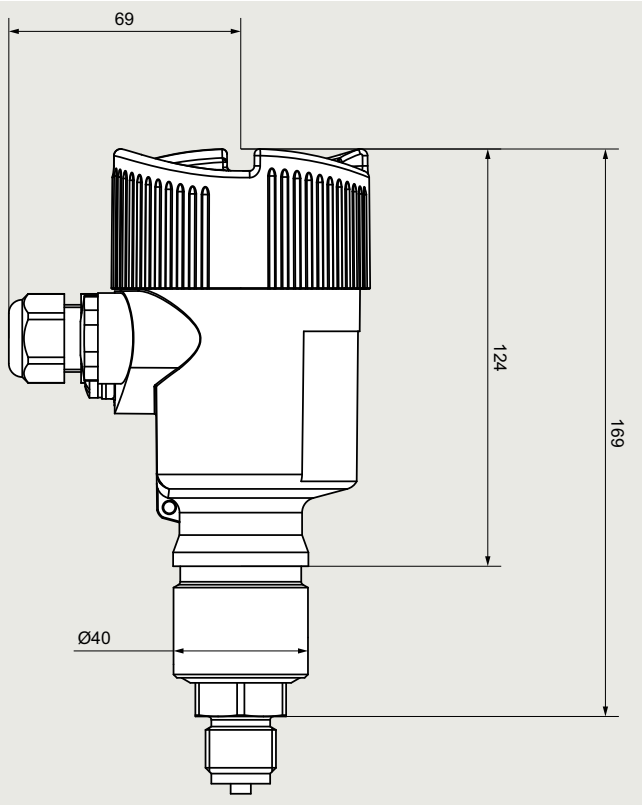
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Dimensional drawings (continued)



SITRANS P310/P410 stainless steel dual chamber housing

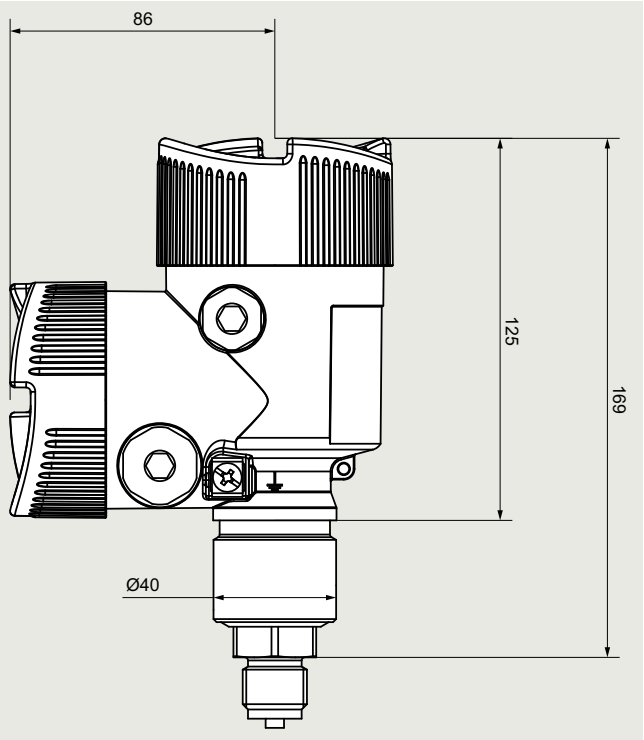
Dimensional drawings (continued)



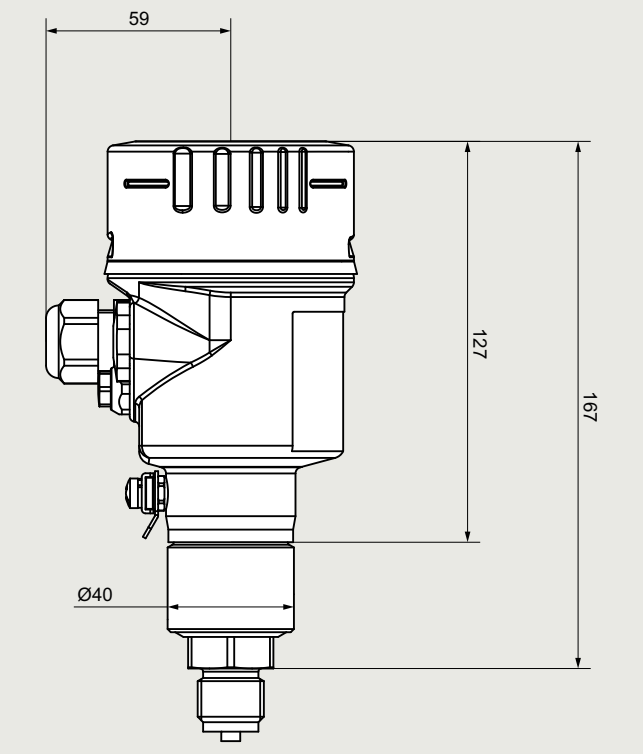
SITRANS P310/P410 plastic single chamber housing

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Dimensional drawings (continued)



SITRANS P310/P410 plastic dual chamber housing



SITRANS P310/P410 electropolished stainless steel housing

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Overview

SITRANS P320/P420 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume flow
- Mass flow

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Overview



SITRANS P320/P420 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameter assignment is performed using input buttons or the HART interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very user-friendly in spite of the numerous setting options.

Due to their advanced diagnostic functionalities according to NAMUR NE107, the SITRANS P320/P420 pressure transmitters are very suitable for use in chemical plants. Thanks to the advanced diagnostic functions and the process value storage, the SITRANS P420 is "Ready for Digitalization".

The "Remote Safety Handling" function saves customers significant amounts of time and money, because the SIL function can be switched on and validated remotely via SIMATIC PDM. This eliminates travel times and on-site operation via the local display or keyboard.

Parameter assignment using the HART protocol is very easy and quick thanks to the innovative EDD with integrated Quick Start wizard.

The pressure transmitters can be equipped with various types of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P320/P420 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume flow
- Mass flow

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Benefits

- Diagnostic functions in accordance with NAMUR recommendation NE107
- SIL devices developed according to IEC 61508
- SIL validation on the device or remotely with SIMATIC PDM
- Reduction of internal inductance for Ex applications to LI = 0
- Step response time for pressure type T63 = 105 ms and for differential pressure type 135 ms.
- Minimal conformity error
- Very low temperature influence
- Very good long-term stability
- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For corrosive and non-corrosive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Wetted parts made of high-grade materials (e.g., stainless steel, alloy, gold, Monel, tantalum)
- Infinitely adjustable spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi)
- Convenient parameterization over 4 input buttons and HART interface

Application

SITRANS P320/P420 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads.

The pressure transmitters can be used in zone 1 or zone 0 with the corresponding Ex approval.

The pressure transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 4 input buttons or programmed externally over HART interface.

Pressure transmitters for gauge pressure

Measured variable:

- Gauge pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for absolute pressure

Measured variable:

- Absolute pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 8.3 mbar a to 160 bar a (0.12 to 2 321 psi a)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for differential pressure and flow

Measured variables:

- Differential pressure
- Small positive or negative overpressure
- Flow $q \sim \sqrt{\Delta p}$ (together with a primary differential pressure transducer (see section "Flowmeters"))

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 1 mbar to 160 bar (0.0145 to 2 321 psi)

Pressure transmitters for level

Measured variable:

- Level of corrosive and non-corrosive liquids in open and closed vessels.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

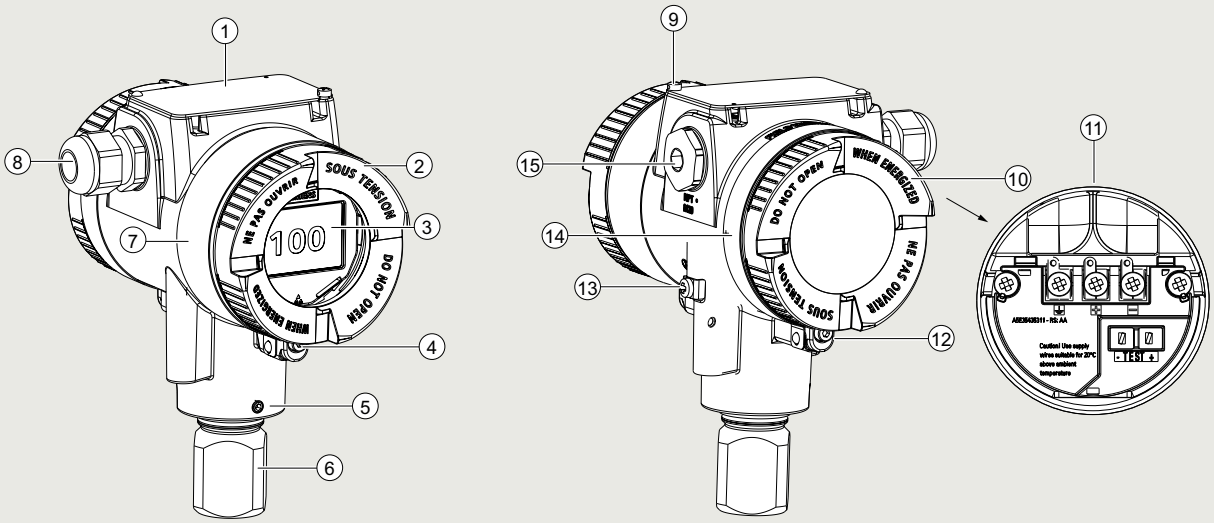
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Application (continued)

- EN 1092-1 flanges
- ASME B16.5 flanges
- J.I.S. flanges
- Diverse range of sealing surface forms available

Design

Depending on the customer-specific order, the device comprises different parts.



1. Cover over buttons and nameplate with general information
2. Cover (front) with glass pane (optional)
3. Display (optional)
4. Safety catch (front)
5. Locking screw for locking the enclosure
6. Process connection
7. Approval label with approval information
8. Cable inlet, optionally with cable gland
9. Locking screw for the cover over the buttons
10. Cover (rear) for electrical terminal compartment
11. Electrical terminal compartment
12. Safety catch (back)
13. Ground terminal
14. Nameplate with information on the remote seal
15. Blanking plug

Device front view

- The electronics enclosure is made of die-cast aluminum or stainless steel investment casting.
- The enclosure has a removable cover at the front and the back.
- Depending on the device design, the front cover (2) may be designed with a glass pane.
- The cable inlet (8) to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug (15).
- The ground terminal (13) is located on the side.
- The electrical terminal compartment (11) for the auxiliary power and shield is accessible when you remove the back cover (10).
- The measuring cell with process connection (6) is located in the bottom part of the enclosure.
  The measuring cell is prevented from rotating by a locking screw (5).
- Thanks to the modular design of the pressure transmitter, the measuring cell and application electronics or terminal compartment can be replaced if required.
- The button cover (1) is located on the upper face of the enclosure. The nameplate with general information is located on the cover over the buttons.

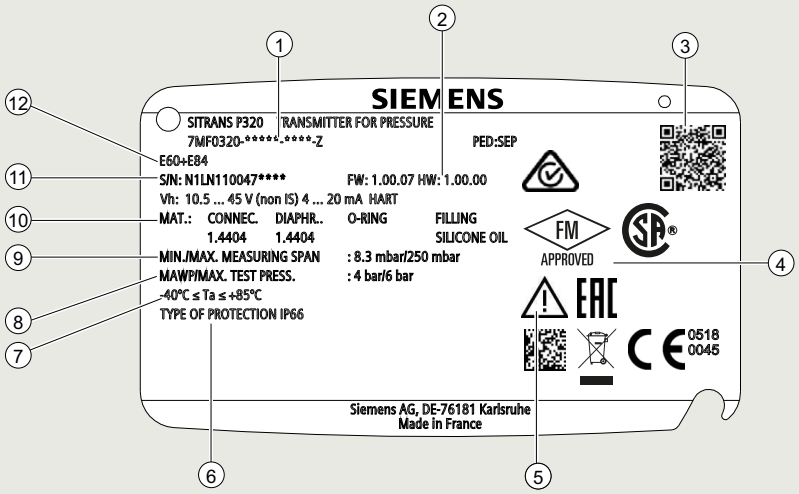
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Design (continued)

Nameplates

Nameplate

The nameplate with the article No. and other important information, such as design details and technical specifications, is located on the cover over the buttons.



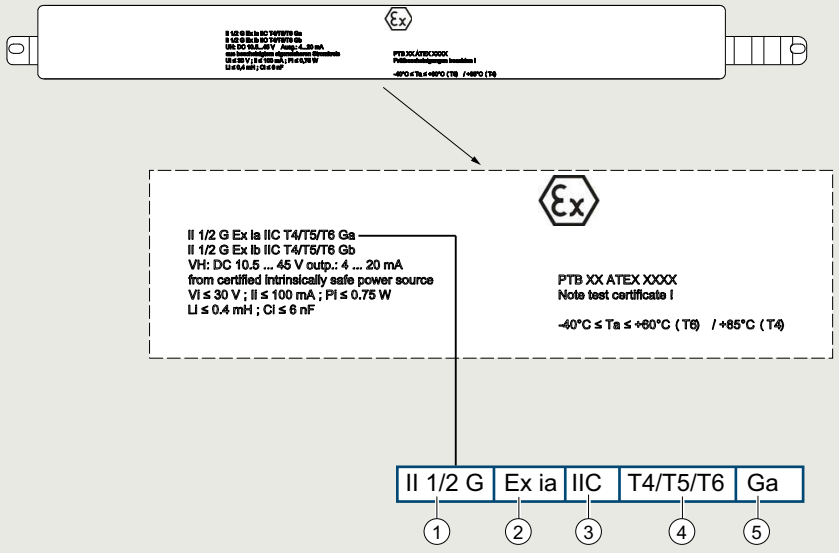
1. Article number
2. Firmware and hardware identification
3. QR code to the mobile website with device-specific information
4. Conformity with country-specific directives
5. Note operating instructions, certificates and approvals
6. Protection class
7. Permitted ambient temperature for the hazardous area of the corresponding temperature class
8. Maximum allowable operating pressure / maximum allowable test pressure
9. Minimum/maximum measuring span
10. Material: connection, diaphragm, O-ring, oil
11. Serial number
12. Order supplement (options, order code)

Certification label with approval information

The certification label with approval information is located on the front of the enclosure.

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Design (continued)



1. Characteristics of the hazardous area
2. Type of protection
3. Group (gas, dust)
4. Maximum surface temperature (temperature class)
5. Device protection level

Tag plate

The tag plate is fastened with a wire under the front cover.

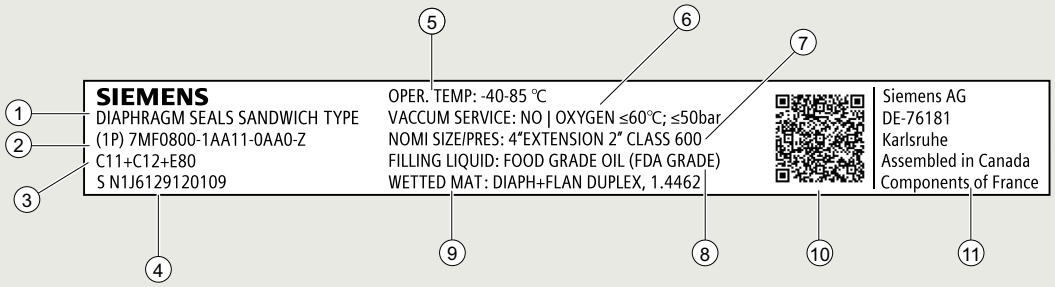


Nameplate with information on the remote seals

The nameplate with information on the remote seals is located on the back of the enclosure.

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Design (continued)



1. Diaphragm seals of sandwich type
2. Article number
3. Order supplement (options, order code)
4. Serial number
5. Operating temperature
6. Vacuum pressure service: No, oxygen ≤ 60 °C; ≤ 50 bar
7. Nominal diameter/pressure: 4 inch, 50 mm tube length, CLASS 600
8. Filling liquid: Food grade oil (FDA-compliant)
9. Wetted materials: Diaphragm duplex, 1.4462
10. QR code to mobile website with device-specific information
11. Assembly and manufacturing location

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Function

Adjustable parameters and diagnostics

SITRANS P320/P420 with HART communication

Parameters	Input buttons	SITRANS P320	SITRANS P420
Application, measurement type	x	x	x
Adjusting lower range value/upper range value	x	x	x
Setting lower range value/upper range value	x	x	x
Electrical damping	x	x	x
Zero adjustment	x	x	x
Fault current	x	x	x
Saturation limits	x	x	x
Scaling of the display	x	x	x
Characteristic curve selection	x	x	x
Temperature unit	x	x	x
Button lock	x	x	x
Change user PIN	x	x	x
Functional safety	x	x	x
Loop test	x	x	x
Start view	x	x	x
Pressure reference	x	x	x
Reset	x	x	x
Diagnostics and trend log			
Min/max pointer	–	x	x
Limit monitoring	–	2	2
Event counter (overrun/undershoot)	–	2	2
Maintenance and service timer	–	x	x
Trend log	–	–	2, max. 1 500 values
Diagnostic log	–	x	x
Parameters change log	–	–	x

Available physical units of display for SITRANS P320/P420

Physical variable	Physical units
Pressure (can also be preset in the factory)	Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH_2O, inH_2O (4 °C), ftH_2O, mmH_2O, mmH_2O (4 °C), mH_2O (4 °C), mmHg, inHg, atm, torr
Level (height data)	m, cm, mm, ft, in
Volumes (fill level)	m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, Nl
Volume (flow)	m³/sec, m³/h, m³/d, l/sec, l/min, l/h, Ml/d, ft³/sec, ft³/h, ft³/d, SCF/min, SCF/h, Nl/h, Nm³/hgal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK))/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d,
Mass (flow)	Kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d
Temperature	°C, °F
Other	%, mA, free text max. 12 characters

For more device information and technical specifications, refer to the individual device versions.

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Selection and ordering data

Pressure transmitters for gauge pressure (pressure series)	Article No.															
SITRANS P320	7MF030	●	-	●	●	●	●	●	-	●	●	●	●			
SITRANS P420	7MF040	●	-	●	●	●	●	●	-	●	●	●	●			
Click the article number for online configuration in the PIA Life Cycle Portal.																
Communication																
HART, 4 ... 20 mA		**0**														
PROFIBUS PA		**1**														
FOUNDATION Fieldbus (FF)		**2**														
PROFINET over Ethernet APL		**5**														
Measuring cell filling																
Silicone oil				**1**												
Inert liquid				**3**												
Neobee oil				**4**												
Maximum measuring span																
250 mbar (3.6 psi)					**F**											
1 000 mbar (14.5 psi)					**J**											
4 000 mbar (58 psi)					**N**											
16 bar (232 psi)					**Q**											
63 bar (914 psi)					**T**											
160 bar (2 321 psi)					**V**											
400 bar (5 802 psi)					**W**											
700 bar (10 153 psi)					**X**											
Process connection																
External thread M20 × 1.5						**B**										
External thread G½ (EN 837-1)						**D**										
Internal thread ½-14 NPT						**E**										
External thread ½-14 NPT						**F**										
Oval flange, fastening thread: $^{7}/_{16}$-20 UNF (IEC 61518)						**G**										
Oval flange, fastening thread: M10 (DIN 19213)						**H**										
Oval flange, fastening thread: M12 (DIN 19213)						**J**										
Flush-mounted diaphragm (options M-R)						**K**										
Version for diaphragm seal pressure						**U**										
Material of wetted parts: Process connection, seal diaphragm																
Stainless steel 316L/1.4404, stainless steel 316L/1.4404							**0**									
Stainless steel 316L/1.4404, alloy C276/2.4819							**1**									
Alloy C22/2.4602, alloy C276/2.4819							**2**									
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated							**7**									
Material of non-wetted parts																
Die-cast aluminum								**1**								
Stainless steel investment casting CF3M/1.4409 similar to 316L								**2**								
Enclosure																
Dual chamber device											**5**					
Type of protection																
Without Ex												**A**				
Intrinsic safety												**B**				
Flameproof enclosure												**C**				
Flameproof enclosure, intrinsic safety												**D**				
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2												**L**				
Intrinsic safety, dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2												**M**				
Combination of options B, C and L (Zone model)												**S**				
Combination of options B, C and L (Zone model, Class Division)												**T**				
Electrical connections/cable entries																
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																
• 2 × M20 × 1.5															**F**	
• 2 × ½-14 NPT															**M**	

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Selection and ordering data (continued)

Pressure transmitters for gauge pressure (pressure series)	Article No.												
SITRANS P320	7MF030	●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P420	7MF040	●	-	●	●	●	●	●	-	●	●	●	●
Local operation/display													
Without local display (lid closed)													0
With local display (lid closed)													1
With local display (lid with glass pane)													2

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland mounted left	A97
Plug mounted right	A98
Cable gland mounted right	A99

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Russian (Pa)	B36
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Transmitter packaged in foil	D60
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	D61
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packed in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	D62
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07

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Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
FM	E08
KC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada)[1]	E21
FM (USA)[1]	E22
IECEx (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
CSA (Japan)	E29
ECASEx (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	E47
CSA (Canada) and FM (USA)[1]	E48
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1]	E49
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
LR (Lloyds Register)	E51
BV (Bureau Veritas)	E52
ABS (American Bureau of Shipping)	E53
RMR (Russian Maritime Register)	E55
KR (Korean Register of Shipping)	E56
RINA (Registro Italiano Navale)	E57
CCS (China Classification Society)	E58
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	E60
Special approvals	
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °F))	E80
Dual Seal	E81
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85
EHEDG (hygiene)	E87
Special designs of devices	
Custom design F02	F02
Custom design F04	F04
Custom design F12	F12
Custom design F14	F14
Mounting bracket	
Zinc-plated steel	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Mounting bracket, zinc-plated steel, reinforced (KTA)	H05
Flange connections with flange EN 1092-1	
P with flange adapter G½ form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J80
• DN 50 PN 40, stainless steel 1.4571/316Ti	J81
• DN 80 PN 40, stainless steel 1.4571/316Ti	J82
P with water trap G½ form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J83
• DN 50 PN 40, stainless steel 1.4571/316Ti	J84
• DN 80 PN 40, stainless steel 1.4571/316Ti	J85
• DN 25 PN 100, stainless steel 1.4571/316Ti	J86
Flange connection options	
DP/P flange connection with epoxy resin coating (can only be ordered together with Y99: 0565).	J77
Process flanges, process connection option	
Process connection (oval flange) NAM (ASTAVA) (MAWP 420 bar)	K21
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Gasket (EN 837-1) material Fe (soft iron)	K60
Gasket (EN 837-1) material 1.4571	K61
Gasket (EN 837-1) material Cu	K62
Process flange options	
Process connection external thread G½, bore hole 11 mm	K80
Oval flange included, PTFE gasket + fixing screws	K86
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	T02
With mounted valve manifold 7MF9011-4FA, process connection at transmitter internal thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	T03
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE sealing ring, steel fixing screws, pressure test certified in factory certificate (EN 10204-2.2)	T05
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE sealing ring, stainless steel fixing screws, pressure test certified in factory certificate (EN 10204-2.2)	T06
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m^3/s, l/s, m, inch, ...;, example 1 ... 5 m]	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
ID number of special design	Y99

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

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Technical specifications

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)			
Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. permissible test pressure (pursuant to DIN 16086)(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 ... 3.6 psi	4 bar 0.4 MPa 58 psi	6 bar 0.6 MPa 87 psi
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	6 bar 0.6 MPa 87 psi	9 bar 0.9 MPa 130 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	20 bar 2 MPa 290 psi	30 bar 3 MPa 435 psi
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 ... 232 psi	45 bar 4.5 MPa 652 psi	70 bar 7 MPa 1015 psi
	0.63 ... 63 bar 0.063 ... 6.3 MPa 9.1 ... 914 psi	80 bar 8 MPa 1160 psi	120 bar 12 MPa 1740 psi
	1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	240 bar 24 MPa 3481 psi	360 bar 36 MPa 5221 psi
	4 ... 400 bar 0.4 ... 40 MPa 58 ... 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8702 psi
	7 ... 700 bar 0.7 ... 70 MPa 102 ... 10153 psi	800 bar 80 MPa 11603 psi	800 bar 80 MPa 11603 psi
Measuring limits			
• Lower measuring limit	For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert fill oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA compliant fill oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
Current simulator	3.55 ... 22.8 mA		
Failure signal	3.55 ... 22.8 mA (factory set to 3.55 mA)		
Load	Resistance R [Ω]		
• Without HART communication	$R_{max} = (U_H - 10.5\ V) / 22.8\ mA$, U_H: Auxiliary power in V		
• With HART communication	R = 230 ... 1100 Ω		
Characteristic curve	• Linearly increasing or linearly decreasing		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		
Characteristic curve deviation at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, turn-down)	r = max. measuring span/set measuring span and nominal measuring range		
Linear characteristic curve			

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Technical specifications (continued)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)		
• 250 mbar/25 kPa/3.6 psi	r ≤ 1.25:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	1.25 < r ≤ 30:	≤ (0.008 · r +0.055)%
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	r ≤ 5:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r +0.045)%
• 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.055% (SITRANS P320) ≤ (0.004 · r + 0.045)% (SITRANS P320)
	r ≤ 5: 5 < r ≤ 100:	≤ 0.04% (SITRANS P420) ≤ (0.004 · r + 0.045)% (SITRANS P420)
Effect of ambient temperature (in % per 28 °C (50 °F))		
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r +0.1)%	
• 1 bar/100 kPa/14.5 psi	≤ (0.05 · r +0.1)%	
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.025 · r +0.125)%	
• 700 bar/70 MPa/10152 psi	≤ (0.08 · r +0.16)%	
Long-term stability at ±30 °C (± 54 °F)		
• 250 mbar/25 kPa/3.6 psi	≤ (0.25 · r)% per year In 5 years ≤ (0.35 · r)% In 10 years ≤ (0.45 · r)% In 15 years ≤ (0.50 · r)%	
• 1 bar/100 kPa/14.5 psi	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%	
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	In 5 years ≤ (0.05 · r)% In 10 years ≤ (0.1 · r)% In 15 years ≤ (0.15 · r)%	
• 700 bar/70 MPa/10152 psi	In 5 years ≤ (0.05 · r)% In 10 years ≤ (0.1 · r)% In 15 years ≤ (0.15 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Operating conditions		
Medium temperature		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert fill oil		
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	-40 ... +100 °C (-40 ... +212 °F)	
- 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with FDA compliant fill oil	-10 ... +100 °C (14 ... +212 °F)	
Ambient conditions		
Ambient temperature/enclosure	Observe the temperature class in hazardous areas.	
• Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)	
• Measuring cell with inert fill oil		
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	-40 ... +85 °C (-40 ... +185 °F)	
- Measuring cell with FDA compliant fill oil	-10 ... +85 °C (14 ... +185 °F)	

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Technical specifications (continued)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)	
- Local display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA compliant fill oil: -20 ... +85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	• Aluminum enclosure: Approx. 1.8 kg (3.9 lb) • Stainless steel enclosure: Approx. 3.8 kg (8.3 lb)
Material	
• Material of wetted parts	
- Process connection	Stainless steel, mat. no. 1.4404/316L or Alloy C22, mat. no. 2.4602
- Oval flange	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or alloy C276, mat. no. 2.4819, or stainless steel, mat. no. 1.4404/316L gold-plated
• Material of non-wetted parts	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Coating: The layer structure and thickness correspond to EN ISO 12944 Corrosion Class C3-M (for standard transmitter) and C5-H (for transmitter with double layer coating) • Stainless steel nameplate (1.4404/316L)
- Mounting bracket	Zinc-plated steel or stainless steel
Process connection	• Connection shank G1/2A according to EN 837-1 • Internal thread ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • External thread M20 × 1.5 and ½-14 NPT
Electrical connection	Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Local display	• With or without integrated local display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2$ V (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 24 ACC NY 265 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
• CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	No.: BVS 18 ATEX E 049X
• Intrinsic safety "i"	

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Technical specifications (continued)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.

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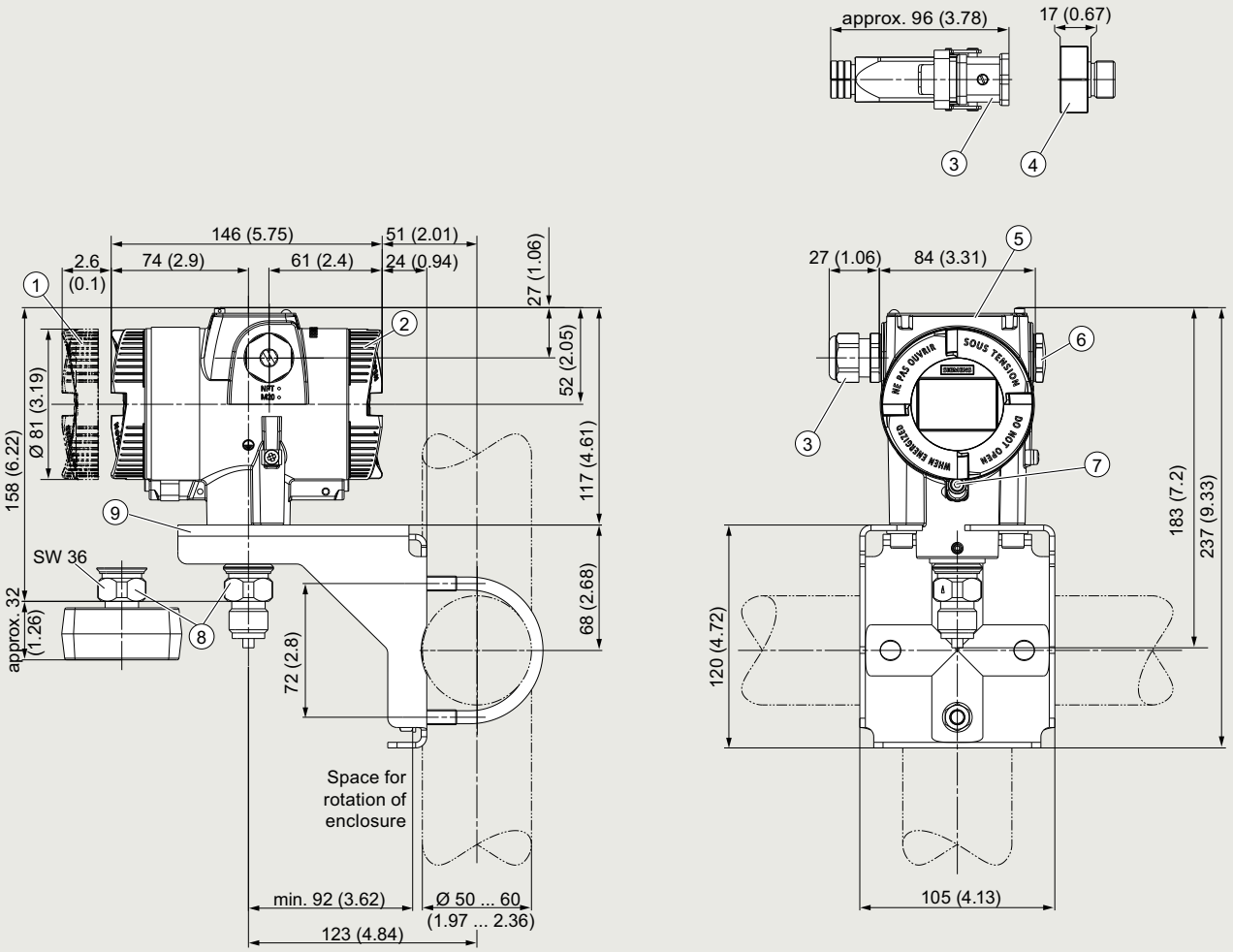
Technical specifications (continued)

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit value monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
• Limit value monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
Device ID sender	P320/P420 0x0B18
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output

Communication	
• Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

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Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1.5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2][3] device plug
   - M12 device plug[2][3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Process connection: G½B connection pin or oval flange
9. Mounting bracket (optional)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for gauge pressure (pressure series), dimensions in mm (inch)

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Selection and ordering data

Pressure transmitters for gauge pressure (differential pressure series)	Article No.																					
SITRANS P320	7MF031	●	-	●	●	●	●	●	-	●	●	●	●									
SITRANS P420	7MF041	●	-	●	●	●	●	●	-	●	●	●	●									
Click the article number for online configuration in the PIA Life Cycle Portal.																						
Communication																						
HART, 4 ... 20 mA		0																				
PROFIBUS PA		1																				
FOUNDATION Fieldbus (FF)		2																				
PROFINET over Ethernet APL		5																				
Measuring cell filling																						
Silicone oil				1																		
Inert filling liquid				3																		
Maximum measuring span																						
20 mbar (8.037 inH_2O)					B																	
60 mbar (24.11 inH_2O)					D																	
250 mbar (1005 inH_2O)					G																	
600 mbar (241.1 inH_2O)					H																	
1 600 mbar (643 inH_2O)					M																	
5 000 mbar (2009 inH_2O)					P																	
30 bar (435 psi)					R																	
160 bar (2 320 psi)					Y																	
Process connection																						
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518)						L																
Oval flange, fastening thread: M10 (PN 160), (DIN 19213)						M																
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation						N																
Oval flange, fastening thread: M10 (PN 160) (DIN 19213) with lateral ventilation						P																
Material of wetted parts: Sensor body, seal diaphragm, process flange																						
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408							0															
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408							1															
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408							2															
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))							4															
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))							6															
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))							8															
Material of non-wetted parts																						
Die-cast aluminum								1														
Stainless steel investment casting CF3M/1.4409 similar to 316L								2														
Enclosure																						
Dual chamber device																						
Type of protection																						
Without Ex																						
Intrinsic safety																						
Flameproof enclosure																						
Flameproof enclosure, intrinsic safety																						
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2																						
Intrinsic safety, dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2																						
Combination of options B, C and L (Zone model)																						
Combination of options B, C and L (Zone model, Class Division)																						
Electrical connections/cable entries																						
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																						
• 2 × M20 × 1.5																						
• 2 × ½-14 NPT																						
Local operation/display																						
Without local display (lid closed)																						
With local display (lid closed)																						

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Selection and ordering data (continued)

	Article No.	
Pressure transmitters for gauge pressure (differential pressure series)		
SITRANS P320	**7MF031**	● - ● ● ● ● ● - ● ● ● ●
SITRANS P420	**7MF041**	● - ● ● ● ● ● - ● ● ● ●
With local display (lid with glass pane)		2

Options **Add "-Z" to article No., add order code and plain text or entry from drop-down list.**	**Order code**
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Sealing plug included, plastic	**A20**
Sealing plug included, metal	**A21**
Sealing plug included, stainless steel	**A22**
Sealing plug included, stainless steel 316L/1.4404	**A23**
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	**A30**
Device plug Han 7D, mounted left (plastic, angled)	**A31**
Device plug Han 7D, mounted left (metal, straight)	**A32**
Device plug Han 7D, mounted left (metal, angled)	**A33**
Device plug Han 8D, mounted left (plastic, straight)	**A34**
Device plug Han 8D, mounted left (plastic, angled)	**A35**
Device plug Han 8D, mounted left (metal, straight)	**A36**
Device plug Han 8D, mounted left (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	**A45**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	**A48**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	**A49**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	**A90**
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	**A91**
Cable gland/device plug mounted left	**A97**
Plug mounted right	**A98**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**

Options **Add "-Z" to article No., add order code and plain text or entry from drop-down list.**	**Order code**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate - 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Declaration of compliance with the order EN 10204-2.1: Compliance with order	**C35**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Extension of the medium temperature to -40 °C for measuring cell filling with inert filling liquid Please note step response time T63: 5.5 s (20 and 60 mbar); 1.4 s (250 and 600 mbar); 0.3 s (1.6 and 5 bar)	**D52**
Transmitter packaged in foil	**D60**
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	**D61**
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	**D62**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, UKCA, RCM) except EAC, FM, CSA, KC	**E00**
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**

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Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
CSA (Japan)	**E29**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Zinc-plated steel	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Mounting bracket, zinc-plated steel, reinforced (KTA)	**H05**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges chambered with gaskets	
1 × chambered, graphite	**K40**
1 × chambered, PTFE (FDA compliant), recommended for gas measurements	**K41**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE (Not permitted with remote seal attachment on both sides)	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food, FDA compliant) (Not permitted with remote seal attachment on both sides)	**K51**
O-ring, process flanges, FFKM (FFPM) (Not permitted with remote seal attachment on both sides)	**K52**
O-ring, process flanges, NBR (Not permitted with remote seal attachment on both sides)	**K53**
O-ring, process flanges, EPDM (Not permitted with remote seal attachment on both sides)	**K54**
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measuring medium: Gas	**K85**
Oval flange attached, PTFE seal + fixing screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters)	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	**Y16**
TAG short (device parameters, max. 8 characters)	**Y17**
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	**Y21**
Local display: Scaling with standard units [m^3/s, l/s, m, inch, ...]; example 1 ... 5 m	**Y22**
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	**Y32**

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Selection and ordering data (continued)

Options **Add "-Z" to article No., add order code and plain text or entry from drop-down list.**	**Order code**
ID number of special design	**Y99**

1) Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Technical specifications

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)			
Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar 0.1 ... 2 kPa 0.4019 ... 8.037 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	1 ... 60 mbar 0.1 ... 6 kPa 0.4019 ... 24.11 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.2 ... 25 kPa 1.005 ... 100.5 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 ... 241.1 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	16 ... 1 600 mbar 1.6 ... 160 kPa 6.43 ... 643 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	50 ... 5 000 mbar 5 ... 500 kPa 20.09 ... 2 009 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	8 ... 160 bar 0.8 ... 16 MPa 116 ... 2 320 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert fill oil	30 mbar a/3 kPa a/0.44 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V) /22.8 mA, U_H: Auxiliary power in V		
• With HART communication	R = 230 ... 1100 Ω		
Characteristic curve	• Linearly increasing or linearly decreasing		
Physical bus	-		
Polarity-independent	-		

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)		
Measuring accuracy		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Characteristic curve deviation at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, turn-down)	r = max. measuring span/set measuring span and nominal measuring range	
Linear characteristic curve		
• 20 mbar/2 kPa/8.031 inH_2O	r ≤ 1.5:	≤ 0.055% (SITRANS P320) ≤ 0.05% (SITRANS P420)
	1.5 < r ≤ 20:	≤ (0.005 · r +0.05)%
• 60 mbar/6 kPa/24.09 inH_2O	r ≤ 2:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	2 < r ≤ 60:	≤ (0.005 · r +0.05)%
• 250 mbar/25 kPa/3.6 psi	r ≤ 2:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	2 < r ≤ 100:	≤ (0.005 · r +0.05)% (SITRANS P320) ≤ (0.005 · r +0.05)% (SITRANS P420)
• 600 mbar/60 kPa/240.9 in H_2O 1 600 mbar/160 kPa/642.4 in H_2O 5 000 mbar/500 kPa/2008 in H_2O 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r +0.045)%
• 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.004 · r +0.045)%
Effect of ambient temperature (in % per 28 °C (50 °F))		
• 20 mbar/2 kPa/8.031 inH_2O	≤ (0.15 · r +0.1)%	
• 60 mbar/6 kPa/24.09 inH_2O	≤ (0.075 · r +0.1)%	
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 5 000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.025 · r + 0.125)% (SITRANS P320)	
• 250 mbar/25 kPa/3.6 psi 5 000 mbar/500 kPa/2008 inH_2O	≤ (0.025 · r + 0.0625)% (SITRANS P420)	
• 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.0125 · r + 0.0625)% (SITRANS P420)	
Long-term stability at ±30 °C (± 54 °F)		
• 20 mbar/2 kPa/8.031 inH_2O	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%	
• 60 mbar/6 kPa/24.09 inH_2O	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%	
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 5 000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	In 5 years ≤ (0.05 · r)% In 10 years ≤ (0.1 · r)% In 15 years ≤ (0.15 · r)%	
Step response time T_{63} (without electrical damping)		
• 20 mbar/2 kPa/8.031 inH_2O	Approx. 0.160 s	
• 60 mbar/6 kPa/24.09 inH_2O	Approx. 0.150 s	
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 5 000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	Approx. 0.135 s	

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Medium temperature	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
- Measuring cell 30 bar (435 psi)	-20 ... +100 °C (-4 ... +212 °F)
- Measuring cell 160 bar (2 320 psi)	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with inert fill oil	-20 ... +100 °C (-4 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert fill oil	-40 ... +85 °C (-40 ... +185 °F)
- Local display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	• Aluminum enclosure: Approx. 3.9 kg (8.5 lb) • Stainless steel enclosure: Approx. 5.9 kg (13 lb)
Material	
• Material of wetted parts	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- Sealing plug	1.4404 or as option alloy C22; 2.4602 or Monel mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Material of non-wetted parts	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L)
- Process flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	¼-18 NPT internal thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Local display	• With or without integrated local display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	U_{SS} ≤ 0.2 V (47 ... 125 Hz)
Noise	U_{eff} ≤ 1.2 mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 24 ACC NY 265 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
• CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	No.: BVS 18 ATEX E 049X
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit value monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
• Limit value monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
Number of function blocks	7
• Analog input	

Communication	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	

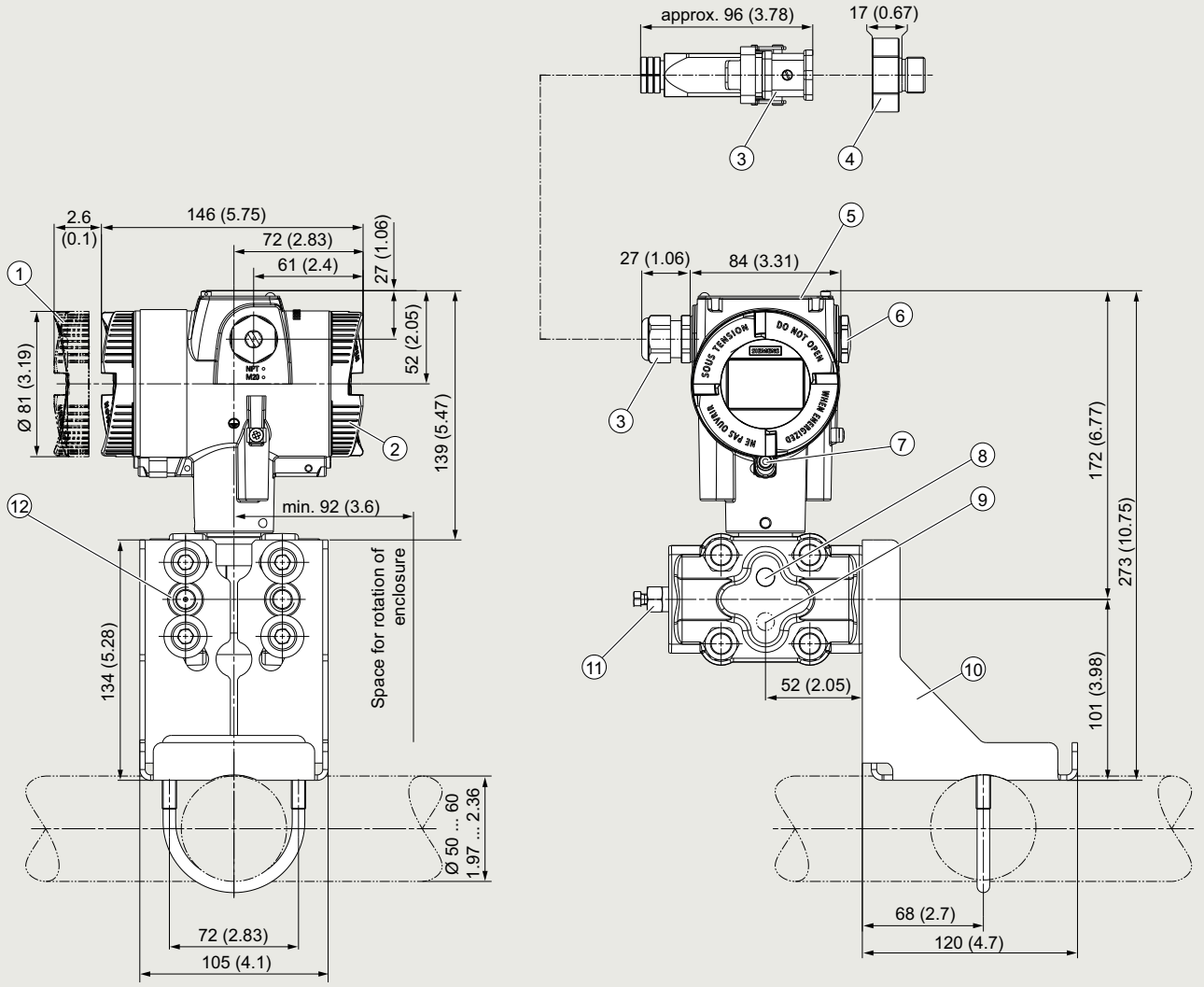
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Technical specifications (continued)

Communication	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

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Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for gauge pressure (differential pressure series), dimensions in mm (inch)

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Selection and ordering data

Pressure transmitters for gauge and absolute pressure, with flush mounted diaphragm	Article No.																
SITRANS P320 for gauge pressure	7MF030	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P420 for gauge pressure	7MF040	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P320 for absolute pressure	7MF032	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P420 for absolute pressure	7MF042	●	-	●	●	●	●	●	-	●	●	●	●				
Click the article number for online configuration in the PIA Life Cycle Portal.																	
Communication																	
HART, 4 ... 20 mA		0															
PROFIBUS PA		1															
FOUNDATION Fieldbus (FF)		2															
PROFINET over Ethernet APL		5															
Measuring cell filling																	
Silicone oil				1													
Inert filling liquid				3													
Neobee oil				4													
Maximum measuring span																	
1 000 mbar (14.5 psi)					J												
4 000 mbar (58 psi)					N												
16 bar (232 psi)					Q												
63 bar (914 psi)					T												
1 300 mbar a (18.9 psi a)					L												
5 000 mbar a (72.5 psi a)					P												
30 bar a (435 psi a)					R												
Process connection																	
Flush-mounted diaphragm						K											
Material of wetted parts: Process connection, seal diaphragm																	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404							0										
Stainless steel 316L/1.4404, alloy C276/2.4819							1										
Alloy C22/2.4602, alloy C276/2.4819							2										
Material of non-wetted parts																	
Die-cast aluminum								1									
Stainless steel investment casting CF3M/1.4409 similar to 316L								2									
Enclosure																	
Dual chamber device												5					
Type of protection																	
Without Ex													A				
Intrinsic safety													B				
Flameproof enclosure													C				
Flameproof enclosure, intrinsic safety													D				
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2													L				
Intrinsic safety, dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2													M				
Combination of options B, C and L (Zone model)													S				
Combination of options B, C and L (Zone model, Class Division)													T				
Electrical connections/cable entries																	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																	
• 2 × M20 × 1.5														F			
• 2 × ½-14 NPT														M			
Local operation/display																	
Without local display (lid closed)															0		
With local display (lid closed)															1		
With local display (lid with glass pane)															2		

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Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Sealing plug included, plastic	**A20**
Sealing plug included, metal	**A21**
Sealing plug included, stainless steel	**A22**
Sealing plug included, stainless steel 316L/1.4404	**A23**
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	**A30**
Device plug Han 7D, mounted left (plastic, angled)	**A31**
Device plug Han 7D, mounted left (metal, straight)	**A32**
Device plug Han 7D, mounted left (metal, angled)	**A33**
Device plug Han 8D, mounted left (plastic, straight)	**A34**
Device plug Han 8D, mounted left (plastic, angled)	**A35**
Device plug Han 8D, mounted left (metal, straight)	**A36**
Device plug Han 8D, mounted left (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	**A45**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	**A48**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	**A49**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	**A90**
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	**A91**
Cable gland/device plug mounted left	**A97**
Plug mounted right	**A98**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Declaration of compliance with the order EN 10204-2.1: Compliance with order	**C35**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Transmitter packaged in foil	**D60**
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	**D61**
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	**D62**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, UKCA, RCM) except EAC, FM, CSA, KC	**E00**
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
CSA (Japan)	**E29**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**

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Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
3A (hygiene)	**E86**
EHEDG (hygiene)	**E87**
Flanges according to EN 1092-1 form B1 and ASME standard B16.5	
EN 1092-1 form B1	
• DN 50 PN 16	**M03**
• DN 80 PN 16	**M05**
• DN 25 PN 40	**M10**
• DN 40 PN 40	**M12**
• DN 50 PN 40	**M13**
• DN 80 PN 40	**M15**
• DN 40 PN 100	**M22**
ASME B16.5	
• 1" Class 150 RF	**M30**
• 1 ½" Class 150 RF	**M31**
• 2" Class 150 RF	**M32**
• 3" Class 150 RF	**M33**
• 4" Class 150 RF	**M34**
• 1 ½" Class 300 RF	**M36**
• 2" Class 300 RF	**M37**
• 3" Class 300 RF	**M38**
• 4" Class 300 RF	**M39**
Sanitary connections in accordance with the standard	
Sanitary flange DIN 11851	
• With slotted union nut DN 50 PN 25	**N03**
• With slotted union nut DN 80 PN 25	**N05**
Tri-Clamp	
• DIN 32676 DN 50 PN 16	**N14**
• DIN 32676 DN 65 PN 10	**N15**
• ISO 2852 2" PN 40	**N22**
• ISO 2852 3" PN 40	**N23**
Aseptic screwed connector	
• DIN 11864-1 form A DN 50 PN 25	**N33**
• DIN 11864-1 form A DN 65 PN 25	**N34**
• DIN 11864-1 form A DN 80 PN 25	**N35**
• DIN 11864-1 form A DN100 PN 25	**N36**
Aseptic flange with notch	
• DIN 11864-2 form A DN 50 PN 16	**N43**
• DIN 11864-2 form A DN 65 PN 16	**N44**
• DIN 11864-2 form A DN 80 PN 16	**N45**
• DIN 11864-2 form A DN100 PN 16	**N46**
Aseptic clamp with groove	
• DIN 11864-3 form A DN 50 PN 25	**N53**
• DIN 11864-3 form A DN 65 PN 25	**N54**
• DIN 11864-3 form A DN 80 PN 16	**N55**
• DIN 11864-3 form A DN100 PN 16	**N56**
Sanitary connections manufacturer-specific	
Varivent type N for pipes DN 40 ... DN 125 PN 40	**P06**
Sanitary connections special design	
Tank connection	
• TG 52/50 PN 40 with gasket	**Q00**
• TG 52/150 PN 40 with gasket	**Q01**
DRD flange D = 65 mm DN 50 PN 40	**Q15**
SMS socket	
• With thread 2" PN 25	**Q28**
• With thread 2 ½" PN 25	**Q29**
• With thread 3" PN 25	**Q30**
Weldable sockets for tank connection	
Weldable piece for TG52/50	**Q90**
Weldable piece for TG52/150	**Q91**
Connections for the paper industry	
Process connection PMC style standard	**R00**
Process connection PMC style minibolt	**R01**
Weldable sockets for PMC style standard	**R02**
Weldable sockets for PMC style minibolt	**R03**
Threaded connection	
External thread G¾-A DIN 3852-2 form A	**R11**
External thread G1-A DIN 3852-2 form A	**R12**
External thread G2-A DIN 3852-2 form A	**R14**
Special options flush mounted	
Cooling extension (media temperature up to 200 °C)	**R85**
Mating connector including gasket	**R90**
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters)	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	**Y16**
TAG short (device parameters, max. 8 characters)	**Y17**
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	**Y21**
Local display: Scaling with standard units [m^3/s, l/s, m, inch, ...]; example 1 ... 5 m	**Y22**
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	**Y32**
ID number of special design	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

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Technical specifications

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush mounted diaphragm			
Input of gauge pressure with flush-mounted diaphragm			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange[1)]	
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi		
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 ... 232 psi		
	0.6 ... 63 bar 0.063 ... 6.3 MPa 9.1 ... 914 psi		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with inert fill oil	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA compliant fill oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. measuring span		
Input of absolute pressure, with flush-mounted diaphragm			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17 ... 525 inH_2O a	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange[1)]	
	166 ... 5 000 mbar a 16.6 ... 500 kPa a 2.41 ... 72.5 psi a		
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a		
	Depending on the process connection, the measuring span may differ from these values.		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 bar a/0 kPa a/0 psi a		
• Upper measuring limit	100% of max. measuring span		
Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	$R = (U_H - 10.5\ V) / 22.8\ mA$, U_H: Auxiliary power in V		
• With HART communication	R = 230 ... 1100 Ω		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush mounted diaphragm		
Gauge pressure measuring accuracy, with flush mounted diaphragm		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Characteristic curve deviation at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range	
Linear characteristic curve		
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.055% (SITRANS P320) ≤ 0.05% (SITRANS P420) ≤ (0.005 · r +0.05)%
Effect of ambient temperature in % per 28 °C (50 °F)		
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	≤ (0.08 · r +0.16)%	
Influence of the medium temperature (in pressure per 10K of temperature difference between the medium temperature and ambient temperature)	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability at ±30 °C (± 54 °F)		
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%	
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Absolute pressure measuring accuracy with flush mounted diaphragm		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Characteristic curve deviation at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range	
• Linear characteristic curve		
- All measuring cells	r ≤ 5: 5 < r ≤ 30:	≤ 0.075% (SITRANS P320) ≤ 0.065% (SITRANS P420) ≤ (0.005 · r + +0.05)%
Influence of ambient temperature in % per 28 °C (50 °F)		
• All measuring cells	≤ (0.08 · r +0.16)% gauge pressure ≤ (0.16 · r +0.24)% absolute pressure	
Influence of the medium temperature (in pressure per 10K of temperature difference between the medium temperature and ambient temperature)	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability at ±30 °C (± 54 °F)		
• All measuring cells	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.40 · r)% In 15 years ≤ (0.50 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush mounted diaphragm		
Operating conditions		
Medium temperature[2]		
• Measuring cell with silicone oil filling	-40 ... +150 °C (-40 ... +302 °F) -40 ... +200 °C (-40 ... +392 °F) with temperature decoupler	
• Measuring cell with inert fill oil	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with FDA compliant fill oil	-10 ... +150 °C (14 ... 302 °F)	
Ambient conditions		
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.	
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)	
- Measuring cell with inert fill oil (different pressure classes)	1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with FDA compliant fill oil	-10 ... +85 °C (14 ... +185 °F)	
- Local display	-20 ... +80 °C (-4 ... +176 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA compliant fill oil: -20 ... +85 °C (-4 ... +185 °F))	
• Climatic class in accordance with IEC 60721-3-4	4K4H	
• Degree of protection		
- According to IEC 60529	IP66, IP68	
- According to NEMA 250	Type 4X	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	Pressure transmitter without mounting flange • Aluminum enclosure: Approx. 1.8 kg (3.9 lb) • Stainless steel enclosure: Approx. 3.8 kg (8.3 lb)	
Material		
• Material of wetted parts		
- Process connection	Stainless steel, mat. no. 1.4404/316L	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Alloy C276, mat. no. 2.4819	
• Material of non-wetted parts		
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L)	
Process connection	• Flanges according to EN and ASME • F&B and pharmaceutical flanges • BioConnect/BioControl • PMC style	
Electrical connection	Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[3] • Device plug M12	
Displays and controls		
Buttons	4 buttons for operation directly on the device	
Local display	• With or without integrated local display (optional) • Lid with inspection window (optional)	
Auxiliary power U_H		
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC for intrinsically safe operation	
Ripple	$U_{SS} \leq 0.2$ V (47 ... 125 Hz)	
Noise	$U_{eff} \leq 1.2$ mV (0.5 ... 10 kHz)	
Auxiliary power	–	
Separate supply voltage	–	
Certificates and approvals		
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Drinking water		
• WRAS (England)	No.: 1903094 (option E83)	
• ACS (France)	No.: 24 ACC NY 265 (option E85)	

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Technical specifications (continued)

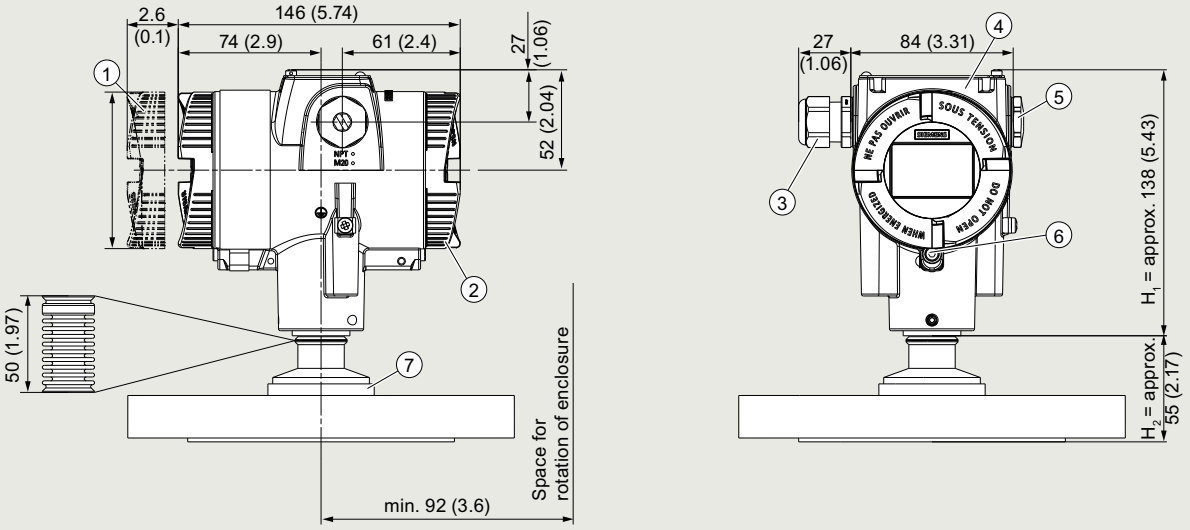
SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush mounted diaphragm	
• NSF (USA)	No.: 20180920-MH61350 (option E84)
• CRN (Canada)	No.: 0F9863.5C (option E60)
• EHEDG	No. EHEDG-C2300082
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	No.: BVS 18 ATEX E 049X
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

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Technical specifications (continued)

1) The MAWP value of the pressure transmitter can be lower than the PN value of the mounting flange and vice versa. To determine the maximum permissible operating pressure and the maximum permissible test pressure, use the lowest value as reference.
2) Observe the temperature limits in the process connection standards (e.g. DIN 32676 and DIN 11851) for the maximum medium temperature for flush mounted process connections.
3) Han 8D is identical to Han 8U.

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
4. Cover over buttons and nameplate with general information
5. Blanking plug
6. Safety catch (only for "flameproof enclosure" type of protection)
7. Process connection

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter, with flush-mounted diaphragm, dimensions in mm (inch)

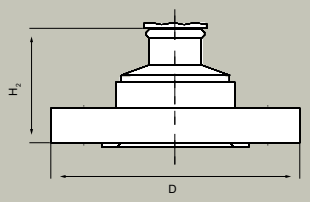
This figure consists of a SITRANS P320/P420 with an example flange. In this figure, the height is divided into H_1 and H_2.

H_1 = Height of the SITRANS P320/P420 up to a defined cross-section

H_2 = Height of the flange up to this defined cross-section

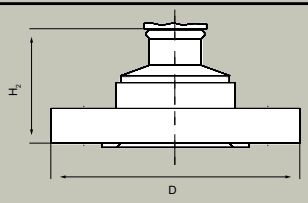
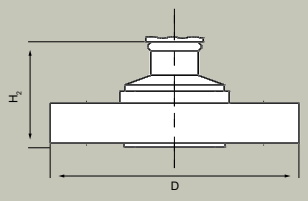
Only the height H_2 is indicated in the dimensions of the flanges.

Flanges according to EN and ASME

Flange	Order code	DN	PN	ØD	H_2
EN 1092-1 	**M03**	50	16	165 mm (6.5 inches)	Approx. 52 mm (2 inches)
	M05	80	16	200 mm (7.9 inches)	
	M10	25	40	115 mm (4.5 inches)	
	M12	40	40	150 mm (5.9 inches)	
	M13	50	40	165 mm (6.5 inches)	

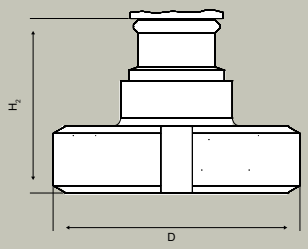
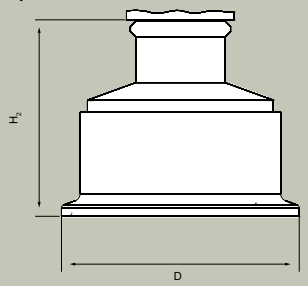
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Dimensional drawings (continued)

Flange	Order code	DN	PN	ØD	H_2
	**M15**	80	40	200 mm (7.9 inches)	Approx. 52 mm (2 inches)
	M22	40	100	170 mm (6.7 inches)	
ASME B16.5					
	**M30**	1 inch	150	110 mm (4.3 inches)	Approx. 52 mm (2 inches)
	M31	1½ inches	150	125 mm (4.9 inches)	
	M32	2 inches	150	150 mm (5.9 inches)	
	M33	3 inches	150	190 mm (7.5 inches)	
	M34	4 inches	150	230 mm (9.1 inches)	
	M36	1½ inches	300	155 mm (6.1 inches)	
	M37	2 inches	300	165 mm (6.5 inches)	
	M38	3 inches	300	210 mm (8.1 inches)	
	M39	4 inches	300	255 mm (10.0 inches)	

NuG and pharmaceutical connections

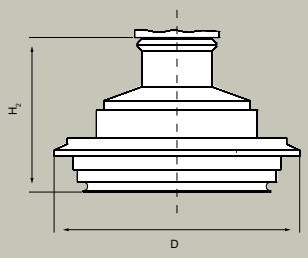
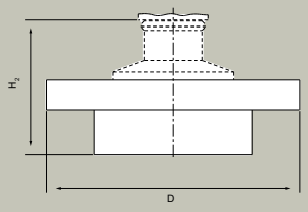
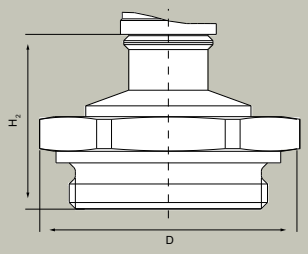
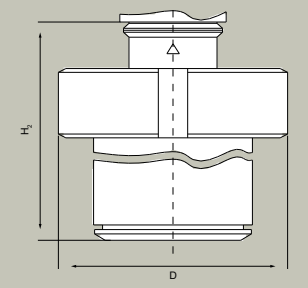
Connections according to DIN

Connection	Order code	DN	PN	ØD	H_2
DIN 11851 (dairy connection with slotted union nut)					
	**N03**	50	25	92 mm (3.6 inches)	Approx. 52 mm (2 inches)
	N05	80	25	127 mm (5.0 inches)	
Tri-Clamp acc. to DIN 32676					
	**N14**	50	16	64 mm (2.5 inches)	Approx. 52 mm (2 inches)
	N15	65	16	91 mm (3.6 inches)	
	N22	2 inches	16	64 mm (2.5 inches)	
	N23	3 inches	10	91 mm (3.6 inches)	

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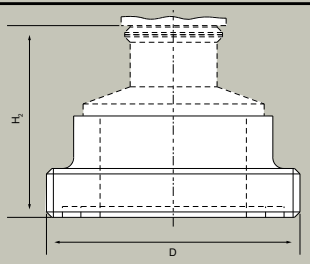
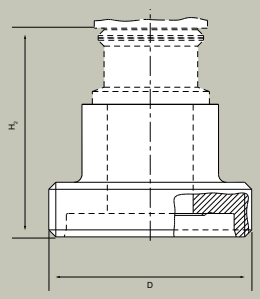
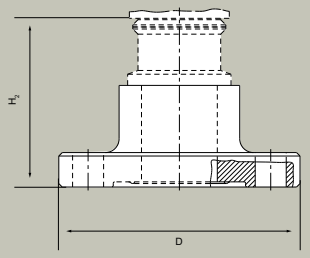
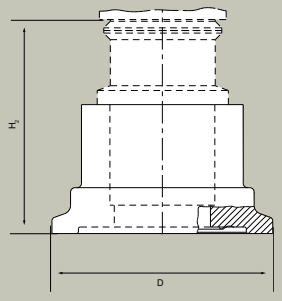
Dimensional drawings (continued)

Other connections

Connection	Order code	DN	PN	ØD	H_2
Varivent connection 	**P06**	40 ... 125	40	84 mm (3.3 inches)	Approx. 52 mm (2 inches)
Sanitary process connection according to DRD 	**Q15**	65	40	105 mm (4.1 inches)	Approx. 52 mm (2 inches)
Threaded connection G¾", G1" and G2" according to DIN 3852-2 form A 	**R11**	¾ inch	60	37 mm (1.5 inches)	Approx. 45 mm (1.8 inches)
	R12	1 inch	60	48 mm (1.9 inches)	Approx. 47 mm (1.9 inches)
	R14	2 inches	60	78 mm (3.1 inches)	Approx. 52 mm (2 inches)
Tank connection TG 52/50 and TG52/150 	**Q00**	25	40	63 mm (2.5 inches)	Approx. 63 mm (2.5 inches)
	Q01	25	40	63 mm (2.5 inches)	Approx. 170 mm (6.7 inches)
SMS screwed connector	**Q28**	2 inches	25	70 mm x 1/6 inch	Approx. 52 mm (2.1 inches)
	Q29	2½ inches	25	85 mm x 1/6 inch	

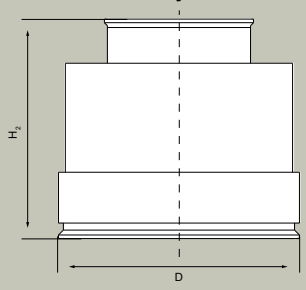
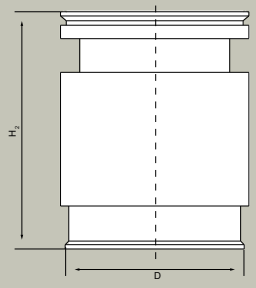
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Dimensional drawings (continued)

Connection	Order code	DN	PN	ØD	H_2
	**Q30**	3 inches	25	98 mm x 1/6 inch	Approx. 52 mm (2.1 inches)
Aseptic screwed connector according to DIN 11864-1 form A 	**N33**	50	25	78 mm x 1/6 inch	Approx. 52 mm (2.1 inches)
	N34	65	25	95 mm x 1/6 inch	
	N35	80	25	110 mm x ¼ inch	
	N36	100	25	130 mm x ¼ inch	
Aseptic flange with notch according to DIN 11864-2 form A 	**N43**	50	16	94 mm (3.7 inches)	Approx. 52 mm (2.1 inches)
	N44	65	16	113 mm (4.4 inches)	
	N45	80	16	133 mm (5.2 inches)	
	N46	100	16	159 mm (6.3 inches)	
Aseptic clamp with groove according to DIN 11864-3 form A 	**N53**	50	25	77.5 mm (3.1 inches)	Approx. 52 mm (2.1 inches)
	N54	65	25	91 mm (3.6 inches)	
	N55	80	16	106 mm (4.2 inches)	
	N56	100	16	130 mm (5.1 inches)	

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Dimensional drawings (continued)

Connection	Order code	DN	PN	ØD	H_2
Process connection PMC style standard 	**R00**	-	-	40.9 mm (1.6 inches)	Approx. 36.8 mm (1.4 inches)
Process connection PMC style minibolt 	**R01**	-	-	26.3 mm (1.0 inch)	Approx. 33.1 mm (1.3 inches)

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Selection and ordering data

Pressure transmitters for absolute pressure (pressure series)	Article No.																	
SITRANS P320	7MF032	●	-	●	●	●	●	●	-	●	●	●	●					
SITRANS P420	7MF042	●	-	●	●	●	●	●	-	●	●	●	●					
Click the article number for online configuration in the PIA Life Cycle Portal.																		
Communication																		
HART, 4 ... 20 mA		0																
PROFIBUS PA		1																
FOUNDATION Fieldbus (FF)		2																
PROFINET over Ethernet APL		5																
Measuring cell filling																		
Silicone oil				1														
Inert filling liquid				3														
Maximum measuring span																		
250 mbar a (100.5 inH_2O a)					F													
1 300 mbar a (522 inH_2O a)					L													
5 000 mbar a (72.5 psi a)					P													
30 bar a (435 psi a)					R													
160 bar a (2 321 psi a)					V													
400 bar a (5 802 psi a)					W													
700 bar a (10 153 psi a)					X													
Process connection																		
External thread M20 × 1.5						B												
External thread G½ (EN 837-1)						D												
Internal thread ½-14 NPT						E												
External thread ½-14 NPT						F												
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518)						G												
Oval flange, fastening thread: M10 (DIN 19213)						H												
Oval flange, fastening thread: M12 (DIN 19213)						J												
Version for diaphragm seal pressure						U												
Material of wetted parts: Process connection, seal diaphragm																		
Stainless steel 316L/1.4404, stainless steel 316L/1.4404							0											
Stainless steel 16L/1.4404, alloy C276/2.4819							1											
Alloy C22/2.4602, alloy C276/2.4819							2											
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated							7											
Material of non-wetted parts																		
Die-cast aluminum								1										
Stainless steel investment casting CF3M/1.4409 similar to 316L								2										
Enclosure																		
Dual chamber device												5						
Type of protection																		
Without Ex													A					
Intrinsic safety													B					
Flameproof enclosure													C					
Flameproof enclosure, intrinsic safety													D					
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2													L					
Intrinsic safety, dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2													M					
Combination of options B, C and L (Zone model)													S					
Combination of options B, C and L (Zone model, Class Division)													T					
Electrical connections/cable entries																		
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																		
• 2 × M20 × 1.5															F			
• 2 × ½-14 NPT															M			
Local operation/display																		
Without local display (lid closed)																	0	
With local display (lid closed)																	1	

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Selection and ordering data (continued)

	Article No.											
Pressure transmitters for absolute pressure (pressure series)												
SITRANS P320	**7MF032**	●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P420	**7MF042**	●	-	●	●	●	●	●	-	●	●	●	●
With local display (lid with glass pane)													2

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Sealing plug included, plastic	**A20**
Sealing plug included, metal	**A21**
Sealing plug included, stainless steel	**A22**
Sealing plug included, stainless steel 316L/1.4404	**A23**
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	**A30**
Device plug Han 7D, mounted left (plastic, angled)	**A31**
Device plug Han 7D, mounted left (metal, straight)	**A32**
Device plug Han 7D, mounted left (metal, angled)	**A33**
Device plug Han 8D, mounted left (plastic, straight)	**A34**
Device plug Han 8D, mounted left (plastic, angled)	**A35**
Device plug Han 8D, mounted left (metal, straight)	**A36**
Device plug Han 8D, mounted left (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	**A45**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	**A48**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	**A49**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	**A90**
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	**A91**
Cable gland/device plug mounted left	**A97**
Plug mounted right	**A98**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Declaration of compliance with the order EN 10204-2.1: Compliance with order	**C35**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Transmitter packaged in foil	**D60**
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	**D61**
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	**D62**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, UKCA, RCM) except EAC, FM, CSA, KC	**E00**
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**

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Selection and ordering data (continued)

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
CSA (Japan)	**E29**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Zinc-plated steel	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Flange connections with flange EN 1092-1	
With flange adapter G½ form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J80**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J81**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J82**
With water trap G½ form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J83**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J84**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J85**
• DN 25 PN 100, stainless steel 1.4571/316Ti	**J86**

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
Valve manifold gaskets (in place of standard gaskets FKM (FPM))	
Gasket (EN 837-1) material Fe (soft iron)	**K60**
Gasket (EN 837-1) material 1.4571	**K61**
Gasket (EN 837-1) material Cu	**K62**
Process connection	
Process connection external thread G½, bore hole 11 mm	**K80**
Oval flange included, PTFE gasket + fixing screws	**K86**
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T02**
With mounted valve manifold 7MF9011-4FA, process connection at transmitter internal thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T03**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE sealing ring, steel fixing screws, pressure test certified in factory certificate (EN 10204-2.2)	**T05**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE sealing ring, stainless steel fixing screws, pressure test certified in factory certificate (EN 10204-2.2)	**T06**
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters)	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	**Y16**
TAG short (device parameters, max. 8 characters)	**Y17**
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	**Y21**
Local display: Scaling with standard units [m^3/s, l/s, m, inch, ...]; example 1 ... 5 m	**Y22**
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	**Y32**
ID number of special design	**Y99**

1) Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

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Technical specifications

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)			
Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a 0.83 ... 25 kPa a 3.3 ... 100.5 inH_2O a	4 bar a 0.4 MPa a 58 psi a	6 bar a 0.6 MPa a 87 psi a
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17.3 ... 522 inH_2O a	6.6 bar a 0.66 MPa a 95 psi a	10 bar a 1 MPa a 145 psi a
	166 ... 5 000 mbar a 16.6 ... 500 kPa a 2.41 ... 72.5 psi a	20 bar a 2 MPa a 290 psi a	30 bar a 3 MPa a 435 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a	65 bar a 6.5 MPa a 942 psi a	100 bar a 10 MPa a 1450 psi a
	5.3 ... 160 bar a 0.53 ... 16 MPa a 77 ... 2321 psi a	240 bar 24 MPa 3481 psi	380 bar a 38 MPa a 5511 psi a
	13.3 ... 400 bar a 1.3 ... 40 MPa a 192 ... 5802 psi a	400 bar a 40 MPa a 5802 psi a	600 bar a 60 MPa a 8702 psi a
	23.3 ... 700 bar a 2.3 ... 70 MPa a 337 ... 10153 psi a	800 bar a 80 MPa a 11603 psi a	800 bar a 80 MPa a 11603 psi a
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 mbar a/kPa a/psi a		
- Measuring cell with inert fill oil	For medium temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		30 mbar a/3 kPa a/0.44 psi a
	For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		30 mbar a + 20 mbar a · (ϑ -60 °C)/°C 3 kPa a + 2 kPa a · (ϑ -60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA (factory set to 3.55 mA)		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V) /22.8 mA, U_H: Auxiliary power in V		
• With HART communication	R = 230 ... 1100 Ω		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		
Characteristic curve deviation at limit point setting, including hysteresis and repeatability			

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)		
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range	
Linear characteristic curve (all measuring cells)		
• r ≤ 2	250 mbar a	≤ 0.1% (SITRANS P320) ≤ 0.075% (SITRANS P420)
	1.3 bar a, 5 bar a, 30 bar a, 160 bar a, 400 bar a and 700 bar a	≤ 0.065% (SITRANS P320) ≤ 0.055% (SITRANS P420)
• 2 < r ≤ 30	250 mbar a	≤ (0.01 · r +0.08)% (SITRANS P320) ≤ (0.01 · r +0.08)% (SITRANS P420)
	1.3 bar a, 5 bar a, 30 bar a, 160 bar a, 400 bar a and 700 bar a	≤ (0.005 · r +0.05)% (SITRANS P320) ≤ (0.005 · r +0.05)% (SITRANS P420)
Effect of ambient temperature (in % per 28 °C (50 °F))		
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r +0.1)%	
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2321 psi a 400 bar a/40 MPa a/5802 psi a 700 bar a/70 MPa a/10153 psi a	≤ (0.08 · r +0.16)%	
Long-term stability at ±30 °C (± 54 °F)		
• 250 mbar a and 1.3 bar a	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.40 · r)% In 15 years ≤ (0.50 · r)%	
• 5 bar a, 30 bar a, 160 bar a, 400 bar a and 700 bar a	In 5 years ≤ (0.1 · r)% In 10 years ≤ (0.15 · r)% In 15 years ≤ (0.20 · r)%	
Step response time T_{63} (without electrical damping)	Approx. 0.105 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Operating conditions		
Medium temperature		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert fill liquid	-20 ... +100 °C (-4 ... +212 °F)	
Ambient conditions		
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.	
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)	
- Measuring cell with inert fill liquid	-40 ... +85 °C (-40 ... +185 °F)	
- Local display	-20 ... +80 °C (-4 ... +176 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant fill oil: -20 ... +85 °C (-4 ... +185 °F))[2)]	
• Climatic class in accordance with IEC 60721-3-4	4K4H	
• Degree of protection		
- According to IEC 60529	IP66, IP68	
- According to NEMA 250	Type 4X	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	• Aluminum enclosure: Approx. 1.8 kg (3.9 lb) • Stainless steel enclosure: Approx. 3.8 kg (8.3 lb)	
Material		
• Material of wetted parts		
- Process connection	Stainless steel, mat. no. 1.4404/316L or Alloy C22, mat. no. 2.4602	
- Oval flange	Stainless steel, mat. no. 1.4404/316L	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Alloy C276, mat. no. 2.4819	
• Material of non-wetted parts		
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L)	
- Mounting bracket	Zinc-plated steel or stainless steel	

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
Process connection	• Connection shank G1/2A according to EN 837-1 • Internal thread ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • External thread M20 × 1.5 and ½-14 NPT
Electrical connection	Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Local display	• With or without integrated local display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	U_{SS} ≤ 0.2 V (47 ... 125 Hz)
Noise	U_{eff} ≤ 1.2 mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 24 ACC NY 265 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
• CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	No.: BVS 18 ATEX E 049X
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To circuit with the operating values U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.
2) Not possible for SITRANS P320 (7MF0320).

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit value monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output

Communication	
• Limit value monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
Number of function blocks	7

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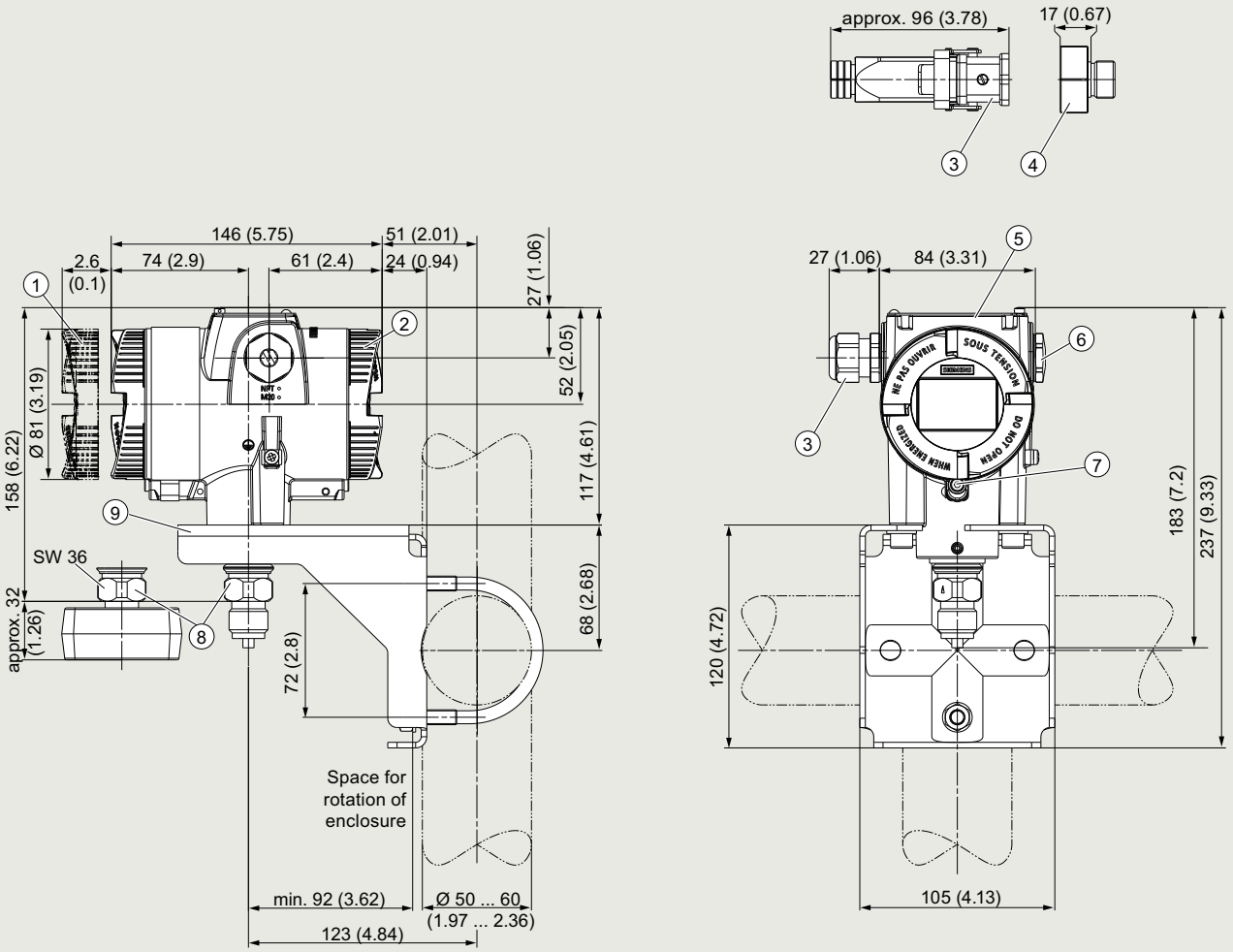
Technical specifications (continued)

Communication	
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes

Communication	
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

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Dimensional drawings



1. Electronics side, local display
   (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1.5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2][3] device plug
   - M12 device plug[2][3]
4. Harting adapter
5. Cover over buttons and nameplate
   with general information
6. Blanking plug
7. Safety catch
   (only for "flameproof enclosure" type of protection)
8. Process connection: G½B connection pin or oval flange
9. Mounting bracket (optional)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (pressure series), dimensions in mm (inch)

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Selection and ordering data

Pressure transmitters for absolute pressure (differential pressure series)	Article No.																
SITRANS P320	7MF033	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P420	7MF043	●	-	●	●	●	●	●	-	●	●	●	●				
Click the article number for online configuration in the PIA Life Cycle Portal.																	
Communication																	
HART, 4 ... 20 mA		0															
PROFIBUS PA		1															
FOUNDATION Fieldbus (FF)		2															
PROFINET over Ethernet APL		5															
Measuring cell filling																	
Silicone oil				1													
Inert filling liquid				3													
Maximum measuring span																	
250 mbar a (100.5 inH_2O a)					G												
1300 mbar a (522 inH_2O a)					L												
5000 mbar a (72.5 psi a)					P												
30 bar a (435 psi a)					R												
160 bar (2 320 psi)					Y												
Process connection																	
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518)						Q											
Oval flange, fastening thread: M10 (DIN 19213)						R											
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation						S											
Oval flange, fastening thread: M10 (DIN 19213) with lateral ventilation						T											
Version for diaphragm seal with fastening thread $^7/_{16}$-20 UNF (IEC 61518)						V											
Version for diaphragm seal with fastening thread M10 (DIN 19213)						W											
Material of wetted parts: Sensor body, seal diaphragm, process flange																	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408							0										
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408							1										
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408							2										
Tantalum/tantalum, process flange stainless steel 316/1.4408							4										
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408							6										
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408							8										
Material of non-wetted parts																	
Die-cast aluminum								1									
Stainless steel investment casting CF3M/1.4409 similar to 316L								2									
Enclosure																	
Dual chamber device												5					
Type of protection																	
Without Ex													A				
Intrinsic safety													B				
Flameproof enclosure													C				
Flameproof enclosure, intrinsic safety													D				
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2													L				
Intrinsic safety, dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2													M				
Combination of options B, C and L (Zone model)													S				
Combination of options B, C and L (Zone model, Class Division)													T				
Electrical connections/cable entries																	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																	
• 2 × M20 × 1.5														F			
• 2 × ½-14 NPT														M			
Local operation/display																	
Without local display (lid closed)																	0
With local display (lid closed)																	1
With local display (lid with glass pane)																	2

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Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Sealing plug included, plastic	**A20**
Sealing plug included, metal	**A21**
Sealing plug included, stainless steel	**A22**
Sealing plug included, stainless steel 316L/1.4404	**A23**
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	**A30**
Device plug Han 7D, mounted left (plastic, angled)	**A31**
Device plug Han 7D, mounted left (metal, straight)	**A32**
Device plug Han 7D, mounted left (metal, angled)	**A33**
Device plug Han 8D, mounted left (plastic, straight)	**A34**
Device plug Han 8D, mounted left (plastic, angled)	**A35**
Device plug Han 8D, mounted left (metal, straight)	**A36**
Device plug Han 8D, mounted left (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	**A45**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	**A48**
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	**A49**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	**A90**
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	**A91**
Cable gland/device plug mounted left	**A97**
Plug mounted right	**A98**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Certificates	
Quality inspection certificate - 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Declaration of compliance with the order EN 10204-2.1: Compliance with order	**C35**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Transmitter packaged in foil	**D60**
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	**D61**
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	**D62**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, UKCA, RCM) except EAC, FM, CSA, KC	**E00**
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
CSA (Japan)	**E29**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**

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Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Zinc-plated steel	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Mounting bracket, zinc-plated steel, reinforced (KTA)	**H05**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges chambered with gaskets	
1 × chambered, graphite	**K40**
1 × chambered, PTFE (FDA compliant), recommended for gas measurements	**K41**

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measuring medium: Gas	**K85**
Oval flange attached, PTFE seal + fixing screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters)	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	**Y16**
TAG short (device parameters, max. 8 characters)	**Y17**
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	**Y21**
Local display: Scaling with standard units [m^3/s, l/s, m, inch, ...]; example 1 ... 5 m	**Y22**
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	**Y32**
ID number of special design	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

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Technical specifications

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)			
Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a 0.83 ... 25 kPa a 3.3 ... 100.5 inH_2O a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17.3 ... 522 inH_2O a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	166 ... 5 000 mbar a 16.6 ... 500 kPa a 2.41 ... 72.5 psi a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	8 ... 160 bar 0.8 ... 16 MPa 116 ... 2 320 psi	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 mbar a/kPa a/psi a		
- Measuring cell with inert liquid	For medium temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		30 mbar a/3 kPa a/0.44 psi a
	For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		30 mbar a + 20 mbar a · (ϑ -60 °C)/°C 3 kPa a + 2 kPa a · (ϑ -60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V) /22.8 mA, U_H: Auxiliary power in V		
• With HART communication	R = 230 ... 1100 Ω		
Characteristic curve	• Linearly increasing or linearly decreasing		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		
Characteristic curve deviation at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, turn-down)	r = max. measuring span/set measuring span and nominal measuring range		
Linear characteristic curve			
• 250 mbar/25 kPa/3.63 psi	r ≤ 5:		≤ 0.065% (SITRANS P320) ≤ 0.055% (SITRANS P420)
	5 < r ≤ 30:		≤ (0.01 · r +0.05)% (SITRANS P320 and SITRANS P420)

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)		
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.055% (SITRANS P420)
	5 < r ≤ 30:	≤ (0.005 · r +0.05)%
• 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.055% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.005 · r +0.05)%
Effect of ambient temperature (in % per 28 °C (50 °F))		
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.1 · r +0.1)%	
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	≤ (0.0025 · r +0.125)%	
Long-term stability at ±30 °C (± 54 °F)		
• 250 mbar a/25 kPa a/3.6 psi a	In 5 years ≤ (0.2 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.30 · r)%	
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	In 5 years ≤ (0.1 · r)% In 10 years ≤ (0.15 · r)% In 15 years ≤ (0.20 · r)%	
Step response time T_{63} (without electrical damping)		
• 250 mbar a/25 kPa a/3.6 psi a 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	Every 0.135 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Operating conditions		
Medium temperature		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
- Measuring cell 30 bar (435 psi)	-20 ... +100 °C (-4 ... +212 °F)	
- Measuring cell 160 bar (2 320 psi)	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with inert fill oil	-20 ... +100 °C (-4 ... +212 °F)	
Ambient conditions		
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.	
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)	
- Measuring cell with inert fill oil	-40 ... +85 °C (-40 ... +185 °F)	
- Local display	-20 ... +80 °C (-4 ... +176 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class in accordance with IEC 60721-3-4	4K4H	
• Degree of protection		
- According to IEC 60529	IP66, IP68	
- According to NEMA 250	Type 4X	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	• Aluminum enclosure: Approx. 3.9 kg (8.5 lb) • Stainless steel enclosure: Approx. 5.9 kg (13 lb)	
Material		
• Material of wetted parts		
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold	
- Process flanges	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360	
- Sealing plug	1.4404 or as option alloy C22; 2.4602 or Monel mat. no. 2.4360	
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR	
• Material of non-wetted parts		

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L)
- Process flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	¼-18 NPT internal thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Local display	• With or without integrated local display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2$ V (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 24 ACC NY 265 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
• CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	No.: BVS 18 ATEX E 049X
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30$ V, $I_i = 101$ mA, $P_i = 760$ mW $U_i = 29$ V, $I_i = 110$ mA, $P_i = 800$ mW
- Effective internal inductance/capacitance	$L_i = 0.24$ µH/$C_i = 3.29$ nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: $U_n = 10.5$ ... 45 V, 4 ... 20 mA
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: $U_n = 10.5$ ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit value monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
• Limit value monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1

Communication	
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input

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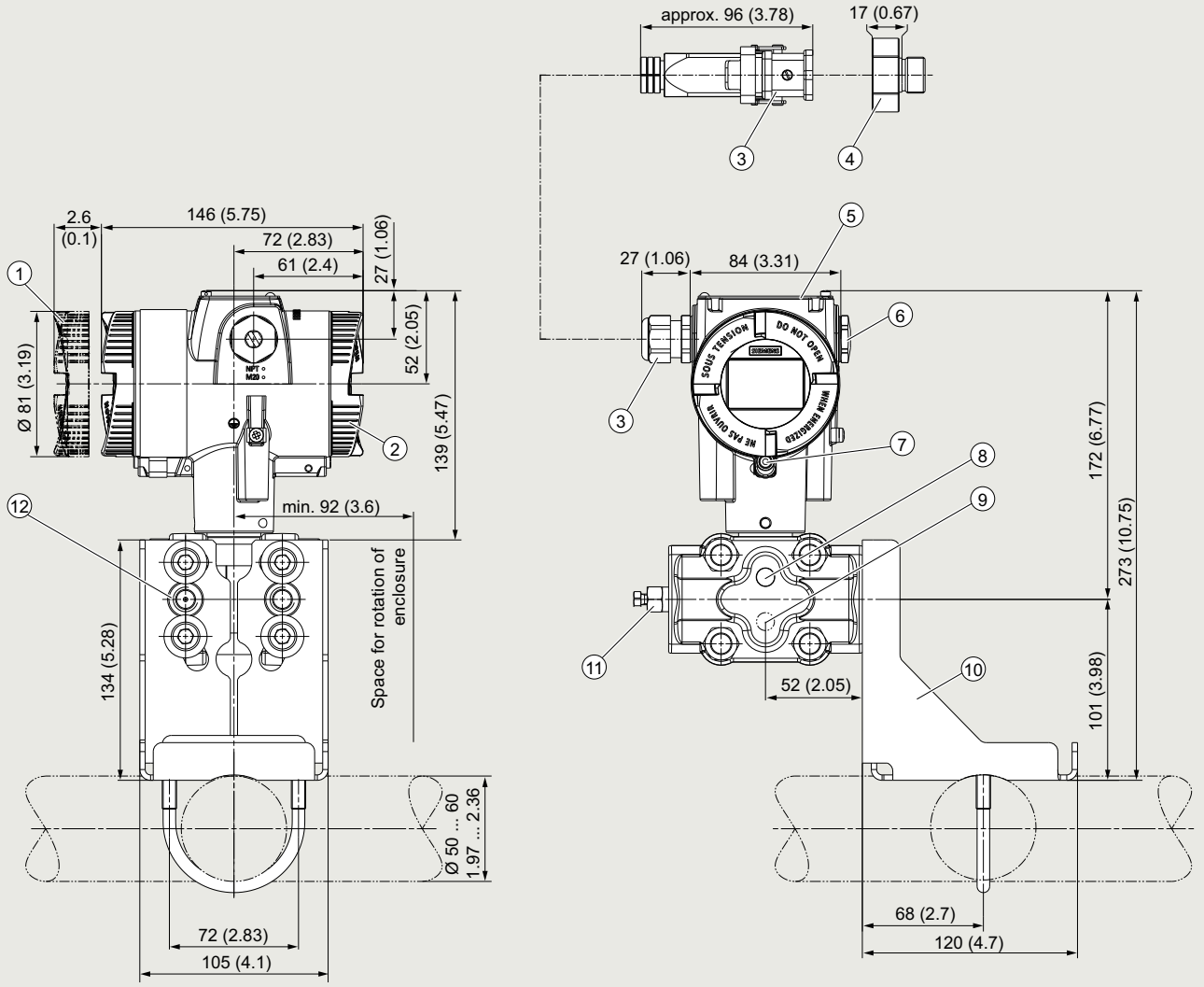
Technical specifications (continued)

Communication	
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support

Communication	
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

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Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (differential pressure series), dimensions in mm (inch)

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Selection and ordering data

Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	Article No.																
SITRANS P320	7MF034	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P420	7MF044	●	-	●	●	●	●	●	-	●	●	●	●				
Click the article number for online configuration in the PIA Life Cycle Portal.																	
Communication																	
HART, 4 ... 20 mA		0															
PROFIBUS PA		1															
FOUNDATION Fieldbus (FF)		2															
PROFINET over Ethernet APL		5															
Measuring cell filling																	
Silicone oil				1													
Inert liquid				3													
Neobee oil				4													
Maximum measuring span																	
10 mbar (4.015 inH_2O)[1]					A												
20 mbar (8.037 inH_2O)					B												
60 mbar (24.11 inH_2O)					D												
250 mbar (100.5 inH_2O)					G												
600 mbar (241.1 inH_2O)					H												
1 600 mbar (643 inH_2O)					M												
5 000 mbar (2009 inH_2O)					P												
30 bar (435 psi)					R												
160 bar (2 320 psi)					Y												
Process connection																	
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518)						L											
Oval flange, fastening thread: M10 (PN 160) (DIN 19213)						M											
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation						N											
Oval flange, fastening thread: M10 (PN 160) (DIN 19213) with lateral ventilation						P											
Version for diaphragm seal with fastening thread $^7/_{16}$-20 UNF (IEC 61518)						V											
Version for diaphragm seal with fastening thread M10 (PN 160) (DIN 19213)						W											
Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread $^7/_{16}$-20 UNF (IEC 61518)						X											
Material of wetted parts: Sensor body, seal diaphragm, process flange																	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408							0										
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408							1										
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408							2										
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))							4										
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))							6										
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408							8										
Material of non-wetted parts																	
Die-cast aluminum								1									
Stainless steel investment casting CF3M/1.4409 similar to 316L								2									
Enclosure																	
Dual chamber device													5				
Type of protection																	
Without Ex														A			
Intrinsic safety														B			
Flameproof enclosure														C			
Flameproof enclosure, intrinsic safety														D			
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2														L			
Intrinsic safety, dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2														M			
Combination of options B, C and L (Zone model)														S			
Combination of options B, C and L (Zone model, Class Division)														T			

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Selection and ordering data (continued)

Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	Article No.																
SITRANS P320	7MF034	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P420	7MF044	●	-	●	●	●	●	●	-	●	●	●	●				
Electrical connections/cable entries																	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																	
• 2 × M20 × 1.5															F		
• 2 × ½-14 NPT															M		
Local operation/display																	
Without local display (lid closed)																0	
With local display (lid closed)																1	
With local display (lid with glass pane)																2	

1) Only possible for SITRANS P420.

Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	Article No.																
SITRANS P320	7MF035	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P420	7MF045	●	-	●	●	●	●	●	-	●	●	●	●				
Click the article number for online configuration in the PIA Life Cycle Portal.																	
Communication																	
HART, 4 ... 20 mA		0															
PROFIBUS PA		1															
FOUNDATION Fieldbus (FF)		2															
Measuring cell filling																	
Silicone oil				1													
Inert liquid				3													
Maximum measuring span																	
250 mbar (100.5 inH_2O)					G												
600 mbar (241.1 inH_2O)					H												
1600 mbar (643 inH_2O)					M												
5000 mbar (2009 inH_2O)					P												
30 bar (435 psi)					R												
Process connection																	
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518)						L											
Oval flange, fastening thread: M12 (PN 420) (DIN 19213)						M											
Oval flange, fastening thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation						N											
Oval flange, fastening thread: M12 (PN 420) (DIN 19213) with lateral ventilation						P											
Version for diaphragm seal with fastening thread $^7/_{16}$-20 UNF (IEC 61518)						V											
Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread $^7/_{16}$-20 UNF (IEC 61518)						X											
Material of wetted parts: Sensor body, seal diaphragm, process flange																	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408							0										
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408							1										
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408							8										
Material of non-wetted parts																	
Die-cast aluminum								1									
Stainless steel investment casting CF3M/1.4409 similar to 316L								2									
Enclosure																	
Dual chamber device													5				
Type of protection																	
Without Ex														A			
Intrinsic safety														B			
Flameproof enclosure														C			
Flameproof enclosure, intrinsic safety														D			
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2														L			

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Selection and ordering data (continued)

Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	Article No.																	
SITRANS P320	7MF035	●	-	●	●	●	●	●	-	●	●	●	●					
SITRANS P420	7MF045	●	-	●	●	●	●	●	-	●	●	●	●					
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2												M						
Combination of options B, C and L (Zone model)												S						
Combination of options B, C and L (Zone model, Class Division)												T						
Electrical connections/cable entries																		
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																		
• 2 × M20 × 1.5														F				
• 2 × ½-14 NPT														M				
Local operation/display																		
Without local display (lid closed)																0		
With local display (lid closed)																1		
With local display (lid with glass pane)																2		

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41

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Selection and ordering data (continued)

Options **Add "-Z" to article No., add order code and plain text or entry from drop-down list.**	**Order code**
Stainless steel Ex plate 1.4404/316L	**D42**
Increase of pressure rating from PN 420 to PN 500 (Tested according to IEC 61010. Only permissible for media of fluid group 2 acc. to DGRL. Not suitable for use with hazardous media.)	**D50**
Extension of the medium temperature to -40 °C for measuring cell filling with inert fill liquid Please note step response time T63: 5.5 s (20 and 60 mbar); 1.4 s (250 and 600 mbar); 0.3 s (1.6 and 5 bar)	**D52**
Transmitter packaged in foil	**D60**
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	**D61**
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	**D62**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, UKCA, RCM) except EAC, FM, CSA, KC	**E00**
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
CSA (Japan)	**E29**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
DIBt overfill protection for liquids (non-flammable and flammable)	**E61**

Options **Add "-Z" to article No., add order code and plain text or entry from drop-down list.**	**Order code**
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Zinc-plated steel	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Mounting bracket, zinc-plated steel, reinforced (KTA)	**H05**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. medium temperature 90 °C (194 °F) Process connection ½-14 NPT, on the side in the middle of the process flanges, no vent valves possible	**K05**
Process flanges chambered with gaskets	
1 × chambered, graphite	**K40**
1 × chambered, PTFE (FDA compliant), recommended for gas measurements	**K41**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE (Not permitted with remote seal attachment on both sides)	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food, FDA compliant) (Not permitted with remote seal attachment on both sides)	**K51**
O-ring, process flanges, FFKM (FFPM) (Not permitted with remote seal attachment on both sides)	**K52**
O-ring, process flanges, NBR (Not permitted with remote seal attachment on both sides)	**K53**
O-ring, process flanges, EPDM (Not permitted with remote seal attachment on both sides)	**K54**
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**

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Selection and ordering data (continued)

Options **Add "-Z" to article No., add order code and plain text or entry from drop-down list.**	**Order code**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measuring medium: Gas	**K85**
Oval flange attached, PTFE seal + fixing screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	**Y01**
Square-rooted characteristic curve [VSLN2, MSLN2]; example: VSLN2	**Y02**

Options **Add "-Z" to article No., add order code and plain text or entry from drop-down list.**	**Order code**
TAG (on stainless steel plate and device parameters, max. 32 characters)	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	**Y16**
TAG short (device parameters, max. 8 characters)	**Y17**
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	**Y21**
Local display: Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... . 5 m^3/s	**Y22**
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	**Y32**
ID number of special design	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

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Technical specifications

SITRANS P320 / SITRANS P420 for differential pressure and flow

Input			
Measured variable	Differential pressure and flow		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	0.25 ... 10 mbar 0.025 ... 1 kPa 0.1003 ... 4.015 inH_2O	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	1 ... 20 mbar 0.1 ... 2 kPa 0.4019 ... 8.037 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	1 ... 60 mbar 0.1 ... 6 kPa 0.4019 ... 24.11 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.2 ... 25 kPa 1.005 ... 100.5 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 ... 241.1 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	16 ... 1600 mbar 1.6 ... 160 kPa 6.43 ... 643 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	50 ... 5 000 mbar 5 ... 500 kPa 20.09 ... 2009 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	8 ... 160 bar 0.8 ... 16 MPa 116 ... 2 320 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.25 ... 25 kPa 1.005 ... 100.5 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 ... 241.1 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	16 ... 1600 mbar 1.6 ... 160 kPa 6.43 ... 643 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	50 ... 5 000 mbar 5 ... 500 kPa 20.09 ... 2009 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	All measuring cells: • -100% of max. measuring range or 30 mbar a /3 kPa a /0.44 psi a Measuring cell 160 bar/16 MPa/2 320 psi: • -25% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a		
- Measuring cell with inert liquid	For medium temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)	-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a	
	For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))	-100% of the maximum measuring range, or 30 mbar a + 20 mbar a · (ϑ -60 °C)/°C 3 kPa a + 2 kPa a · (ϑ -60 °C)/°C0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F	
- Measuring cell with FDA compliant fill oil	For medium temperature -10 °C < ϑ ≤ +100 °C (-14 °F < ϑ ≤ +212 °F)	-100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a	
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow		
Output	**HART**	
Output signal	4 ... 20 mA	
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set to 3.8 mA	
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA	
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current	
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display	
• Current simulator	3.55 ... 22.8 mA	
• Failure signal	3.55 ... 22.8 mA	
Load	Resistance R [Ω]	
• Without HART communication	R = (U_H - 10.5 V) /22.8 mA U_H: Auxiliary power in V	
• With HART communication	R = 230 ... 1100 Ω	
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)	
Physical bus	-	
Polarity-independent	-	
Measuring accuracy		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Characteristic curve deviation at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range	
Linear characteristic curve		
• 10 mbar/1 kPa/0.145 psi	r ≤ 2:	≤ 0.065% (SITRANS P420)
	2 < r ≤ 40:	≤ (0.01 · r +0.05)% (SITRANS P420)
• 20 mbar/2 kPa/0.29 psi	r ≤ 1.5:	≤ 0.055% (SITRANS P320) ≤ 0.05% (SITRANS P420)
	1.5 < r ≤ 20:	≤ (0.005 · r +0.05)%
• 60 mbar/6 kPa/0.87 psi	r ≤ 2:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	2 < r ≤ 60:	≤ (0.005 · r +0.05)%
• 250 mbar/25 kPa/3.63 psi	r ≤ 2:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	2 < r ≤ 100:	≤ (0.005 · r + 0.05)% (SITRANS P320 / SITRANS P420)
• 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r + 0.045)% (SITRANS P320 / SITRANS P420)
• 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.004 · r + 0.045)% (SITRANS P320 / SITRANS P420)
• 250 mbar/25 kPa/3.63 psi (PN 420)	r ≤ 2:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	2 < r ≤ 100:	≤ (0.005 · r + 0.05)%
Square-rooted characteristic curve (flow > 50%)		
• 10 mbar/1 kPa/0.145 psi	r ≤ 2:	≤ 0.065%
	2 < r ≤ 40:	≤ (0.01 · r +0.05)%
• 20 mbar/2 kPa/0.29 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 20:	≤ (0.005 · r +0.05)%
• 60 mbar/6 kPa/0.87 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 60:	≤ (0.005 · r +0.05)%
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r +0.045)%
• 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow		
• 160 bar/16 MPa/2 320 psi	5 < r ≤ 20:	≤ (0.004 · r +0.045)%
Square-rooted characteristic curve (flow 25 ... 50%)		
• 10 mbar/1 kPa/0.145 psi	r ≤ 2:	≤ 0.13%
	2 < r ≤ 40:	≤ (0.02 · r +0.1)%
• 20 mbar/2 kPa/0.29 psi	r ≤ 5:	≤ 0.15%
	5 < r ≤ 20:	≤ (0.01 · r +0.1)%
• 60 mbar/6 kPa/0.87 psi	r ≤ 5:	≤ 0.15%
	5 < r ≤ 60:	≤ (0.01 · r +0.1)%
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.13% (SITRANS P320) ≤ 0.08% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.008 · r +0.09)%
• 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.11% (SITRANS P320) ≤ 0.08% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.008 · r +0.09)%
Effect of ambient temperature (in % per 28 °C (50 °F))		
• 10 mbar/2 kPa/0.145 psi	≤ (0.3 · r +0.1)%	
• 20 mbar/2 kPa/0.29 psi	≤ (0.15 · r +0.1)%	
• 60 mbar/6 kPa/0.87 psi	≤ (0.075 · r +0.1)%	
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.025 · r + 0.125)% (SITRANS P320)	
• 250 mbar/25 kPa/3.63 psi 5 bar/500 kPa/72.5 psi	≤ (0.025 · r + 0.0625)% (SITRANS P420)	
• 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.0125 · r + 0.0625)% (SITRANS P420)	
Effect of static pressure		
• At the lower range value	Zero offset is possible with position error compensation	
- 10 mbar/1 kPa/0.145 psi	≤ (0.4 · r)% per 70 bar	
- 20 mbar/2 kPa/0.29 psi	≤ (0.3 · r)% per 70 bar (SITRANS P320) ≤ (0.2 · r)% per 70 bar (SITRANS P420)	
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.1 · r)% per 70 bar	
- 5 bar/500 kPa/72.5 psi	≤ (0.15 · r)% per 70 bar	
• On the measuring span (for PN160)		
- 10 mbar/1 kPa/0.145 psi	≤ 0.4% per 70 bar	
- 20 mbar/2 kPa/0.29 psi	≤ 0.2% per 70 bar	
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ 0.1% per 70 bar	
• On the measuring span (for PN420)		
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.14 · r)% per 70 bar	
Long-term stability at ±30 °C (± 54 °F)	Static pressure max. 70 bar/7 MPa/1015 psi	

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow	
• 10 mbar/1 kPa/0.145 psi	In 5 years ≤ (0.3 · r)% In 10 years ≤ (0.5 · r)% In 15 years ≤ (0.7 · r)%
• 20 mbar/2 kPa/0.29 psi	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%
• 60 mbar/6 kPa/0.87 psi	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	In 5 years ≤ (0.05 · r)% In 10 years ≤ (0.1 · r)% In 15 years ≤ (0.15 · r)%
Step response time T_{63} (without electrical damping for pressure rating PN 160)	
• 10 mbar/1 kPa/0.145 psi	Approx. 0.160 s
• 20 mbar/2 kPa/0.29 psi	Approx. 0.160 s
• 60 mbar/6 kPa/0.87 psi	Approx. 0.150 s
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	Approx. 0.135 s
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.028 inH_2O per 10° incline (zero offset is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Medium temperature	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
- Measuring cell 30 bar (435 psi)	-20 ... +100 °C (-4 ... +212 °F)
- Measuring cell 160 bar (2 320 psi)	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with inert fill oil	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with FDA compliant fill oil	-10 ... +100 °C (14 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert fill oil	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with FDA compliant fill oil	-10 ... +85 °C (14 ... +185 °F)
- Local display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA compliant fill oil: -20 ... +85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	• Aluminum enclosure: Approx. 3.9 kg (8.5 lb) • Stainless steel enclosure: Approx. 5.9 kg (13 lb)
Material	
• Material of wetted parts	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- Sealing plug	1.4404 or as option alloy C22; 2.4602 or Monel mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Material of non-wetted parts	

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L)
- Process flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	¼-18 NPT internal thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6 092 psi))
Electrical connection	Screw terminals Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Local display	• With or without integrated local display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2$ V (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) **For flow only** For gases of fluid group 1 and liquids of fluid group 1; fulfills the basic safety requirements as per article 3, paragraph 1 (appendix 1); classified as category III, module H conformity evaluation by TÜV Nord
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 24 ACC NY 265 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
• CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	No.: BVS 18 ATEX E 049X
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30$ V, $I_i = 101$ mA, $P_i = 760$ mW $U_i = 29$ V, $I_i = 110$ mA, $P_i = 800$ mW
- Effective internal inductance/capacitance	$L_i = 0.24$ µH/$C_i = 3.29$ nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: $U_n = 10.5$ ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: $U_n = 10.5$ ... 45 V, 4 ... 20 mA

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow	
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit value monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
• Limit value monitoring	One upper and lower warning limit and one alarm limit respectively

Communication	
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve

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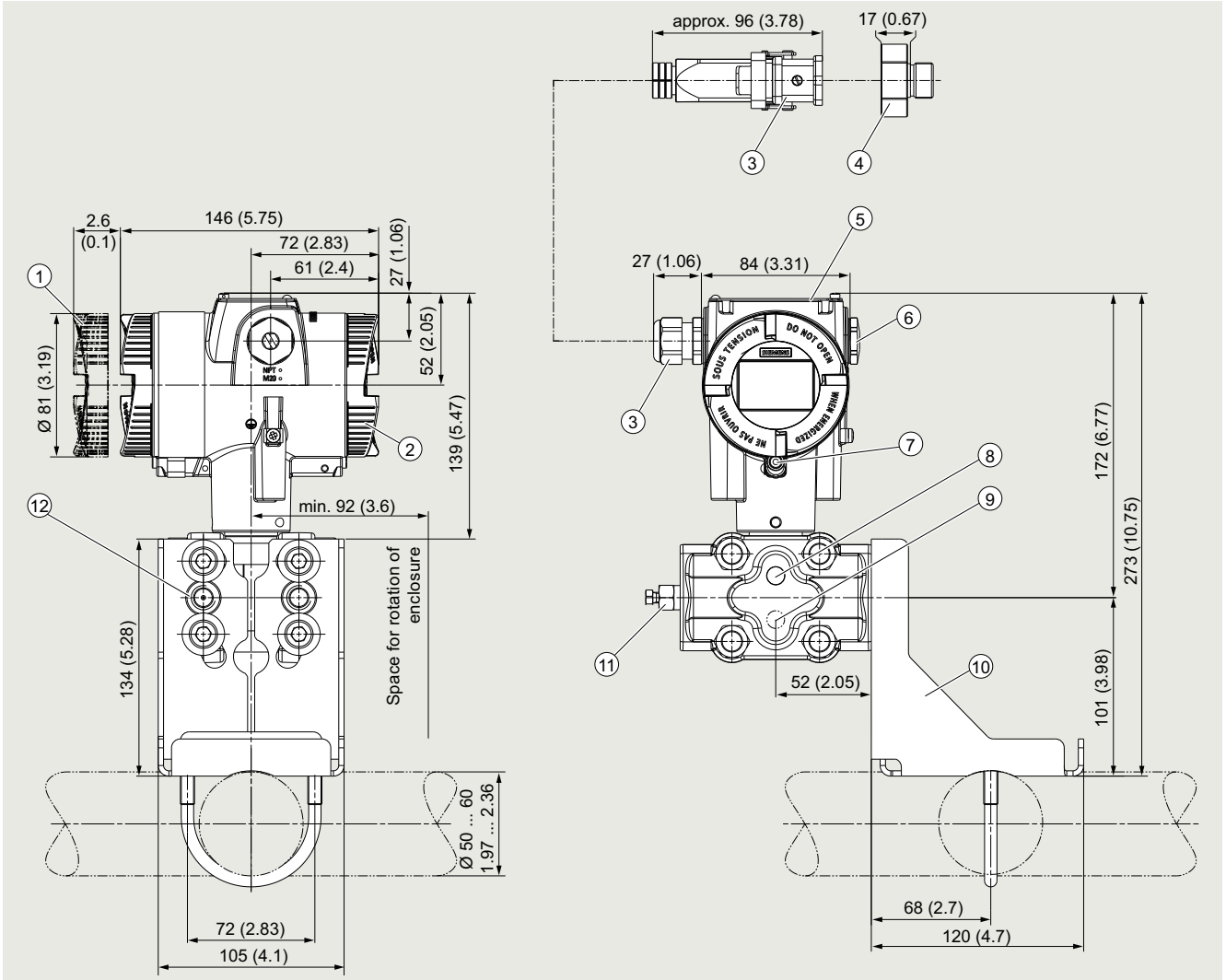
Technical specifications (continued)

Communication	
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support

Communication	
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

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Dimensional drawings



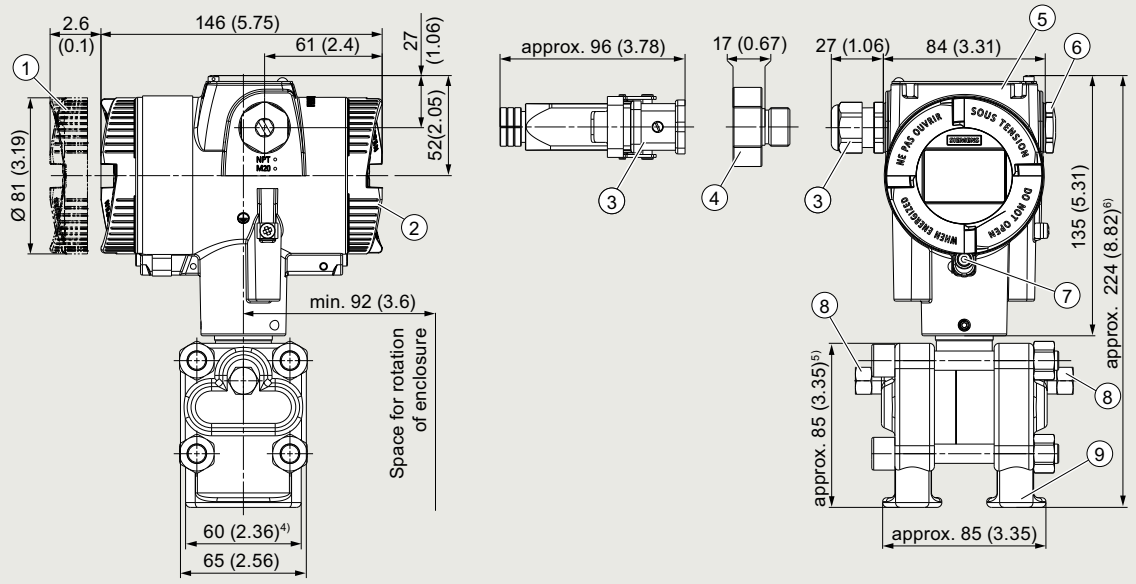
1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2][3] device plug
   - M12 device plug[2][3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for differential pressure and flow, dimensions in mm (inch)

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Dimensional drawings (continued)



1. Electronics side, local display (longer overall length for cover with inspection window)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1.5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Sealing plug with valve (option)
9. Process connection: ¼-18 NPT (IEC 61518)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"
4) 74 mm (2.9 inches) for PN ≥ 420 (MAWP ≥ 6092 psi)
5) 91 mm (3.6 inches) for PN ≥ 420 (MAWP ≥ 6092 psi)
6) 226 mm (8.9 inches) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P320/P420 pressure transmitter for differential pressure and flow with process covers for vertical differential pressure lines (option "K81"), dimensions in mm (inch)

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Selection and ordering data

Pressure transmitters for level	Article No.																
SITRANS P320	7MF036	●	-	●	●	●	●	●	-	●	●	●	●				
SITRANS P420	7MF046	●	-	●	●	●	●	●	-	●	●	●	●				
Click the article number for online configuration in the PIA Life Cycle Portal.																	
Communication																	
HART, 4 ... 20 mA		**0**															
PROFIBUS PA		**1**															
FOUNDATION Fieldbus (FF)		**2**															
PROFINET over Ethernet APL		**5**															
Measuring cell filling																	
Silicone oil				**1**													
Inert liquid				**3**													
Maximum measuring span																	
60 mbar (24.11 inH_2O)					**D**												
250 mbar (100.5 inH_2O)					**G**												
600 mbar (241 inH_2O)					**H**												
1600 mbar (643 inH_2O)					**M**												
5000 mbar (72.5 psi)					**P**												
30 bar (435 psi)					**R**												
160 bar (2321 psi)					**Y**												
Process connection																	
Version for diaphragm seal with fastening thread $^7/_{16}$-20 UNF (IEC 61518): Remote seal 7MF0814 must be ordered separately.						**V**											
Version for diaphragm seal with fastening thread M10 (DIN 19213): The remote seal must be ordered separately. System delivery time: Delivery time of the transmitter included in the delivery time of the remote seal.						**W**											
Material of wetted parts: Sensor body, seal diaphragm, process flange																	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408							**0**										
Stainless steel 316L/1.4404; alloy C276/2.4819, process flange stainless steel 316/1.4408							**1**										
Sensor pressure: Alloy C22/2.4602, alloy C276/2.4819 Sensor differential pressure: Alloy C276/2.4819, alloy C276/2.4819; process flange stainless steel 316/1.4408							**2**										
Tantalum, tantalum; process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 60 mbar (0.87 psi))							**4**										
Monel 400/2.4360, Monel 400/2.4360; process flange: Stainless steel 316/1.4408 (not in combination with maximum measuring span 60 mbar (0.87 psi))							**6**										
Stainless steel 316L/1.4404, gold-plated; process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 60 mbar (0.87 psi))							**8**										
Material of non-wetted parts																	
Die-cast aluminum								**1**									
Stainless steel investment casting CF3M/1.4409 similar to 316L								**2**									
Enclosure																	
Dual chamber device												**5**					
Type of protection																	
Without Ex													**A**				
Intrinsic safety													**B**				
Flameproof enclosure													**C**				
Flameproof enclosure, intrinsic safety													**D**				
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2													**L**				
Intrinsic safety, dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2													**M**				
Combination of options B, C and L (Zone model)													**S**				
Combination of options B, C and L (Zone model, Class Division)													**T**				
Electrical connections/cable entries																	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																	
• 2 × M20 × 1.5															**F**		
• 2 × ½-14 NPT															**M**		
Local operation/display																	
Without local display (lid closed)																**0**	
With local display (lid closed)																**1**	

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Selection and ordering data (continued)

Pressure transmitters for level	Article No.												
SITRANS P320	7MF036	●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P420	7MF046	●	-	●	●	●	●	●	-	●	●	●	●
With local display (lid with glass pane)													2

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	D62
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada)[1)]	E21
FM (USA and Canada)[1)]	E22
IECEx (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27

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Selection and ordering data (continued)

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
PESO (India)	**E28**
CSA (Japan)	**E29**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
DIBt overfill protection for liquids (non-flammable and flammable)	**E61**
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
Process flanges	
Gasket process flange 1 × chambered, graphite	**K40**
Gasket process flange, 1 × chambered, PTFE	**K41**
Vent valve in the material of the process flange	**K84**
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters)	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	**Y16**
TAG short (device parameters, max. 8 characters)	**Y17**
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	**Y21**
Local display: Scaling with standard units [m^3/s, l/s, m, inch, ...]; example 1 ... 5 m	**Y22**
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	**Y32**
ID number of special design	**Y99**

[1)] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Diaphragm seal **In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420** **7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit**		**Article No. 7MF0814-** ● ● ● 0 3 - 0 ● ● ● ● ● ●	**Order code**
Click the article number for online configuration in the PIA Life Cycle Portal.			
Standard of process connection EN 1092-1			
Nominal diameter	**Rated pressure**		
DN 25	PN 10/16/25/40	**0 B D**	
	PN 63/100	**0 B F**	
	PN 160	**0 B G**	
	PN 250	**0 B H**	
DN 40	PN 10/16/25/40	**0 D D**	
	PN 63/100	**0 D F**	
	PN 160	**0 D G**	
DN 50	PN 10/16/25/40	**0 E D**	
	PN 63	**0 E E**	
	PN 100	**0 E F**	
DN 80	PN 10/16/25/40	**0 G D**	
	PN 100	**0 G F**	
DN 100	PN 10/16	**0 H B**	
	PN 25/40	**0 H D**	
DN 125	PN 16	**0 J B**	
	PN 40	**0 J D**	

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Selection and ordering data (continued)

Diaphragm seal In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0814-												Order code		
		●	●	●	0	3	-	0	●	●	●			●	●	●
Process connection standard ASME B16.5																
Nominal diameter	**Rated pressure**															
1 inch	Class 150	1	K	L												
	Class 300	1	K	M												
	Class 600	1	K	N												
	Class 1500	1	K	P												
1½ inches	Class 150	1	L	A												
	Class 300	1	L	B												
	Class 400/600	1	L	D												
	Class 900/1500	1	L	F												
2 inches	Class 150	1	M	A												
	Class 300	1	M	B												
	Class 400/600	1	M	D												
	Class 900/1500	1	M	F												
3 inches	Class 150	1	P	A												
	Class 300	1	P	B												
	Class 600	1	P	D												
	Class 1500	1	P	F												
4 inches	Class 150	1	Q	A												
	Class 300	1	Q	B												
	Class 400	1	Q	D												
	Class 1500	1	Q	F												
5 inches	Class 150	1	R	A												
	Class 300	1	R	B												
	Class 400	1	R	C												
Process connection standard J.I.S.																
Nominal diameter	**Rated pressure**															
DN 50	10K	2	E	S												
	20k	2	E	T												
	40K	2	E	U												
DN 80	10K	2	G	S												
	20k	2	G	T												
	40K	2	G	U												
DN 100	10K	2	H	S												
	20k	2	H	T												
	40K	2	H	U												
Other version, add order code and plain text		9	A	A										H	1	Y
Fill liquid																
Silicone oil M50									B							
High-temperature oil									C							
Silicone oil M5									A							
Food oil (FDA-listed)									E							
Neobee M20 (FDA-listed)									R							
Halocarbon oil									D							
Other version, add order code and plain text									Z					P	1	Y
Material of wetted parts																
Stainless steel 316L																
• Without coating										A						
• With PFA coating										D						

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Selection and ordering data (continued)

Diaphragm seal In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0814-										Order code			
		●	●	●	0	3	-	0	●	●	●		●	●	●
• With PTFE coating										E	0				
• With ECTFE coating										F					
Monel 400, 2.4360										G					
Hastelloy C276, 2.4819										J					
Tantalum										K					
Titanium, 3.7035										L	0				
Nickel 201										M	0				
Diaphragm Duplex, 1.4462										Q					
Diaphragm and flange Duplex, 1.4462										R					
Stainless steel 316L, gold-plated										S	0				
Hastelloy C4, 2.4610										U	0				
Hastelloy C22, 2.4602										V	0				
Other version, add order code and plain text										Z			Q	1	Y
Tube length															
None											0				
50 mm (2 inches)											1				
100 mm (4 inches)											2				
150 mm (6 inches)											3				
200 mm (8 inches)											4				
250 mm (10 inches)											5				
Other version, add order code and plain text										Z	8		R	1	Y
Customer-specific tube length															
• Wetted parts: Stainless steel without coating															
Range	Standard length														
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)									A	1				
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)									A	2				
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)									A	3				
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)									A	4				
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)									A	5				
• Wetted parts: Stainless steel with ECTFE coating															
Range	Standard length														
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)									F	1				
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)									F	2				
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)									F	3				
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)									F	4				
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)									F	5				
• Wetted parts: Stainless steel with PFA coating															
Range	Standard length														
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)									D	1				
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)									D	2				
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)									D	3				
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)									D	4				
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)									D	5				
• Wetted parts: Monel 400															
Range	Standard length														
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)									G	1				
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)									G	2				
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)									G	3				
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)									G	4				
• Wetted parts: Hastelloy C276															

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Selection and ordering data (continued)

Diaphragm seal In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0814-										Order code		
		●	●	●	0	3	-	0	●	●	●	●	●	●
Range	Standard length													
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)								J	1				
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)								J	2				
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)								J	3				
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)								J	4				
• Wetted parts: Tantalum														
Range	Standard length													
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)								K	1				
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)								K	2				
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)								K	3				
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)								K	4				

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	C11
Inspection certificate according to EN 10204-3.1 for main body and diaphragm	C12
Manufacturer code according to NACE (MR 0103-2012 and MR 0175-2009) (only in combination with wetted parts made of stainless steel 316 L and Hastelloy)	C13
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	C15
Inspection certificate (EN 10204-3.1) - Pressure test	C16
Certificate on the FDA listing of the fill oil according to EN 10204-2.2	C17
Factory certificate functional safety (SIL2/3), suitability of devices for use according to IEC 61508 and IEC 61511 (contains SIL Declaration of Conformity)	C20
Accessories	
Epoxy resin coating Color: Transparent Scope: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. Maximum medium temperature with epoxy lacquering: 140 °C	D15
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	D42
Volume deflagration flame arrester (VDFA) for differential pressure transmitter	D62
Negative pressure service	
Negative pressure service for differential pressure transmitters	D83
Extended negative pressure service for differential pressure transmitters	D88
Approvals and certificates	
Country-specific approval CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	E60
Oil-free and grease-free cleaned version for oxygen application including EN 10204-2.2 certificates (only with fill liquid halocarbon oil and at max. temperature 60 °C and max. pressure 50 bar)	E80
Oil-free and grease-free cleaned version not for oxygen application, including EN 10204-2.2 certificates	E87
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	M50
Sealing surface groove according to EN 1092-1, form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	M54

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	M64
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 40	M71
• DN 50	M72
• DN 80	M73
• DN 100	M74
• DN 125	M75
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
• DN 40	M77
• DN 50	M78
• DN 80	M79
• DN 100	M80
• DN 125	M81
Sealing surface internal face according to EN 1092-1, form F (only for wetted parts made of stainless steel 316L)	
• DN 50	M84
• DN 80	M85
• DN 100	M86
• DN 125	M87
Remote seal connection	
Elongated pipe, approx. 150 mm (5.9 inches)	S05
Elongated pipe, approx. 200 mm (7.9 inches)	S06
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	W01
Company Labom, Hude	W02
Special design	
Welded filling hole	X01
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	Y44
Specification of process conditions[1)]	
Ambient temperature range	

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Selection and ordering data (continued)

Options **Add "-Z" to article number, specify order code and plain text or entry from drop-down list.**	**Order code**
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" below the "More information" section.

Technical specifications

SITRANS P320 / SITRANS P420 for level			
Input			
Measured variable	Level		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	25 ... 60 mbar 2.5 ... 6 kPa 10 ... 24.1 inH_2O	See mounting flange	
	25 ... 250 mbar 2.5 ... 25 kPa 10 ... 100.5 inH_2O		
	25 ... 600 mbar 2.5 ... 60 kPa 10 ... 241 inH_2O		
	53 ... 1 600 mbar 5.3 ... 160 kPa 21 ... 643 inH_2O		
	166 ... 5 000 mbar 16.6 ... 500 kPa 2.41 ... 72.5 psi		
	1 ... 30 bar 0.1 ... 3 MPa 14.5 ... 435 psi		
	8 ... 160 bar 0.8 ... 16 MPa 116 ... 2320 psi		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with silicone oil filling (30 bar)	-30 bar/ -3 MPa/ -435 psi		
- Measuring cell with silicone oil filling (160 bar)	-40 bar/-4 MPa/-580 psi		
• Upper measuring limit	100% of max. measuring span		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V) /22.8 mA, U_H: Auxiliary power in V		
• With HART communication	R = 230 ... 1100 Ω		
Characteristic curve	• Linearly increasing or linearly decreasing		
Physical bus	-		
Polarity-independent	-		

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for level			
Measuring accuracy			
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		
Characteristic curve deviation at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, turn-down)	r = maximum measuring span/set measuring span or nominal measuring range		
Linear characteristic curve	**r ≤ 2.4**	**r ≤ 5**	**5 < r ≤ 10**
• 60 mbar/6 kPA/0.87 psi	≤ 0.125%		
• 250 mbar/25 kPa/3.6 psi		≤ 0.125%	≤ (0.007 · r +0.09) %
• 600 mbar/60 kPa/8.7 psi			
• 1600 mbar/160 kPa/23.21 psi			
• 5 bar/500 kPa/72.5 psi			
• 30 bar/3 MPa/435.11 psi			
• 160 bar/16 MPa/2320 psi			
Effect of ambient temperature (in % per 28 °C (50 °F))			
SITRANS P320			
• 60 mbar/6 kPA/0.87 psi	≤ (0.075 · r +0.1)%		
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435.11 psi 160 bar/16 MPa/2320 psi	≤ (0.025 · r +0.125)%		
SITRANS P420			
• 60 mbar/6 kPA/0.87 psi	≤ (0.075 · r +0.1)%		
• 250 mbar/25 kPa/3.6 psi 5 bar/500 kPa/72.5 psi	≤ (0.025 · r +0.0625)%		
• 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435.11 psi 160 bar/16 MPa/2320 psi	≤ (0.0125 · r +0.0625) %		
Effect of static pressure			
• At the lower range value			
• 60 mbar/6 kPA/0.87 psi	≤ (0.4 · r)% per rated pressure		
• 250 mbar/25 kPa/3.63 psi	≤ (0.3 · r)% per rated pressure		
• 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.52 psi 30 bar/3 MPa/435.11 psi 160 bar/16 MPa/2320 psi	≤ (0.15 · r)% per rated pressure		
• On the measuring span	≤ (0.1 · r)% per rated pressure		
Long-term stability at ±30 °C (± 54 °F)			
• All measuring cells	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)% Static pressure max. 70 bar/7 MPa/1015 psi		
Step response time T_{63} (without electrical damping)	Depends on the installed remote seal		
Influence of mounting position	Depends on the fill liquid in the mounting flange		
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V		
Operating conditions			
Medium temperature			
• Measuring cell with silicone oil filling • Measuring cell with inert fill oil	• High side: See mounting flange • Low side: -40 ... +100 °C (-40 ... +212 °F)		
Ambient conditions			
• Ambient temperature/enclosure	Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection.		
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)		
- Measuring cell with inert fill oil	-40 ... +85 °C (-40 ... +185 °F)		

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for level		
- Local display	-20 ... +80 °C (-4 ... +176 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class in accordance with IEC 60721-3-4	4K4H	
• Degree of protection		
- According to IEC 60529	IP66, IP68	
- As per NEMA 250	Type 4X	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	Pressure transmitter with mounting flange, without tube	
• According to EN	• Aluminum enclosure: Approx. 11 ... 13 kg (24.2 ... 28.7 lb) • Stainless steel enclosure: Approx. 13 ... 15 kg (28.7 ... 33 lb)	
• According to ASME	• Aluminum enclosure: Approx. 11 ... 18 kg (24.2 ... 39.7 lb) • Stainless steel enclosure: Approx. 13 ... 20 kg (28.7 ... 44 lb)	
Material		
• Material of wetted parts		
- High side	Seal diaphragm of mounting flange	Stainless steel, mat. no. 1.4404/316L, Monel 400, mat. no. 2.4360, Alloy B2, mat. no. 2.4617, Alloy C276, mat. no. 2.4819, Alloy C22, mat. no. 2.4602, tantalum, PTFE, PFA, ECTFE
	Sealing surface	Smooth according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 2092-1 form B2 or ASME B16.5 RFSF for the remaining materials
- Gasket material in the process flanges	For standard applications	Viton
	For negative pressure applications on the mounting flange	Copper
- Low side	Seal diaphragm	Stainless steel, mat. no. 1.4404/316L
	Process flanges	Stainless steel, mat. no. 1.4408/316
	Process flange screw	Stainless steel ISO 3506-1 A4-70
	O-ring	FPM (Viton)
• Material of non-wetted parts		
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L)	
- Process flange screws	Stainless steel ISO 3506-1 A4-70	
- Measuring cell filling	Silicone oil	
• Mounting flange fill liquid	Silicone oil or other material	
Process connection		
• High side	Flange according to EN, ASME, and JIS	
• Low side	Internal thread ¼-18 NPT and flange connection with fastening thread M10 as per DIN 19213 or 7/16-20 UNF as per EN 61518	
Electrical connection	Screw terminals Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12	
Displays and controls		
Buttons	4 buttons for operation directly on the device	
Local display	• With or without integrated local display (optional) • Lid with inspection window (optional)	
Auxiliary power U_H		
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode	
Ripple	$U_{SS} \leq 0.2$ V (47 ... 125 Hz)	
Noise	$U_{eff} \leq 1.2$ mV (0.5 ... 10 kHz)	
Auxiliary power	–	
Separate supply voltage	–	
Certificates and approvals		
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Drinking water		

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Technical specifications (continued)

SITRANS P320 / SITRANS P420 for level	
• WRAS (England)	No.: 1903094 (option E83)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	BVS 18 ATEX E 049X
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex tb IIIC T120 °C Da Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.

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Technical specifications (continued)

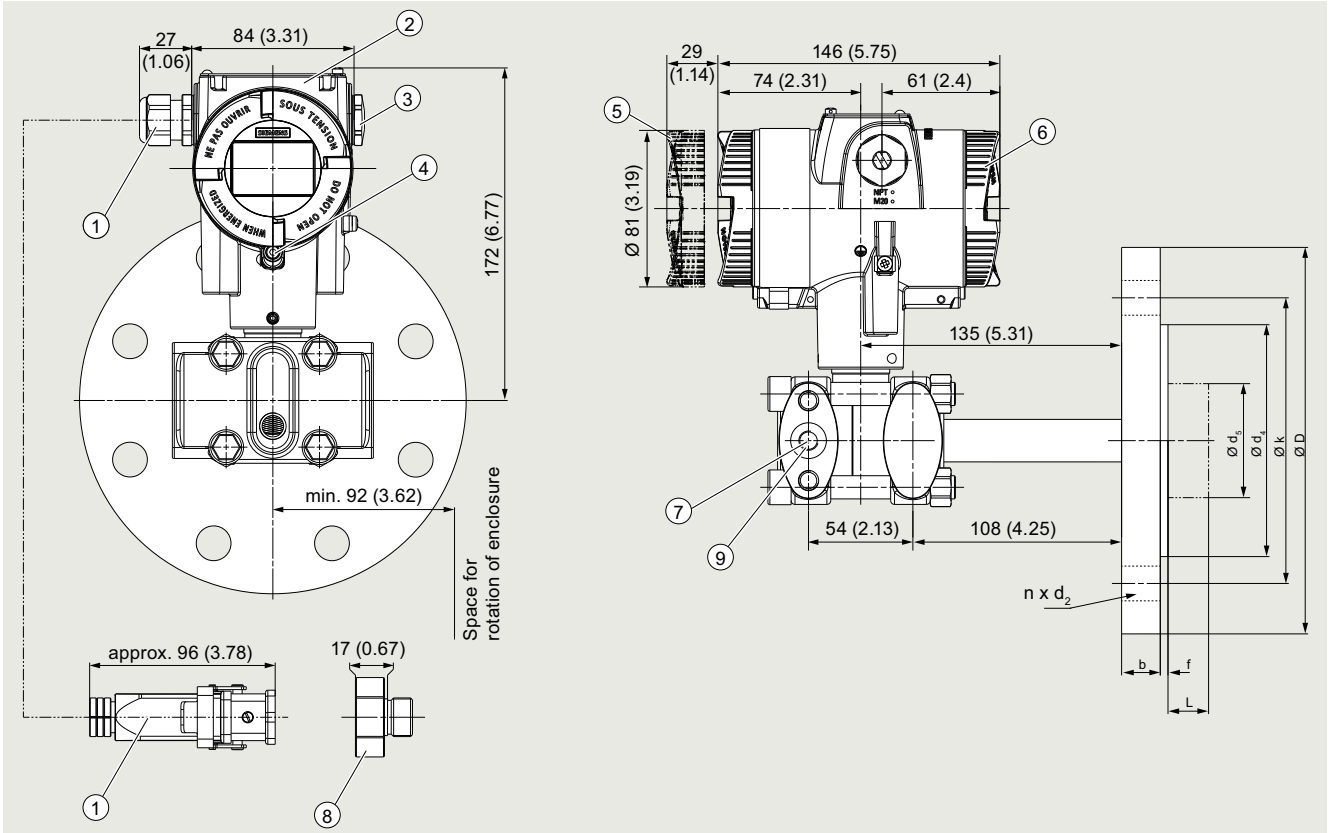
Mounting flange	
Nominal diameter	Rated pressure
• According to EN 1092-1	
- DN 80	PN 40
- DN100	PN 16, PN 40
• According to ASME B16.5	
- 3 inches	Class 150, Class 300
- 4 inches	Class 150, Class 300

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes

Communication	
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

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Dimensional drawings



1. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
2. Cover over buttons and nameplate with general information
3. Blanking plug
4. Safety catch
   (only for "flameproof enclosure" type of protection)
5. Connection side
6. Electronics side, local display
   (longer overall length for cover with glass pane)[1]
7. Locking screw
8. Harting adapter
9. Process connection of low pressure side ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for level, including mounting flange, dimensions in mm (inch)

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Dimensional drawings (continued)

Connection to EN 1092-1

Nominal diameter	Rated pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm		mm
DN 40	PN 10/16/ 25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 or 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/ 25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63	26	195	26	102	48.3	40	51	2	145	4	
	PN 100	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/ 25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection according to ASME B16.5

Nominal diameter	Rated pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
	Class	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)		Inch (mm)
1½ inches	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inches	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inches	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inches	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inches	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

Process connection according to J.I.S

Nominal diameter	Rated pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10 K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20 K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40 K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10 K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20 K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40 K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10 K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20 K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40 K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d_M: Effective diaphragm diameter

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More information

Specification of process conditions for selection and ordering data

Ambient temperature range

The standard remote seal systems are optimized for an ambient temperature range of -10 to +50 °C (14 to +122 °F). Therefore, in the ordering options, the **order code "D66" is** preset.

If the range of the ambient temperature deviates from this, you have the possibility to choose other ambient temperature ranges:

- With the **order code D67**, a range from -40 to +50 °C (-40 to +122 °F)
- With the **order code D68**, a range from -10 to +85 °C (14 to +185 °F)

In the case of a **special design**, which you can select with the **order option Y99** in the device settings, it is possible to enter the ambient temperature as a numerical value.

Process temperature

The standard optimization for the process temperature depends on the filling liquid used:

Filling liquid	Code	Optimized temperature range as standard
Silicone M50	B	-10 ... +200 °C (14 ... +392 °F)
High-temperature oil	C	-10 ... +300 °C (14 ... +572 °F)
Silicone oil M5	A	-40 ... +140 °C (-40 ... +284 °F)
Food oil (FDA-listed)	E	-10 ... +140 °C (14 ... +284 °F)
Halocarbon oil	D	-20 ... +60 °C (-4 ... +140 °F)
Neobee M20 (FDA-listed)	R	-10 ... +140 °C (14 ... +284 °F)

- If the **process temperatures deviate** from the temperature ranges mentioned in the table above, we ask you to send the process temperature with the **order code Y50** along with the order.
- If the remote seal has a small diameter (< DN 50/2") or a long capillary (> 4 m), we also ask you to provide the process data with the **following order code** when ordering.

These entries are transmitted and ensure the correct functioning of the remote seal systems.

	Order code
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

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Selection and ordering data

	Article No.	Option
Mounting bracket and fastening parts		
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****-**M*), zinc-plated steel with 5/16-24 UNF screw set, pipe bracket with accessories	**7MF7900-1AB**	
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****-**F*), zinc-plated steel with M8 screw set, pipe bracket with accessories	**7MF7900-1AC**	
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****-**M*), stainless steel 1.4404/316L with 5/16-24 UNF screw set, pipe bracket with accessories	**7MF7900-1AH**	
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****-**F*), stainless steel 1.4404/316L with M8 screw set, pipe bracket with accessories	**7MF7900-1AJ**	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160, DP420 (7MF0*[1;3;4;5]*), zinc-plated steel with 7/16-20 UNF screw set, pipe bracket with accessories	**7MF7900-2AB**	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160 (7MF0*[1;3;4]*), zinc-plated steel with M10 screw set, pipe bracket with accessories	**7MF7900-2AC**	
Mounting bracket for differential pressure transmitter DP420 (for 7MF0*5*), zinc-plated steel with M12 screw set, pipe bracket with accessories	**7MF7900-2AD**	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160, DP420 (7MF0*[1;3;4;5]*), stainless steel 1.4404/316L with 7/16-20 UNF screw set, pipe bracket with accessories	**7MF7900-2AH**	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160 (7MF0*[1;3;4]*), stainless steel 1.4404/316L with M10 screw set, pipe bracket with accessories	**7MF7900-2AJ**	
Mounting bracket for differential pressure transmitter DP420 (for 7MF0*5*), stainless steel 1.4404/316L with M12 screw set, pipe bracket with accessories	**7MF7900-2AK**	
Reinforced mounting bracket, for differential pressure transmitter DP gauge/DP abs. and DP160, DP420 (for 7MF0*[1;3;4;5]*), zinc-plated steel, incl. 7/16-20UNF screw set, stainless steel	**7MF7900-2BB**	
Reinforced mounting bracket, for differential pressure transmitter DP gauge/DP abs. and DP160 (7MF0*[1;3;4]*), zinc-plated steel, incl. M10 screw set, stainless steel	**7MF7900-2BC**	
Reinforced mounting bracket, for differential pressure transmitter DP420 (7MF0*5*), zinc-plated steel, reinforced incl. M12 screw set, stainless steel	**7MF7900-2BD**	
Mounting bracket for vibration-free mounting, for gauge, absolute and differential pressure transmitter (7MF0***-*****-**M*), stainless steel 1.4404/316L, incl. 5/16-24 UNF screw set, pipe bracket incl. accessories	**7MF7900-3AH**	
Mounting bracket for vibration-free mounting, for gauge, absolute and differential pressure transmitter (7MF0***-*****-**F*), stainless steel 1.4404/316L, incl. M8 screw set, pipe bracket incl. accessories	**7MF7900-3AJ**	
Lid		
Aluminum lid, 2× painted, without glass, with NBR gasket	**7MF7901-1BB**	
Aluminum lid, 2× painted, without glass, with FVMQ gasket	**7MF7901-1BC**	
Aluminum lid, 2× painted, with glass, with NBR gasket	**7MF7901-1BG**	
Aluminum lid, 2× painted, with glass, with FVMQ gasket	**7MF7901-1BH**	
Stainless steel investment casting lid, without glass, with NBR gasket	**7MF7901-2AB**	
Stainless steel investment casting lid, without glass, with FVMQ gasket	**7MF7901-2AC**	
Stainless steel investment casting lid, with glass, with NBR gasket	**7MF7901-2AG**	
Stainless steel investment casting lid, with glass, with FVMQ gasket	**7MF7901-2AH**	
Gasket for lid, 67.94 × 2.62 NBR 70 Shore A (10 units)	**7MF7901-7AB**	
Gasket for lid, 67.94 × 2.62 FVMQ (10 units)	**7MF7901-7AC**	
Local display		
Complete digital display, with fixing accessories, without Siemens logo	**7MF7902-1AC**	
Application electronics		
Electronics HART, Ex i	**7MF7903-1AB**	
• S/N specification for electronics (only with 7MF7903-1AB)		**Y55**
Electronics PROFIBUS PA, Ex i	**7MF7903-1BB**	
• S/N specification for electronics (only with 7MF7903-1BB)		**Y55**
Electronics FOUNDATION Fieldbus, Ex i	**7MF7903-1CB**	
• S/N specification for electronics (only with 7MF7903-1CB)		**Y55**
Electronics APL PROFINET, Ex i	**7MF7903-1DB**	
• S/N specification for electronics (only with 7MF7903-1DB)		**Y55**
Connection board		
HART connection board, without overvoltage protection, with fixing accessories	**7MF7903-2AB**	
HART connection board, with overvoltage protection, with fixing accessories	**7MF7903-2AC**	

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Selection and ordering data (continued)

	Article No.	Option
PROFIBUS PA connection board, without overvoltage protection, with fixing accessories	**7MF7903-2BB**	
FOUNDATION Fieldbus connection board, without overvoltage protection, with fixing accessories	**7MF7903-2CB**	
APL PROFINET connection board, without overvoltage protection, with fixing accessories	**7MF7903-2DB**	
Overvoltage protection		
Overvoltage protection up to 6 kV (external), M20×1.5 (for SITRANS P320/P420)	**7MF7903-7AB**	
Overvoltage protection up to 6 kV (external), ½-14 NPT (for SITRANS P320/P420)	**7MF7903-7AC**	
Key insert		
Control keys and mounting insert with EPDM gasket	**7MF7904-1AG**	
Control keys and mounting insert with FVMQ gasket	**7MF7904-1AH**	
Nameplate		
Nameplate, labeled, with grooved pin fixing accessories	**7MF7905-1AC**	
• S/N specification for nameplate, labeled (only with 7MF7905-1AC)		**Y55**
Ex plate		
Ex plate, labeled, with grooved pin fixing accessories	**7MF7905-1BC**	
• S/N specification for Ex plate, labeled (only with 7MF7905-1BC)		**Y55**
Remote seal plate		
Remote seal plate, labeled, with grooved pin fixing accessories	**7MF7905-1CC**	
• S/N specification for remote seal plate, labeled (only with 7MF7905-1CC)		**Y55**
TAG plate		
TAG plate, unlabeled, with fixing accessories, wire, end sleeve (10 units)	**7MF7905-1DB**	
TAG plate, labeled according to S/N, with fixing accessories, wire, end sleeve	**7MF7905-1DC**	
S/N specification for TAG plate, labeled (only with 7MF7905-1DC)		**Y55**
TAG plate, labeled according to text specification, with fixing accessories, wire, end sleeve	**7MF7905-1DD**	
• Measuring range setting: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi (only with 7MF7905-1DD)		**Y01**
• Plant designation (TAG) (on stainless steel plate, max. 32 characters) (only with 7MF7905-1DD)		**Y15**
• Measuring point description (on stainless steel plate, max. 32 characters) (only with 7MF7905-1DD)		**Y16**
Ex and remote seal stickers		
Ex and remote seal stickers, labeled	**7MF7905-3CC**	
• S/N specification of pressure measuring device for Ex and remote seal stickers, labeled (only with 7MF7905-3CC)		**Y55**
• S/N specification of remote seal for Ex and remote seal stickers, labeled (only with 7MF7905-3CC)		**Y56**
Electrical connection/cable gland		
M20×1.5 cable gland, gray plastic, not Ex, cable Ø 6 ... 12 mm	**7MF7906-1AB**	
M20×1.5 cable gland, blue plastic, Ex i, cable Ø 6 ... 12 mm	**7MF7906-1AC**	
M20×1.5 cable gland, nickel-plated brass, not Ex, cable Ø 6 ... 12 mm	**7MF7906-1AD**	
M20×1.5 cable gland, nickel-plated brass, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	**7MF7906-1AE**	
M20×1.5 cable gland, 1.4404, not Ex, cable Ø 6 ... 12 mm	**7MF7906-1AH**	
M20×1.5 cable gland, 1.4404, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	**7MF7906-1AJ**	
½-14 NPT cable gland, gray plastic, not Ex, cable Ø 6 ... 12 mm	**7MF7906-1BB**	
½-14 NPT cable gland, blue plastic, Ex i, cable Ø 6 ... 12 mm	**7MF7906-1BC**	
½-14 NPT cable gland, nickel-plated brass, not Ex, cable Ø 6 ... 12 mm	**7MF7906-1BD**	
½-14 NPT cable gland, nickel-plated brass, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	**7MF7906-1BE**	
½-14 NPT cable gland, 1.4404, not Ex, cable Ø 6 ... 12 mm	**7MF7906-1BH**	
½-14 NPT cable gland, 1.4404, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	**7MF7906-1BJ**	
½-14 NPT cable gland, CMP, nickel-plated brass, Ex d,e,i,t. Approval details on request, cable Øi 6.1 ... 11.7 mm, Øa 9.5 ... 15.9 mm	**7MF7906-1NE**	

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Selection and ordering data (continued)

	Article No.	Option
½-14 NPT cable gland, Capri ADE 4F cpl., nickel-plated brass, Ex d,i. Approval details on request, cable Øi 7 ... 12 mm, Øa 10 ... 16 mm	**7MF7906-1PE**	
½-14 NPT cable gland, Capri ADE 4F cpl., stainless steel (316L), Ex d,i. Approval details on request, cable Øi 7 ... 12 mm, Øa 10 ... 16 mm	**7MF7906-1PJ**	
Electrical connection/device plug, cable socket		
HAN 7D device plug, gray plastic, straight	**7MF7906-2AB**	
HAN 7D device plug, gray plastic, angled	**7MF7906-2AC**	
HAN 7D device plug, gray metal, straight	**7MF7906-2AN**	
HAN 7D device plug, gray metal, angled	**7MF7906-2AP**	
HAN 7D device plug, blue metal, straight	**7MF7906-2AQ**	
HAN 7D device plug, blue metal, angled	**7MF7906-2AR**	
HAN 7D cable socket, gray plastic, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm²	**7MF7906-2BB**	
HAN 7D cable socket, gray metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm²	**7MF7906-2BN**	
HAN 7D cable socket, blue metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm²	**7MF7906-2BQ**	
HAN 8D device plug, gray plastic, straight	**7MF7906-2EB**	
HAN 8D device plug, gray plastic, angled	**7MF7906-2EC**	
HAN 8D device plug, gray metal, straight	**7MF7906-2EN**	
HAN 8D device plug, gray metal, angled	**7MF7906-2EP**	
HAN 8D device plug, blue metal, straight	**7MF7906-2EQ**	
HAN 8D device plug, blue metal, angled	**7MF7906-2ER**	
HAN 8D cable socket, gray plastic, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm²	**7MF7906-2FB**	
HAN 8D cable socket, gray metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm²	**7MF7906-2FN**	
HAN 8D cable socket, blue metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm²	**7MF7906-2FQ**	
HAN 7D device plug, metal, EMC, straight (for 7MF0*[1;3;4;5;6]*-*****-**F*)	**7MF7906-2NN**	
HAN 7D device plug, metal, EMC, angled (for 7MF0*[0;2]*-*****-**F*)	**7MF7906-2NP**	
HAN 7D cable socket, metal, EMC, straight, incl. Jacob cable gland, cable Ø 9 ... 13 mm, for core cross-section 0.5 mm² (for 7MF0*[0;2]*-*****-**F*)	**7MF7906-2PN**	
HAN 7D cable socket, metal, EMC, angled, incl. Jacob cable gland, cable Ø 9 ... 13 mm, for core cross-section 0.5 mm² (for 7MF0*[1;3;4;5;6]*-*****-**F*)	**7MF7906-2PP**	
HAN 7D cable socket, metal, EMC, straight, incl. Lapp cable gland, cable Ø 7.5 ... 9 mm, for core cross-section 0.5 mm² (for 7MF0*[0;2]*-*****-**F*)	**7MF7906-2QN**	
HAN 7D cable socket, metal, EMC, angled, incl. Lapp cable gland, cable Ø 7.5 ... 9 mm, for core cross-section 0.5 mm² (for 7MF0*[1;3;4;5;6]*-*****-**F*)	**7MF7906-2QP**	
M20 adapter for HAN 7D/HAN 8D device plug, aluminum, with O-ring	**7MF7906-2WB**	
Adapter for HAN 7D/HAN 8D device plug, 1.4404, with O-ring	**7MF7906-2WC**	
M12 device plug, M20×1.5, stainless steel, pre-assembled for PROFIBUS PA	**7MF7906-3AH**	
M12 device plug, M20×1.5, stainless steel, with 4 cores	**7MF7906-3AJ**	
M12 cable socket, stainless steel (core cross-section Phoenix: 0.25 ... 0.75 mm², Weidmüller: max. 0.5 mm²)	**7MF7906-3WC**	
Electrical connection/sealing plug		
M20×1.5 sealing plug, black plastic, not Ex	**7MF7906-7AB**	
M20×1.5 sealing plug, nickel-plated brass, not Ex	**7MF7906-7AD**	
M20×1.5 sealing plug, zinc-plated S235JR, Ex d, with gasket	**7MF7906-7AG**	
M20×1.5 sealing plug, 1.4404, Ex d, with gasket	**7MF7906-7AJ**	
½-14 NPT sealing plug, zinc-plated S235JR, Ex d	**7MF7906-7BG**	
½-14 NPT sealing plug, A4, Ex d	**7MF7906-7BJ**	
Process flanges/sealing screw		
¼-18 NPT sealing screw, stainless steel (2 units)	**7MF7910-1AB**	
¼-18 NPT sealing screw, Hastelloy C-22/2.4602 (2 units)	**7MF7910-1AC**	
¼-18 NPT sealing screw, Monel 400/2.4360 (2 units)	**7MF7910-1AD**	
Process flanges/vent valve		
¼-18 NPT vent valve, stainless steel (2 units)	**7MF7910-1BB**	
¼-18 NPT vent valve, Hastelloy C-22/2.4602 (2 units)	**7MF7910-1BC**	

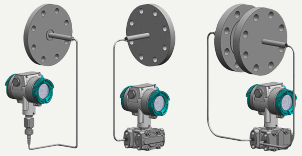
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Selection and ordering data (continued)

	Article No.	Option
¼-18 NPT vent valve, Monel 400/2.4360 (2 units)	**7MF7910-1BD**	
Process flanges/screen filter		
Screen for ¼-18 NPT thread (10 units)	**7MF7910-7AB**	
Process flanges/gaskets		
O-ring for process flanges, 39.5×1.78 FEP (2 units)	**7MF7910-8AD**	
O-ring for process flanges, 39×1.8 FFKM (FFPM) (2 units)	**7MF7910-8AE**	
O-ring for process flanges, 39×1.8 NBR (10 units)	**7MF7910-8AF**	
O-ring for process flanges, 39.5×1.78 EPDM with WRAS, ACS, NSF61 (2 units)	**7MF7910-8AG**	
O-ring for process flanges, 39.5×1.78 EPDM with NSF61 (2 units)	**7MF7910-8AH**	
O-ring for process flanges, 39.5×1.78 FKM (FPM) (10 units) (successor of 7MF7910-8AB)	**7MF7910-8AJ**	
O-ring for process flanges, 38.2×1.9 PTFE (10 units) (successor of 7MF7910-8AC)	**7MF7910-8AK**	
Gasket for process flanges, 38.3×42.7×1.5 copper (2 units) (successor of 7MF7910-8AN)	**7MF7910-8AP**	
Gasket for process flanges, 1× chambered, square 41×46×1.85 graphite (10 units)	**7MF7910-8BB**	
Gasket for process flanges, 1× chambered, square 41×45×2 PTFE (2 units)	**7MF7910-8BD**	
Other accessories		
Weld-in unit	**7MF7911-1CA**	
• For tank connection TG52/50		**Q90**
• For tank connection TG52/150		**Q91**
• For process connection PMC Style Standard		**R02**
• For process connection PMC Style Minibolt with fixing screw, washer		**R03**
7/16-20UNFx1 3/4"-SD (1.4980) screw set, high-strength, incl. graphite gasket for oval flange (for 7MF0*0*-**G**-****; 7MF0*2*-**G**-****)	**7MF7911-7WF**	
M12x40-SD (1.4980) screw set, high-strength incl. graphite gasket for oval flange (for 7MF0*0*-**J**-****; 7MF0*2*-**J**-****)	**7MF7911-7WG**	
FKM (FPM) gasket	**7MF7911-8BB**	
• For PMC Style Minibolt (5 units)		**R01**
PTFE gasket	**7MF7911-8BC**	
• For PMC Style Standard (5 units)		**R00**
Silicone gasket	**7MF7911-8BH**	
• For tank connection TG52/50 or TG52/150 (5 units)		**Q00**
Ground terminal set with sheet, screw, washer, stainless steel 1.4404/316L	**7MF7920-2AB**	
Customized parts for Y99	**7MF7948-8YY**	
• Customized parts in free text (only with 7MF7948-8YY)		**Y99**

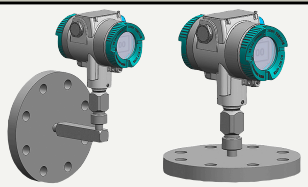
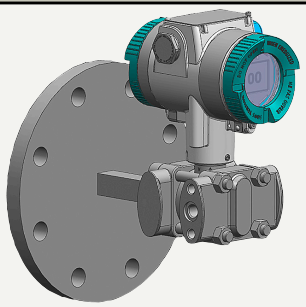
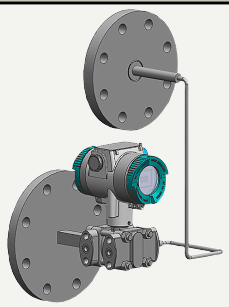
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Overview

Type	7MF0800, 7MF0801, 7MF0802		7MF0810, 7MF0811, 7MF0812	
				
Description	Diaphragm seal		Diaphragm seal	
Application	For the process industry		For the process industry	
Version	Sandwich design		Flange design	
Type	Flexible with flexible capillary		Flexible with flexible capillary	
Article No.	7MF0800*, 7MF0801*, 7MF0802*		7MF0810*/7MF0811*/7MF0812*	
Process connection standard	**Nominal diameter**	**Nominal pressure**	**Nominal diameter**	**Nominal pressure**
• EN 1092-1	DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125	PN 16 ... 400	DN 25	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160, PN 250
			DN 40	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160
			DN 50	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100
			DN 80	PN 10, PN 16, PN 25, PN 40, PN 100
			DN 100	PN 10, PN 16, PN 25, PN 40
			DN 125	PN 16, PN 40
• SME B16.5	1", 1½", 2", 2½", 3", 4", 5"	Class 150 ... 2500	1″	Class 150/300/600/1500
			1½″	Class 150/300/400/600/900/1500
			2″	Class 150/300/400/600/900/1500
			3″	Class 150/300/600/1500
			4″	Class 150/300/400/1500
			5″	Class 150/300/400
• J.I.S.	DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125	10 ... 63K	DN 50, DN 80, DN 100	10K/20K/40K
Sealing surface	For **stainless steel** mat. no. 1.4404/316L According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA For the **other materials** according to EN 1092-1, form B2 or ASME B16.5 RFSF		For **stainless steel** mat. no. 1.4404/316L According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA For the **other materials** according to EN 1092-1, form B2 or ASME B16.5 RFSF	
Materials	• Main body stainless steel mat. no. 1.4404/316L • Wetted parts • Stainless steel, mat. no. 1.4404/316L - No coating - PTFE coating - ECTFE coating - PFA coating • Monel 400, mat. no. 2.4360 • Hastelloy C276, mat. no. 2.4819 • Hastelloy C4, mat. no. 2.4610 • Hastelloy C22, mat. no. 2.4602 • Tantalum • Titanium, mat. no. 3.7035 • Nickel 201 • Duplex 2205, mat. no. 1.4462 • Stainless steel 316L, gold plated, layer thickness approx. 25 µm		• Main body stainless steel mat. no. 1.4404/316L • Wetted parts • Stainless steel, mat. no. 1.4404/316L - No coating - PTFE coating - ECTFE coating - PFA coating • Monel 400, mat. no. 2.4360 • Hastelloy C276, mat. no. 2.4819 • Hastelloy C4, mat. no. 2.4610 • Hastelloy C22, mat. no. 2.4602 • Tantalum • Titanium, mat. no. 3.7035 • Nickel 201 • Duplex 2205, mat. no. 1.4462 • Stainless steel 316L, gold plated, layer thickness approx. 25 µm	
Capillary length	≤ 10 m (32.8 ft), longer lengths on request		≤ 10 m (32.8 ft), longer lengths on request	
Filling liquid	Silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil (for O2 measurements), food oil (FDA listed), Neobee M20 (FDA listed)		Silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil (for O2 measurements), food oil (FDA listed), Neobee M20 (FDA listed)	
Tube length	Without tube, 50 mm (1.97"), 100 mm (3.94"), 150 mm (5.91"), 200 mm (7.87"), 250 mm (9.84")		Without tube, 50 mm (1.97"), 100 mm (3.94"), 150 mm (5.91"), 200 mm (7.87"), 250 mm (9.84")	

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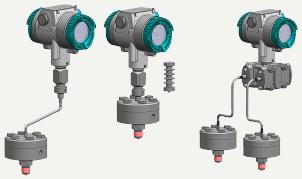
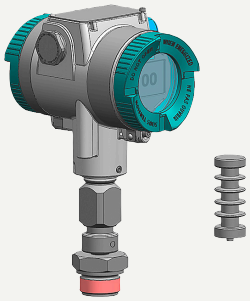
Overview (continued)

Type	7MF0810		7MF0814		7MF0813	
						
Description	Diaphragm seal		Diaphragm seal		Diaphragm seal	
Application	For the process industry		For the process industry		For the process industry	
Version	Flange design		Flange design		Flange design	
Type	Mounted directly		Mounted directly		Mounting flange (with optional tube) Direct mounting at high side and with flexible capillary connected at low side	
Article No.	7MF0810*		7MF0814*		7MF0813*	
Process connection standard	**Nominal diameter**	**Nominal pressure**	**Nominal diameter**	**Nominal pressure**	**Nominal diameter**	**Nominal pressure**
• EN 1092-1	DN 25	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160, PN 250	-	-	-	-
	DN 40	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160	DN 40	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160	DN 40	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160
	DN 50	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100	DN 50	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100	DN 50	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100
	DN 80	PN 10, PN 16, PN 25, PN 40, PN 100	DN 80	PN 10, PN 16, PN 25, PN 40, PN 100	DN 80	PN 10, PN 16, PN 25, PN 40, PN 100
	DN 100	PN 10, PN 16, PN 25, PN 40	DN 100	PN 10, PN 16, PN 25, PN 40	DN 100	PN 10, PN 16, PN 25, PN 40
	DN 125	PN 16, PN 40	DN 125	PN 16, PN 40	DN 125	PN 16, PN 40
• SME B16.5	1″	Class 150/300/600/1500	-	-	-	-
	1½″	Class 150/300/400/600/900/1500	1½″	Class 150/300/400/600/900/1500	1½″	Class 150/300/400/600/900/1500
	2″	Class 150/300/400/600/900/1500	2″	Class 150/300/400/600/900/1500	2″	Class 150/300/400/600/900/1500
	3″	Class 150/300/600/1500	3″	Class 150/300/600/1500	3″	Class 150/300/600/1500
	4″	Class 150/300/400/1500	4″	Class 150/300/400/1500	4″	Class 150/300/400/1500
	5″	Class 150/300/400	5″	Class 150/300/400	5″	Class 150/300/400
• J.I.S.	DN 50, DN 80, DN 100	10K/20K/40K	DN 50, DN 80, DN 100	10K/20K/40K	DN 50, DN 80, DN 100	10K/20K/40K
Sealing surface	For **stainless steel** mat. no. 1.4404/316L According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA For the **other materials** according to EN 1092-1, form B2 or ASME B16.5 RFSF		For **stainless steel** mat. no. 1.4404/316L According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA For the **other materials** according to EN 1092-1, form B2 or ASME B16.5 RFSF		For **stainless steel** mat. no. 1.4404/316L According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA For the **other materials** according to EN 1092-1, form B2 or ASME B16.5 RFSF	
Materials	• Main body stainless steel mat. no. 1.4404/316L • Wetted parts • Stainless steel, mat. no. 1.4404/316L - No coating - PTFE coating - ECTFE coating - PFA coating		• Main body stainless steel mat. no. 1.4404/316L • Wetted parts • Stainless steel, mat. no. 1.4404/316L - No coating - PTFE coating - ECTFE coating - PFA coating		• Main body stainless steel mat. no. 1.4404/316L • Wetted parts • Stainless steel, mat. no. 1.4404/316L - No coating - PTFE coating - ECTFE coating - PFA coating	

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Overview (continued)

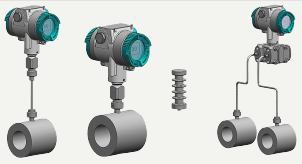
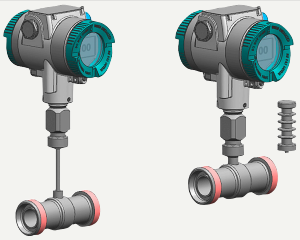
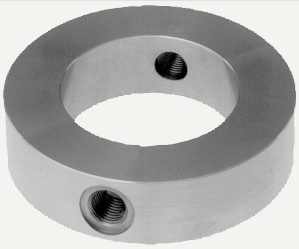
Type	7MF0810	7MF0814	7MF0813
	• Monel 400, mat. no. 2.4360 • Hastelloy C276, mat. no. 2.4819 • Hastelloy C4, mat. no. 2.4610 • Hastelloy C22, mat. no. 2.4602 • Tantalum • Titanium, mat. no. 3.7035 • Nickel 201 • Duplex 2205, mat. no. 1.4462 • Stainless steel 316L, gold plated, layer thickness approx. 25 µm	• Monel 400, mat. no. 2.4360 • Hastelloy C276, mat. no. 2.4819 • Hastelloy C4, mat. no. 2.4610 • Hastelloy C22, mat. no. 2.4602 • Tantalum • Titanium, mat. no. 3.7035 • Nickel 201 • Duplex 2205, mat. no. 1.4462 • Stainless steel 316L, gold plated, layer thickness approx. 25 µm	• Monel 400, mat. no. 2.4360 • Hastelloy C276, mat. no. 2.4819 • Hastelloy C4, mat. no. 2.4610 • Hastelloy C22, mat. no. 2.4602 • Tantalum • Titanium, mat. no. 3.7035 • Nickel 201 • Duplex 2205, mat. no. 1.4462 • Stainless steel 316L, gold plated, layer thickness approx. 25 µm
Capillary length			≤ 10 m (32.8 ft), longer lengths on request
Filling liquid	Silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil (for O2 measurements), food oil (FDA listed), Neobee M20 (FDA listed)	Silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil (for O2 measurements), food oil (FDA listed), Neobee M20 (FDA listed)	Silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil (for O2 measurements), food oil (FDA listed), Neobee M20 (FDA listed)
Tube length	Without tube, 50 mm (1.97"), 100 mm (3.94"), 150 mm (5.91"), 200 mm (7.87"), 250 mm (9.84")	Without tube, 50 mm (1.97"), 100 mm (3.94"), 150 mm (5.91"), 200 mm (7.87"), 250 mm (9.84")	Without tube, 50 mm (1.97"), 100 mm (3.94"), 150 mm (5.91"), 200 mm (7.87"), 250 mm (9.84")

Type	7MF0840, 7MF0842		7MF0850		7MF0830, 7MF0832	
						
Description	Diaphragm seal		Diaphragm seal		Diaphragm seal	
Application	For the process industry		For the process industry		For the process industry	
Version	With inner membrane (nominal diameter 50/2"), process connection: open		Mounted directly		Flange design	
Type	Direct mounting or connected via flexible capillary		Miniature diaphragm seal		With quick release, with flexible capillary or direct mounting	
Article No.	7MF0840*, 7MF0842*		7MF0850*		7MF0830*, 7MF0832*	
Process connection standard, nominal diameter and rated pressure	**Nominal diameter**	**Nominal pressure**	**Nominal diameter**	**Nominal pressure**	**Nominal diameter**	**Nominal pressure**
	Open flange according to EN 1092-1		**DIN 3852, form A**		**DIN 11851 with groove nut**	
	DN 15	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160, PN 250	G 1"	PN 400	DN 25, DN 32, DN 40	PN 40
	DN 20	PN 10, PN 16, PN 25, PN 40	G 1½"	PN 250	DN 50, DN 65, DN 80	PN 25
	DN 25	PN 10, PN 16, PN 25, PN 40, PN 63, PN 100, PN 160, PN 250	G 2"	PN 250	**DIN 11851 with thread**	
	Open flange per ASME B16.5		**ASME B1.20.1**		DN 25, DN 32, DN 40	PN 40
	½", ¾", 1"	Class 150/300/600/1500	1" NPT-M	Class 3625	DN 50, DN 65, DN 80	PN 25
	Thread according to EN 837-1		1½" NPT-M	Class 1450	**Clamp ISO 2852**	
	G¼"B, G½"B, G¾"B, G1"B	PN 100, PN 250	2" NPT-M	Class 1450	DN 25, DN 38, DN 51	PN 16
	Thread per ASME B1.20.1				DN 63.5, DN 76.1	PN 10
	¼" NPT-M, ¼" NPT-F	Class 1500/3675			**Clamp DIN 32676, series C**	
	½" NPT-M, ½" NPT-F	Class 1500/3675			1", 1½"	PN 25
	¾" NPT-M, ¾" NPT-F	Class 1500/3675			2", 2½"	PN 16

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Overview (continued)

Type	7MF0840, 7MF0842		7MF0850		7MF0830, 7MF0832	
Process connection standard, nominal diameter and rated pressure	1" NPT-M, 1" NPT-F	Class 1500/3675	2" NPT-M	Class 1450	3"	PN 10
					Clamp DIN 32676, series A metric	
					DN 25, DN 32, DN 40	PN 25
					DN 50	PN 16
					DN 65	PN 10
					Varivent	
					DN 25, DN 32, DN 40, DN 50	PN 25
					DRD flange	
					DN 50	PN 40
Sealing surface	For **stainless steel** mat. no. 1.4404/316L According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA					
Materials	**Base**: • Stainless steel, mat. no. 1.4404/316L **Membrane**: • Stainless steel, mat. no. 1.4404/316L - No coating - PTFE coating • Monel 400, mat. no. 2.4360 • Hastelloy C276, mat. no. 2.4819 • Hastelloy C4, mat. no. 2.4610 • Hastelloy C22, mat. no. 2.4602 • Tantalum • Titanium, mat. no. 3.7035 • Nickel 201 • Stainless steel 316L, gold-plated, layer thickness approx. 25 µm		**Main body**: • Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819 **Membrane**: • Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819		**Main body**: • Stainless steel, mat. no. 1.4404/316L **Wetted parts**: • Stainless steel, mat. no. 1.4404/316L **Capillary**: • Stainless steel	
Capillary length	≤ 10 m (32.8 ft), longer lengths on request				≤ 10 m (32.8 ft), longer lengths on request	
Filling liquid	Silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil (for O2 measurements), food oil (FDA listed), Neobee M20 (FDA listed)		Silicone oil M5, food oil (FDA listed), Neobee M20 (FDA listed)		Food oil (FDA-listed), Neobee M20 (FDA-listed)	

Type	7MF0900, 7MF0902		7MF0930		7MF4925	
						
Description	Diaphragm seal		Diaphragm seal		Flushing ring	
Application	For the process industry		For the process industry		For the process industry	
Version	Inline seal		Inline seal			
Type	In sandwich design, direct mounting or with a flexible capillary		With quick release, flange type design, with flexible capillary or direct mounting		Flushing ring for diaphragm seals 7MF0800 to 7MF0814	
Article No.	7MF0900*, 7MF0902*		7MF0930*		7MF4925*	
Process connection standard, nominal diameter and rated pressure	**EN 1092-1**		**DIN 11851 with thread**		**EN 1092-1 1**	
	DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125	PN 6 ... 100	DN 25, DN 32, DN 40	PN 40	DN 50, DN 80, DN 100, DN 125	PN 16 ... 100
	ASME B16.5		DN 50, DN 65, DN 80	PN 25	**ASME B 16.5**	
	1", 1½", 2", 2½", 3", 4", 5"	Class 150 ... 2500	**Clamp ISO 2852**		2", 3", 4", 5"	Class 150 ... 600
			DN 25, DN 38, DN 51	PN 16		

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Overview (continued)

Type	7MF0900, 7MF0902	7MF0930	7MF4925
Process connection standard, nominal diameter and rated pressure		DN 63.5, DN 76.1, DN 51 PN 10 **Clamp DIN 32676, series C** 1", 1½" PN 25 2", 2½" PN 16 3" PN 10 **Clamp DIN 32676, series A metric** DN 25, DN 32, DN 40 PN 25 DN 50 PN 16 DN 65 PN 10	
Sealing surface	For **stainless steel** mat. no. 1.4404/316L According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA For the **other materials** Smooth according to EN 1092-1, form B2 or ASME B16.5 RFSF		**EN 1092-1** Form B1 Form B2 Form D/Form D Form C/Form C Form D/Form C Form E Form F **ASME B16.5** RF 125 ... 250 AA RFSF RJF ring groove
Materials	**Main body** Stainless steel, mat. no. 1.4404/316L **Diaphragm** Stainless steel, mat. no. 1.4404/316L **Wetted parts** Stainless steel, mat. no. 1.4404/316L, no coating **Capillary** Stainless steel	**Main body** Stainless steel, mat. no. 1.4404/316L **Diaphragm** Stainless steel, mat. no. 1.4404/316L **Capillary** Stainless steel	Stainless steel 1.4404/316L
Capillary length	≤ 10 m (32.8 ft), longer lengths on request	≤ 10 m (32.8 ft), longer lengths on request	
Filling liquid	Silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil (for O2 measurements), food oil (FDA listed), Neobee M20 (FDA listed)	Silicone oil M5, food oil (FDA listed), Neobee M20 (FDA listed)	Food oil (FDA-listed), Neobee M20 (FDA-listed) Flushing holes (2 units), internal thread: G¼, G½, ¼-18 NPT, ½-14 NPT

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Overview

In many cases, the pressure transmitter and the measured medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the following SITRANS P320/420 pressure transmitter series:

- Gauge pressure
- Absolute pressure
- Differential pressure and flow

Note

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical specifications". Only then will the remote seal work to optimum effect.

Benefits

- No direct contact between pressure transmitter and medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

Application

Remote seal systems should be used when it is necessary or expedient to separate the medium and measuring instrument.

Some examples of such cases:

- The medium temperature is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials that are not available for the pressure transmitter.
- The medium is highly viscous or has a high solids content and would block the sample chambers of the pressure transmitter.
- The medium could freeze in the sample chambers or the pulse cable.
- The medium is heterogeneous or fibrous.
- The medium has a tendency towards polymerization or crystallization.
- The process requires quick-release remote seals, as required in the food & beverages industry for fast cleaning, for example.
- The process requires cleaning of the measuring point, like in a batch process, for example.

Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between the pressure transmitter and remote seal (direct mounting or via a capillary)

The space for the medium is sealed off with a flat embedded elastic diaphragm. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary must be connected between the remote seal and the pressure transmitter in order, for example, to reduce the temperature effects on the pressure transmitter when the medium is hot.

However, the capillary influences the response time and the temperature response of the overall remote seal system. When capillaries are used to connect a remote seal to a pressure transmitter for differential pressure, two capillaries of equal length must always be used.

Optionally, the remote seal with diaphragm extension (tube) can be ordered.

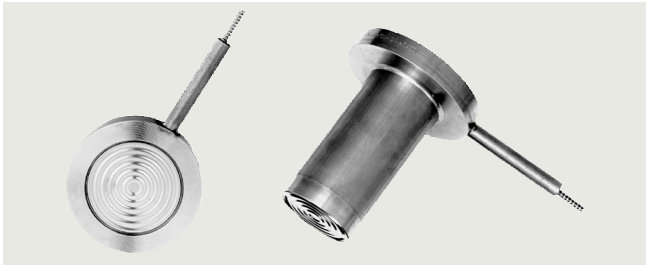
The remote seals in sandwich design are secured with a blank flange.

Designs

Diaphragm seal

With diaphragm seals, the pressure is sensed by a flat embedded diaphragm.

Diaphragm seals are differentiated as follows:



Diaphragm seal in sandwich design without (left) and with diaphragm extension (tube)

- Sandwich design
- Sandwich design with diaphragm extension (tube) according to EN or ASME and secured with a blank flange



Diaphragm seal in flange design without (left) and with diaphragm extension (tube)

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Design (continued)

- Flange design
- Flange design with diaphragm extension (tube) according to EN or ASME and secured using holes on the flange



Diaphragm seal with quick-release

- Remote seal with quick-release, e.g., according to DIN 11851, SMS Standard, IDF Standard, APV-RJF Standard, clamp connection, etc.
- Miniature remote seal with external thread for screwing into threaded holes
- Remote seal with customer-specific process connections

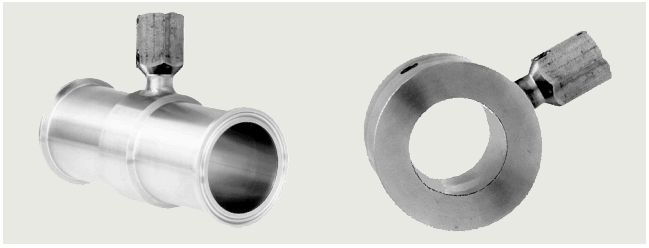


Miniature diaphragm seal with flush-mounted diaphragm

- Miniature diaphragm seal

Remote seals with quick-release are used mainly in the food industry. Their design means that the medium cannot accumulate in dead volumes. The remote seal's quick-release mechanism enables fast disassembly for cleaning.

Inline seal



Quick-release inline seal (left) and for flange mounting

Design (continued)

With inline seals, the pressure is sensed using a cylindrical diaphragm inside the pipe and then transmitted with the filling liquid to the pressure transmitter.

The inline seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Because it is completely integrated in the process line, there are no turbulences, dead spaces or other obstacles in the flow direction. The inline seal is also piggable.

Inline seals are differentiated as follows:

- Quick-release inline seal, e.g., according to DIN 11851, SMS Standard, IDF Standard, APV/RJF Standard, clamp connection, etc. The remote seal's quick release mechanism enables fast disassembly for cleaning.
- Inline seal for flange mounting according to EN or ASME
- Inline seal with customer-specific process connections

Note:

The pressure information on the transmitter and the remote seal must be observed in accordance with the pressure-temperature relationship.

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Function

The measured pressure is transferred to the fill liquid by the diaphragm and enters the measuring chamber of the pressure transmitter through the capillary. The fill liquid completely fills the inside of the diaphragm seal, the capillary and the measuring chamber of the pressure transmitter so that it is free of gas.

Transmission response

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

Temperature error

Temperature errors are caused by changes in the volume of the fill liquid as a result of temperature fluctuations. To select the right remote seal, you must calculate the temperature error.

Below is an overview of the factors which affect the extent of the temperature error, and information on how to calculate the temperature error.

The temperature error depends on the following variables:

- Rigidity of the diaphragm used
- Fill liquid used
- Effect of the fill liquid underneath the process flanges or in the connection shank of the pressure transmitter
- Inside diameter of the capillary: The greater the inside diameter, the greater the temperature error
- Capillary length: The longer the capillary, the greater the temperature error

Diaphragm rigidity

The rigidity of the diaphragm is extremely important. The greater the diameter of the diaphragm, the softer the diaphragm and the more sensitive it is to temperature-induced changes in the volume of the fill liquid.

Large-diameter diaphragms are therefore always required for small measuring ranges.

Apart from diaphragm rigidity, the following factors are also important:

- Diaphragm thickness
- Diaphragm material
- Any coatings

Fill liquid

Temperature fluctuations cause volume changes in all fill liquids. Choosing the right fill liquid can minimize the temperature error; however, the fill liquid must be appropriate for the temperature limits and operating pressure. The fill liquid must also be harmless to health.

There is fill liquid underneath the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank). The temperature error must therefore be calculated separately for each combination.

Note:

A vacuum-resistant remote seal is recommended for continuous negative pressure operation at 500 mbar a or below, including during commissioning (see ordering data).

You can find an example of how to calculate the temperature error in "Technical specifications".

Adjustment time

The adjustment time depends on the following factors:

- Inside diameter of the capillary: The greater the inside diameter, the shorter the adjustment time.
- Fill liquid viscosity: The greater the viscosity, the longer the adjustment time.
- Capillary length: The longer the capillary, the longer the adjustment time.
- Pressure in the pressure measurement system: The higher the pressure, the shorter the adjustment time.

Recommendations

For the best possible pressure transmitter and remote seal combination, please note the following:

- Use a diameter as large as possible for the remote seal. This makes the effective diameter of the remote seal diaphragms larger and reduces the temperature error.
- Use a capillary as short as possible. This reduces the adjustment time and the temperature error.
- Use the fill liquid with the lowest viscosity and smallest coefficients of expansion. Make sure, however, that the fill liquid meets the high-pressure, negative pressure and temperature process requirements. The fill liquid and the medium must also be compatible.
- Please note the following points for operation in the negative pressure range:
  - The pressure transmitter must always be positioned below the lowest shank.
  - The operating range of some fill liquids may be extremely limited in terms of the permissible temperature of the medium.
  - A vacuum-resistant remote seal is required for continuous operation in the negative pressure range.
- You can find recommendations for the minimum measuring span in "Technical specifications".

Note

The remote seals listed here are merely a selection of the most common remote seals. As there is a wide range of process connections, this list may not include all remote seals available.

Other versions may include:

- Different process connections and standards
- Aseptic or sterile screw glands
- Different dimensions
- Different nominal pressures
- Special diaphragm materials and coatings
- Different sealing surfaces
- Different fill liquids
- Different capillary lengths
- Capillary sheathed in protective tubing
- Calibration at higher/lower temperatures, etc.

Please contact your local Siemens office for further information.

Negative pressure service

Fill liquids, such as silicone oils, inert or those suitable for food, are used in remote seal systems for transmission of the process pressure to the pressure transmitter.

In each liquid, particles have the tendency to leave the liquid compound with increasing temperature (transition from liquid to

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Function (continued)

gaseous aggregate state). This means the vapor pressure increases with increasing temperature and is dependent on the substance or mixture present.

The higher the temperature and the lower the associated process pressure in the liquid, the more difficult it is to guarantee the desired transmission properties of the remote seal's fill liquid and therefore the measuring arrangement.

In addition, the sealing elements at the transmitter must be designed so that a diffusion of molecules from the atmosphere into the remote seal system is prevented due to the constantly occurring negative pressure.

In addition to the influencing variables process pressure and process temperature, the vapor pressure curve of the fill liquid at the remote seal end and the stiffness of the remote seal membrane impact the functionality of the remote seal in the negative pressure range.

This means you have to pay special attention to the physical properties of fill liquids with applications in the negative pressure range.

There are three stages for the negative pressure resistance:

- **Standard version** of the remote seal without additional protective measures, suitable for the overpressure range and low negative pressure range. This design is identified with (1) in the diagrams below.
- **Negative pressure service** with suitable seals and treated fill liquid, identified with (2) in the diagrams below. Here you select the order codes D81 or D83, depending on the mounting type.
- **Extended negative pressure service** with more extended treatment of the fill liquid and the remote seals, identified in the diagrams below with (3). Here you select the order codes D85 or D88, depending on the mounting type.

There are two more areas in the charts. The area (4) identifies an area that has to be clarified with Technical Support prior to placing the order. The area (5) describes the area in which the remote seal fill liquid is permanently destroyed and the entire remote seal is therefore without function.

Technical specifications of the remote seal fill liquids

Fill liquid	Reference in the article no.	Density at 20 °C (68 °F) [kg/dm³]	Viscosity at 20 °C (68 °F) [mm²/s]	Suitable for negative pressure service	Suitable for extended negative pressure service
Silicone oil M5	A	0.914	4	x	-
Silicone oil M50	B	0.966	50	x	x
High-temperature oil	C	1.079	57	x	x
Halocarbon oil	D	1.968	14	x	-
Food oil (FDA-listed)	E	0.920	10	x	x
Neobee M20	R	0.921	10	x	x

The suitable negative pressure service is specified with the pressure/temperature curves of the respective liquids described below.

Note: For reasons of operational safety, the transmitter must not exceed the height of the remote seal - with differential pressure applications, the height of the bottom remote seal - for measurements in the negative pressure range. The associated mounting types B, C1, C2 or H are described at the end of this section under the topic "Measuring arrangements".

Selection of the required negative pressure service

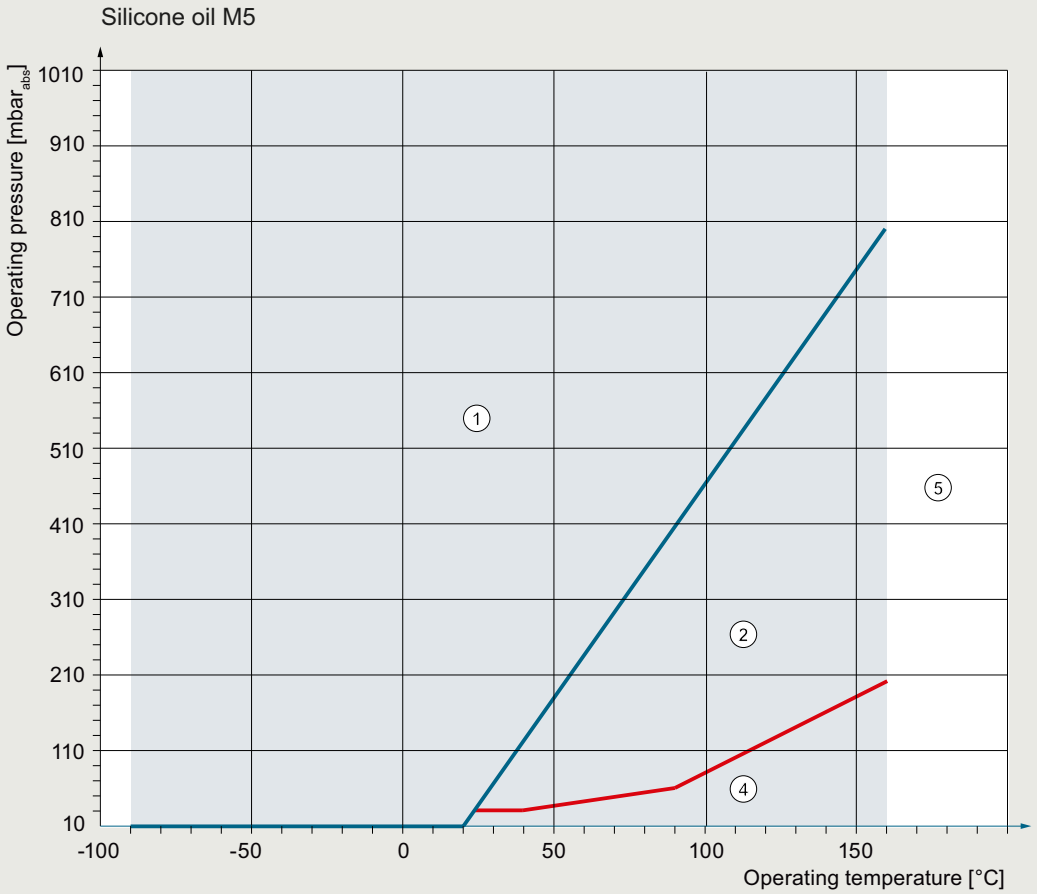
The procedure for determining the required negative pressure service is described below using the silicone oil M5 as fill liquid. The minimum existing process pressure of a fictitious process is 200 $mbar_{abs}$ (2.9 psi) (at a maximum process temperature of 150 °C (302 °F). This intersection is identified by an "X" in the chart below. This means the negative pressure service D81 or D83 (depending on the application) is sufficient in this example.

The suitable negative pressure resistance is determined this way for all other fill liquids also.

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Function (continued)

Note:
Note the response times according to the table "Response times" (see Technical specifications).



(1) Operating range of the standard remote seal design without special measures.

(2) Operating range for which the **negative pressure service D81 or D83** is required.
Note: An extended negative pressure service is **not** possible for this fill fluid.

(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

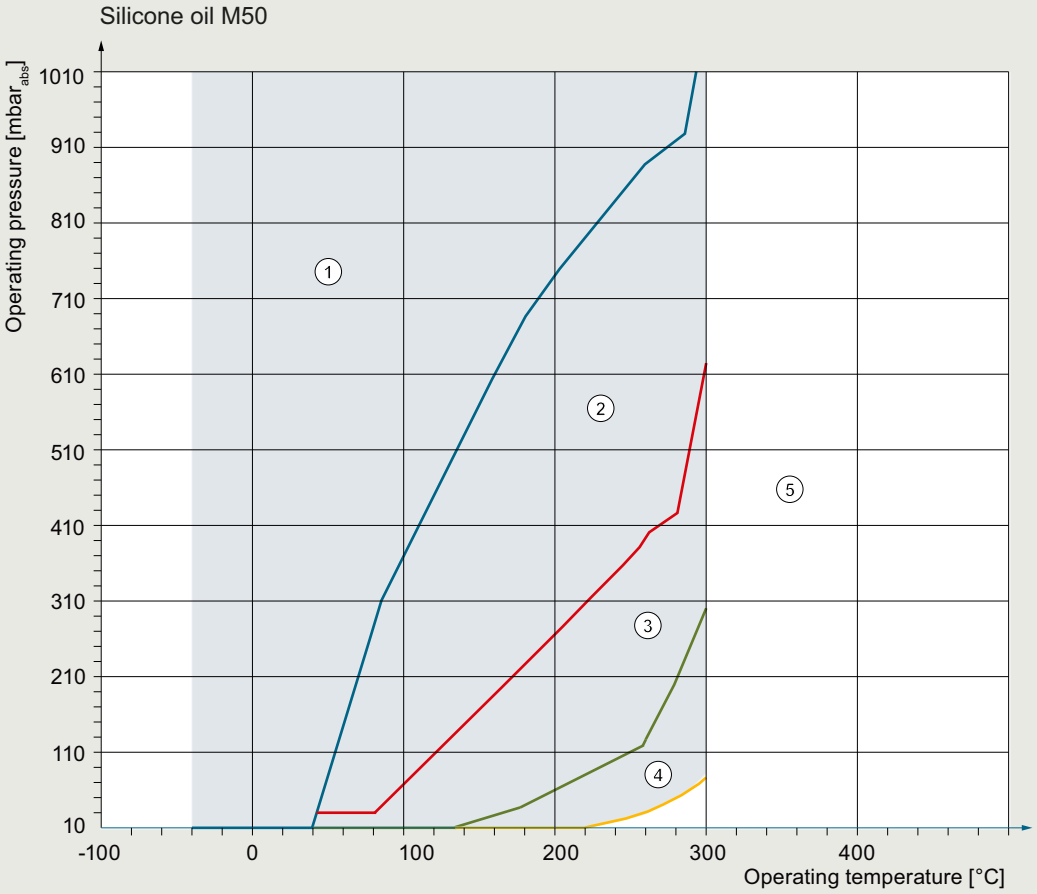
(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 160 °C
Min. temperature limit: -90 °C

Negative pressure applications with silicone oil M5

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Function (continued)



(1) Operating range of the standard remote seal design without special measures.

(2) Operating range for which the **negative pressure service D81 or D83** is required.

(3) Operating range for which the **extended negative pressure service D85 or D88** is required

(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

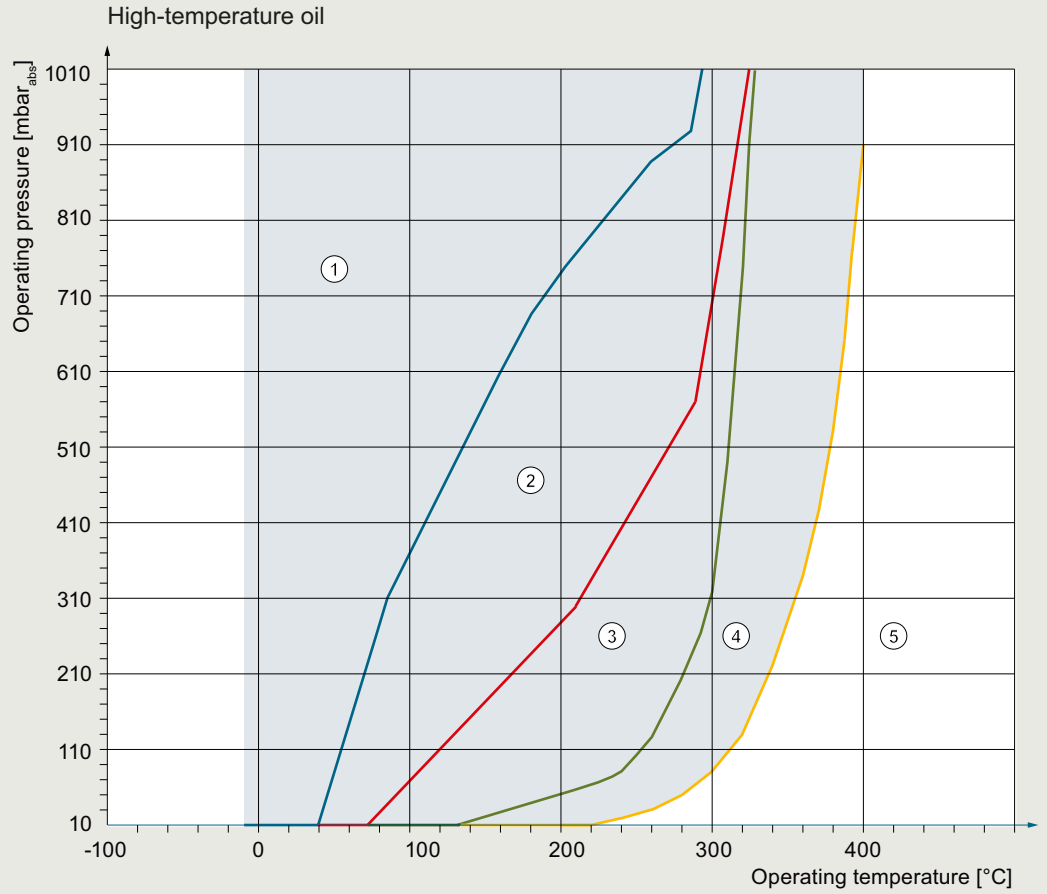
(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 300 °C
Min. temperature limit: -40 °C

Negative pressure applications with silicone oil M50

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Function (continued)



(1) Operating range of the standard remote seal design without special measures.

(2) Operating range for which the **negative pressure service D81 or D83** is required.

(3) Operating range for which the **extended negative pressure service D85 or D88** is required

(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

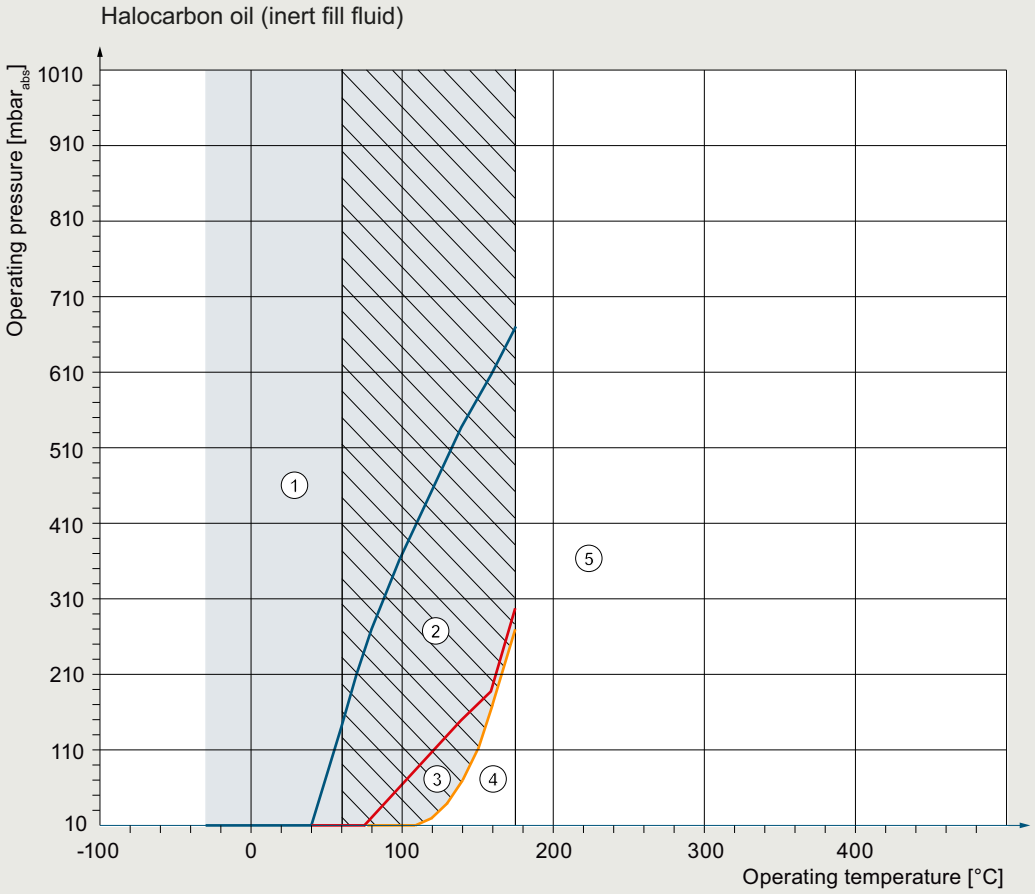
(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 400 °C
Min. temperature limit: -10 °C

Negative pressure applications with high-temperature oil

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Function (continued)



1. Operating range of the standard remote seal design without special measures.
2. Operating range for which the **negative pressure service D81 or D83** is required.
3. Operating range for which the extended **negative pressure service D85 or D88** is required.
4. Please contact Technical Support for applications in this area.
   Detailed information regarding application, process and ambient data are necessary.
5. Area in which you have to expect the destruction of the fill fluid.
   A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 175 °C
Min. temperature limit: -45 °C

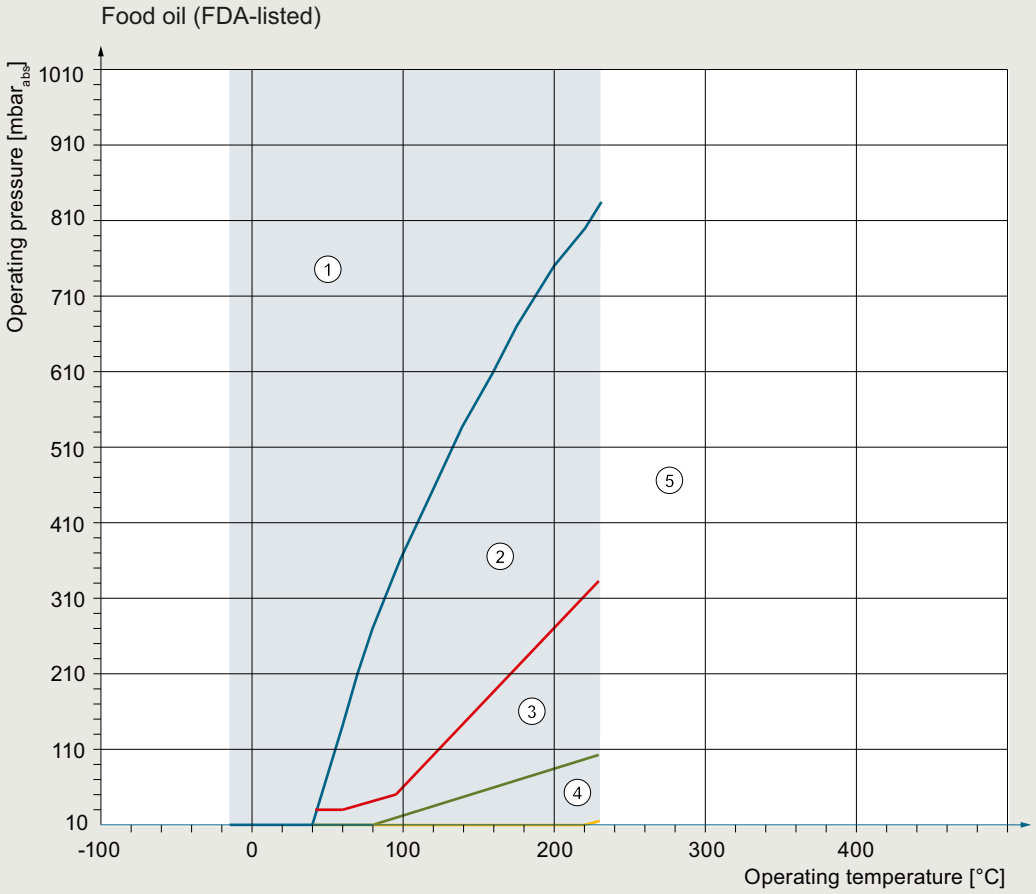
Oxygen application for operating temperature between 60 and 175 °C
and also for operating pressure > 50 bar not permissible.

Negative pressure applications with halocarbon oil (inert fill liquid)

A BAM approval for process temperatures up to 60 °C (140 °F) and system pressures up to 50 bar (725 psi) is available for the oxygen application.

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Function (continued)



(1) Operating range of the standard remote seal design without special measures.

(2) Operating range for which the **negative pressure service D81 or D83** is required.

(3) Operating range for which the **extended negative pressure service D85 or D88** is required

(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

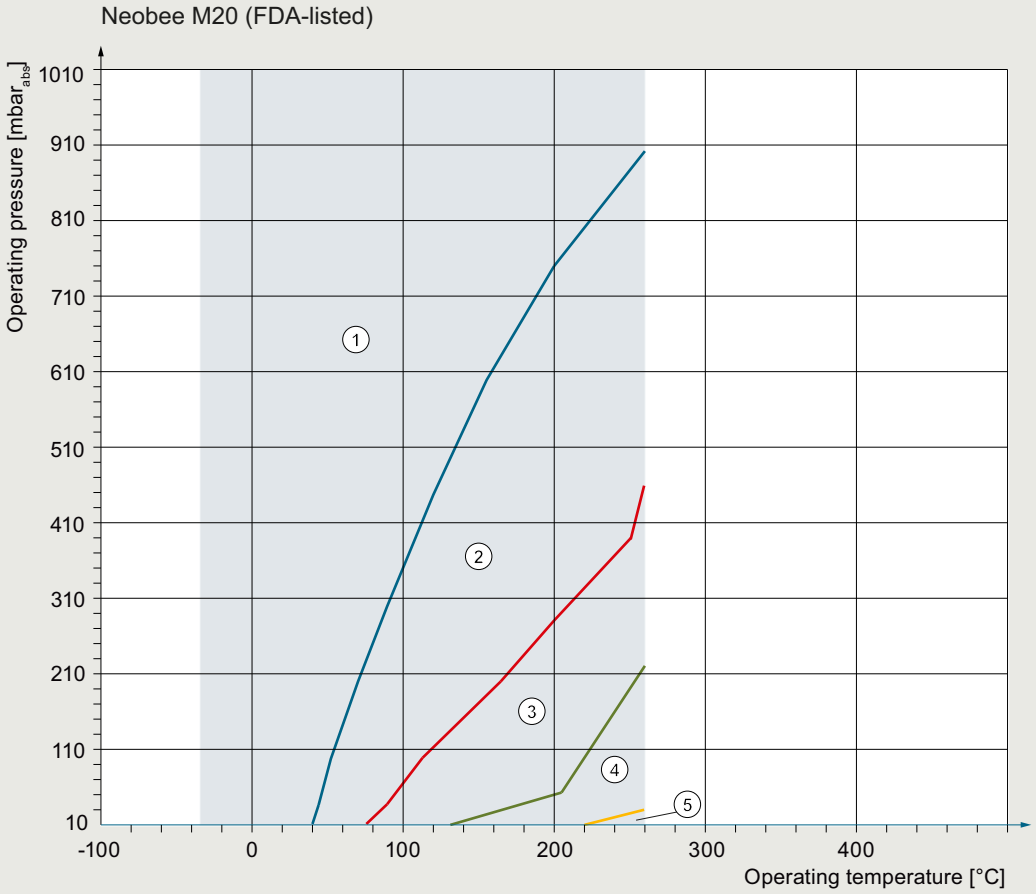
(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 230 °C
Min. temperature limit: -15 °C

Negative pressure applications with food oil (FDA-listed)

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Function (continued)



(1) Operating range of the standard remote seal design without special measures.

(2) Operating range for which the **negative pressure service D81 or D83** is required.

(3) Operating range for which the **extended negative pressure service D85 or D88** is required

(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 260 °C
Min. temperature limit: -35 °C

Negative pressure applications with Neobee M20 (FDA-listed)

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Technical specifications

Diaphragm seal temperature error

Temperature errors of diaphragm seals when connected to pressure transmitters for gauge pressure, absolute pressure, differential pressure (single-sided) and level

Notes

Table values apply to:

- The fill fluids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed), Neobee M20
- Diaphragm material stainless steel

With selected order code W01:

- The values listed in the table for "High-temperature oil" fill fluid and for the wetted parts made of stainless steel 316L, mat no. 1.4404/1.4435, apply.
- For the other fill fluids, the following supplements must be applied to the determined table values for the temperature errors[1]:
  - For "FDA oil": 5%
  - For "Silicone oil M5": 35%
  - For "Silicone oil M50": 35%
  - For "Halocarbon oil": 20%
  - For "Neobee M20": 20%

1) The specified surcharges for the various wetted parts are unaffected. They still need to be included in the calculation.

Information on gauge and absolute pressure

- Minimum permissible measuring span gauge pressure / differential pressure: 25 mbar
- Absolute pressure: 50 mbar

Gauge pressure

- min. permissible for 60 mbar cell:
  - All but 7MF036*= 19.8 mbar
  - 7MF036*= 24.75 mbar
- min. permissible for 250 mbar cell
  - All = 24.75 mbar
  - 60 and 250 mbar cell

For measuring ranges below 31 mbar, the permissible error can amount to 0.19% (instead of 0.125%).

The other measuring ranges are not affected or excluded by the turndown.

Absolute pressure:

- min. permissible 49.5 mbar
- ABS 250 mbar cell

For measuring ranges below 86 mbar, the permissible error can amount to 0.22% (instead of 0.125%).

The other measuring ranges are not affected or excluded by the turndown.

	Nominal diameter/design	Diaphragm diameter		Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar/(10 K · m_{Cap})	(psi/(10 K · m_{Cap}))
Sandwich design or with flange according to EN 1092-1	DN 25 without tube	27	(1.06)	5	(0.073)	16	(0.232)
	DN 40 without tube	40	(1.57)	1.6	(0.023)	2.9	(0.042)
	DN 50 without tube	59	(2.32)	1.5	(0.022)	2	(0.029)
	DN 50 with tube	45	(1.89)	5	(0.073)	10	(0.145)
	DN 80 without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)
	DN 80 with tube	72	(2.83)	1	(0.015)	1	(1.015)
	DN 100 without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)
	DN 100 with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)
	DN 125 without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)
	DN 125 with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)
Sandwich design or with flange according to ASME B16.5	1 inch without tube	27	(1.06)	5	(0.073)	16	(0.232)
	1½ without tube	40	(1.57)	1.6	(0.023)	2.9	(0.042)
	2 inches without tube	59	(2.32)	1.5	(0.022)	2	(0.029)
	2 inches with tube	45	(1.89)	5	(0.073)	10	(0.145)
	3 inches without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)
	3 inches with tube	72	(2.83)	1	(0.015)	1	(1.015)
	4 inches without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)
	4 inches with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)
	5 inches without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)
	5 inches with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)
Remote seal with union nut according to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)

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Technical specifications (continued)

	Nominal diameter/design	Diaphragm diameter		Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar/(10 K · m_{Cap})	(psi/(10 K · m_{Cap}))
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)
Remote seal, screw gland design	DN 50	52	(2.05)	4	(0.058)	5	(0.073)
Remote seal with screwed connector according to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)
Clamp connection	1½ inches	32	(1.26)	8	(0.116)	25	(0.363)
	2 inches	40	(1.57)	4	(0.058)	10	(0.145)
	2½ inches	59	(2.32)	3	(0.044)	5	(0.073)
	3 inches	72	(2.83)	1	(0.015)	1	(0.015)
Miniature diaphragm seal	G1B	25	(0.98)	20	(0.290)	60	(0.870)
	G1½B	40	(1.57)	4	(0.058)	10	(0.145)
	G2B	52	(2.05)	4	(0.058)	5	(0.073)

	Nominal diameter/design	Diaphragm diameter		Temperature error of process flange/connection shank f_{PF}		Recommended min. measuring spans (guidance values, note temperature error)	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar	(psi)
Sandwich design or with flange according to EN 1092-1	DN 25 without tube	27	(1.06)	23.6	(0.342)	4000	(58)
	DN 40 without tube	40	(1.57)	4.3	(0.062)	1000	(14.5)
	DN 50 without tube	59	(2.32)	2	(0.029)	200	(2.90)
	DN 50 with tube	45	(1.89)	10	(0.145)	500	(7.25)
	DN 80 without tube	89	(3.50)	0.2	(0.003)	100	(1.45)
	DN 80 with tube	72	(2.83)	1	(1.015)	250	(3.63)
	DN 100 without tube	89	(3.50)	0.4	(0.006)	100	(1.45)
	DN 100 with tube	89	(3.50)	0.4	(0.006)	100	(1.45)
	DN 125 without tube	124	(4.88)	0.1	(0.002)	20	(0.29)
	DN 125 with tube	124	(4.88)	0.1	(0.002)	20	(0.29)
Sandwich design or with flange according to ASME B16.5	1 inch without tube	27	(1.06)	23.6	(0.342)	4000	(58)
	1½ without tube	40	(1.57)	4.3	(0.062)	1000	(14.5)
	2 inches without tube	59	(2.32)	2	(0.029)	200	(2.90)
	2 inches with tube	45	(1.89)	10	(0.145)	500	(7.25)
	3 inches without tube	89	(3.50)	0.2	(0.003)	100	(1.45)
	3 inches with tube	72	(2.83)	1	(1.015)	250	(3.63)
	4 inches without tube	89	(3.50)	0.4	(0.006)	100	(1.45)
	4 inches with tube	89	(3.50)	0.4	(0.006)	100	(1.45)
	5 inches without tube	124	(4.88)	0.1	(0.002)	20	(0.29)
	5 inches with tube	124	(4.88)	0.1	(0.002)	20	(0.29)
Remote seal with union nut according to DIN 11851	DN 25	25	(0.98)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	250	(3.63)
Remote seal, screw gland design	DN 50	52	(2.05)	5	(0.073)	500	(7.25)

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Technical specifications (continued)

	Nominal diameter/design	Diaphragm diameter		Temperature error of process flange/connection shank f_{PF}		Recommended min. measuring spans (guidance values, note temperature error)	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar	(psi)
Remote seal with screwed connector according to DIN 11851	DN 25	25	(0.98)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	250	(3.63)
Clamp connection	1½ inches	32	(1.26)	25	(0.363)	4000	(58)
	2 inches	40	(1.57)	10	(0.145)	2000	(29)
	2½ inches	59	(2.32)	5	(0.073)	500	(7.25)
	3 inches	72	(2.83)	1	(0.015)	250	(3.63)
Miniature diaphragm seal	G1B	25	(0.98)	60	(0.870)	6000	(87)
	G1½B	40	(1.57)	10	(0.145)	2000	(29)
	G2B	52	(2.05)	5	(0.073)	500	(7.25)

Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

Notes

Table values apply to:

- The fill fluids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed), Neobee M20
- Diaphragm material stainless steel

With selected order code W01:

- The values listed in the table for "High-temperature oil" fill fluid and for the wetted parts made of stainless steel 316L, mat no. 1.4404/1.4435, apply.
- For the other fill fluids, the following supplements must be applied to the determined table values for the temperature errors[1]:
  - For "FDA oil": 5%
  - For "Silicone oil M5": 35%
  - For "Silicone oil M50": 35%
  - For "Halocarbon oil": 20%
  - For "Neobee M20": 20%

[1] The specified surcharges for the various wetted parts are unaffected. They still need to be included in the calculation.

	Nominal diameter/design	Diaphragm diameter		Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar/(10 K · m_{Cap})	(psi/(10 K · m_{Cap}))
Sandwich design or with flange according to EN 1092-1	DN 40 without tube	40	(1.57)	0.2	(0.003)	0.4	(0.006)
	DN 50 without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0045)
	DN 50 with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)
	DN 80 without tube	89	(3.50)	0.05	(0.001)	0.05	(0.001)
	DN 80 with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)
	DN 100 without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)
	DN 100 with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)
	DN 125 without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)
	DN 125 with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)
Sandwich design with flange according to ASME B16.5	1½ without tube	40	(1.57)	0.2	(0.003)	0.4	(0.006)
	2 inches without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0043)
	2 inches with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)
	3 inches without tube	89	(3.50)	0.05	(0.001)	0.05	(0.0007)
	3 inches with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)
	4 inches without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)
	4 inches with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)
	5 inches without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)
	5 inches with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)
Remote seal, screw gland design	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)
Remote seal with union nut according to DIN 11851	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)

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Technical specifications (continued)

	Nominal diameter/design	Diaphragm diameter		Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar/(10 K · m_{Cap})	(psi/(10 K · m_{Cap}))
Remote seal with screwed connector according to DIN 11851	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)
Clamp connection	2 inches	40	(1.57)	1	(0.015)	2.5	(0.036)
	2½ inches	59	(2.32)	0.7	(0.010)	0.67	(0.010)
	3 inches	72	(2.83)	0.24	(0.004)	0.17	(0.003)

	Nominal diameter/design	Diaphragm diameter		Temperature error of process flange/connection shank f_{PF}		Recommended min. measuring spans (guidance values, note temperature error)	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar	(psi)
Sandwich design or with flange according to EN 1092-1	DN 40 without tube	40	(1.57)	0.4	(0.006)	1600	(23.2)
	DN 50 without tube	59	(2.32)	0.3	(0.0045)	250	(3.626)
	DN 50 with tube	45	(1.89)	1.7	(0.025)	250	(3.626)
	DN 80 without tube	89	(3.50)	0.05	(0.0007)	50	(0.725)
	DN 80 with tube	72	(2.83)	0.17	(0.003)	100	(1.45)
	DN 100 without tube	89	(3.50)	0.07	(0.001)	50	(0.725)
	DN 100 with tube	89	(3.50)	0.07	(0.001)	50	(0.725)
	DN 125 without tube	124	(4.88)	0.03	(0.0004)	20	(0.29)
	DN 125 with tube	124	(4.88)	0.03	(0.0004)	20	(0.29)
Sandwich design with flange according to ASME B16.5	1½ without tube	40	(1.57)	0.4	(0.006)	1600	(23.2)
	2 inches without tube	59	(2.32)	0.3	(0.0045)	250	(3.626)
	2 inches with tube	45	(1.89)	1.7	(0.025)	250	(3.626)
	3 inches without tube	89	(3.50)	0.05	(0.0007)	50	(0.725)
	3 inches with tube	72	(2.83)	0.17	(0.003)	100	(1.45)
	4 inches without tube	89	(3.50)	0.07	(0.001)	50	(0.725)
	4 inches with tube	89	(3.50)	0.07	(0.001)	50	(0.725)
	5 inches without tube	124	(4.88)	0.03	(0.0004)	20	(0.29)
	5 inches with tube	124	(4.88)	0.03	(0.0004)	20	(0.29)
Remote seal, screw gland design	DN 50	52	(2.05)	0.83	(0.012)	250	(3.626)
Remote seal with union nut according to DIN 11851	DN 50	52	(2.05)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.17	(0.003)	100	(1.450)
Remote seal with screwed connector according to DIN 11851	DN 50	52	(2.05)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.17	(0.003)	100	(1.450)
Clamp connection	2 inches	40	(1.57)	2.5	(0.036)	2000	(29.01)
	2½ inches	59	(2.32)	0.67	(0.010)	250	(3.626)
	3 inches	72	(2.83)	0.17	(0.003)	100	(1.450)

Inline seal temperature errors

Notes

Table values apply to:

- The fill fluids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed), Neobee M20
- Diaphragm material stainless steel
- Half the values apply to glycerin/water mixture as fill fluid

Diaphragm thickness:

- 0.05 mm (0.002 inches) for DN 25/DN 40/DN 50
- 0.1 mm (0.004 inches) for DN 80/DN 100

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Technical specifications (continued)

Temperature errors of inline seals for flange-mounting 7MF0900 for one-sided mounting

Nominal diameter/design	Process error mbar/10 K	(psi/10 K)	Transmitter error mbar/10 K	(psi/10 K)	Remote line error mbar/10 K	(psi/10 K)	Minimum measuring span mbar	(psi)
DN 25 (1 inch)	8.0	(0.116)	12.0	(0.174)	Not possible	Not possible	3000	(43.5)
DN 40 (1½ inches)	10.0	(0.145)	9.5	(0.138)	8.0	(0.116)	3000	(43.5)
DN 50 (2 inches)	12.0	(0.174)	9.0	(0.131)	19.0	(0.276)	3000	(43.5)
DN 80 (3 inches)	9.5	(0.138)	5.0	(0.073)	10.5	(0.152)	2000	(29)
DN 100 (4 inches)	16.0	(0.232)	7.0	(0.102)	16.0	(0.232)	3000	(43.5)

Temperature errors of inline seals for flange-mounting 7MF0902 for two-sided mounting

Nominal diameter/design	Process error mbar/10 K	(psi/10 K)	Transmitter error mbar/10 K	(psi/10 K)	Remote line error mbar/10 K	(psi/10 K)	Minimum measuring span mbar	(psi)
DN 25 (1 inch)	Not possible	Not possible	Not possible	Not possible	Not possible	Not possible	Not possible	Not possible
DN 40 (1½ inches)	10.0	(0.145)	9.5	(0.138)	7.5	(0.109)	600	(8.7)
DN 50 (2 inches)	13.5	(0.196)	12.5	(0.181)	19.0	(0.276)	600	(8.7)
DN 80 (3 inches)	11.0	(0.160)	12.5	(0.181)	10.5	(0.152)	600	(8.7)
DN 100 (4 inches)	14.0	(0.203)	9.0	(0.131)	14.0	(0.203)	3000	(43.5)

Temperature errors of quick-release inline seals 7MF0930 for one-sided mounting

Nominal diameter/design	Process error mbar/10 K	(psi/10 K)	Transmitter error mbar/10 K	(psi/10 K)	Remote line error mbar/10 K	(psi/10 K)	Minimum measuring span mbar	(psi)
DN 25 (1 inch)	30.0	(0.435)	23.0	(0.334)	13.0	(0.189)	6000	(87)
DN 32 (1¼ inches)	9.0	(0.131)	5.0	(0.073)	16.5	(0.239)	3000	(43.5)
DN 40 (1½ inches)	3.0	(0.044)	1.5	(0.022)	4.0	(0.058)	2000	(29)
DN 50 (2 inches)	4.0	(0.058)	1.0	(0.015)	3.0	(0.044)	2000	(29)
DN 65 (2½ inches)	5.5	(0.080)	2.0	(0.029)	6.0	(0.087)	2000	(29)

Calculation of the temperature error

The following equation is used to calculate the temperature error:

$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{MU} - \vartheta_{Cal}) \cdot f_{PF}$

Legend:	
dp	Additional temperature error (mbar)
ϑ_{RS}	Temperature on remote seal diaphragm (generally corresponds to temperature of medium)
ϑ_{Cal}	Calibration/reference temperature (20 °C (68 °F))
f_{DM}	Temperature error of remote seal
ϑ_{Cap}	Ambient temperature on the capillaries
l_{Cap}	Capillary length
f_{Cap}	Temperature error of capillaries
ϑ_{TR}	Ambient temperature on pressure transmitter
f_{PF}	Temperature error of the oil filling in the process flanges of the pressure transmitter

Example of temperature error calculation

What are you looking for?

We are looking for an additional temperature error of the remote seals (**dp**).

Prevailing values:

SITRANS P pressure transmitters for differential pressure 250 mbar, set to 0 ... 100 mbar, with diaphragm seals DN 100 without tube, stainless steel diaphragm mat. no. 1.4404/316L	f_{DM} = 0.05 mbar/10 K (0.039 inH_2O/10 K)
Capillary length	l_{Cap} = 6 m (19.7 ft)
Capillaries fitted on both sides	f_{Cap} = 0.07 mbar/(10 K · m_{Cap}) 0.028 inH_2O/(10 K · m_{Cap})
Fill fluid silicone oil M5	f_{PF} = 0.07 mbar/10 K (0.028 inH_2O/10 K)
Medium temperature	ϑ_{DM} = 100 °C (212 °F)
Temperature on the capillaries	ϑ_{Cap} = 50 °C (122 °F)
Temperature on pressure transmitter	ϑ_{MU} = 50 °C (122 °F)
Calibration temperature	ϑ_{Cal} = 20 °C (68 °F)

Calculation in mbar:

dp = (100 °C – 20 °C) · 0.05 mbar/10 K +
(50 °C – 20 °C) · 6 m · 0.07 mbar/(10 K · m) + (50 °C – 20 °C) · 0.07 mbar/10 K

Calculation in inH_2O:

dp = (212 °F – 68 °F) · 0.039 inH_2O/10 K +
(112 °F – 68 °F) · 19.7 ft · 0.028
inH_2O/(10 K · 3.28 ft) + (112 °F – 68 °F) · (0.028 inH_2O/10 K)

dp = 0.16 inH_2O + 0.51 inH_2O + 0.08 inH_2O

Result:

dp = 1.87 mbar (0.75 inH_2O)

(corresponds to 2.27% of set measuring span)

Note:

The determined temperature error only applies to the error resulting from connection of the remote seal.

The transmission response of the respective pressure transmitter is not taken into account here!
The transmission response must be calculated separately, and the

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Technical specifications (continued)

resulting measuring error added to the temperature error determined above from connection of the remote seal.

Dependence of temperature error on diaphragm material

The temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

Diaphragm material	Change in temperature error of remote seal
	Increase in values by:
Stainless steel, duplex, ...	See previous tables
Hastelloy C4, mat. no. 2.4610	50%
Hastelloy C276, mat. no. 2.4819	50%
Monel 400, mat. no. 2.4360	60%
Tantalum	50%
Titanium	50%
PTFE coating on stainless steel diaphragm	80%

Diaphragm material	Change in temperature error of remote seal
ECTFE coating or PFA coating on stainless steel diaphragm	100%
Gold coating on stainless steel diaphragm	40%
Inconel	50%
Incoloy	50%

Maximum medium temperature

Note

When taking into account the maximum medium temperature, the application limits of the fill fluids and gaskets used as well as the pressure/temperature limits of the respective process connections must also be taken into consideration.

The following maximum medium temperatures apply depending on the material of wetted parts.

Material	Max. medium temperature	Min./max. Pressure
Stainless steel, mat. no. 1.4404/316L	400 °C (752 °F)	No restrictions
PTFE coating	200 °C (392 °F)	< 0 bar (0 psi); gauge pressure
	260 °C (500 °F)	0 bar (0 psi) ... 25 bar (363 psi); gauge pressure
	150 °C (302 °F)	25 bar (363 psi) ... 40 bar (580 psi); gauge pressure
	50 °C (302 °F)	40 bar (580 psi) ... 60 bar (870 psi); gauge pressure
ECTFE coating	150 °C (302 °F)	For pressures < 1 bar (14.5 psi) on request
PFA coating	200 °C (392 °F)	< 0 bar (0 psi); gauge pressure
	260 °C (500 °F)	0 bar (0 psi) ... 25 bar (363 psi); gauge pressure
	150 °C (302 °F)	25 bar (363 psi) ... 40 bar (580 psi); gauge pressure
	50 °C (302 °F)	40 bar (580 psi) ... 100 bar (1450 psi); gauge pressure
Hastelloy C4, mat. no. 2.4610	400 °C (752 °F)	No restrictions
Hastelloy C276, mat. no. 2.4819	400 °C (752 °F)	No restrictions
Hastelloy C22, mat. no. 2.4602	400 °C (752 °F)	No restrictions
Monel 400, mat. no. 2.4360	400 °C (752 °F)	No restrictions
Tantalum	300 °C (572 °F)	No restrictions
	150 °C (302 °F)	No restrictions
Duplex, mat. no. 1.4462	250 °C (482 °F)	No restrictions
Titanium	150 °C (302 °F)	No restrictions
Inconel	400 °C (752 °F)	No restrictions
Incoloy	400 °C (752 °F)	No restrictions
Gold coating	400 °C (752 °F)	No restrictions

Maximum length of the capillary for diaphragm seals (guidance values)

Nominal diameter DN		Max. length of the capillary Diaphragm seal		Inline seal 7MF0900*		7MF0902*		7MF0930*	
		m	(ft)	m	(ft)	m	(ft)	m	(ft)
DN 25	(1")	2.5	(8.2)	Only direct mounting possible	Only direct mounting possible	Not possible	Not possible	1	(3.2)
DN 32	(1¼")	2.5	(8.2)	-	-	-	-	6	(19.7)
DN 40	(1½")	4	(13.1)	1.66	(5.5)	1	(3.2)	6	(19.7)
DN 50	(2")	6	(19.7)	4	(13.1)	4	(13.1)	6	(19.7)
DN 65	(2½")	8	(26.2)	-	-	-	-	6	(19.7)
DN 80	(3")	15	(49.1)	4	(13.1)	6	(19.7)	-	-
DN 100	(4")	15	(49.1)	4	(13.1)	4	(13.1)	-	-
DN 125	(5")	15	(49.1)	-	-	-	-	-	-

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Technical specifications (continued)

Response times

The response times specified in the following table (in seconds per meter length of the capillary) apply to a change in pressure which corresponds to the set measuring span.

The listed values must be multiplied by the respective length of the capillary, or with pressure transmitters for differential pressure and flow by the total length of both capillaries.

The response times are independent of the set measuring span within the range of the respective pressure transmitter. The response times are of insignificant importance for measuring spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

Fill fluid	Density		Temperature on capillary		Response time in s/m (s/ft) with max. measuring span of pressure transmitter					
	kg/dm³	(lb/in³)	°C	(°F)	250 mbar	(101 inH_2O)	600 mbar	(241 inH_2O)	1600 mbar	(643 inH_2O)
Silicone oil M5	0.914	(0.033)	+60	(140)	0.06	(0.018)	0.02	(0.006)	0.01	(0.003)
			+20	(68)	0.11	(0.034)	0.02	(0.006)	0.02	(0.006)
			-20	(-4)	0.3	(0.091)	0.12	(0.037)	0.05	(0.015)
Silicone oil M50	0.966	(0.035)	+60	(140)	0.6	(0.183)	0.25	(0.076)	0.09	(0.027)
			+20	(68)	0.61	(0.186)	0.26	(0.079)	0.1	(0.030)
			-20	(-4)	1.69	(0.515)	0.71	(0.216)	0.27	(0.082)
High-temperature oil	1.070	(0.039)	+60	(140)	0.14	(0.043)	0.06	(0.018)	0.02	(0.006)
			+20	(68)	0.65	(0.198)	0.27	(0.082)	0.1	(0.030)
			-10	(14)	3.96	(1.207)	1.65	(0.503)	0.62	(0.189)
Halocarbon oil	1.968	(0.071)	+60	(140)	0.07	(0.021)	0.03	(0.009)	0.01	(0.003)
			+20	(68)	0.29	(0.088)	0.12	(0.037)	0.05	(0.015)
			-20	(-4)	2.88	(0.878)	1.2	(0.366)	0.45	(0.137)
Food oil (FDA-listed)	0.920	(0.033)	+60	(140)	0.75	(0.229)	0.33	(0.101)	0.17	(0.052)
			+20	(68)	4	(1.220)	1.75	(0.534)	0.67	(0.204)
			-20	(-4)	20	(6.100)	8.5	(2.593)	3.25	(0.991)
Neobee M20	0.920	(0.033)	+60	(140)	0.69	(0.210)	0.29	(0.884)	0.11	(0.034)
			+20	(68)	1.81	(0.552)	0.76	(0.232)	0.29	(0.088)
			-20	(-4)	6.46	(1.969)	2.71	(0.826)	1.04	(0.317)

See charts under "Function" for permissible data of fill fluid for pressure and temperatures.

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More information

Specification of process conditions for selection and ordering data

Ambient temperature range

The standard remote seal systems are optimized for an ambient temperature range of -10 to +50 °C (14 to +122 °F). Therefore, in the ordering options, the **order code "D66" is** preset.

If the range of the ambient temperature deviates from this, you have the possibility to choose other ambient temperature ranges:

- With the **order code D67**, a range from -40 to +50 °C (-40 to +122 °F)
- With the **order code D68**, a range from -10 to +85 °C (14 to +185 °F)

In the case of a **special design**, which you can select with the **order option Y99** in the device settings, it is possible to enter the ambient temperature as a numerical value.

Process temperature

The standard optimization for the process temperature depends on the filling liquid used:

Filling liquid	Code	Optimized temperature range as standard
Silicone M50	B	-10 ... +200 °C (14 ... +392 °F)
High-temperature oil	C	-10 ... +300 °C (14 ... +572 °F)
Silicone oil M5	A	-40 ... +140 °C (-40 ... +284 °F)
Food oil (FDA-listed)	E	-10 ... +140 °C (14 ... +284 °F)
Halocarbon oil	D	-20 ... +60 °C (-4 ... +140 °F)
Neobee M20 (FDA-listed)	R	-10 ... +140 °C (14 ... +284 °F)

- If the **process temperatures deviate** from the temperature ranges mentioned in the table above, we ask you to send the process temperature with the **order code Y50** along with the order.
- If the remote seal has a small diameter (< DN 50/2") or a long capillary (> 4 m), we also ask you to provide the process data with the **following order code** when ordering.

These entries are transmitted and ensure the correct functioning of the remote seal systems.

	Order code
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

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Overview



Diaphragm seals in sandwich design

Selection and ordering data

		Article No.												Order code
Diaphragm seal **In sandwich design, connected with flexible capillary tube to a transmitter**														
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service) **7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit**		**7MF0800-**												
SITRANS P320/P420 for absolute pressure from differential pressure **7MF03../7MF04.. order separately, scope of delivery: 1 unit**		**7MF0801-**												
SITRANS P320/P420 transmitter for differential pressure and flow **7MF03../7MF04.. order separately, scope of delivery: 2 units**		**7MF0802-**												
		●	●	●	●	●	-	0	●	●	●		●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.														
Nominal diameter	Nominal pressure													
Process connection standard EN 1092-1 (DN 25, DN 40 and DN 50 only recommended for pressure transmitters for gauge pressure)														
DN 25	PN 16 ... 400	**0**	**B**	**Q**										
DN 40	PN 16 ... 400	**0**	**D**	**Q**										
DN 50	PN 16 ... 400	**0**	**E**	**Q**										
DN 65	PN 16 ... 400	**0**	**F**	**Q**										
DN 80	PN 16 ... 400	**0**	**G**	**Q**										
DN 100	PN 16 ... 400	**0**	**H**	**Q**										
DN 125	PN 16 ... 400	**0**	**J**	**Q**										
Process connection standard ASME B16.5 (1 inch, 1½ inches and 2 inches only recommended for pressure transmitters for gauge pressure)														
1 inch	Class 150 ... 2500	**1**	**K**	**X**										
1½ inches	Class 150 ... 2500	**1**	**L**	**X**										
2 inches	Class 150 ... 2500	**1**	**M**	**X**										
2½ inches	Class 150 ... 2500	**1**	**N**	**X**										
3 inches	Class 150 ... 2500	**1**	**P**	**X**										
4 inches	Class 150 ... 2500	**1**	**Q**	**X**										
5 inches	Class 150 ... 2500	**1**	**R**	**X**										
Process connection standard J.I.S. (DN 25, DN 40 and DN 50 only recommended for pressure transmitters for gauge pressure)														
DN 25	10K ... 63K	**2**	**B**	**W**										
DN 40	10K ... 63K	**2**	**D**	**W**										
DN 50	10K ... 63K	**2**	**E**	**W**										
DN 65	10K ... 63K	**2**	**F**	**W**										
DN 80	10K ... 63K	**2**	**G**	**W**										
DN 100	10K ... 63K	**2**	**H**	**W**										
DN 125	10K ... 63K	**2**	**J**	**W**										

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Selection and ordering data (continued)

	Article No.										Order code		
Diaphragm seal **In sandwich design, connected with flexible capillary tube to a transmitter**													
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service) **7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit**	**7MF0800-**												
SITRANS P320/P420 for absolute pressure from differential pressure **7MF03../7MF04.. order separately, scope of delivery: 1 unit**	**7MF0801-**												
SITRANS P320/P420 transmitter for differential pressure and flow **7MF03../7MF04.. order separately, scope of delivery: 2 units**	**7MF0802-**												
	●	●	●	●	●	-	0	●	●	●		●	●	●
Other version, add order code and plain text	9	A	A									H	1	Y
Capillary length														
1 m (38.37 inches)				1	0									
1.6 m (63 inches)				1	1									
2 m (78.7 inches)				1	2									
2.5 m (98.4 inches)				1	3									
3 m (118.1 inches)				1	4									
4 m (157.5 inches)				1	5									
5 m (196.9 inches)				1	6									
6 m (236.2 inches)				1	7									
7 m (275.6 inches)				1	8									
8 m (315 inches)				2	0									
9 m (354.3 inches)				2	1									
10 m (393.7 inches)				2	2									
11 m (433.1 inches); only for 7MF0802				2	3									
12 m (472.4 inches); only for 7MF0802				2	4									
13 m (511.811 inches); only for 7MF0802				2	5									
14 m (551.2 inches); only for 7MF0802				2	6									
15 m (590.6 inches); only for 7MF0802				2	7									
Other version, add order code and plain text				9	8							L	1	Y
Filling liquid														
Silicone oil M50								B						
High-temperature oil								C						
Silicone oil M5								A						
Food oil (FDA-listed)								E						
Halocarbon oil								D						
Neobee M20 (FDA listed)								R						
Other version, add order code and plain text								Z				P	1	Y
Material of wetted parts														
Stainless steel 316L														
• Without coating									A					
• With PFA coating									D					
• With PTFE coating									E	0				
• With ECTFE coating									F					
Monel 400, 2.4360									G					
Hastelloy C276, 2.4819									J					
Tantalum									K					
Titanium, 3.7035									L	0				
Nickel 201									M	0				
Diaphragm Duplex, 1.4462									Q					
Diaphragm and flange Duplex, 1.4462									R					
Stainless steel 316L, gold-plated									S	0				
Hastelloy C4, 2.4610									U	0				
Hastelloy C22, 2.4602									V	0				

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Selection and ordering data (continued)

		Article No.	Order code
Diaphragm seal **In sandwich design, connected with flexible capillary tube to a transmitter** **SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service)** **7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit**		**7MF0800-**	
SITRANS P320/P420 for absolute pressure from differential pressure **7MF03../7MF04.. order separately, scope of delivery: 1 unit**		**7MF0801-**	
SITRANS P320/P420 transmitter for differential pressure and flow **7MF03../7MF04.. order separately, scope of delivery: 2 units**		**7MF0802-**	
		● ● ● ● ● - 0 ● ● ●	● ● ●
Other version, add order code and plain text		Z 8	Q 1 Y
Tube length			
None		0	
50 mm (2 inches)		1	
100 mm (4 inches)		2	
150 mm (6 inches)		3	
200 mm (8 inches)		4	
250 mm (10 inches)		5	
Other version, add order code and plain text		Z 8	Q 1 Y
Customer-specific tube length			
Wetted parts: Stainless steel without coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	A 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	A 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	A 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	A 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	A 5	
Wetted parts: Stainless steel with ECTFE coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	F 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	F 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	F 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	F 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	F 5	
Wetted parts: Stainless steel with PFA coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	D 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	D 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	D 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	D 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	D 5	
Wetted parts: Monel 400			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	G 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	G 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	G 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	G 4	
Wetted parts: Hastelloy C276			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	J 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	J 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	J 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	J 4	
Wetted parts: Tantalum			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	K 1	

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Selection and ordering data (continued)

		Article No.	Order code
Diaphragm seal **In sandwich design, connected with flexible capillary tube to a transmitter**			
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service) **7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit**		**7MF0800-**	
SITRANS P320/P420 for absolute pressure from differential pressure **7MF03../7MF04.. order separately, scope of delivery: 1 unit**		**7MF0801-**	
SITRANS P320/P420 transmitter for differential pressure and flow **7MF03../7MF04.. order separately, scope of delivery: 2 units**		**7MF0802-**	
		● ● ● ● ● - 0 ● ● ●	● ● ●
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	K	2
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	K	3
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	K	4

Options **Add "-Z" to article number and specify order code.**	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	**C11**
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	**C12**
Manufacturer declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	**C13**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Inspection certificate (EN 10204-3.1) - pressure test	**C16**
Certificate on the FDA listing of the fill oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	**C20**
Accessories	
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	**D42**
Volume deflagration flame arrester (VDFA)	
• For gauge pressure and absolute pressure transmitters	**D61**
• For differential pressure and level transmitters	**D62**
Negative pressure service	
Negative pressure service	
• For gauge pressure and absolute pressure transmitters	**D81**
• For differential pressure transmitters	**D83**
Extended negative pressure service	
• For gauge pressure and absolute pressure transmitters (only 7MF0800)	**D85**
• For differential pressure transmitters	**D88**
Marine approvals	
Note: If one of the order codes E50 to E60 is selected, the corresponding option must also be selected for the transmitter!	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approval	
CRN approval Canada (Canadian Registration Number)	**E60**

Options **Add "-Z" to article number and specify order code.**	Order code
General product approvals without explosion proof approvals	
Oil-free and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-free and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN 1092-1 resp. RFSF/ANSI 16.5 (for wetted parts made of stainless steel 316L only)	**M50**
Sealing surface groove according to EN 1092-1, form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	**M54**
Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	**M64**
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface female face according to EN 1092-1, form F (only for wetted parts made of stainless steel 316L)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection (Only for 7MF0800)	
Single-side mounted at differential pressure transmitter at high side	**S03**
Single-side mounted at differential pressure transmitter at low side	**S04**
Capillary coating	
PE protective tube	

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Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code.	Order code
• 1 m (38.37 inches)	**S10**
• 1.6 m (63 inches)	**S11**
• 2 m (78.7 inches)	**S12**
• 2.5 m (98.4 inches)	**S13**
• 3 m (118.1 inches)	**S14**
• 4 m (157.5 inches)	**S15**
• 5 m (196.9 inches)	**S16**
• 6 m (236.2 inches)	**S17**
• 7 m (275.6 inches)	**S18**
• 8 m (315 inches)	**S19**
• 9 m (354.3 inches)	**S20**
• 10 m (393.7 inches)	**S21**
• 11 m (433.1 inches); only for 7MF0802	**S22**
• 12 m (472.4 inches); only for 7MF0802	**S23**
• 13 m (511.811 inches); only for 7MF0802	**S24**
• 14 m (551.2 inches); only for 7MF0802	**S25**
• 15 m (590.6 inches); only for 7MF0802	**S26**
PTFE protective tube	
• 1 m (38.37 inches)	**S40**
• 1.6 m (63 inches)	**S41**
• 2 m (78.7 inches)	**S42**
• 2.5 m (98.4 inches)	**S43**
• 3 m (118.1 inches)	**S44**
• 4 m (157.5 inches)	**S45**
• 5 m (196.9 inches)	**S46**
• 6 m (236.2 inches)	**S47**
• 7 m (275.6 inches)	**S48**
• 8 m (315 inches)	**S49**
• 9 m (354.3 inches)	**S50**
• 10 m (393.7 inches)	**S51**
• 11 m (433.1 inches); only for 7MF0802	**S52**
• 12 m (472.4 inches); only for 7MF0802	**S53**
• 13 m (511.811 inches); only for 7MF0802	**S54**
• 14 m (551.2 inches); only for 7MF0802	**S55**
• 15 m (590.6 inches); only for 7MF0802	**S56**
PVC protective tube	
• 1 m (38.37 inches)	**S70**
• 1.6 m (63 inches)	**S71**
• 2 m (78.7 inches)	**S72**
• 2.5 m (98.4 inches)	**S73**
• 3 m (118.1 inches)	**S74**
• 4 m (157.5 inches)	**S75**
• 5 m (196.9 inches)	**S76**
• 6 m (236.2 inches)	**S77**
• 7 m (275.6 inches)	**S78**
• 8 m (315 inches)	**S79**
• 9 m (354.3 inches)	**S80**
• 10 m (393.7 inches)	**S81**
• 11 m (433.1 inches); only for 7MF0802	**S82**
• 12 m (472.4 inches); only for 7MF0802	**S83**
• 13 m (511.811 inches); only for 7MF0802	**S84**
• 14 m (551.2 inches); only for 7MF0802	**S85**
• 15 m (590.6 inches); only for 7MF0802	**S86**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**
Special design	
Welded filling hole	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

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Technical specifications

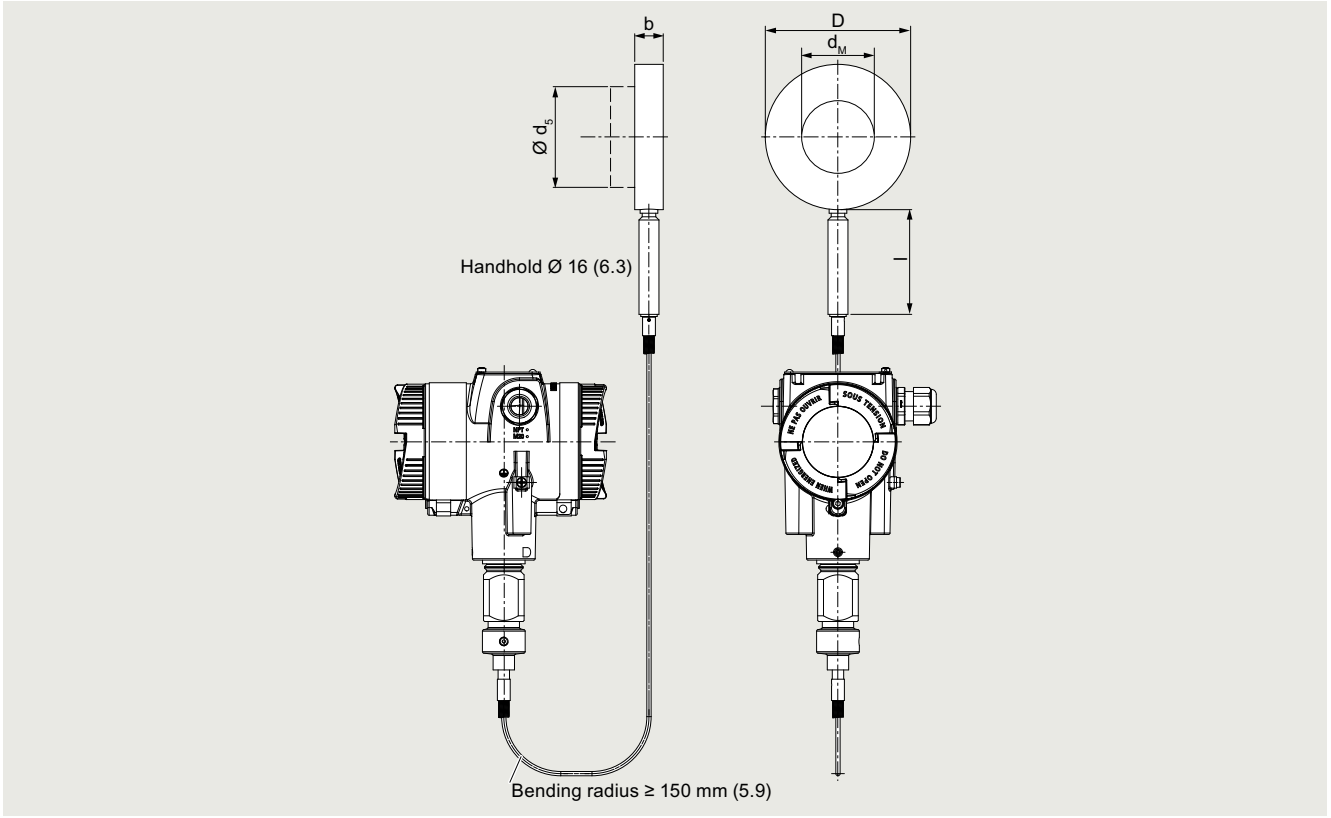
SITRANS P320/P420 diaphragm seals in sandwich design with flexible capillary	
Nominal diameter	**Nominal pressure**
Standard of process connection EN 1092-1	
• DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125	PN 16 ... PN 400
Standard of process connection ASME B16.5	
• 1 inch, 1½ inch, 2 inch, 2½ inch, 3 inch, 4 inch, 5 inch	Class 150 ... Class 2500
Process connection standard J.I.S.	
• DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125	10K ... 63K
Sealing surface	
• For stainless steel mat. no. 1.4404/316L	According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	According to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel, mat. no. 1.4404/316L
• Wetted parts	Stainless steel, mat. no. 1.4404/316L • Without coating • PTFE coating • ECTFE coating (for negative pressure on request) • PFA coating Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4610 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, layer thickness approx. 25 µm
• Capillary	Stainless steel, mat. no. 1.4571/316Ti (with options W01 and E50 ... E58) or mat. no. 1.4301/304
• Sheath	Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L
Gasket material in the process flanges	
• For gauge pressure transmitters, absolute pressure transmitters and negative pressure applications	Copper
• For other applications	Viton
Permissible pressure load	See above and the technical specifications of the pressure transmitters
Tube length	Without tube as standard. A custom tube length can be selected as an order code.
Capillary	
• Length	≤ 10 m (32.8 ft), longer lengths on request
• Inside diameter	≤ 1.3 mm (0.051 inch)
• Minimum bending radius	150 mm (5.9 inches)
Filling liquid	• Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O_2) • Food oil (FDA-listed) • Neobee M20 (FDA-listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"

Technical specifications (continued)

SITRANS P320/P420 diaphragm seals in sandwich design with flexible capillary	
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

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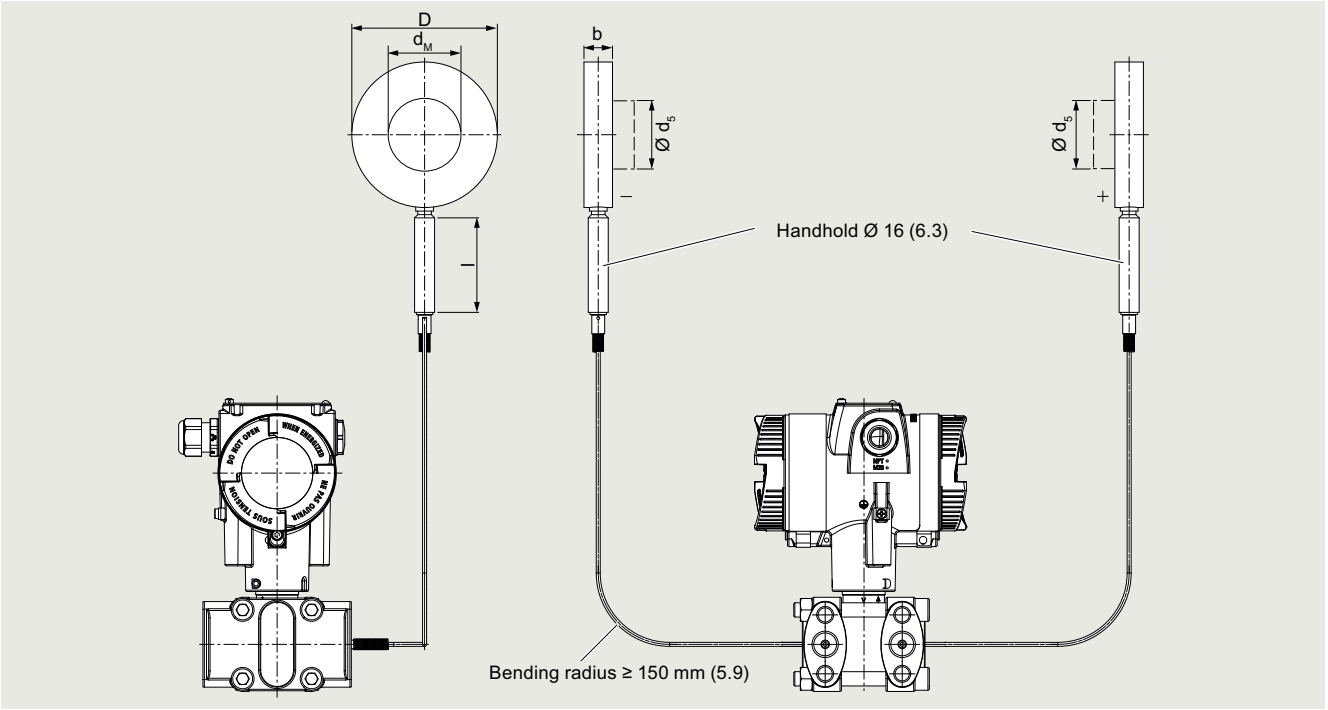
Dimensional drawings



Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for gauge pressure, dimensions in mm (inch)

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Dimensional drawings (continued)



Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P320/420 pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

Connection according to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_5	d_M with tube	d_M without tube	l
		mm	mm	mm	mm	mm	mm
DN 25	PN 16 ... 400	20	68	24.5	22.6	27	100
DN 40		20	88	38	30	40	100
DN 50		20	102	48.3	40	51	100
DN 65		20	122	48.3	40	65	100
DN 80		20	138	76	65	85	100
DN 100		20	158	94	85	85	100
DN 125		22	188	125	16	116	100

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_5	d_M with tube	d_M without tube	l
	lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
1"	150 ... 2500	20 (0.79)	51 (2.01)	24.5 (0.96)	22.6 (0.89)	30 (1.18)	100 (3.94)
1½"		20 (0.79)	73 (2.9)	38 (1.5)	30 (1.18)	40 (1.57)	100 (3.94)
2"		20 (0.79)	100 (3.94)	48.3 (1.9)	40 (1.57)	51 (2.01)	100 (3.94)
2½"		20 (0.79)	105 (4.13)	48.3 (1.9)	40 (1.57)	65 (2.56)	100 (3.94)
3"		20 (0.79)	134 (5.28)	72 (2.8)	65 (2.56)	85 (3.35)	100 (3.94)
4"		20 (0.79)	158 (6.22)	94 (3.69)	85 (3.35)	85 (3.35)	100 (3.94)
5"		22 (0.87)	186 (7.32)	125 (4.92)	116 (4.57)	116 (4.57)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

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Dimensional drawings (continued)

Connection according to J.I.S.

Nominal diameter	Nominal pressure	b mm (inch)	D 10K, 20K mm (inch)	D 30K ... 63K mm (inch)	d_5 mm (inch)	d_M with tube mm (inch)	d_M without tube mm (inch)	l mm (inch)
DN 25	10K ... 63K	20 (0.79)	67 (2.64)	70 (2.76)	24.5 (0.96)	22.6 (0.89)	30 (1.18)	100 (3.94)
DN 40		20 (0.79)	81 (3.19)	90 (3.54)	38 (1.5)	30 (1.18)	36 (1.42)	100 (3.94)
DN 50		20 (0.79)	96 (3.78)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	100 (3.94)
DN 65		20 (0.79)	116 (4.57)	130 (5.12)	48.3 (1.9)	40 (1.57)	65 (2.56)	100 (3.94)
DN 80		20 (0.79)	132 (5.2)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	100 (3.94)
DN 100		20 (0.79)	160 (6.3)	160 (6.3)	94 (3.69)	85 (3.35)	85 (3.35)	100 (3.94)
DN 125		20 (0.79)	195 (7.68)	195 (7.68)	125 (4.92)	116 (4.57)	116 (4.57)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

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Overview



Diaphragm seals of flange design

Selection and ordering data

		Article No.												Order code
Diaphragm seal **Flange type design, connected to a transmitter with flexible capillary**														
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit		**7MF0810-**												
SITRANS P320/P420 for absolute pressure from differential pressure 7MF03../7MF04.. order separately, scope of delivery: 1 unit		**7MF0811-**												
SITRANS P320/P420 transmitter for differential pressure and flow 7MF03../7MF04.. order separately, scope of delivery: 2 units		**7MF0812-**												
		●	●	●	●	●	-	0	●	●	●		●	●	●	
Click the article number for online configuration in the PIA Life Cycle Portal.														
Nominal diameter	Nominal pressure													
Process connection standard EN 1092-1 (DN 25, DN 40 and DN 50 only recommended for pressure transmitters for gauge pressure)														
DN 25	PN 10/16/25/40	**0**	**B**	**D**										
	PN 63/100	**0**	**B**	**F**										
	PN 160	**0**	**B**	**G**										
	PN 250	**0**	**B**	**H**										
DN 40	PN 10/16/25/40	**0**	**D**	**D**										
	PN 63/100	**0**	**D**	**F**										
	PN 160	**0**	**D**	**G**										
DN 50	PN 10/16/25/40	**0**	**E**	**D**										
	PN 63	**0**	**E**	**E**										
	PN 100	**0**	**E**	**F**										
DN 80	PN 10/16/25/40	**0**	**G**	**D**										
	PN 100	**0**	**G**	**F**										
DN 100	PN 10/16	**0**	**H**	**B**										
	PN 25/40	**0**	**H**	**D**										
DN 125	PN 16	**0**	**J**	**B**										
	PN 40	**0**	**J**	**D**										
Process connection standard ASME B16.5 (1 inch, 1½ inches and 2 inches only recommended for pressure transmitters for gauge pressure)														
1 inch	Class 150	**1**	**K**	**L**										
	Class 300	**1**	**K**	**M**										
	Class 600	**1**	**K**	**N**										
	Class 1500	**1**	**K**	**P**										
1½ inches	Class 150	**1**	**L**	**A**										
	Class 300	**1**	**L**	**B**										
	Class 400/600	**1**	**L**	**D**										
	Class 900/1500	**1**	**L**	**F**										
2 inches	Class 150	**1**	**M**	**A**										
	Class 300	**1**	**M**	**B**										

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Selection and ordering data (continued)

		Article No.												Order code		
Diaphragm seal **Flange type design, connected to a transmitter with flexible capillary**																
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit		**7MF0810-**														
SITRANS P320/P420 for absolute pressure from differential pressure 7MF03../7MF04.. order separately, scope of delivery: 1 unit		**7MF0811-**														
SITRANS P320/P420 transmitter for differential pressure and flow 7MF03../7MF04.. order separately, scope of delivery: 2 units		**7MF0812-**														
		●	●	●	●	●	-	0	●	●	●			●	●	●
	Class 400/600	1	M	D												
	Class 900/1500	1	M	F												
3 inches	Class 150	1	P	A												
	Class 300	1	P	B												
	Class 600	1	P	D												
	Class 1500	1	P	F												
4 inches	Class 150	1	Q	A												
	Class 300	1	Q	B												
	Class 400	1	Q	C												
	Class 1500	1	Q	F												
5 inches	Class 150	1	R	A												
	Class 300	1	R	B												
	Class 400	1	R	C												
Process connection standard J.I.S. (DN 50 only recommended for pressure transmitters for gauge pressure)																
DN 50	10 K	2	E	S												
	20 K	2	E	T												
	40 K	2	E	U												
DN 80	10 K	2	G	S												
	20 K	2	G	T												
	40 K	2	G	U												
DN 100	10 K	2	H	S												
	20 K	2	H	T												
	40 K	2	H	U												
Other version, add order code and plain text		9	A	A										H	1	Y
Transmitter connection																
Connection via capillary Capillary length																
1 m (38.37 inches)					1	0										
1.6 m (63 inches)					1	1										
2 m (78.7 inches)					1	2										
2.5 m (98.4 inches)					1	3										
3 m (118.1 inches)					1	4										
4 m (157.5 inches)					1	5										
5 m (196.9 inches)					1	6										
6 m (236.2 inches)					1	7										
7 m (275.6 inches)					1	8										
8 m (315 inches)					2	0										
9 m (354.3 inches)					2	1										
10 m (393.7 inches)					2	2										
11 m (433.1 inches); only for 7MF0812					2	3										
12 m (472.4 inches); only for 7MF0812					2	4										
13 m (511.811 inches); only for 7MF0812					2	5										
14 m (551.2 inches); only for 7MF0812					2	6										
15 m (590.6 inches); only for 7MF0812					2	7										
Other version, add order code and plain text					9	8								L	1	Y

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Selection and ordering data (continued)

		Article No.													Order code		
Diaphragm seal **Flange type design, connected to a transmitter with flexible capillary** **SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit**		**7MF0810-**															
SITRANS P320/P420 for absolute pressure from differential pressure 7MF03../7MF04.. order separately, scope of delivery: 1 unit		**7MF0811-**															
SITRANS P320/P420 transmitter for differential pressure and flow 7MF03../7MF04.. order separately, scope of delivery: 2 units		**7MF0812-**															
		●	●	●	●	●	-	0	●	●	●				●	●	●
Filling liquid																	
Silicone oil M50									**B**								
High-temperature oil									**C**								
Silicone oil M5									**A**								
Food oil (FDA-listed)									**E**								
Halocarbon oil									**D**								
Neobee M20 (FDA listed)									**R**								
Other version, add order code and plain text									**Z**						**P**	**1**	**Y**
Material of wetted parts																	
Stainless steel 316L																	
• Without coating										**A**							
• With PFA coating										**D**							
• With PTFE coating										**E**	**0**						
• With ECTFE coating										**F**							
Monel 400, 2.4360										**G**							
Hastelloy C276, 2.4819										**J**							
Tantalum										**K**							
Titanium, 3.7035										**L**	**0**						
Nickel 201										**M**	**0**						
Diaphragm Duplex, 1.4462										**Q**							
Diaphragm and flange Duplex, 1.4462										**R**							
Stainless steel 316L, gold-plated										**S**	**0**						
Hastelloy C4, 2.4610										**U**	**0**						
Hastelloy C22, 2.4602										**V**	**0**						
Other version, add order code and plain text										**Z**	**8**				**Q**	**1**	**Y**
Tube length																	
Without tube											**0**						
50 mm (2 inches)											**1**						
100 mm (4 inches)											**2**						
150 mm (6 inches)											**3**						
200 mm (8 inches)											**4**						
250 mm (10 inches)											**5**						
Other version, add order code and plain text										**Z**	**8**				**Q**	**1**	**Y**
Customer-specific tube length																	
Wetted parts: Stainless steel without coating																	
Range	Standard length																
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)									**A**	**1**						
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)									**A**	**2**						
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)									**A**	**3**						
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)									**A**	**4**						
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)									**A**	**5**						
Wetted parts: Stainless steel with ECTFE coating																	
Range	Standard length																
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)									**F**	**1**						

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Selection and ordering data (continued)

		Article No.	Order code
Diaphragm seal **Flange type design, connected to a transmitter with flexible capillary** **SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit**		**7MF0810-**	
SITRANS P320/P420 for absolute pressure from differential pressure 7MF03../7MF04.. order separately, scope of delivery: 1 unit		**7MF0811-**	
SITRANS P320/P420 transmitter for differential pressure and flow 7MF03../7MF04.. order separately, scope of delivery: 2 units		**7MF0812-**	
		● ● ● ● ● - 0 ● ● ●	● ● ●
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	F 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	F 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	F 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	F 5	
Wetted parts: Stainless steel with PFA coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	D 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	D 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	D 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	D 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	D 5	
Wetted parts: Monel 400			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	G 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	G 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	G 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	G 4	
Wetted parts: Hastelloy C276			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	J 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	J 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	J 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	J 4	
Wetted parts: Tantalum			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	K 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	K 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	K 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	K 4	

Options **Add "-Z" to article number and specify order code.**	**Order code**
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	**C11**
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	**C12**
Manufacturer declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	**C13**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Inspection certificate (EN 10204-3.1) - pressure test	**C16**
Certificate on the FDA-listing of the fill oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	**C20**

Options **Add "-Z" to article number and specify order code.**	**Order code**
Accessories	
Representation of the epoxy resin coating Color: Transparent coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. Maximum process medium temperature for epoxy lacquering: 140 °C	**D15**
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	**D42**
Volume deflagration flame arrester (VDFA)	
• For gauge pressure and absolute pressure transmitters	**D61**
• For differential pressure and level transmitters	**D62**
Negative pressure service	
Negative pressure service	
• For gauge pressure and absolute pressure transmitters (only 7MF0810)	**D81**
• For differential pressure transmitters	**D83**

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Selection and ordering data (continued)

Options **Add "-Z" to article number and specify order code.**	Order code
Extended negative pressure service	
• For gauge pressure and absolute pressure transmitters (only 7MF0810)	**D85**
• For differential pressure transmitters	**D88**
Marine approvals	
Note: If one of the order codes E50 to E60 is selected, the corresponding option must also be selected for the transmitter!	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approval	
CRN approval Canada (Canadian Registration Number)	**E60**
General product approvals without explosion proof approvals	
Oil-free and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-free and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN 1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	**M50**
Sealing surface groove according to EN 1092-1, form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	**M54**
Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	**M64**
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface female face according to EN 1092-1, form F (only for wetted parts made of stainless steel 316L)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection	
For 7MF0810	
• Radial capillary outlet (for single-side mounting)	**S01**
• Single-side mounted at differential pressure transmitter at high side	**S03**
• Single-side mounted at differential pressure transmitter at low side	**S04**
For 7MF0811	
• Radial capillary outlet (for single-side mounting)	**S01**
For 7MF0812	
• Radial capillary pipe outlet (for double-side mounting)	**S02**
Capillary coating	
PE protective tube	
• 1 m (38.37 inches)	**S10**
• 1.6 m (63 inches)	**S11**
• 2 m (78.7 inches)	**S12**
• 2.5 m (98.4 inches)	**S13**
• 3 m (118.1 inches)	**S14**
• 4 m (157.5 inches)	**S15**
• 5 m (196.9 inches)	**S16**
• 6 m (236.2 inches)	**S17**
• 7 m (275.6 inches)	**S18**
• 8 m (315 inches)	**S19**
• 9 m (354.3 inches)	**S20**
• 10 m (393.7 inches)	**S21**
• 11 m (433.1 inches); only for 7MF0812	**S22**
• 12 m (472.4 inches); only for 7MF0812	**S23**
• 13 m (511.811 inches); only for 7MF0812	**S24**
• 14 m (551.2 inches); only for 7MF0812	**S25**
• 15 m (590.6 inches); only for 7MF0812	**S26**
PTFE protective tube	
• 1 m (38.37 inches)	**S40**
• 1.6 m (63 inches)	**S41**
• 2 m (78.7 inches)	**S42**
• 2.5 m (98.4 inches)	**S43**
• 3 m (118.1 inches)	**S44**
• 4 m (157.5 inches)	**S45**
• 5 m (196.9 inches)	**S46**
• 6 m (236.2 inches)	**S47**
• 7 m (275.6 inches)	**S48**
• 8 m (315 inches)	**S49**
• 9 m (354.3 inches)	**S50**
• 10 m (393.7 inches)	**S51**
• 11 m (433.1 inches); only for 7MF0812	**S52**
• 12 m (472.4 inches); only for 7MF0812	**S53**
• 13 m (511.811 inches); only for 7MF0812	**S54**
• 14 m (551.2 inches); only for 7MF0812	**S55**
• 15 m (590.6 inches); only for 7MF0812	**S56**
PVC protective tube	
• 1 m (38.37 inches)	**S70**
• 1.6 m (63 inches)	**S71**
• 2 m (78.7 inches)	**S72**
• 2.5 m (98.4 inches)	**S73**
• 3 m (118.1 inches)	**S74**
• 4 m (157.5 inches)	**S75**
• 5 m (196.9 inches)	**S76**
• 6 m (236.2 inches)	**S77**

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Selection and ordering data (continued)

Options **Add "-Z" to article number and specify order code.**	**Order code**
• 7 m (275.6 inches)	**S78**
• 8 m (315 inches)	**S79**
• 9 m (354.3 inches)	**S80**
• 10 m (393.7 inches)	**S81**
• 11 m (433.1 inches); only for 7MF0812	**S82**
• 12 m (472.4 inches); only for 7MF0812	**S83**
• 13 m (511.811 inches); only for 7MF0812	**S84**
• 14 m (551.2 inches); only for 7MF0812	**S85**
• 15 m (590.6 inches); only for 7MF0812	**S86**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**

Options **Add "-Z" to article number and specify order code.**	**Order code**
Special design	
Welded filling hole	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

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Technical specifications

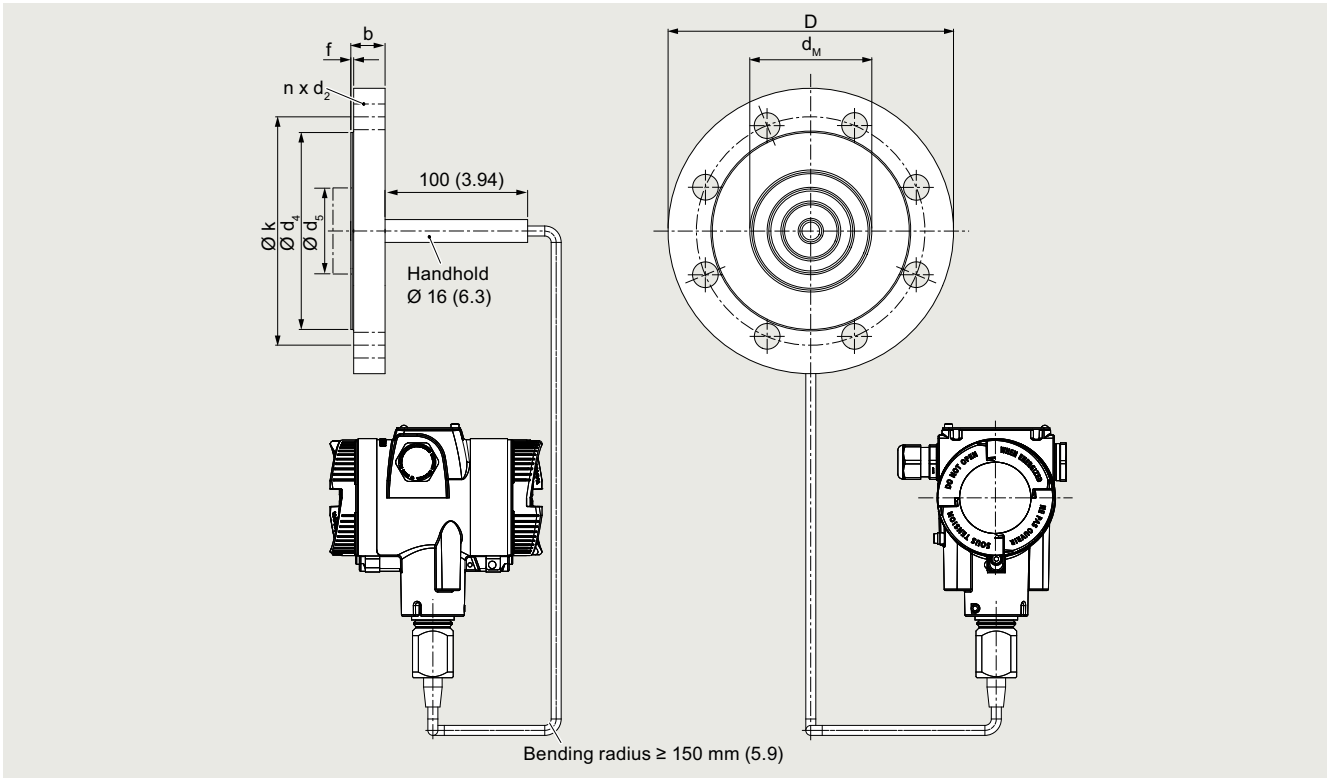
SITRANS P320/P420 diaphragm seals in flange design with flexible capillary	
Nominal diameter	**Nominal pressure**
Standard of process connection EN 1092-1	
• DN 25	PN 10/16/25/40/63/100/160/250
• DN 40	PN 10/16/25/40/63/100/160
• DN 50	PN 10/16/25/40/63/100
• DN 80	PN 10/16/25/40/100
• DN 100	PN 10/16/25/40
• DN 125	PN 16/40
Process connection standard ASME B16.5	
• 1 inch	Class 150/300/600/1500
• 1½ inches	Class 150/300/400/600/900/1500
• 2 inches	Class 150/300/400/600/900/1500
• 3 inches	Class 150/300/600/1500
• 4 inches	Class 150/300/400/1500
• 5 inches	Class 150/300/400
Process connection standard J.I.S.	
• DN 50	10K
• DN 80	20K
• DN 100	40K
Sealing surface	
• For stainless steel mat. no. 1.4404/316L	According to EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA
• For other materials	According to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel, mat. no. 1.4404/316L
• Wetted parts	Stainless steel, mat. no. 1.4404/316L • Without coating • PTFE coating • ECTFE coating (for negative pressure on request) • PFA coating Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4610 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, layer thickness approx. 25 µm
• Capillary	Stainless steel, mat. no. 1.4571/316Ti (with options W01 and E50 to E58) or mat. no. 1.4301/304
• Sheath	Flexible spiral coiled tube made of stainless steel mat. no. 1.4404/316L
Gasket material in the process flanges	
• For pressure transmitters, absolute pressure transmitters and negative pressure applications	Copper
• For other applications	Viton
Permissible pressure load	See above and the technical specifications of the pressure transmitter
Tube length	Without tube as standard. A custom tube length can be selected as an order code.
Capillary	
• Length	≤ 10 m (32.8 ft), longer lengths on request
• Inside diameter	≤ 1.3 mm (0.051 inch)
• Minimum bending radius	150 mm (5.9 inches)

Technical specifications (continued)

SITRANS P320/P420 diaphragm seals in flange design with flexible capillary	
Filling liquid (for remote seals of sandwich and flange type)	• Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O_2) • Food oil (FDA-listed) • Neobee M20 (FDA-listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

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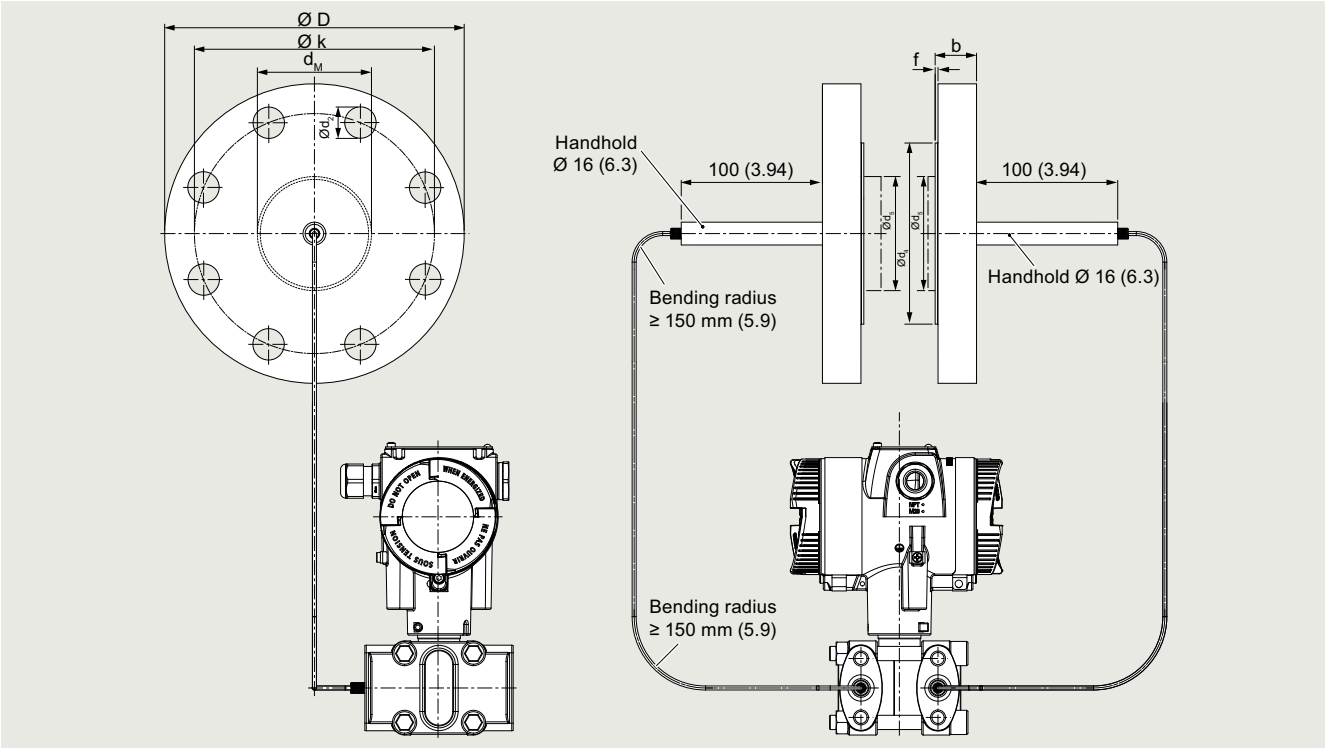
Dimensional drawings



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for gauge pressure, dimensions in mm (inch)

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Dimensional drawings (continued)



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

Connection according to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 25	PN 10/16/25/40	18	115	14	68	24.5	22.6	27	2	85	4	0, 50, 100, 150 or 200
	PN 63/100	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 160	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 250	28	150	22	68	24.5	22.6	27	2	105	4	
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

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Dimensional drawings (continued)

Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
	lb/sq.in.	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)		Inch (mm)
1"	150	0.71 (18)	4.33 (110)	0.61 (15.6)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.08 (2)	3.13 (79.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.77 (19.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.08 (2)	3.5 (88.9)	4	
	600	0.96 (24.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.28 (7)	3.5 (88.9)	4	
	1500	1.4 (35.6)	5.91 (150)	1 (25.4)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.28 (7)	4 (101.6)	4	
1½"	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2"	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3"	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4"	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5"	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

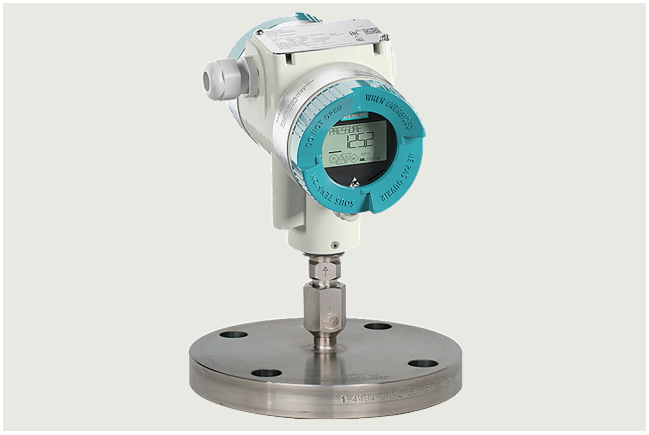
Connection according to J.I.S.

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

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Overview



Diaphragm seal of flange design, directly fitted on a pressure transmitter for gauge pressure

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Selection and ordering data

Diaphragm seal Flange type design, mounted directly onto the transmitter SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0810-	Order code
		● ● ● ● ● - 0 ● ● ●	● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.			
Nominal diameter	**Nominal pressure**		
Process connection standard EN 1092-1			
DN 25	PN 10/16/25/40	**0 B D**	
	PN 63/100	**0 B F**	
	PN 160	**0 B G**	
	PN 250	**0 B H**	
DN 40	PN 10/16/25/40	**0 D D**	
	PN 63/100	**0 D F**	
	PN 160	**0 D G**	
DN 50	PN 10/16/25/40	**0 E D**	
	PN 63	**0 E E**	
	PN 100	**0 E F**	
DN 80	PN 10/16/25/40	**0 G D**	
	PN 100	**0 G F**	
DN 100	PN 10/16	**0 H B**	
	PN 25/40	**0 H D**	
DN 125	PN 16	**0 J B**	
	PN 40	**0 J D**	
Process connection standard ASME B16.5			
1 inch	Class 150	**1 K L**	
	Class 300	**1 K M**	
	Class 600	**1 K N**	
	Class 1500	**1 K P**	
1½ inches	Class 150	**1 L A**	
	Class 300	**1 L B**	
	Class 400/600	**1 L D**	
	Class 900/1500	**1 L F**	
2 inches	Class 150	**1 M A**	
	Class 300	**1 M B**	
	Class 400/600	**1 M D**	
	Class 900/1500	**1 M F**	
3 inches	Class 150	**1 P A**	
	Class 300	**1 P B**	
	Class 600	**1 P D**	
	Class 1500	**1 P F**	
4 inches	Class 150	**1 Q A**	
	Class 300	**1 Q B**	
	Class 400	**1 Q C**	
	Class 1500	**1 Q F**	
5 inches	Class 150	**1 R A**	
	Class 300	**1 R B**	
	Class 400	**1 R C**	
Process connection standard J.I.S.			
DN 50	10 K	**2 E S**	
	20 K	**2 E T**	
	40 K	**2 E U**	
DN 80	10 K	**2 G S**	

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Selection and ordering data (continued)

Diaphragm seal Flange type design, mounted directly onto the transmitter SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0810-											Order code		
		●	●	●	●	●	-	0	●	●	●		●	●	●
	20 K	2	G	T											
	40 K	2	G	U											
DN 100	10 K	2	H	S											
	20 K	2	H	T											
	40 K	2	H	U											
Other version, add order code and plain text		9	A	A									H	1	Y
Transmitter connection															
Without capillary pipe, direct mount, straight connection (for gauge pressure transmitters)					0	0									
Without capillary pipe, direct mount, connection with 90° elbow (for gauge pressure transmitters)					0	1									
Filling liquid															
Silicone oil M50									B						
High-temperature oil									C						
Silicone oil M5									A						
Food oil (FDA-listed)									E						
Halocarbon oil									D						
Neobee M20 (FDA listed)									R						
Other version, add order code and plain text									Z				P	1	Y
Material of wetted parts															
Stainless steel 316L															
• Without coating										A					
• With PFA coating										D					
• With PTFE coating										E	0				
• With ECTFE coating										F					
Monel 400, 2.4360										G					
Hastelloy C276, 2.4819										J					
Tantalum										K					
Titanium, 3.7035										L	0				
Nickel 201										M	0				
Diaphragm Duplex, 1.4462										Q					
Diaphragm and flange Duplex, 1.4462										R					
Stainless steel 316L, gold-plated										S	0				
Hastelloy C4, 2.4610										U	0				
Hastelloy C22, 2.4602										V	0				
Other version, add order code and plain text										Z	8		Q	1	Y
Tube length															
Without tube											0				
50 mm (2 inches)											1				
100 mm (4 inches)											2				
150 mm (6 inches)											3				
200 mm (8 inches)											4				
250 mm (10 inches)											5				
Other version, add order code and plain text										Z	8		Q	1	Y
Customer-specific tube length															
Wetted parts: Stainless steel without coating															
Range	Standard length														
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)									A	1				
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)									A	2				

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Selection and ordering data (continued)

Diaphragm seal Flange type design, mounted directly onto the transmitter SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0810-	Order code
		● ● ● ● ● - 0 ● ● ●	● ● ●
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	A 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	A 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	A 5	
Wetted parts: Stainless steel with ECTFE coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	F 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	F 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	F 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	F 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	F 5	
Wetted parts: Stainless steel with PFA coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	D 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	D 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	D 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	D 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	D 5	
Wetted parts: Monel 400			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	G 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	G 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	G 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	G 4	
Wetted parts: Hastelloy C276			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	J 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	J 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	J 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	J 4	
Wetted parts: Tantalum			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	K 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	K 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	K 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	K 4	

Options Add "-Z" to article number and specify order code.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	C11
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	C12
Manufacturer declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	C13
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	C15
Inspection certificate (EN 10204-3.1) - pressure test	C16
Certificate on the FDA-listing of the fill oil according to EN 10204-2.2	C17

Options Add "-Z" to article number and specify order code.	Order code
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	C20
Accessories	
Representation of the epoxy resin coating Color: Transparent coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. Maximum process medium temperature for epoxy lacquering: 140 °C	D15
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	D42
Volume deflagration flame arrester (VDFA) for gauge pressure and absolute pressure transmitters	D61

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Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code.	Order code
Negative pressure service	
Negative pressure service for gauge pressure and absolute pressure transmitters	**D81**
Extended negative pressure service for gauge pressure and absolute pressure transmitters (only for 7MF0810)	**D85**
Country-specific approval	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	**E60**
General product approvals without explosion proof approvals	
Oil-free and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-free and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN 1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	**M50**
Sealing surface groove according to EN 1092-1, form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	**M54**
Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	**M64**
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface female face according to EN 1092-1, form F (only for wetted parts made of stainless steel 316L)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection	
Elongated pipe, approx. 150 mm, max. medium temperature 250 °C (482 °F), observe the max. permissible medium temperature of the filling liquid.	**S05**
Elongated pipe, approx. 200 mm, max. medium temperature 300 °C (572 °F), observe the max. permissible medium temperature of the filling liquid.	**S06**
Elongated pipe elbow, approx. 200 mm, max. medium temperature 300 °C (572 °F), observe the max. permissible medium temperature of the filling liquid.	**S07**
Cooling element, max. medium temperature approx. 300 °C (572 °F), observe the max. permissible medium temperature of the filling liquid.	**S08**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**
Special design	
Welded filling hole	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

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Technical specifications

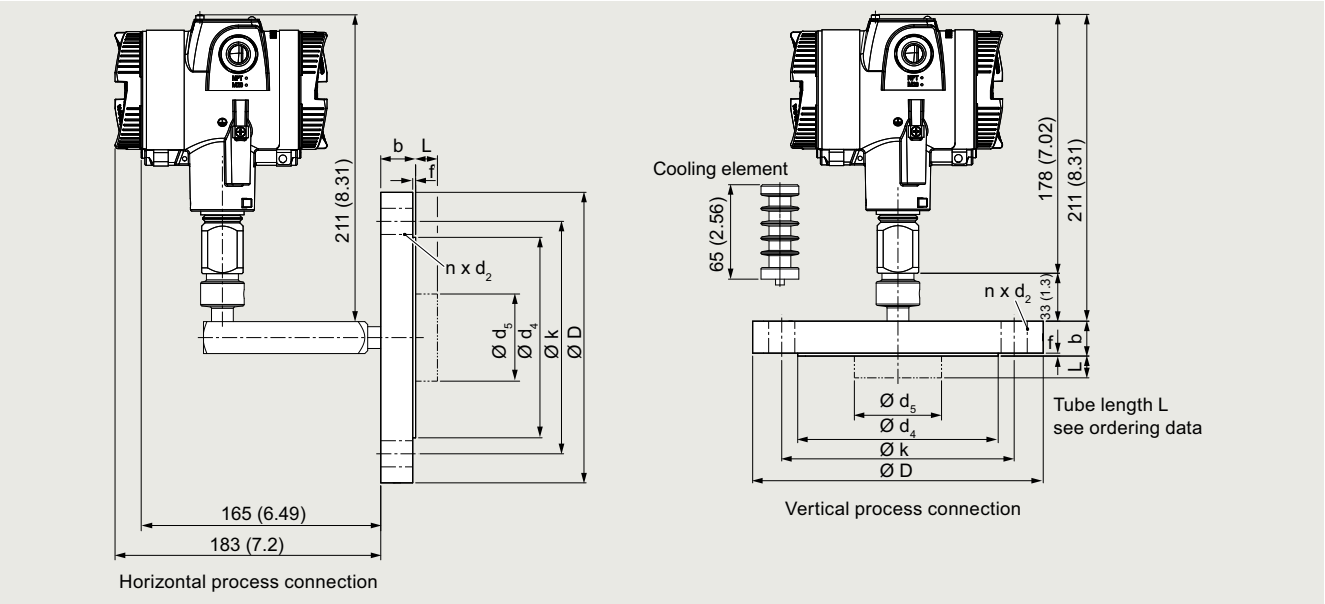
SITRANS P320/P420 diaphragm seals in flange design, mounted directly on the transmitter	
Nominal diameter	**Nominal pressure**
Standard of process connection EN 1092-1	
• DN 25	PN 10/16/25/40/63/100/160/250
• DN 40	PN 10/16/25/40/63/100/160
• DN 50	PN 10/16/25/40/63/100
• DN 80	PN 10/16/25/40/100
• DN 100	PN 10/16/25/40
• DN 125	PN 16/40
Process connection standard ASME B16.5	
• 1 inch	Class 150/300/600/1500
• 1½ inches	Class 150/300/400/600/900/1500
• 2 inches	Class 150/300/400/600/900/1500
• 3 inches	Class 150/300/600/1500
• 4 inches	Class 150/300/400/1500
• 5 inches	Class 150/300/400
Process connection standard J.I.S.	
• DN 50	10K
• DN 80	20K
• DN 100	40K
Sealing surface	
• For stainless steel mat. no. 1.4404/316L	According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	Smooth according to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel, mat. no. 1.4404/316L
• Wetted parts	Stainless steel, mat. no. 1.4404/316L • No coating • PTFE coating • ECTFE coating (for negative pressure on request) • PFA coating Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4610 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, layer thickness approx. 25 µm
• Capillary	Stainless steel, mat. no. 1.4404/316L
• Gasket material at the transmitter connection	Copper
Permissible pressure load	See above and the technical specifications of the transmitter
Tube length	• Without tube • 50 mm (1.97 inches) • 100 mm (3.94 inches) • 150 mm (5.91 inches) • 200 mm (7.87 inches)
Capillary	
• Length	≤ 10 m (32.8 ft), longer lengths on request
• Inside diameter	≤ 1.3 mm (0.051 inch)
• Minimum bending radius	150 mm (5.9 inches)
Filling liquid	• Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O_2) • Food oil (FDA-listed) • Neobee M20 (FDA-listed)

Technical specifications (continued)

SITRANS P320/P420 diaphragm seals in flange design, mounted directly on the transmitter	
Max. recommended medium temperature	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

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Dimensional drawings



Diaphragm seals of flange design, direct connection to a SITRANS P320/420 pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

Connection according to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 25	PN 10/16/25/40	18	115	14	68	24.5	22.6	27	2	85	4	0, 50, 100, 150 or 200
	PN 63/100	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 160	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 250	28	150	22	68	24.5	22.6	27	2	105	4	
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
	lb/sq.in.	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)		Inch (mm)
1"	150	0.71 (18)	4.33 (110)	0.61 (15.6)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.08 (2)	3.13 (79.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.77 (19.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.08 (2)	3.5 (88.9)	4	
	600	0.96 (24.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.28 (7)	3.5 (88.9)	4	
	1500	1.4 (35.6)	5.91 (150)	1 (25.4)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1,18 (30)	0.28 (7)	4 (101.6)	4	
1½"	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	

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Dimensional drawings (continued)

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
	lb/sq.in.	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)		Inch (mm)
1½"	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1,18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
2"	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3"	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4"	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5"	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

Connection according to J.I.S.

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		Inch (mm)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

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Overview



Diaphragm seal of flange design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

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Selection and ordering data

Diaphragm seal Flange design, mounted directly and with capillary Mounting flange (optionally with tube) for direct mounting on high side and flange remote seal without tube, mounted via capillary on low side of SITRANS P for differential pressure; SITRANS P320/420 SITRANS P320/P420 transmitter for differential pressure and flow 7MF03../7MF04.. order separately, scope of delivery: 2 units		Article No. 7MF0813- ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.			
Nominal diameter	**Nominal pressure**		
Process connection standard EN 1092-1			
DN 40	PN 10/16/25/40	0 D D	
	PN 63/100	0 D F	
	PN 160	0 D G	
DN 50	PN 10/16/25/40	0 E D	
	PN 63	0 E E	
	PN 100	0 E F	
DN 80	PN 10/16/25/40	0 G D	
	PN 100	0 G F	
DN 100	PN 10/16	0 H B	
	PN 25/40	0 H D	
DN 125	PN 16	0 J B	
	PN 40	0 J D	
Process connection standard ASME B16.5			
1½ inches	Class 150	1 L A	
	Class 300	1 L B	
	Class 400/600	1 L D	
	Class 900/1500	1 L F	
2 inches	Class 150	1 M A	
	Class 300	1 M B	
	Class 400/600	1 M D	
	Class 900/1500	1 M F	
3 inches	Class 150	1 P A	
	Class 300	1 P B	
	Class 600	1 P D	
	Class 1500	1 P F	
4 inches	Class 150	1 Q A	
	Class 300	1 Q B	
	Class 400	1 Q C	
	Class 1500	1 Q F	
5 inches	Class 150	1 R A	
	Class 300	1 R B	
	Class 400	1 R C	
Process connection standard J.I.S.			
DN 50	10K	2 E S	
	20K	2 E T	
	40K	2 E U	
DN 80	10K	2 G S	
	20K	2 G T	
	40K	2 G U	
DN 100	10K	2 H S	
	20K	2 H T	
	40K	2 H U	
Other version, add order code and plain text		9 A A	H 1 Y

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Selection and ordering data (continued)

	Article No.											Order code		
Diaphragm seal **Flange design, mounted directly and with capillary** **Mounting flange (optionally with tube) for direct mounting on high side and flange remote seal without tube, mounted via capillary on low side of SITRANS P for differential pressure; SITRANS P320/420** **SITRANS P320/P420 transmitter for differential pressure and flow 7MF03../7MF04.. order separately, scope of delivery: 2 units**	**7MF0813-**													
	●	●	●	●	●	-	0	●	●	●		●	●	●
Capillary length at low side														
1 m (38.37 inches)				1	0									
1.6 m (63 inches)				1	1									
2 m (78.7 inches)				1	2									
2.5 m (98.4 inches)				1	3									
3 m (118.1 inches)				1	4									
4 m (157.5 inches)				1	5									
5 m (196.9 inches)				1	6									
6 m (236.2 inches)				1	7									
7 m (275.6 inches)				1	8									
8 m (315 inches)				2	0									
9 m (354.3 inches)				2	1									
10 m (393.7 inches)				2	2									
Other version, add order code and plain text				9	8							L	1	Y
Filling liquid														
Silicone oil M50								B						
High-temperature oil								C						
Silicone oil M5								A						
Food oil (FDA-listed)								E						
Halocarbon oil								D						
Neobee M20 (FDA listed)								R						
Other version, add order code and plain text								Z				P	1	Y
Material of wetted parts														
Stainless steel 316L														
• Without coating									A					
• With PFA coating									D					
• With PTFE coating									E	0				
• With ECTFE coating									F					
Monel 400, 2.4360									G					
Hastelloy C276, 2.4819									J					
Tantalum									K					
Titanium, 3.7035									L	0				
Nickel 201									M	0				
Diaphragm Duplex, 1.4462									Q					
Diaphragm and flange Duplex, 1.4462									R					
Stainless steel 316L, gold-plated									S	0				
Hastelloy C4, 2.4610									U	0				
Hastelloy C22, 2.4602									V	0				
Other version, add order code and plain text									Z	8		Q	1	Y
Tube length														
Note: If a tube is ordered, only the directly mounted remote seal is equipped with a tube.														
None										0				
50 mm (2 inches)										1				
100 mm (4 inches)										2				
150 mm (6 inches)										3				

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Selection and ordering data (continued)

Diaphragm seal Flange design, mounted directly and with capillary Mounting flange (optionally with tube) for direct mounting on high side and flange remote seal without tube, mounted via capillary on low side of SITRANS P for differential pressure; SITRANS P320/420 SITRANS P320/P420 transmitter for differential pressure and flow 7MF03../7MF04.. order separately, scope of delivery: 2 units		Article No. 7MF0813- ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
200 mm (8 inches)		4	
250 mm (10 inches)		5	
Other version, add order code and plain text		Z 8	Q 1 Y
Customer-specific tube length			
Wetted parts: Stainless steel without coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	A 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	A 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	A 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	A 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	A 5	
Wetted parts: Stainless steel with ECTFE coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	F 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	F 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	F 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	F 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	F 5	
Wetted parts: Stainless steel with PFA coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	D 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	D 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	D 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	D 4	
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)	D 5	
Wetted parts: Monel 400			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	G 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	G 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	G 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	G 4	
Wetted parts: Hastelloy C276			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	J 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	J 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	J 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	J 4	
Wetted parts: Tantalum			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)	K 1	
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)	K 2	
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)	K 3	
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)	K 4	

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Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	**C11**
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	**C12**
Manufacturer declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	**C13**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Inspection certificate (EN 10204-3.1) - pressure test	**C16**
Certificate on the FDA-listing of the fill oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	**C20**
Accessories	
Representation of the epoxy resin coating Color: Transparent coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. Maximum process medium temperature for epoxy lacquering: 140 °C	**D15**
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	**D42**
Volume deflagration flame arrester (VDFA) for differential pressure and level transmitters	**D62**
Negative pressure service	
Negative pressure service for differential pressure transmitters	**D83**
Extended negative pressure service for differential pressure transmitters	**D88**
Country-specific approval	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	**E60**
General product approvals without explosion proof approvals	
Oil-free and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-free and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN 1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	**M50**
Sealing surface groove according to EN 1092-1, form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	**M54**
Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	**M64**
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface female face according to EN 1092-1, form F (only for wetted parts made of stainless steel 316L)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary coating	
PE protective tube	
• 1 m (38.37 inches)	**S10**
• 1.6 m (63 inches)	**S11**
• 2 m (78.7 inches)	**S12**
• 2.5 m (98.4 inches)	**S13**
• 3 m (118.1 inches)	**S14**
• 4 m (157.5 inches)	**S15**
• 5 m (196.9 inches)	**S16**
• 6 m (236.2 inches)	**S17**
• 7 m (275.6 inches)	**S18**
• 8 m (315 inches)	**S19**
• 9 m (354.3 inches)	**S20**
• 10 m (393.7 inches)	**S21**
PTFE protective tube	
• 1 m (38.37 inches)	**S40**
• 1.6 m (63 inches)	**S41**
• 2 m (78.7 inches)	**S42**
• 2.5 m (98.4 inches)	**S43**
• 3 m (118.1 inches)	**S44**
• 4 m (157.5 inches)	**S45**
• 5 m (196.9 inches)	**S46**
• 6 m (236.2 inches)	**S47**
• 7 m (275.6 inches)	**S48**
• 8 m (315 inches)	**S49**
• 9 m (354.3 inches)	**S50**
• 10 m (393.7 inches)	**S51**
PVC protective tube	
• 1 m (38.37 inches)	**S70**
• 1.6 m (63 inches)	**S71**
• 2 m (78.7 inches)	**S72**
• 2.5 m (98.4 inches)	**S73**
• 3 m (118.1 inches)	**S74**
• 4 m (157.5 inches)	**S75**
• 5 m (196.9 inches)	**S76**
• 6 m (236.2 inches)	**S77**
• 7 m (275.6 inches)	**S78**
• 8 m (315 inches)	**S79**
• 9 m (354.3 inches)	**S80**
• 10 m (393.7 inches)	**S81**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**

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Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code.	Order code
Special design	
Welded filling hole	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

Technical specifications

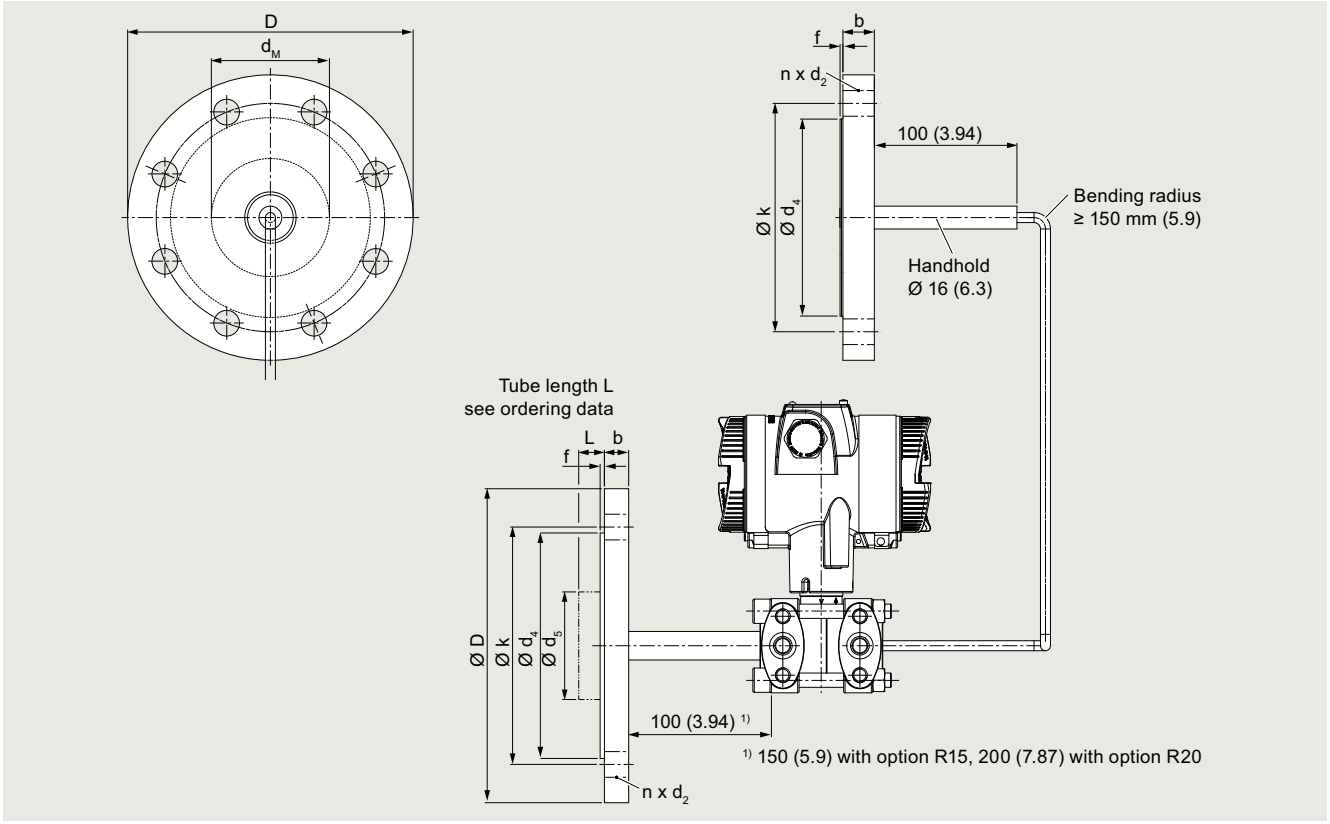
SITRANS P320/P420 diaphragm seals in flange design, mounted directly and with capillary	
Nominal diameter	**Nominal pressure**
Standard of process connection EN 1092-1	
• DN 40	PN 10/16/25/40/63/100/160
• DN 50	PN 10/16/25/40/63/100
• DN 80	PN 10/16/25/40/100
• DN 100	PN 10/16/25/40
• DN 125	PN 16/40
Process connection standard ASME B16.5	
• 1½ inches	Class 150/300/400/600/900/1500
• 2 inches	Class 150/300/400/600/900/1500
• 3 inches	Class 150/300/600/1500
• 4 inches	Class 150/300/400/1500
• 5 inches	Class 150/300/400
Process connection standard J.I.S.	
• DN 50	10K
• DN 80	20K
• DN 100	40K
Sealing surface	
• For stainless steel mat. no. 1.4404/316L	According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	According to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel, mat. no. 1.4404/316L
• Wetted parts	Stainless steel, mat. no. 1.4404/316L • Without coating • PTFE coating • ECTFE coating (for negative pressure on request) • PFA coating Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4610 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, layer thickness approx. 25 µm
• Capillary	Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304
• Sheath	Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L

Technical specifications (continued)

SITRANS P320/P420 diaphragm seals in flange design, mounted directly and with capillary	
Gasket material in the process flanges	
• For gauge pressure transmitters, absolute pressure transmitters and negative pressure applications	Copper
• For other applications	Viton
Permissible pressure load	See above and the technical specifications of the pressure transmitter
Tube length	• Without tube • 50 mm (1.97 inches) • 100 mm (3.94 inches) • 150 mm (5.91 inches) • 200 mm (7.87 inches) Note: If a tube is ordered, only the directly mounted remote seal is equipped with a tube.
Capillary	
• Length	≤ 10 m (32.8 ft), longer lengths on request
• Inside diameter	≤ 1.3 mm (0.051 inch)
• Minimum bending radius	150 mm (5.9 inches)
Filling liquid	• Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O_2) • Food oil (FDA-listed) • Neobee M20 (FDA-listed)
Max. recommended medium temperature	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

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Dimensional drawings



Diaphragm seals of flange design with flexible capillary, rigid mounting, for connection to a SITRANS P320/420 pressure transmitter for differential pressure, dimensions in mm (inch)

Connection according to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 or 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

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Dimensional drawings (continued)

Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
	lb/sq.in.	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)		Inch (mm)
1½"	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2"	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3"	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4"	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5"	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

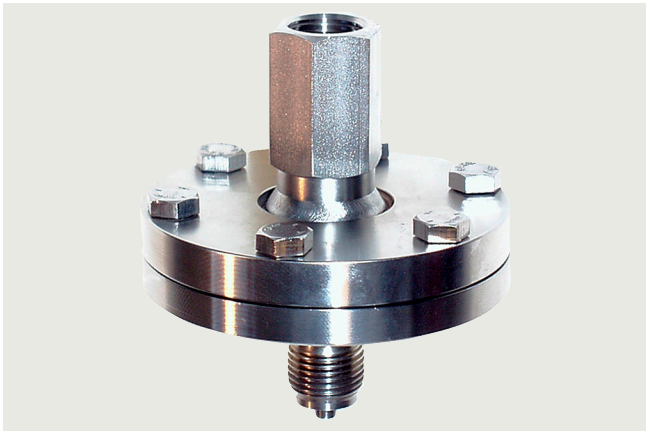
Connection according to J.I.S.

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5
d_M: Effective diaphragm diameter

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Overview



Diaphragm seal, screwed design with inside diaphragm for gauge, absolute and differential pressure for direct mounting



Process connection: open measurement flange

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Selection and ordering data

		Article No.														Order code
Diaphragm seals, screwed **With inside diaphragm, direct mounting or connected via flexible capillary pipe to a transmitter**																
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service) **7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit**		**7MF0840-**														
SITRANS P320/P420 for differential pressure and flow **7MF03../7MF04.. to be ordered separately; scope of delivery: 2 units**		**7MF0842-**														
		●	●	●	●	●	-	0	●	●	0		●	●	●	
Click the article number for online configuration in the PIA Life Cycle Portal.																
Nominal diameter	**Nominal pressure**															
Open flange, process connection standard EN 1092-1																
DN 15	PN 10/16/25/40	**0**	**A**	**D**												
	PN 63/100	**0**	**A**	**F**												
	PN 160	**0**	**A**	**G**												
	PN 250	**0**	**A**	**H**												
DN 20	PN 10/16/25/40	**0**	**A**	**M**												
DN 25	PN 10/16/25/40	**0**	**B**	**D**												
	PN 63/100	**0**	**B**	**F**												
	PN 160	**0**	**B**	**G**												
	PN 250	**0**	**B**	**H**												
Open flange, process connection standard ASME B16.5																
½ inch	Class 150	**1**	**K**	**A**												
	Class 300	**1**	**K**	**B**												
	Class 600	**1**	**K**	**C**												
	Class 1500	**1**	**K**	**D**												
¾ inch	Class 150	**1**	**K**	**F**												
	Class 300	**1**	**K**	**G**												
	Class 600	**1**	**K**	**H**												
	Class 1500	**1**	**K**	**J**												
1 inch	Class 150	**1**	**K**	**L**												
	Class 300	**1**	**K**	**M**												
	Class 600	**1**	**K**	**N**												
	Class 1500	**1**	**K**	**P**												
Process connection: Thread according to EN 837-1																
G¼"B	PN 100	**3**	**S**	**B**												
G¼"B	PN 250	**3**	**S**	**C**												
G½"B	PN 100	**3**	**S**	**F**												
G½"B	PN 250	**3**	**S**	**G**												
G¾"B	PN 100	**3**	**S**	**K**												
G¾"B	PN 250	**3**	**S**	**L**												
G1"B	PN 100	**3**	**S**	**P**												
G1"B	PN 250	**3**	**S**	**Q**												
Process connection: thread according to ASME B1.20.1																
¼" NPTM	Class 1500	**5**	**T**	**A**												
¼" NPTM	Class 3675	**5**	**T**	**B**												
¼" NPTF	Class 1500	**5**	**T**	**C**												
¼" NPTF	Class 3675	**5**	**T**	**D**												
½" NPTM	Class 1500	**5**	**T**	**E**												
½" NPTM	Class 3675	**5**	**T**	**F**												
½" NPTF	Class 1500	**5**	**T**	**G**												
½" NPTF	Class 3675	**5**	**T**	**H**												
¾" NPTM	Class 1500	**5**	**T**	**J**												

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Selection and ordering data (continued)

		Article No.											Order code		
Diaphragm seals, screwed **With inside diaphragm, direct mounting or connected via flexible capillary pipe to a transmitter** **SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service)** **7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit**		**7MF0840-**													
SITRANS P320/P420 for differential pressure and flow **7MF03../7MF04.. to be ordered separately; scope of delivery: 2 units**		**7MF0842-**													
		●	●	●	●	●	-	0	●	●	0		●	●	●
¾" NPTM	Class 3675	5	T	K											
¾" NPTF	Class 1500	5	T	L											
¾" NPTF	Class 3675	5	T	M											
1" NPTM	Class 1500	5	T	N											
1" NPTM	Class 3675	5	T	P											
1" NPTF	Class 1500	5	T	Q											
1" NPTF	Class 3675	5	T	R											
Other version, add order code and plain text		9	A	A									H	1	Y
Transmitter connection															
Without capillary pipe, direct mount, straight connection (for gauge pressure transmitters)					0	0									
Other version, add order code and plain text															
1 m (38.37 inches)					1	0									
1.6 m (63 inches)					1	1									
2 m (78.7 inches)					1	2									
2.5 m (98.4 inches)					1	3									
3 m (118.1 inches)					1	4									
4 m (157.5 inches)					1	5									
5 m (196.9 inches)					1	6									
6 m (236.2 inches)					1	7									
7 m (275.6 inches)					1	8									
8 m (315 inches)					2	0									
9 m (354.3 inches)					2	1									
10 m (393.7 inches)					2	2									
Other version, add order code and plain text					9	8							L	1	Y
Filling liquid															
Silicone oil M50									B						
High-temperature oil									C						
Silicone oil M5									A						
Food oil (FDA-listed)									E						
Neobee M20 (FDA-listed)									R						
Halocarbon oil									D						
Other version, add order code and plain text									Z				P	1	Y
Material of wetted parts															
Stainless steel 316L without coating										A					
Stainless steel 316L with PTFE coating										E					
Monel 400, 2.4360										G					
Hastelloy C276, 2.4819										J					
Tantalum										K					
Stainless steel 316L, gold-plated										S					
Neobee M20 (FDA listed)										R					
Hastelloy C4, 2.4610										U					
Other version, add order code and plain text										Z			Q	1	Y

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Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	**C11**
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	**C13**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Inspection certificate (EN 10204-3.1) - pressure test	**C16**
Certificate on the FDA-listing of the fill oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	**C20**
Accessories	
Representation of the epoxy resin coating Color: Transparent coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. Maximum process medium temperature for epoxy lacquering: 140 °C	**D15**
Flushing port ¼" 18 NPT unsealed	**D70**
Flushing port ¼" 18 NPT sealed with stainless steel plug	**D71**
Gasket material between upper and lower enclosure PTFE (instead of FKM viton)	**D75**
Gasket material between upper and lower enclosure metal C spring lock washer (instead of FKM viton)	**D76**
PTFE coating of lower section (only for G½B PN 100, DN 25 PN 10 ... 40, 1 inch Class 150/300)	**D77**
Country-specific approval	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	**E60**
Negative pressure service	
Negative pressure service (for gauge pressure and absolute pressure transmitters)	**D81**
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure service (for gauge pressure and absolute pressure transmitters) (only 7MF0800)	**D85**
Extended negative pressure service (for differential pressure transmitters)	**D88**
General product approvals without explosion proof approvals	
Oil-free and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-free and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2	**E87**
Capillary connection (Only for 7MF0840)	
Single-side mounted at differential pressure transmitter at high side	**S03**
Single-side mounted at differential pressure transmitter at low side	**S04**
Cooling element	**S08**
Capillary coating	
PE protective tube	
• 1 m (38.37 inches)	**S10**
• 1.6 m (63 inches)	**S11**
• 2 m (78.7 inches)	**S12**
• 2.5 m (98.4 inches)	**S13**
• 3 m (118.1 inches)	**S14**
• 4 m (157.5 inches)	**S15**
• 5 m (196.9 inches)	**S16**
• 6 m (236.2 inches)	**S17**
• 7 m (275.6 inches)	**S18**
• 8 m (315 inches)	**S19**
• 9 m (354.3 inches)	**S20**
• 10 m (393.7 inches)	**S21**
PTFE protective tube	
• 1 m (38.37 inches)	**S40**
• 1.6 m (63 inches)	**S41**
• 2 m (78.7 inches)	**S42**
• 2.5 m (98.4 inches)	**S43**
• 3 m (118.1 inches)	**S44**
• 4 m (157.5 inches)	**S45**
• 5 m (196.9 inches)	**S46**
• 6 m (236.2 inches)	**S47**
• 7 m (275.6 inches)	**S48**
• 8 m (315 inches)	**S49**
• 9 m (354.3 inches)	**S50**
• 10 m (393.7 inches)	**S51**
PVC protective tube	
• 1 m (38.37 inches)	**S70**
• 1.6 m (63 inches)	**S71**
• 2 m (78.7 inches)	**S72**
• 2.5 m (98.4 inches)	**S73**
• 3 m (118.1 inches)	**S74**
• 4 m (157.5 inches)	**S75**
• 5 m (196.9 inches)	**S76**
• 6 m (236.2 inches)	**S77**
• 7 m (275.6 inches)	**S78**
• 8 m (315 inches)	**S79**
• 9 m (354.3 inches)	**S80**
• 10 m (393.7 inches)	**S81**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**
Special design	
Welded filling holes	**X01**
Version for low pressure ranges with a larger diaphragm of 90 mm (3 ½"). Recommended for pressure ranges < 500 mbar (7 psi); maximum operating pressure 100 bar (1500 psi)	**X03**
Fully welded version, maximum operating pressure 40 bar (580 psi)	**X04**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

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Technical specifications

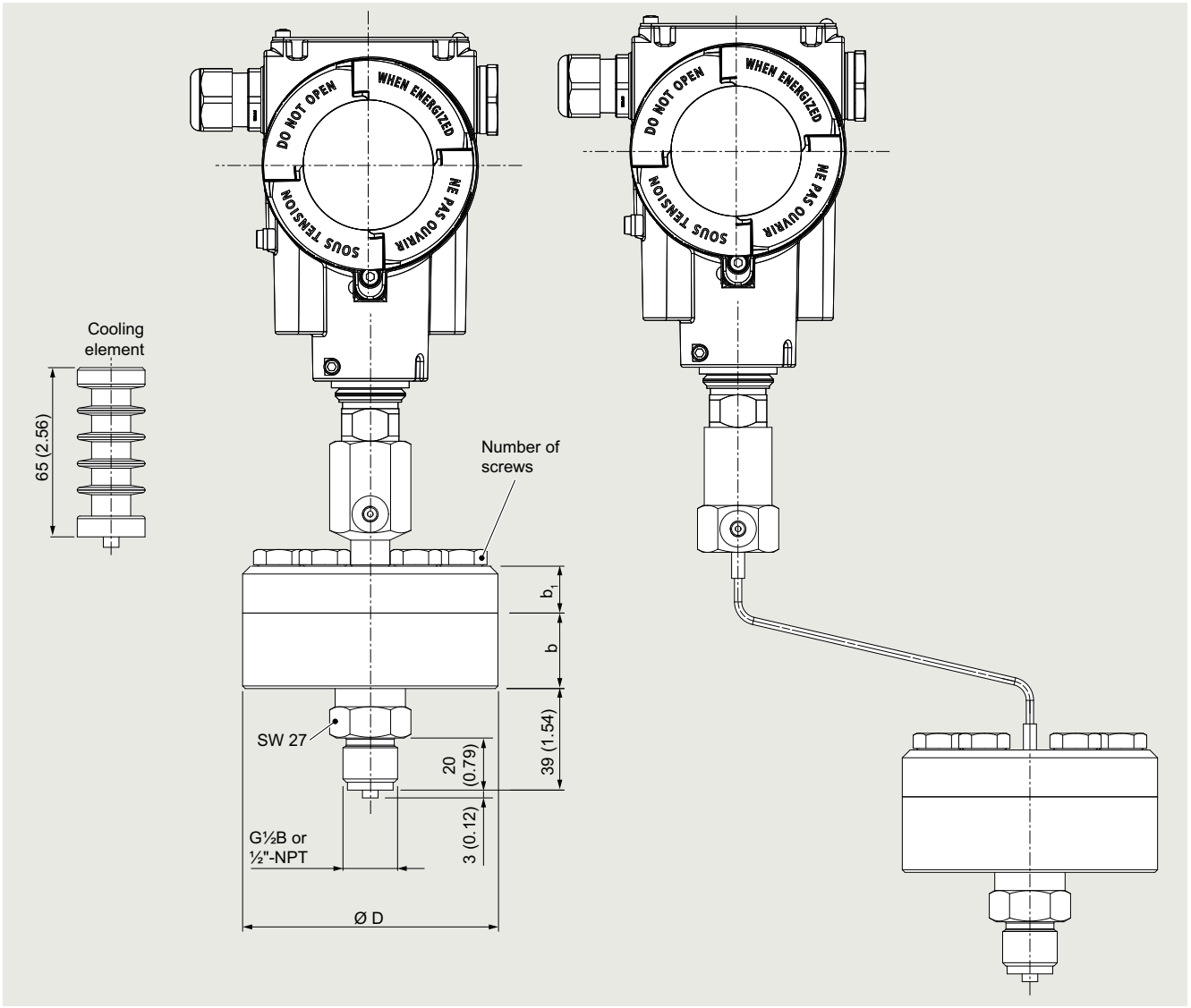
SITRANS P320/P420 diaphragm seals, screwed design	
Process connection	**Nominal pressure**
- Open flange EN 1092-1	
• DN 15	PN 10/16/25/40/63/100/160/250
• DN 20	PN 10/16/25/40
• DN 25	PN 10/16/25/40/63/100/160/250
Open flange ASME B16.5	
• ½ inch, ¾ inch, 1 inch	Class 150/300/600/1500
Thread EN 837-1	
• G¼"B, G½"B, G¾"B, G1"B	PN 100/250
Thread ASME B1.20.1	
• ¼" NPT-M, ¼" NPT-F	Class 1500/3675
• ½" NPT-M, ½" NPT-F	Class 1500/3675
• ¾" NPT-M, ¾" NPT-F	Class 1500/3675
• 1" NPT-M, 1" NPT-F	Class 1500/3675
Sealing surface for open measurement flange	
• For stainless steel mat. no. 1.4404/316L	According to EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA
Materials	
• Lower section (in the case of process connection thread)	Stainless steel, mat. no. 1.4404/316L
• Diaphragm	Stainless steel, mat. no. 1.4404/316L • Without coating • With PTFE coating Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4610 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Stainless steel 316L, gold plated, layer thickness approx. 25 µm
• Top section (process connection in the case of an open measurement flange)	Stainless steel, mat. no. 1.4404/316L
• Capillary	Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304
• Gasket material on the process connection	Viton or copper (in the case of vacuum-free version)
• Gasket material between top and bottom section	Viton (FKM) (standard:) Teflon (PTFE) metal spring ring (silver-coated)
Capillary	
• Length	≤ 10 m (32.8 ft)
• Inside diameter	≤ 1.3 mm (0.051 inch)
• Minimum bending radius	150 mm (5.9 inches)
• Sheath	Flexible spiral coiled tube made of stainless steel, mat. no. 14301/304
Filling liquid (for remote seals of sandwich and flange type)	• Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O_2) • Food oil (FDA-listed) • Neobee M20 (FDA-listed)
Max. recommended medium temperature	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"
Weight	Approx. 1.5 kg (3.3 lbs)

Technical specifications (continued)

SITRANS P320/P420 diaphragm seals, screwed design	
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

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Dimensional drawings

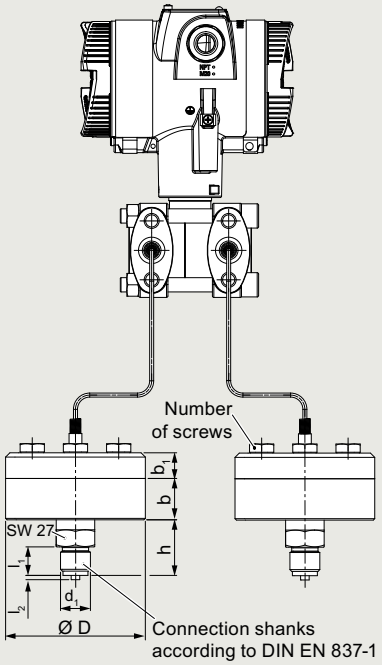


Diaphragm seal, screwed design with interior diaphragm, for gauge and absolute pressure, attached to the transmitter directly and with capillaries, dimensions in mm (inch)

Range	D mm (inch)	b mm (inch)	b_1 mm (inch)	Number of screws
Up to 100 bar	98 (3.86)	14 (0.55)	16 (0.63)	6
Up to 250 bar	98 (3.86)	14 (0.55)	20 (0.79)	12

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Dimensional drawings (continued)

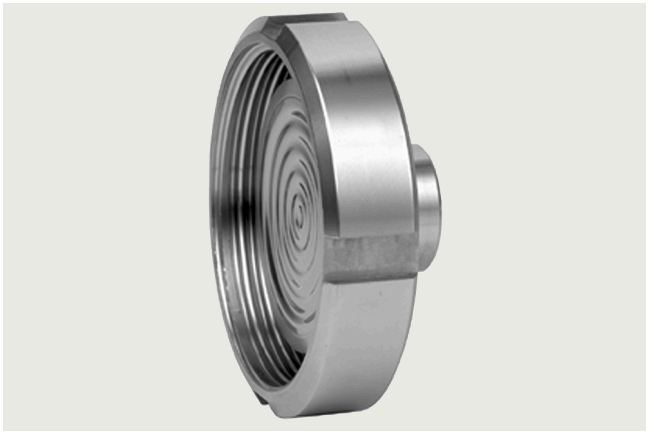


Diaphragm seal, screwed design with interior diaphragm, for differential pressure, attached to the transmitter directly and with capillaries, dimensions in mm (inch)

Nominal diameter	Nominal pressure	D mm (inch)	d4	k	M	Number of holes	b mm (inch)	b1	f
DN 25	PN 10/16/25/40	115 (4.53)	68 (2.68)	85 (3.35)	M12	4	26 (1.02)	12 (0.47)	21 (0.83)
1"	150 lb/sq.in	110 (4.33)	50.8 (2)	79.4 (3.13)	M12	4	32 (1.26)	12 (0.47)	1.6 (0.063)
1"	300 lb/sq.in	125 (4.92)	50.8 (2)	88.9 (3.5)	M16	4	32 (1.26)	12 (0.47)	1.6 (0.063)

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Overview



Quick-release diaphragm seals, acc. to DIN 11851 with slotted union nut



Quick-release diaphragm seals, with clamp connection

Quick-release diaphragm seals can be supplied for the pressure transmitters of the SITRANS P320/420 series.

The quick-release remote seals are common designs in the food industry. Their design means that the medium cannot accumulate in dead volumes. The remote seal's quick release mechanism enables fast disassembly for cleaning.

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Selection and ordering data

		Article No.												Order code		
Diaphragm seal with quick-release Flange type design, with flexible capillary pipe or direct mounting on pressure transmitter																
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service) 7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit		**7MF0830-**														
SITRANS P320/P420 for absolute pressure from differential pressure 7MF03../7MF04.. order separately, scope of delivery: 2 units		**7MF0832-**														
		●	●	●	●	●	-	0	●	A	0			●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.																
Nominal diameter	Nominal pressure															
Process connection standard DIN 11851 with groove nut																
DN 25	PN 40	**0**	**B**	**M**												
DN 32	PN 40	**0**	**C**	**D**												
DN 40	PN 40	**0**	**D**	**M**												
DN 50	PN 25	**0**	**E**	**K**												
DN 65	PN 25	**0**	**F**	**L**												
DN 80	PN 25	**0**	**G**	**K**												
Process connection standard DIN 11851 with thread																
DN 25	PN 40	**1**	**B**	**M**												
DN 32	PN 40	**1**	**C**	**D**												
DN 40	PN 40	**1**	**D**	**M**												
DN 50	PN 25	**1**	**E**	**K**												
DN 65	PN 25	**1**	**F**	**L**												
DN 80	PN 25	**1**	**G**	**K**												
Process connection standard clamp ISO 2852																
DN 25	PN 16	**2**	**B**	**K**												
DN 38	PN 16	**2**	**C**	**Q**												
DN 51	PN 16	**2**	**F**	**H**												
DN 63.5	PN 10	**2**	**F**	**J**												
DN 76.1	PN 10	**2**	**G**	**J**												
Process connection standard clamp DIN 32676, schedule C																
DN 1 inch	PN 25	**3**	**K**	**V**												
DN 1½ inch	PN 25	**3**	**L**	**V**												
DN 2 inch	PN 16	**3**	**M**	**V**												
DN 2½ inch	PN 16	**3**	**N**	**V**												
DN 3 inch	PN 10	**3**	**P**	**V**												
Process connection standard clamp DIN 32676, schedule A metric																
DN 25	PN 25	**4**	**B**	**L**												
DN 32	PN 25	**4**	**C**	**C**												
DN 40	PN 25	**4**	**D**	**L**												
DN 50	PN 16	**4**	**E**	**J**												
DN 65	PN 10	**4**	**F**	**K**												
Varivent																
DN 25/32	PN 25	**5**	**C**	**L**												
DN 40/50	PN 25	**5**	**D**	**K**												
DRD flange																
DN 50	PN 40	**6**	**E**	**M**												
Other version, add order code and plain text		**9**	**A**	**A**										**H**	**1**	**Y**
Transmitter connection																
Without capillary pipe, direct mount, straight connection (for gauge pressure transmitters)					**0**	**0**										
Connection via capillary Capillary length:																
1 m (38.37 inches)					**1**	**0**										
1.6 m (63 inches)					**1**	**1**										
2 m (78.7 inches)					**1**	**2**										

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Selection and ordering data (continued)

	Article No.	Order code
Diaphragm seal with quick-release Flange type design, with flexible capillary pipe or direct mounting on pressure transmitter		
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only in conjunction with underpressure service) 7MF03../7MF04../7MF802. to be ordered separately; scope of delivery: 1 unit	**7MF0830-**	
SITRANS P320/P420 for absolute pressure from differential pressure 7MF03../7MF04.. order separately, scope of delivery: 2 units	**7MF0832-**	
	● ● ● ● ● - 0 ● A 0	● ● ●
2.5 m (98.4 inches)	1 3	
3 m (118.1 inches)	1 4	
4 m (157.5 inches)	1 5	
5 m (196.9 inches)	1 6	
6 m (236.2 inches)	1 7	
7 m (275.6 inches)	1 8	
8 m (315 inches)	2 0	
9 m (354.3 inches)	2 1	
10 m (393.7 inches)	2 2	
Other version, add order code and plain text	9 8	L 1 Y
Filling liquid		
Food oil (FDA-listed)	E	
Neobee M20 (FDA listed)	R	
Other version, add order code and plain text	Z	P 1 Y

Options Add "-Z" to article number and specify order code.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	**C11**
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	**C12**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Inspection certificate (EN 10204-3.1) - pressure test	**C16**
Certificate on the FDA listing of the fill oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	**C20**
Accessories	
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	**D42**
Negative pressure service	
Negative pressure service	
• For gauge pressure and absolute pressure transmitters	**D81**
• For differential pressure transmitters	**D83**
Extended negative pressure service	
• For gauge pressure and absolute pressure transmitters	**D85**
• For differential pressure transmitters	**D88**
Country-specific approval	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	**E60**
Capillary connection (Only for 7MF0830)	
Single-side mounted at differential pressure transmitter at high side	**S03**
Single-side mounted at differential pressure transmitter at low side	**S04**
Cooling element	**S08**

Options Add "-Z" to article number and specify order code.	Order code
Capillary coating	
PE protective tube	
• 1 m (38.37 inches)	**S10**
• 1.6 m (63 inches)	**S11**
• 2 m (78.7 inches)	**S12**
• 2.5 m (98.4 inches)	**S13**
• 3 m (118.1 inches)	**S14**
• 4 m (157.5 inches)	**S15**
• 5 m (196.9 inches)	**S16**
• 6 m (236.2 inches)	**S17**
• 7 m (275.6 inches)	**S18**
• 8 m (315 inches)	**S19**
• 9 m (354.3 inches)	**S20**
• 10 m (393.7 inches)	**S21**
PTFE protective tube	
• 1 m (38.37 inches)	**S40**
• 1.6 m (63 inches)	**S41**
• 2 m (78.7 inches)	**S42**
• 2.5 m (98.4 inches)	**S43**
• 3 m (118.1 inches)	**S44**
• 4 m (157.5 inches)	**S45**
• 5 m (196.9 inches)	**S46**
• 6 m (236.2 inches)	**S47**
• 7 m (275.6 inches)	**S48**
• 8 m (315 inches)	**S49**
• 9 m (354.3 inches)	**S50**
• 10 m (393.7 inches)	**S51**
PVC protective tube	

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Selection and ordering data (continued)

Options **Add "-Z" to article number and specify order code.**	**Order code**
• 1 m (38.37 inches)	**S70**
• 1.6 m (63 inches)	**S71**
• 2 m (78.7 inches)	**S72**
• 2.5 m (98.4 inches)	**S73**
• 3 m (118.1 inches)	**S74**
• 4 m (157.5 inches)	**S75**
• 5 m (196.9 inches)	**S76**
• 6 m (236.2 inches)	**S77**
• 7 m (275.6 inches)	**S78**
• 8 m (315 inches)	**S79**
• 9 m (354.3 inches)	**S80**
• 10 m (393.7 inches)	**S81**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**
Special design	
Welded filling holes	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

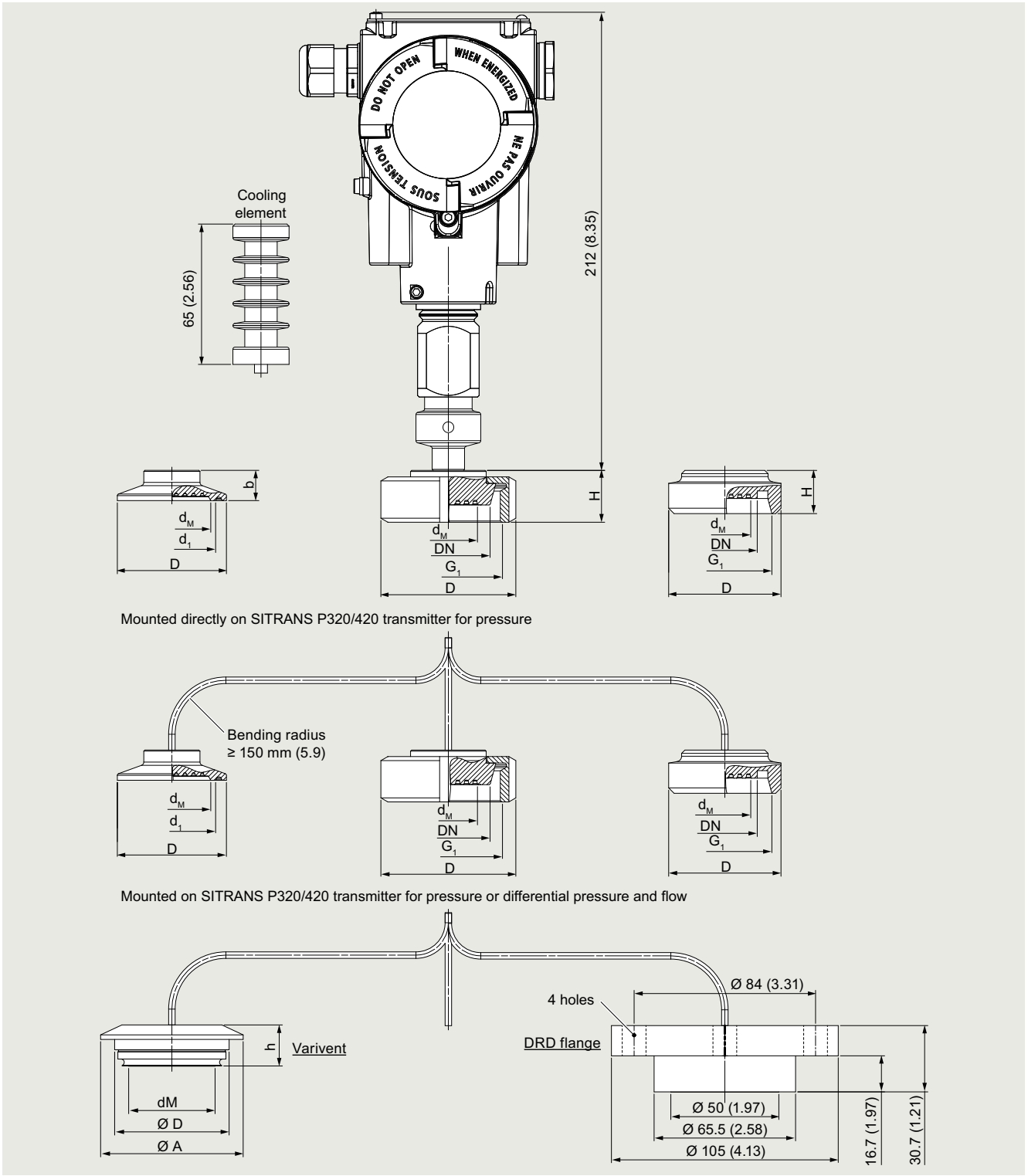
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Technical specifications

SITRANS P320/P420 quick-release diaphragm seals	
Connection, nominal diameter	**Nominal pressure**
Process connection standard DIN 11851 with groove nut	
• DN 25/32/40	PN 40
• DN 50/65/80	PN 25
Process connection standard DIN 11851 with thread	
• DN 25/32/40	PN 40
• DN 50/65/80	PN 25
Standard of process connection clamp ISO 2852	
• DN 25/38/51	PN 16
• DN 63.5/76.1	PN 10
Standard of process connection clamp DIN 32676, schedule C Tri-Clamp	
• 1 inch, 1½ inches	PN 25
• 2 inches, 2½ inch	PN 16
• 3 inches	PN 10
Standard of process connection clamp DIN 32676, schedule A metric	
• DN 25/32/40	PN 25
• DN 50	PN 16
• DN 65	PN 10
Varivent	
• DN 25/32/40/50	PN 25
DRD flange	
• DN 50	PN 40
Materials	
• Main body	Stainless steel, mat. no. 1.4404/316L
• Wetted parts	Stainless steel, mat. no. 1.4404/316L
• Capillary	Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304
• Sheath	Spiral coiled tube made of stainless steel, mat. no. 1.4404/316L
Permissible pressure load	See above and the technical specifications of the pressure transmitter
Tube length	Without tube
Capillary	
• Length	≤ 10 m (32.8 ft), longer lengths on request
• Inside diameter	≤ 1.3 mm (0.051 inch)
• Minimum bending radius	150 mm (5.9 inches)
• Sheath	Flexible spiral coiled tube made of stainless steel mat. no. 1.4404/316L
Filling liquid	• Food oil (FDA-listed) • Neobee M20 (FDA-listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
EHEDG	Complies with EHEDG recommendations

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Dimensional drawings



Quick-release diaphragm seals

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Dimensional drawings (continued)

Connection according to DIN 11851 with groove nut

Nominal diameter	Ø d_M mm	Ø D mm	H mm	G_1 mm
DN 25	25	63	36	Radius 52x1/6
DN 32	32	70	36	Radius 52x1/6
DN 40	40	78	36	Radius 65x1/6
DN 50	52	112	36	Radius 78x1/6
DN 65	65	112	36	Radius 95x1/6
DN 80	72	127	36	Radius 110x1/6

d_M effective diaphragm diameter

Connection according to DIN 11851 with thread

Nominal diameter	Ø d_M mm	H mm	G_1 mm
DN 25	25	36	Radius 52x1/6
DN 32	32	36	Radius 52x1/6
DN 40	40	36	Radius 65x1/6
DN 50	52	36	Radius 78x1/6
DN 65	65	36	Radius 95x1/6
DN 80	72	36	Radius 110x1/6

d_M effective diaphragm diameter

Clamp connection according to ISO 2852 for pipes according to ISO 2037

Nominal diameter	Nominal pressure	d_M mm	d_1 mm	b mm	D mm
DN 25	PN 16	22.6	43.5	14	50.5
DN 38	PN 16	34	43.5	12	50.5
DN 51	PN 16	46	56.5	14	64
DN 63.5	PN 10	51	70.5	14	77.5
DN 76.1	PN 10	65	83.5	14	91

d_M effective diaphragm diameter

Clamp connection according to DIN 32676 row C for pipes according to ASME BPE

Nominal diameter	Nominal pressure	d_M mm (inch)	d_1 mm (inch)	b mm (inch)	D mm (inch)
1"	PN 25	22.6 (0.89)	43.5 (1.71)	14 (0.55)	50.5 (1.99)
1½"	PN 25	34 (1.34)	43.5 (1.71)	12 (0.47)	50.5 (1.99)
2"	PN 16	46 (1.81)	56.5 (2.22)	14 (0.55)	64 (2.52)
2½"	PN 16	51 (2.01)	70.5 (2.78)	14 (0.55)	77.5 (3.05)
3"	PN 16	65 (2.56)	83.5 (3.29)	14 (0.55)	91 (3.58)

d_M effective diaphragm diameter

Clamp connection according to DIN 32676 row A (metric) for pipes according to EN 10357 (DIN 11850)

Nominal diameter	Nominal pressure	Ø d_M mm	d_1 mm	b mm	D mm
DN 25	PN 25	22.6	43.5	14	50.5
DN 32	PN 25	27	43.5	12	50.5
DN 40	PN 25	34	43.5	12	50.5
DN 50	PN 16	46	56.5	14	64
DN 65	PN 16	65	83.5	14	91

d_M effective diaphragm diameter

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Dimensional drawings (continued)

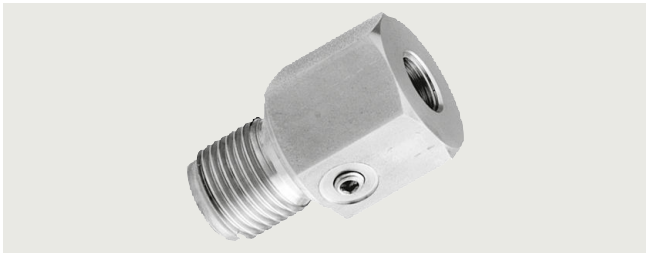
Varivent

Nominal diameter	d_M mm (inch)	A mm (inch)	D mm (inch)	h mm (inch)
DN 25, DN 32, 1", 1¼"	40 (1.57)	66 (2.6)	50 (1.97)	19 (0.75)
DN 40 ... 125, 1 ½" ... 6"	58 (2.28)	84 (3.3)	68 (2.68)	19 (0.75)

d_M effective diaphragm diameter

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Overview



The miniature diaphragm seals are available for the pressure transmitters of the SITRANS P320/420 series.

For high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

Design

The miniature diaphragm seals consist of a flush-mounted diaphragm, a fixed threaded pin and are free of dead space.

Selection and ordering data

Miniature diaphragm seal Installed directly on pressure transmitter SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0850-											Order code		
		●	●	●	0	0	-	0	●	●	0		●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.															
Process connection															
Process connection standard DIN 3852-2 form A															
G 1"	PN 400	4	S	V											
G 1½"	PN 250	4	S	W											
G 2"	PN 250	4	S	X											
Process connection standard ASME B1.20.1															
1" NPTM	PN 250	5	T	U											
1½" NPT-M	PN 100	5	T	V											
2" NPTM	PN 100	5	T	W											
Other version, add order code and plain text		9	A	A									H	1	Y
Filling liquid															
Silicone oil M5									A						
Food oil (FDA-listed)									E						
Neobee M20 (FDA listed)									R						
Other version, add order code and plain text									Z				P	1	Y
Material of wetted parts															
Stainless steel 316L without coating										A					
Hastelloy C276, 2.4819										J					

Options Add "-Z" to article number and specify order code.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	C11
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	C12
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	C13
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	C15
Inspection certificate (EN 10204-3.1) - pressure test	C16

Options Add "-Z" to article number and specify order code.	Order code
Certificate on the FDA listing of the fill oil according to EN 10204-2.2	C17
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	C20
Accessories	
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	D42
Negative pressure service	
Negative pressure service for gauge pressure and absolute pressure transmitters	D81

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Selection and ordering data (continued)

Options **Add "-Z" to article number and specify order code.**	**Order code**
Extended negative pressure service for gauge pressure and absolute pressure transmitters	**D85**
Country-specific approval	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	**E60**
Capillary connection	
Cooling element between transmitter and remote seal	**S08**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**

Options **Add "-Z" to article number and specify order code.**	**Order code**
Special design	
Welded filling hole	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

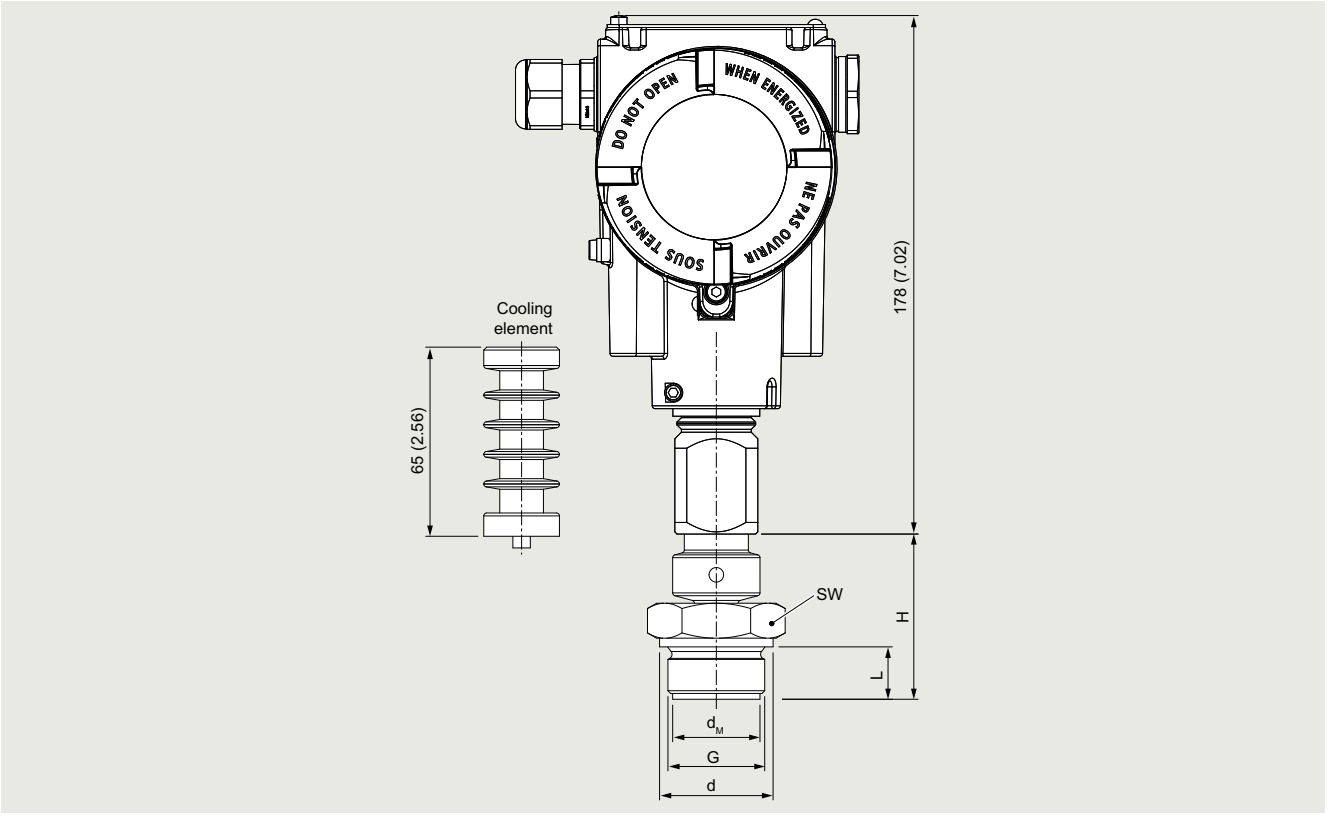
[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

Technical specifications

SITRANS P320/P420 miniature diaphragm seals	
Measuring span when	
• G1B and 1" NPT	> 6 bar (> 87 psi)
• G1½B and 1½" NPT	> 2 bar (> 29 psi)
• G2B and 2" NPT	> 600 mbar (> 8.7 psi)
Filling liquid	• Silicone oil M5 • Food oil (FDA-listed) • Neobee M20 (FDA-listed)
Material	
• Main body	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
• Diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
Maximum pressure	100% of the nominal pressure of the pressure transmitter, but a maximum of PN 400 (5802 psi) (depending on the seal used)
Temperature of use	As for pressure transmitter
Medium temperature range	As for pressure transmitter
Max. recommended medium temperature	150 °C (302 °F)
Weight	
• G1B and 1" NPT	Approx. 0.3 kg (approx. 0.66 lb)
• G1½B and 1½" NPT	Approx. 0.5 kg (approx. 1.10 lb)
• G2B and 2" NPT	Approx. 0.8 kg (approx. 1.76 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

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Dimensional drawings



Diaphragm seal, miniature type, dimensions in mm (inch)

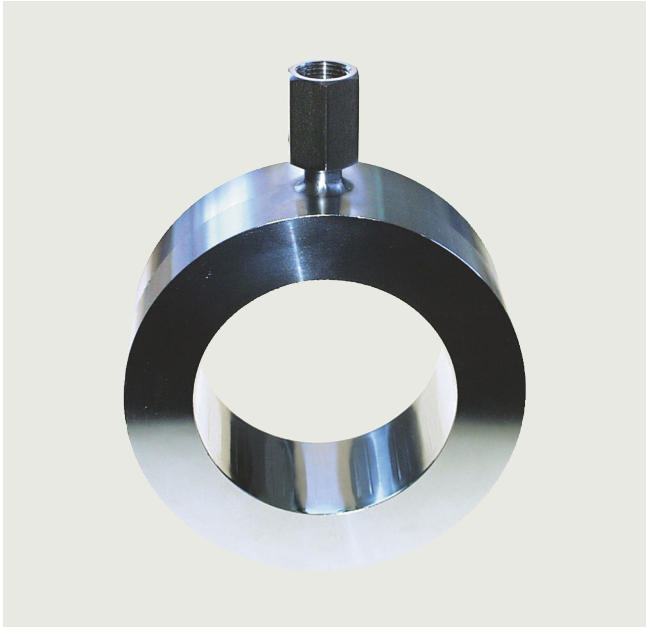
G	Ø d_M mm (inch)	Width across flats mm (inch)	Ø d mm (inch)	L mm (inch)	H mm (inch)
G1B	25 (0.98)	41 (1.61)	39 (1.53)	28 (1.1)	56 (2.21)
G1½B	40 (1.57)	55 (2.17)	60 (2.36)	30 (1.18)	50 (1.97)
G2B	50 (1.97)	60 (2.36)	70 (2.76)	30 (1.18)	63 (2.48)

G	Ø d_M mm (inch)	Width across flats mm (inch)	L mm (inch)	H mm (inch)
1" NPT	27 (1.06)	41 (1.61)	25 (0.98)	40 (1.57)
1½" NPT	34 (1.34)	55 (2.17)	26 (1.02)	45 (1.77)
2" NPT	46 (1.81)	60 (2.56)	26 (1.02)	45 (1.77)

d_M: Effective diaphragm diameter

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Overview



Inline seals for flange-mounting

The inline seal is fully integrated into the process control. It is especially suitable for flowing and high-viscosity media.

The inline seal consists of a cylindrical jacket into which a thin-walled tube is welded. It is clamped directly between two flanges in the pipeline.

Design

- Inline seals for flange-mounting (flange design) according to EN/ASME for SITRANS P320/420 pressure transmitters
  - For gauge and absolute pressure (only in connection with negative pressure service)
  - For differential pressure and flow
- Sealing surface according to EN 1092-1 or ASME B16.5
- Connection to the pressure transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical specifications for details of materials used for the wetted parts
- Material used for the capillary, the protective jacket, the remote seal's main body and the measuring cell: Stainless steel, mat. no. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA-listed) vegetable oil or glycerin/water (not suitable for applications in negative pressure range).

Function

The measured pressure is transferred to the filling liquid by the diaphragm and enters the sample chamber of the pressure transmitter either directly or through the capillary. The filling fluid completely fills the inside of the diaphragm seal, the capillary and the sample chamber of the pressure transmitter so that it is free of gas.

Note:

A vacuum-resistant remote seal is recommended for low-pressure operation, including during commissioning (see ordering data).

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Selection and ordering data

Inline seals in sandwich design, direct mounting or with a flexible capillary connected with pressure transmitter SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit SITRANS P320/P420 for differential pressure and flow 7FM03../7MF04.. to be ordered separately, scope of delivery: 2 units		Article No. 7MF0900- 7MF0902-											Order code		
		●	●	●	●	●	-	0	●	●	0		●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.															
Nominal diameter	Nominal pressure														
Process connection standard EN 1092-1															
DN 25	PN 6 ... 100	0	B	P											
DN 40	PN 6 ... 100	0	D	P											
DN 50	PN 6 ... 100	0	E	P											
DN 65	PN 6 ... 100	0	F	P											
DN 80	PN 6 ... 100	0	G	P											
DN 100	PN 6 ... 100	0	H	P											
DN 125	PN 6 ... 100	0	J	P											
Process connection standard ASME B16.5															
1 inch	Class 150 ... 2500	1	K	X											
1½ inches	Class 150 ... 2500	1	L	X											
2 inches	Class 150 ... 2500	1	M	X											
2½ inches	Class 150 ... 2500	1	N	X											
3 inches	Class 150 ... 2500	1	P	X											
4 inches	Class 150 ... 2500	1	Q	X											
5 inches	Class 150 ... 2500	1	R	X											
Different version, add order code and plain text.		9	A	A									H	1	Y
Transmitter connection															
Without capillary pipe, direct mount, straight connection (for gauge pressure transmitters)					0	0									
Without capillary pipe, direct mount, connection with 90° elbow (for gauge pressure transmitters)					0	1									
Connection via capillary Capillary length:															
1 m (38.37 inches)					1	0									
1.6 m (63 inches)					1	1									
2 m (78.7 inches)					1	2									
2.5 m (98.4 inches)					1	3									
3 m (118.1 inches)					1	4									
4 m (157.5 inches)					1	5									
5 m (196.9 inches)					1	6									
6 m (236.2 inches)					1	7									
7 m (275.6 inches)					1	8									
8 m (315 inches)					2	0									
9 m (354.3 inches)					2	1									
10 m (393.7 inches)					2	2									
11 m (433.1 inches); only for 7MF0902					2	3									
12 m (472.4 inches); only for 7MF0902					2	4									
13 m (511.811 inches); only for 7MF0902					2	5									
14 m (551.2 inches); only for 7MF0902					2	6									
15 m (590.6 inches); only for 7MF0902					2	7									
Other version, add order code and plain text					9	8							L	1	Y
Filling liquid															
Silicone oil M50									B						
High-temperature oil									C						
Silicone oil M5									A						

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Selection and ordering data (continued)

	Article No.	Order code
Inline seals in sandwich design, direct mounting or with a flexible capillary connected with pressure transmitter		
SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit	**7MF0900-**	
SITRANS P320/P420 for differential pressure and flow 7FM03../7MF04.. to be ordered separately, scope of delivery: 2 units	**7MF0902-**	
	● ● ● ● ● - 0 ● ● 0	● ● ●
Food oil (FDA-listed)	E	
Halocarbon oil	D	
Neobee M20 (FDA listed)	R	
Other version, add order code and plain text	Z	P 1 Y
Material of wetted parts		
Stainless steel 316L	A	
Other version, add order code and plain text	Z	Q 1 Y

Options Add "-Z" to article number and specify order code.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	**C11**
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	**C13**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Inspection certificate (EN 10204-3.1) - pressure test	**C16**
Certificate on the FDA-listing of the fill oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	**C20**
Accessories	
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	**D42**
Volume deflagration flame arrester (VDFA)	
• For gauge pressure and absolute pressure transmitters	**D61**
• For differential pressure and level transmitters	**D62**
Negative pressure service	
Negative pressure service	
• For gauge pressure and absolute pressure transmitters	**D81**
• For differential pressure transmitters	**D83**
Extended negative pressure service	
• For gauge pressure and absolute pressure transmitters	**D85**
• For differential pressure transmitters	**D88**
Country-specific approval	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	**E60**
General product approvals without explosion proof approvals	
Oil-free and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-free and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN 1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	**M50**
Sealing surface groove according to EN 1092-1, form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	**M54**

Options Add "-Z" to article number and specify order code.	Order code
Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	**M64**
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface female face according to EN 1092-1, form F (only for wetted parts made of stainless steel 316L)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection	
For 7MF0900	
• Single-side mounted at differential pressure transmitter at high side	**S03**
• Single-side mounted at differential pressure transmitter at low side	**S04**
• Cooling element	**S08**
Capillary coating	
PE protective tube	
• 1 m (38.37 inches)	**S10**
• 1.6 m (63 inches)	**S11**
• 2 m (78.7 inches)	**S12**
• 2.5 m (98.4 inches)	**S13**

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Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code.	Order code
• 3 m (118.1 inches)	**S14**
• 4 m (157.5 inches)	**S15**
• 5 m (196.9 inches)	**S16**
• 6 m (236.2 inches)	**S17**
• 7 m (275.6 inches)	**S18**
• 8 m (315 inches)	**S19**
• 9 m (354.3 inches)	**S20**
• 10 m (393.7 inches)	**S21**
• 11 m (433.1 inches); only for 7MF0902	**S22**
• 12 m (472.4 inches); only for 7MF0902	**S23**
• 13 m (511.811 inches); only for 7MF0902	**S24**
• 14 m (551.2 inches); only for 7MF0902	**S25**
• 15 m (590.6 inches); only for 7MF0902	**S26**
PTFE protective tube	
• 1 m (38.37 inches)	**S40**
• 1.6 m (63 inches)	**S41**
• 2 m (78.7 inches)	**S42**
• 2.5 m (98.4 inches)	**S43**
• 3 m (118.1 inches)	**S44**
• 4 m (157.5 inches)	**S45**
• 5 m (196.9 inches)	**S46**
• 6 m (236.2 inches)	**S47**
• 7 m (275.6 inches)	**S48**
• 8 m (315 inches)	**S49**
• 9 m (354.3 inches)	**S50**
• 10 m (393.7 inches)	**S51**
• 11 m (433.1 inches); only for 7MF0902	**S52**
• 12 m (472.4 inches); only for 7MF0902	**S53**
• 13 m (511.811 inches); only for 7MF0902	**S54**
• 14 m (551.2 inches); only for 7MF0902	**S55**
• 15 m (590.6 inches); only for 7MF0902	**S56**
PVC protective tube	
• 1 m (38.37 inches)	**S70**
• 1.6 m (63 inches)	**S71**
• 2 m (78.7 inches)	**S72**
• 2.5 m (98.4 inches)	**S73**
• 3 m (118.1 inches)	**S74**

Options Add "-Z" to article number and specify order code.	Order code
• 4 m (157.5 inches)	**S75**
• 5 m (196.9 inches)	**S76**
• 6 m (236.2 inches)	**S77**
• 7 m (275.6 inches)	**S78**
• 8 m (315 inches)	**S79**
• 9 m (354.3 inches)	**S80**
• 10 m (393.7 inches)	**S81**
• 11 m (433.1 inches); only for 7MF0902	**S82**
• 12 m (472.4 inches); only for 7MF0902	**S83**
• 13 m (511.811 inches); only for 7MF0902	**S84**
• 14 m (551.2 inches); only for 7MF0902	**S85**
• 15 m (590.6 inches); only for 7MF0902	**S86**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**
Special design	
Welded filling holes	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• +10 ... +50 °C (+50 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

[1] See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

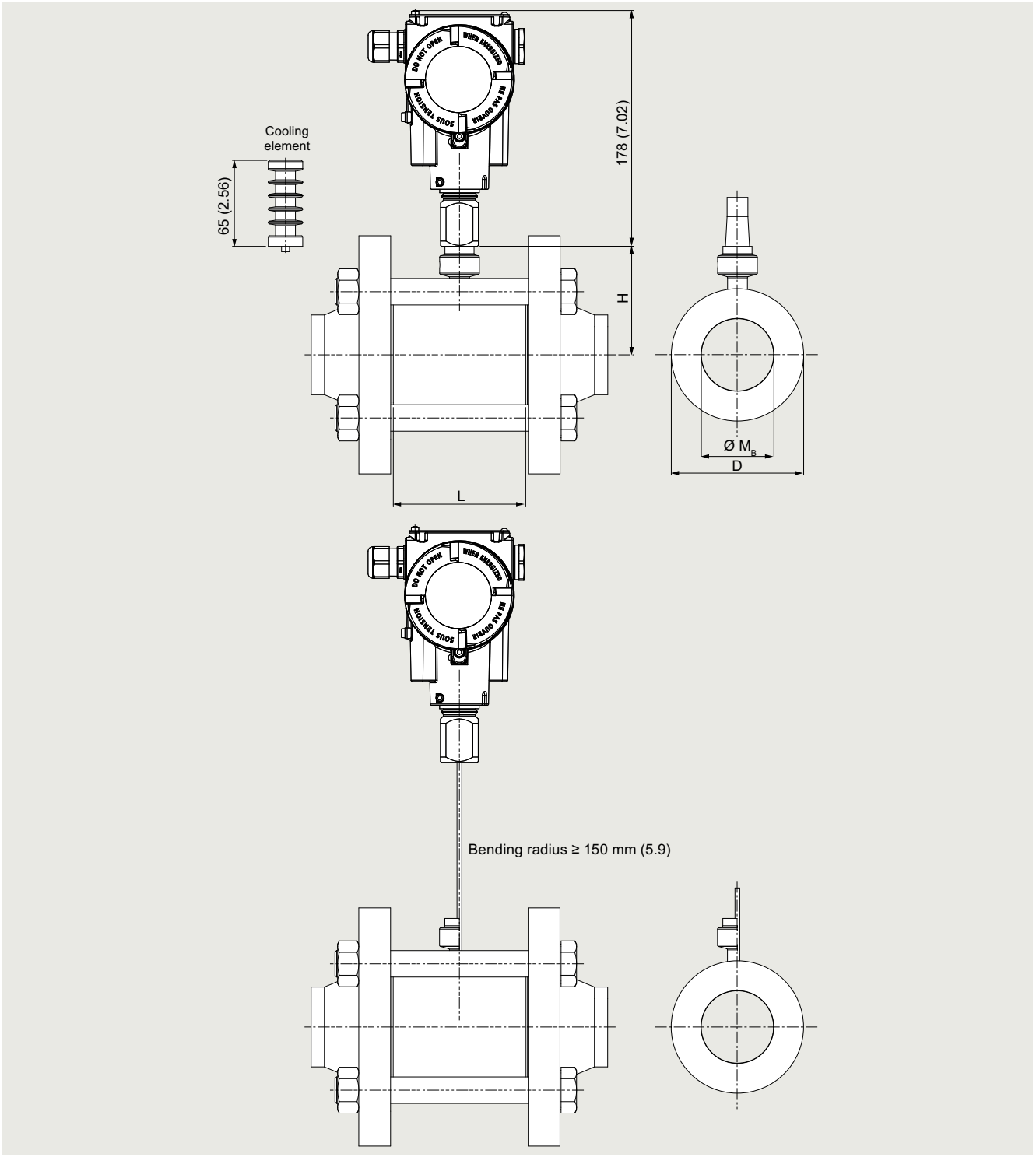
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Technical specifications

SITRANS P320/P420 inline seals in sandwich design	
Nominal diameter	Nominal pressure
Standard of process connection EN 1092-1	
• DN 25/40/50/65/80/100/125	PN 6 ... PN 100
Standard of process connection ASME B16.5	
• 1, 1½, 2, 2½, 3, 4, 5 inch	Class 150 ... Class 2500
Process connection	Flange according to EN 1092-1 or ASME B 16.5
Sealing surface	• For stainless steel mat. no. 1.4404/316L according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA • For the other materials according to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel, mat. no. 1.4404/316L
• Diaphragm	Stainless steel, mat. no. 1.4404/316L
• Wetted parts	Stainless steel, mat. no. 1.4404/316L
• Capillary	Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304
• Sheath	Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L
Capillary	
• Length	≤ 10 m (32.8 ft)
• Inside diameter	≤ 1.3 mm (0.051 inch)
• Minimum bending radius	150 mm (5.9 inches)
Filling liquid	• Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil • Food oil (FDA-listed) • Neobee M20 (FDA-listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of Article 4, Paragraph 1 (annex 1); assigned to category III, conformity evaluation module H by the TÜV Nord

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Dimensional drawings



Inline seal for flange-mounting, installed on SITRANS P320/420 pressure transmitter, dimensions in mm (inch)

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Dimensional drawings (continued)

Connection according to EN 1092-1

Nominal diameter	PN bar	D mm	Mb mm	L mm	H mm
DN 25	6 ... 100	68	28.5	60	81
DN 40		88	43.1	60	91
DN 50		100	54.5	60	93
DN 65		120	70.3	60	107
DN 80		138	82.5	60	116
DN 100		160	107.1	60	127
DN 125		188	127	60	141

Connection according to ASME B16.5

Nominal diameter	Class	D mm (inch)	Mb mm (inch)	L mm (inch)	H mm (inch)
1"	150 ... 2500	50 (1.97)	28.5 (1.12)	60 (2.36)	72 (2.83)
1½"		73.5 (2.89)	43.1 (1.70)	60 (2.36)	84 (3.31)
2"		91.9 (3.62)	54.5 (2.15)	60 (2.36)	93 (3.66)
2½"		104.6 (4.12)	70.3 (2.77)	60 (2.36)	99 (3.9)
3"		127 (5)	82.5 (3.25)	60 (2.36)	110 (4.33)
4"		157.2 (6.19)	107.1 (4.22)	60 (2.36)	125 (4.92)
5"		188 (7.4)	127 (5)	60 (2.36)	141 (5.55)

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Overview



Quick-release inline seal, according to DIN 11851 with screwed connector



Quick-release inline seal, with clamp connection

Quick-release inline seals are available for pressure transmitters of the SITRANS P320/420 series.

Application

The quick-release inline seal is a special design for flowing and high-viscosity media. Because it is completely integrated in the process line, there are no turbulences, dead spaces or other obstacles in the flow direction. The medium flows almost unhindered through the inline seal and causes self-cleaning of the sample chamber. The inline seal is also piggable.

Design

The quick-release lock is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The inline seal is connected to the pressure transmitter either directly or via a capillary tube.

Function

The measured pressure is transferred to the filling liquid by the measuring diaphragm located around the circumference inside the inline seal and enters the sample chamber of the pressure transmitter through the capillary. The filling fluid completely fills the inside of the inline seal, the capillary and the sample chamber of the pressure transmitter so that it is free of gas.

Note:

A vacuum-resistant remote seal is recommended for low-pressure operation, including during commissioning (see ordering data).

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Selection and ordering data

Inline seal with quick-release Flange type design, with flexible capillary pipe or direct mounting on pressure transmitter SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit		Article No. 7MF0930- ● ● ● ● ● - 0 ● A 0											Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.													
Nominal diameter	**Nominal pressure**												
Process connection standard DIN 11851 with thread													
DN 25	PN 40	1	B	M									
DN 32	PN 40	1	C	D									
DN 40	PN 40	1	D	M									
DN 50	PN 25	1	E	K									
DN 65	PN 25	1	F	L									
DN 80	PN 25	1	G	K									
Process connection standard Clamp ISO 2852													
DN 25	PN 16	2	B	K									
DN 38	PN 16	2	C	Q									
DN 51	PN 16	2	F	H									
DN 63.5	PN 10	2	F	J									
DN 76.1	PN 10	2	G	J									
Process connection standard Clamp DIN 32676, schedule C													
DN 1 inch	PN 25	3	K	V									
DN 1½ inch	PN 25	3	L	V									
DN 2 inch	PN 16	3	M	V									
DN 2½ inch	PN 16	3	N	V									
DN 3 inch	PN 10	3	P	V									
Process connection standard Clamp DIN 32676, schedule A metric													
DN 25	PN 25	4	B	L									
DN 32	PN 25	4	C	C									
DN 40	PN 25	4	D	L									
DN 50	PN 16	4	E	J									
DN 65	PN 10	4	F	K									
Other version Add order code and plain text.		9	A	A									H 1 Y
Transmitter connection													
Without capillary pipe, direct mount, straight connection (for gauge pressure transmitters)					0	0							
Connection via capillary Capillary length:													
1 m (38.37 inches)					1	0							
1.6 m (63 inches)					1	1							
2 m (78.7 inches)					1	2							
2.5 m (98.4 inches)					1	3							
3 m (118.1 inches)					1	4							
4 m (157.5 inches)					1	5							
5 m (196.9 inches)					1	6							
6 m (236.2 inches)					1	7							
7 m (275.6 inches)					1	8							
8 m (315 inches)					2	0							
9 m (354.3 inches)					2	1							
10 m (393.7 inches)					2	2							
Other version, add order code and plain text					9	8							L 1 Y

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Selection and ordering data (continued)

	Article No.	Order code
Inline seal with quick-release Flange type design, with flexible capillary pipe or direct mounting on pressure transmitter SITRANS P320/P420 or SITRANS P300 for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04../7MF802 is to be ordered separately, scope of delivery: 1 unit	**7MF0930-**	
	● ● ● ● ● - 0 ● A 0	● ● ●
Filling liquid		
Food oil (FDA-listed)	**E**	
Neobee M20 (FDA listed)	**R**	
Other version, add order code and plain text	**Z**	**P 1 Y**

Options Add "-Z" to article number and specify order code.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) acc. to IEC 62828-2	**C11**
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	**C12**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Inspection certificate (EN 10204-3.1) - pressure test	**C16**
Certificate on the FDA listing of the fill oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL Declaration of Conformity)	**C20**
Accessories	
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	**D42**
Negative pressure service	
Negative pressure service for gauge pressure and absolute pressure transmitters	**D81**
Extended negative pressure service for gauge pressure and absolute pressure transmitters	**D85**
Country-specific approval	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	**E60**
Capillary connection	
Single-side mounted at differential pressure transmitter at high side	**S03**
Single-side mounted at differential pressure transmitter at low side	**S04**
Cooling element	**S08**
Capillary coating	
PE protective tube	
• 1 m (38.37 inches)	**S10**
• 1.6 m (63 inches)	**S11**
• 2 m (78.7 inches)	**S12**
• 2.5 m (98.4 inches)	**S13**
• 3 m (118.1 inches)	**S14**
• 4 m (157.5 inches)	**S15**
• 5 m (196.9 inches)	**S16**
• 6 m (236.2 inches)	**S17**
• 7 m (275.6 inches)	**S18**
• 8 m (315 inches)	**S19**
• 9 m (354.3 inches)	**S20**
• 10 m (393.7 inches)	**S21**
PTFE protective tube	
• 1 m (38.37 inches)	**S40**

Options Add "-Z" to article number and specify order code.	Order code
• 1.6 m (63 inches)	**S41**
• 2 m (78.7 inches)	**S42**
• 2.5 m (98.4 inches)	**S43**
• 3 m (118.1 inches)	**S44**
• 4 m (157.5 inches)	**S45**
• 5 m (196.9 inches)	**S46**
• 6 m (236.2 inches)	**S47**
• 7 m (275.6 inches)	**S48**
• 8 m (315 inches)	**S49**
• 9 m (354.3 inches)	**S50**
• 10 m (393.7 inches)	**S51**
PVC protective tube	
• 1 m (38.37 inches)	**S70**
• 1.6 m (63 inches)	**S71**
• 2 m (78.7 inches)	**S72**
• 2.5 m (98.4 inches)	**S73**
• 3 m (118.1 inches)	**S74**
• 4 m (157.5 inches)	**S75**
• 5 m (196.9 inches)	**S76**
• 6 m (236.2 inches)	**S77**
• 7 m (275.6 inches)	**S78**
• 8 m (315 inches)	**S79**
• 9 m (354.3 inches)	**S80**
• 10 m (393.7 inches)	**S81**
Desired remote seal supplier Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**
Special design	
Welded filling holes	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
+10 ... +50 °C (+50 ... +122 °F) preset	**D66**
-40 ... +50 °C (-40 ... +122 °F)	**D67**
-10 ... +85 °C (+14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

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Selection and ordering data (continued)

Options **Add "-Z" to article number and specify order code.**	**Order code**
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	**D69+Y51**

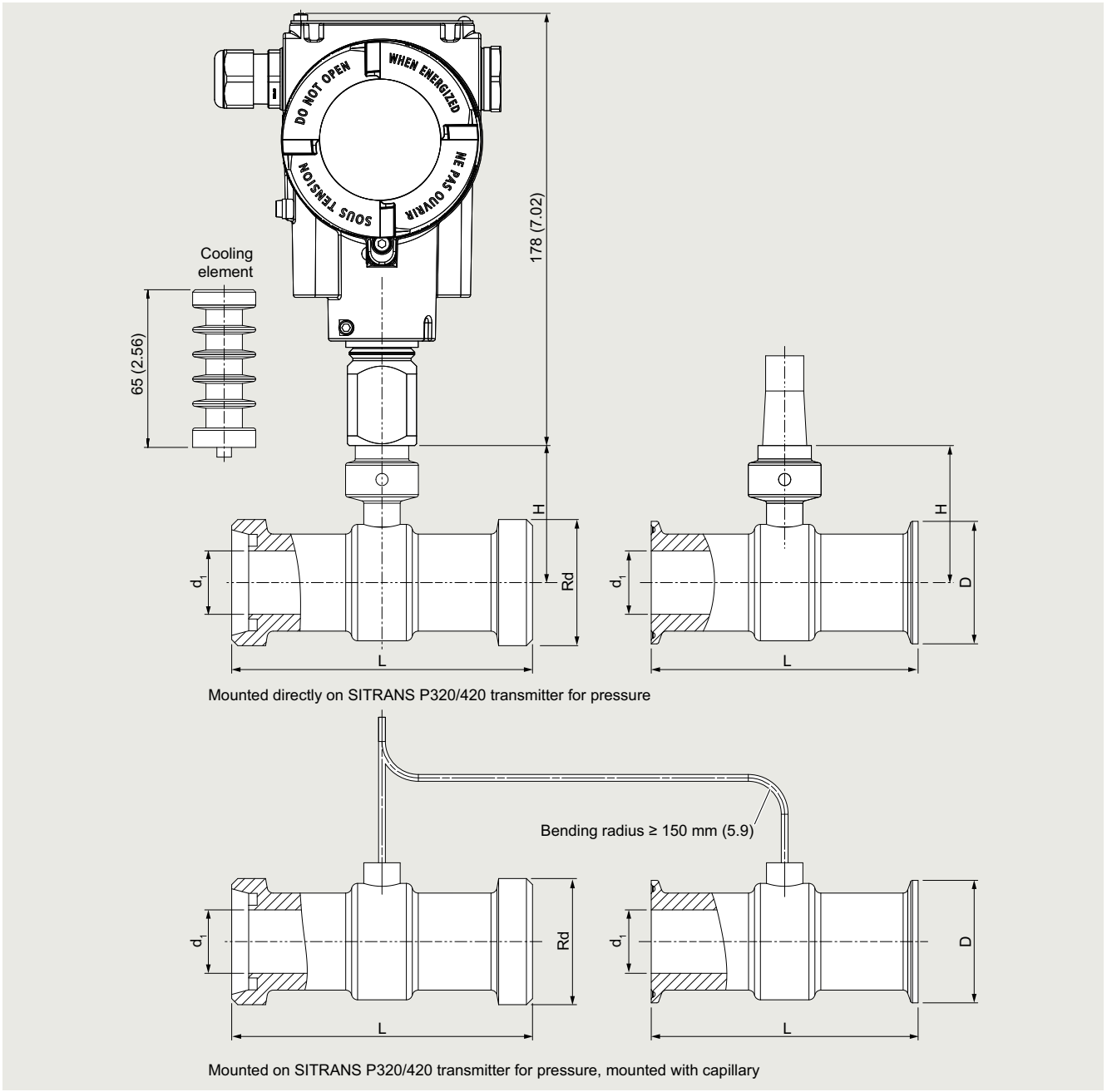
1) See also "Specification of process conditions for selection and ordering data" in the section "More information" under "Technical reference" for SITRANS P320/P420.

Technical specifications

SITRANS P320/P420 quick-release inline seals		
Connection	Nominal diameter	Nominal pressure
• Process connection standard DIN 11851 with thread	DN 25/32/40	PN 40
	DN 50/65/80	PN 25
• Standard of process connection clamp ISO 2852	DN 25/38/51	PN 16
	DN 63.5/76.1	PN 10
• Standard of process connection clamp DIN 32676, schedule C Tri-Clamp	1, 1½ inch	PN 25
	2, 2½ inch	PN 16
	3 inches	PN 10
• Process connection standard clamp DIN 32676, schedule A metric	DN 25/32/40	PN 25
	DN 50	PN 16
	DN 65	PN 10
Material		
• Main body	Stainless steel, mat. no. 1.4404/316L	
• Capillary	Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304	
• Diaphragm	Stainless steel, mat. no. 1.4404/316L	
Capillary		
• Length	≤ 10 m (32.8 ft)	
• Inside diameter	≤ 1.3 mm (0.051 inch)	
• Minimum bending radius	150 mm (5.9 inches)	
• Sheath	Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L	
Filling liquid	• Food oil (FDA-listed) • Neobee M20 (FDA-listed)	
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. **More information** In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: • "Function" - "Technical specifications of the remote seal filling liquids" • "More information" - "Specification of process conditions for selection and ordering data"	
Weight	Approx. 4 kg (approx. 8.82 lb)	
Certificates and approvals		
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of Article 4, Paragraph 1 (annex 1); assigned to category III, conformity evaluation module H by the TÜV Nord	
EHEDG	Complies with EHEDG recommendations	

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Dimensional drawings



Quick-release inline seal, dimensions in mm (inch)

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Dimensional drawings (continued)

Inline seals for pipes according to EN 10357 (DIN 11851)

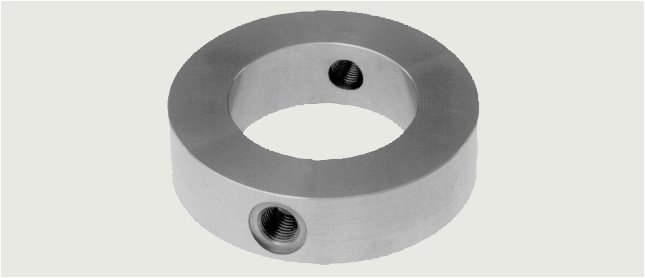
				Food connections DIN 11851		DIN 32676	
Nominal diameter	Length L [mm]	Inside diameter di (mm)	Connection height h (mm)	Nominal pressure	Round thread connection according to DIN 11851 Thread radius	Nominal pressure	Clamp connection according to DIN 32676 D (mm)
DN 10	96	10	27.5	PN 40	28 × 1/8"	PN 16	34
DN 15	150	16	12	PN 40	34 × 1/8"	PN 16	34
DN 25	110	26	21	PN 40	52 × 1/6"	PN 16	50.5
DN 32	110	32	26	PN 40	58 × 1/6"	PN 16	50.5
DN 40	110	38	28.5	PN 40	65 × 1/6"	PN 16	50.5
DN 50	110	50	34	PN 25	78 × 1/6"	PN 16	64
DN 65	110	66	42	PN 25	95 × 1/6"	PN 10	91
DN 80	60	81	47.5	PN 25	110 × 1/4"	PN 10	106
DN 100	60	100	60	PN 25	130 × 1/4"	PN 10	119

Inline seals for pipes according to BS 4825 Part 3 and pipe outer diameter (suitable for pipes according to ASME-BPE)

Nominal diameter					Food connections IDF according to ISO 2853		Clamp connection according to ISO 2852	
Inch	mm	Length L [mm]	Inside diameter di (mm)	Connection height h (mm)	Nominal pressure	IDF thread according to ISO 2853 IDF thread (Tr)	Nominal pressure	Clamp connection according to ISO 2852 D (mm)
1	25.4	110	22.2	21	PN 40	37 × 3.175	PN 16	50.5
1½	38	110	34.8	28.5	PN 40	50 × 3.175	PN 16	50.5
2	51	110	47.8	34	PN 25	64 × 3.175	PN 16	64
1½	63.5	110	60.3	38	PN 25	77.5 × 3.175	PN 16	77.5
3	76.1	60	72.9	44.5	PN 25	91 × 3.175	PN 10	91
4	101.6	60	97.6	59.5	PN 25	118 × 3.175	PN 10	119

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Overview



Flushing rings are required for remote seals in flange and sandwich design (article numbers 7MF0800 ... 7MF0814) when the medium has a tendency to form deposits or blockages due to the process conditions and the geometry of the connection.

The ferrule is clamped in between the process flange and the remote seal.

Due to the lateral flushing holes, particles accumulated in front of the membrane can be washed away and the pressure space can be vented. Different nominal diameters and forms enable adaption to the relevant process flange.

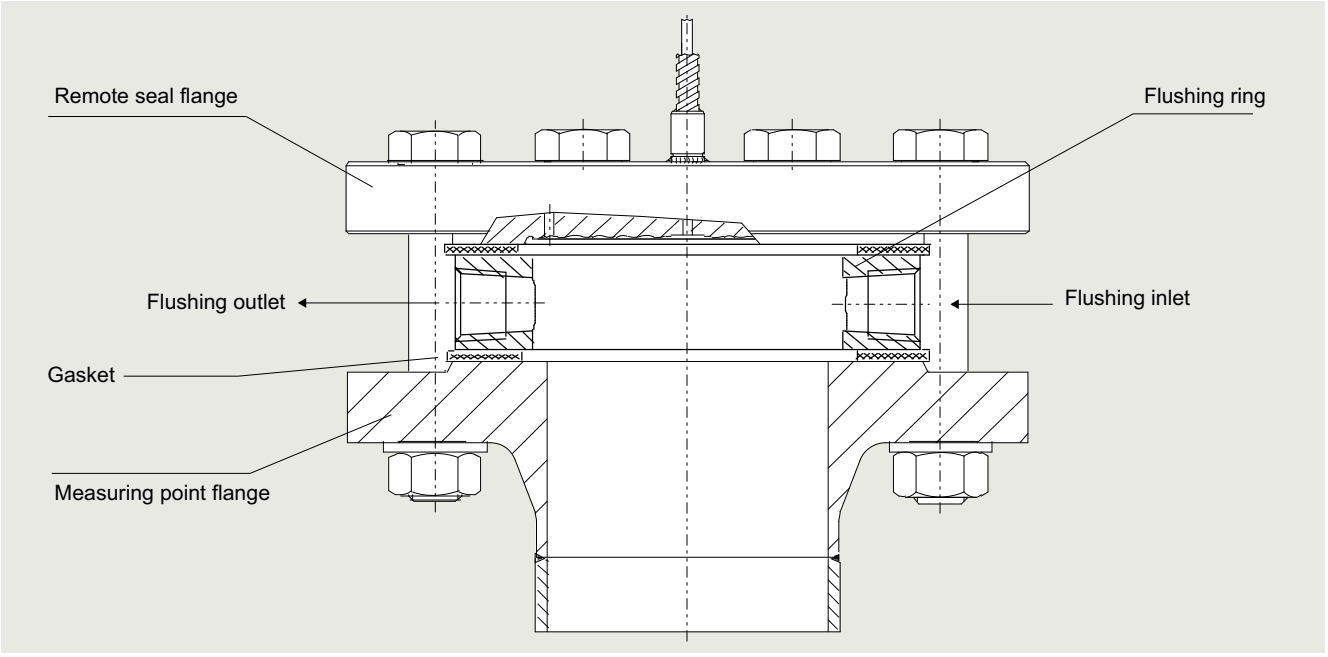
Process connection

For flanges according to EN and ASME:
DN 50, 80, 100, 125; PN 16 ... 100 or
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

Standard version

Material: CrNi steel, mat. no. 1.4404/316L
Sealing surfaces and flushing holes: See ordering data

Design



Example of installation

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Selection and ordering data

Flushing ring For remote seals 7MF0800 to 7MF0814		Article No. 7MF4925-					Order code		
		1 ●	●	●	●		●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.									
Nominal diameter	**Nominal pressure**								
DN 50	PN 16 ... PN 100	A							
DN 80	PN 16 ... PN 100	B							
DN 100	PN 16 ... PN 100	C							
DN 125	PN 16 ... PN 100	D							
2 inches	Class 150 ... 600	G							
3 inches	Class 150 ... 600	H							
4 inches	Class 150 ... 600	J							
5 inches	Class 150 ... 600	K							
Only for RJF ring groove, 7MF4925-1*R....:									
2 inches	Class 150	N	R						
3 inches	Class 150	P	R						
4 inches	Class 150	Q	R						
5 inches	Class 150	R	R						
2 inches	Class 300 ... 600	U	R						
3 inches	Class 300 ... 600	V	R						
4 inches	Class 300 ... 600	W	R						
5 inches	Class 300 ... 600	X	R						
Other version, add Order Code and plain text: Nominal diameter ...; Nominal pressure ...		Z					J	1	Y
Sealing surface									
EN 1092-1									
• Form B1			A						
• Form B2			C						
• Form C / Form C			D						
• Form D / Form C			E						
• Form D / Form D			F						
• Form E			G						
• Form F			H						
ASME B16.5									
• RF 125 ... 250 AA			M						
• RFSF			Q						
• RJF ring groove			R						
Other version, add Order Code and plain text: Sealing surface ...			Z				K	1	Y
Flushing holes (2 units)									
Female thread G¼				1					
Female thread G½				2					
Female thread ¼-18 NPT				3					
Female thread ½-14 NPT				4					
Material									
Stainless steel mat. no. 1.4404/316L					0				
Other version, add Order Code and plain text: Material ...					9		M	1	Y

Options **Add "-Z" to article number and specify order code.**	**Order code**
Inspection certificate according to EN 10204-3.1	**C12**

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Technical specifications

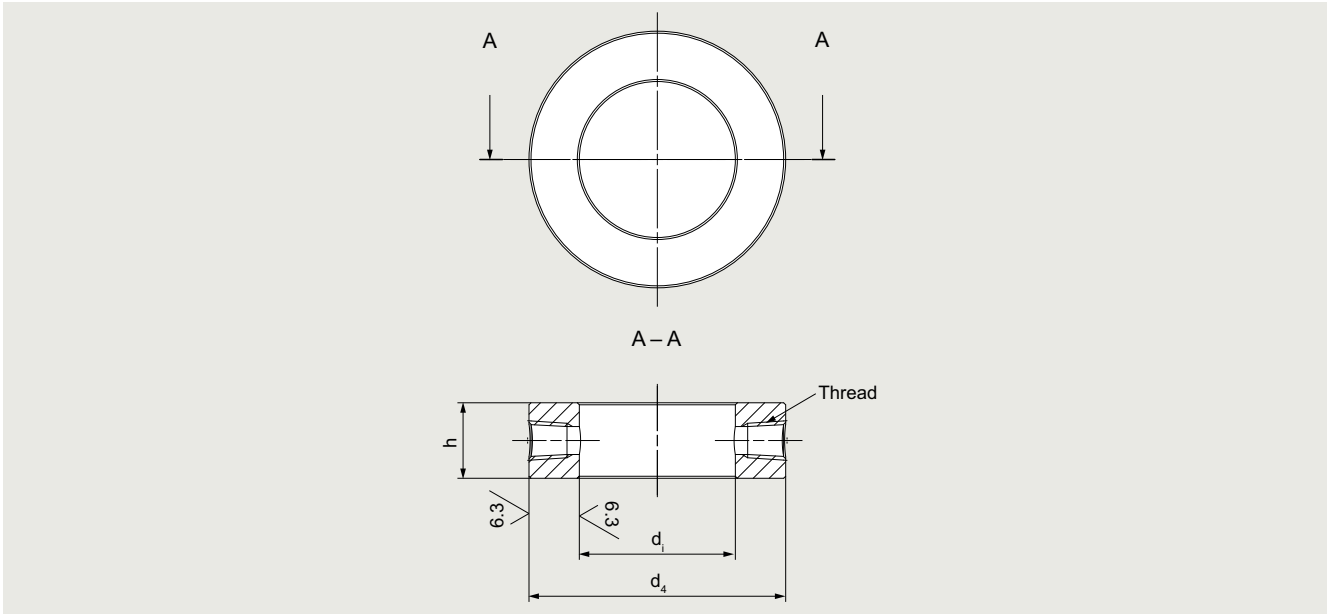
SITRANS P320/P420 flushing ring for diaphragm seals	
Nominal diameter	Nominal pressure
• DN 50	PN 16 ... PN 100
• DN 80	PN 16 ... PN 100
• DN 100	PN 16 ... PN 100
• DN 125	PN 16 ... PN 100
• 2 inches	Class 150 ... Class 600
• 3 inches	Class 150 ... Class 600
• 4 inches	Class 150 ... Class 600
• 5 inches	Class 150 ... Class 600
Sealing surface	
• According to EN 1092-1	• Form B1 • Form B2 • Form D/Form D • Form C/Form C • Form D/Form C • Form E • Form F
• According to ASME B16.5	• RF 125 ... 250 AA • RFSF • RJF ring groove
Flushing holes (2 units), female thread:	• G¼ • G½ • ¼-18 NPT • ½-14 NPT
Material	Stainless steel 1.4404/316L

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Dimensional drawings

Connection according to EN 1092-1

Form B1 and form B2



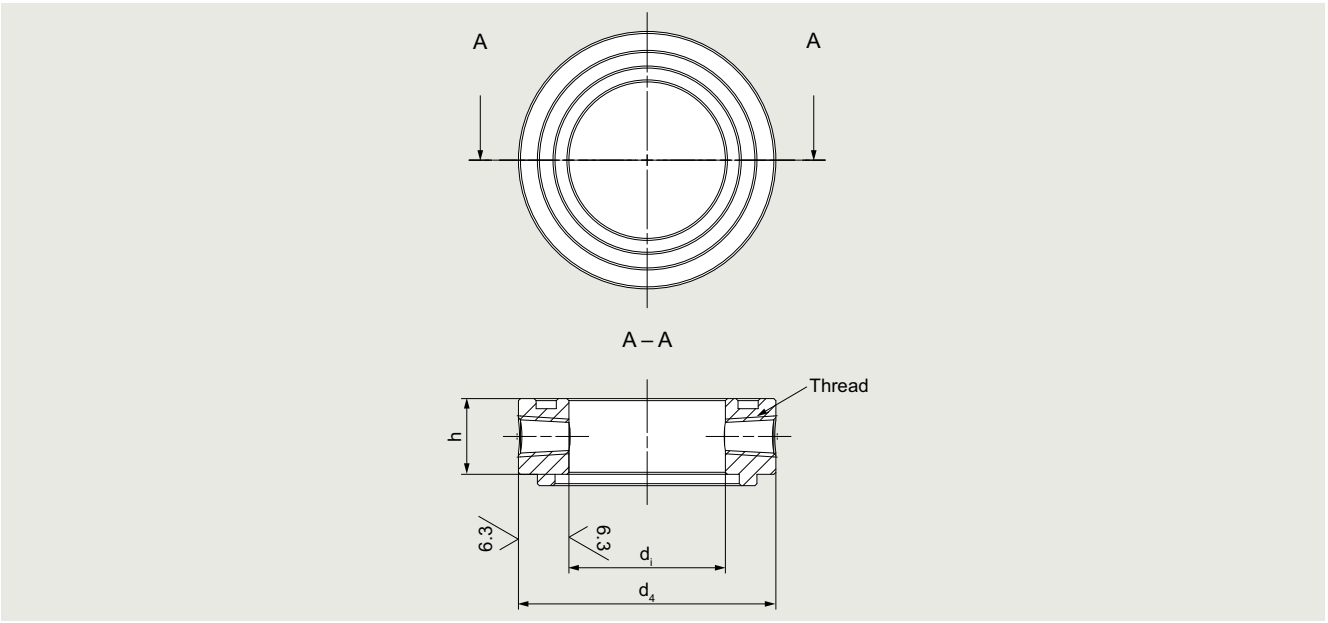
Flushing ring; sealing surface (EN 1092-1), form B1 and form B2

Nominal diameter	PN bar	Thread	d_4 Ø in mm (inch)	d_i Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
DN 50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
DN 80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
DN 100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
DN 125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)
DN 50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
DN 80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
DN 100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
DN 125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)

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Dimensional drawings (continued)

Form D / Form C



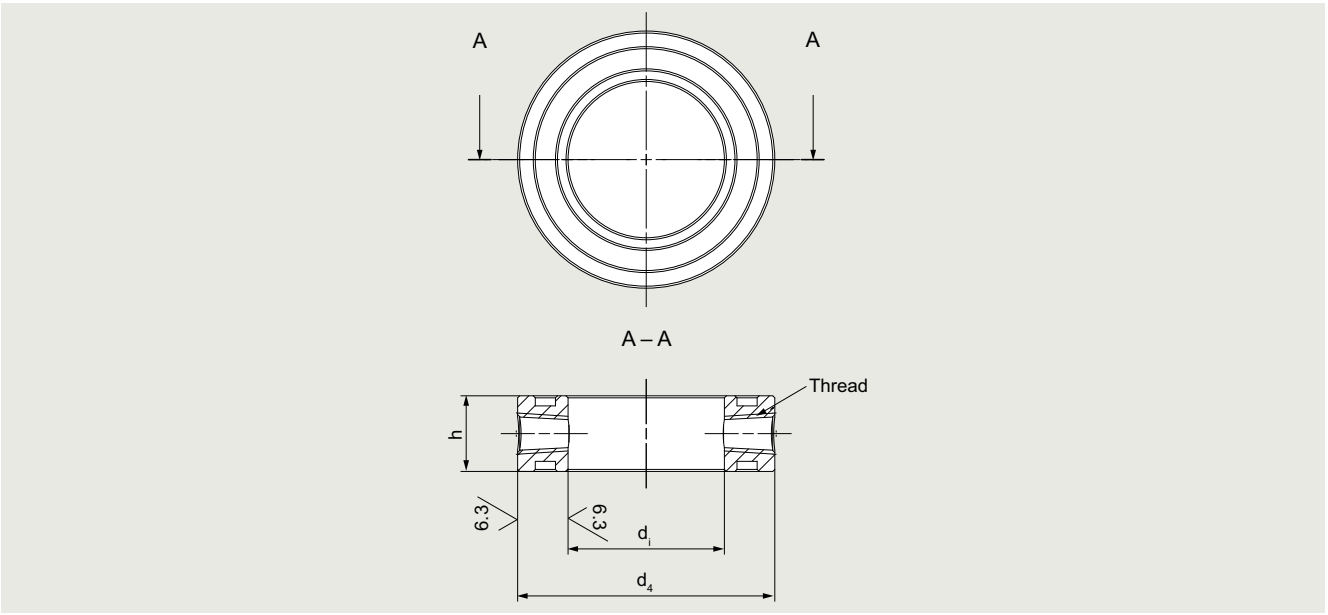
Flushing ring; sealing surface (EN 1092-1), form D / form C

Nominal diameter	PN bar	Thread	d_4 Ø in mm (inch)	d_i Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
DN 50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	35.5 (1.40)	1.46 (3.22)
DN 80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	35.5 (1.40)	2.36 (5.2)
DN 100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	35.5 (1.40)	3.96 (8.73)
DN 125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	35.5 (1.40)	4.00 (8.82)
DN 50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40.5 (1.595)	1.67 (3.68)
DN 80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40.5 (1.595)	2.69 (5.93)
DN 100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40.5 (1.595)	4.52 (9.97)
DN 125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40.5 (1.595)	4.56 (10.05)

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Dimensional drawings (continued)

Form D / Form D



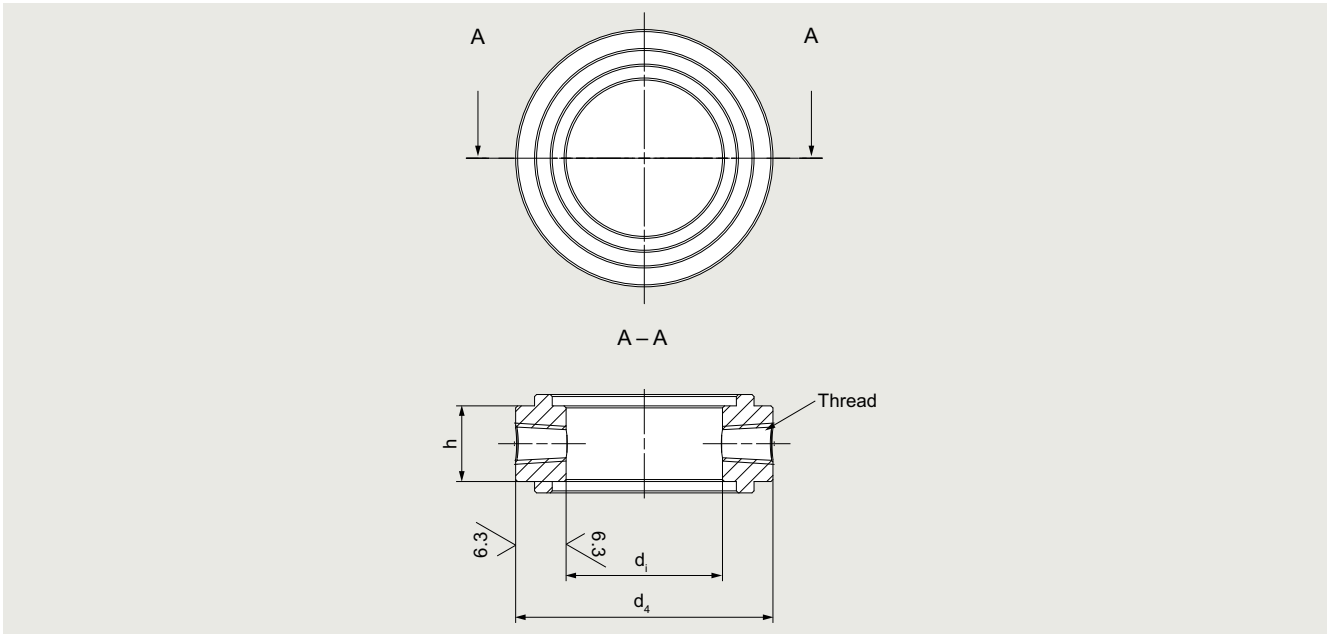
Flushing ring; sealing surface (EN 1092-1), form D/form D

Nominal diameter	PN bar	Thread	d_4 Ø in mm (inch)	d_i Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
DN 50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
DN 80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
DN 100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
DN 125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)
DN 50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
DN 80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
DN 100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
DN 125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)

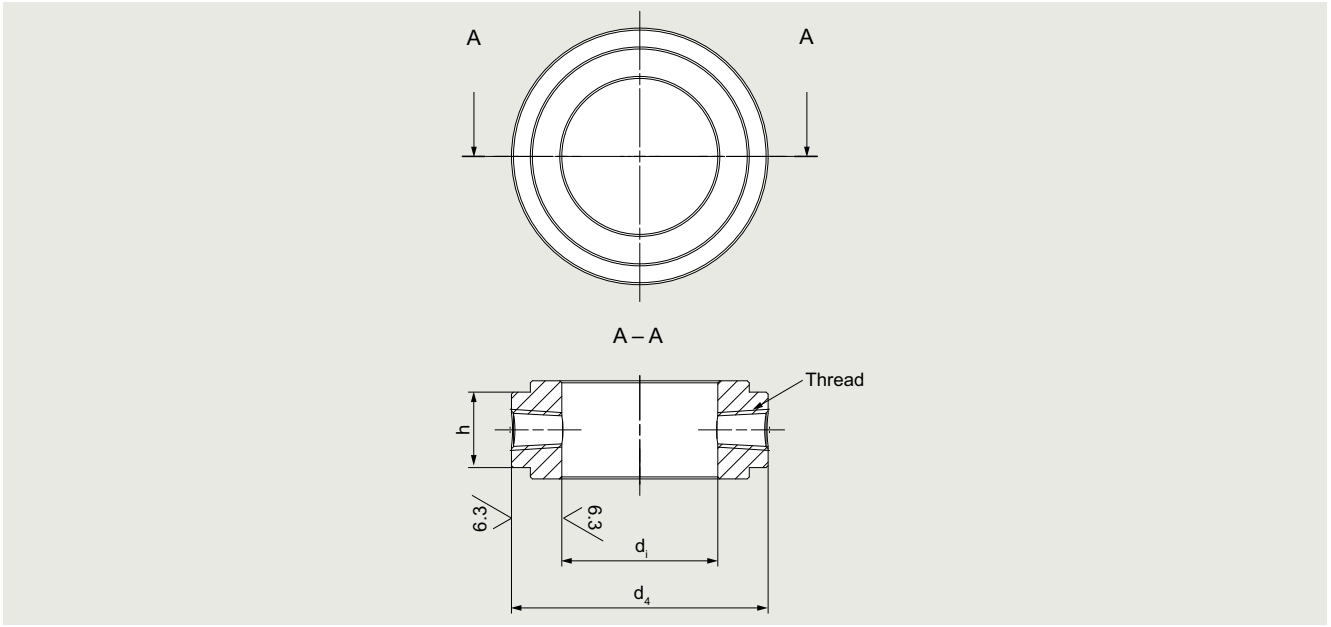
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Dimensional drawings (continued)

Form C / form C and form E



Flushing ring; sealing surface (EN 1092-1), form C / form C



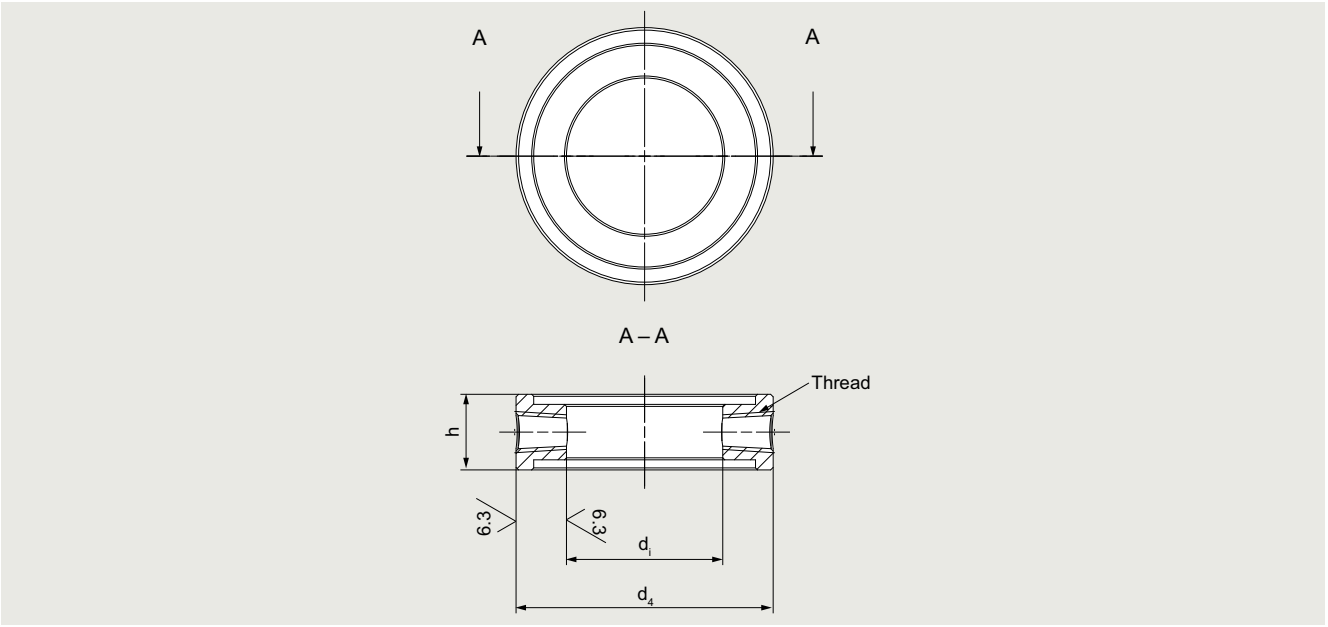
Flushing ring; sealing surface (EN 1092-1), form E

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Dimensional drawings (continued)

Nominal diameter	PN bar	Thread	d_4 Ø in mm (inch)	d_i Ø in mm (inch)	h Ø in mm (inch)	x Ø in mm (inch)	f3 Ø in mm (inch)	Weight kg (lb)
DN 50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
DN 80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
DN 100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
DN 125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	4.21 (9.28)
DN 50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
DN 80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
DN 100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
DN 125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	3.38 (7.45)

Form F



Flushing ring; sealing surface (EN 1092-1), form F

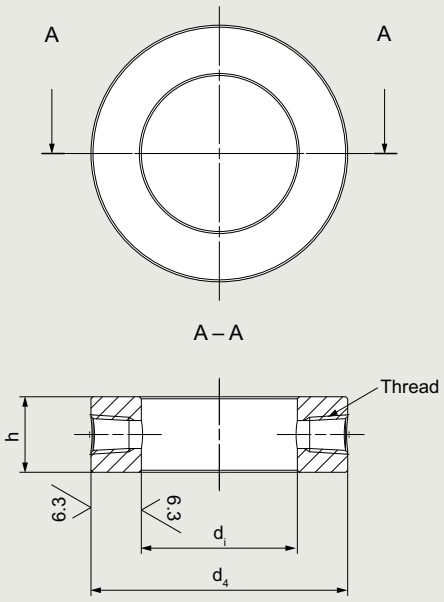
Nominal diameter	PN bar	Thread	d_4 Ø in mm (inch)	d_i Ø in mm (inch)	h Ø in mm (inch)	x Ø in mm (inch)	f3 Ø in mm (inch)	Weight kg (lb)
DN 50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	35 (1.38)	88 (3.46)	4 (0.16)	1.25 (2.76)
DN 80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	35 (1.38)	121 (4.76)	4 (0.16)	2.02 (4.45)
DN 100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	35 (1.38)	150 (5.91)	4.5 (0.18)	3.11 (6.86)
DN 125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	35 (1.38)	175 (6.89)	4.5 (0.18)	3.19 (7.03)
DN 50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	88 (3.46)	4 (0.16)	1.45 (3.2)
DN 80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	121 (4.76)	4 (0.16)	2.35 (5.18)
DN 100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	150 (5.91)	4.5 (0.18)	3.67 (8.09)
DN 125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	175 (6.89)	4.5 (0.18)	3.76 (8.29)

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Dimensional drawings (continued)

Connection according to ASME B 16.5

RFSF and RF 125 ... 250 AO



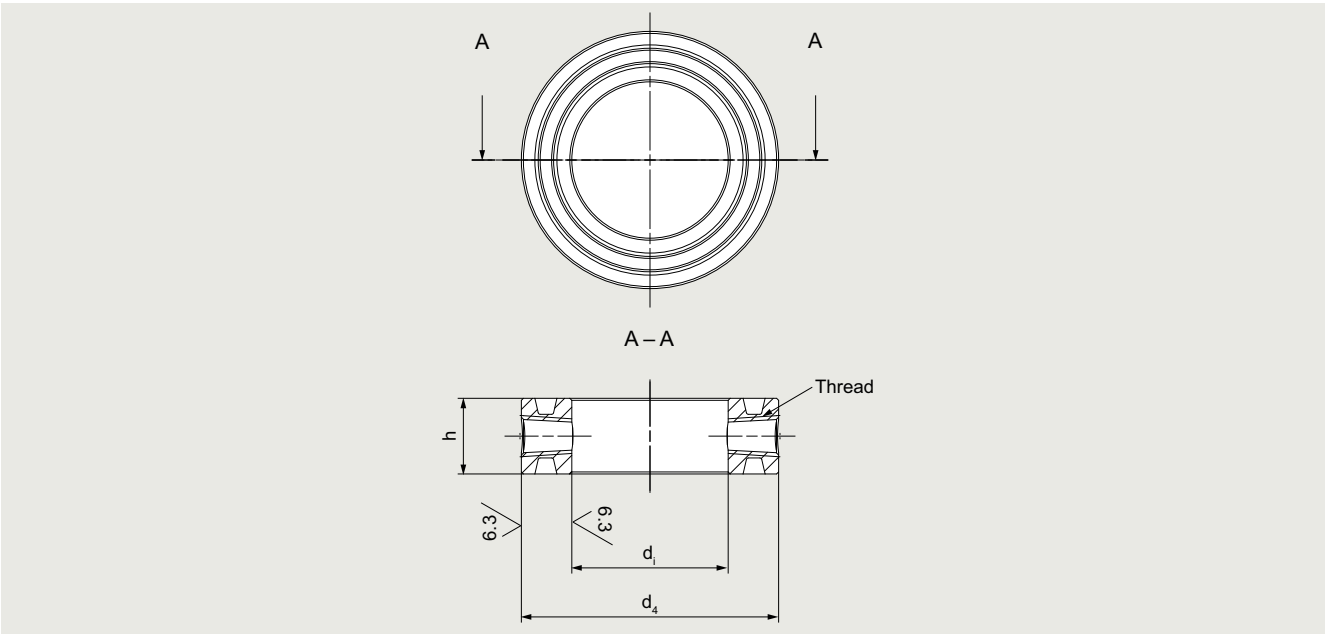
Flushing ring; sealing surface (ASME B 16.5), RFSF and RF 125 to 250 AO

Nominal diameter	Class	Thread	d_4 Ø in mm (inch)	d_i Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
2"	150 ... 600	¼ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3"	150 ... 600	¼ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4"	150 ... 600	¼ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5"	150 ... 600	¼ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)
2"	150 ... 600	½ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3"	150 ... 600	½ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4"	150 ... 600	½ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5"	150 ... 600	½ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)

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Dimensional drawings (continued)

RJF ring groove



Flushing ring; sealing surface (ASME B 16.5), RJF ring groove

Nominal diameter	Class	Thread	d_4 Ø in mm (inch)	d_i Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
2"	150	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
3"	150	¼ NPT	133 (5.24)	92 (3.62)	40 (1.58)	2.32 (5.12)
4"	150	¼ NPT	171 (6.73)	92 (3.62)	40 (1.58)	5.22 (11.51)
5"	150	¼ NPT	194 (7.64)	141 (5.55)	40 (1.58)	4.46 (9.83)
2"	150	½ NPT	102 (4.02)	62 (2.44)	46 (1.81)	1.90 (4.19)
3"	150	½ NPT	133 (5.24)	92 (3.62)	46 (1.81)	2.66 (5.86)
4"	150	½ NPT	171 (6.73)	92 (3.62)	46 (1.81)	6.00 (13.23)
5"	150	½ NPT	194 (7.64)	141 (5.55)	46 (1.81)	5.13 (11.31)
2"	300 ... 600	¼ NPT	108 (4.25)	62 (2.44)	40 (1.58)	1.96 (4.32)
3"	300 ... 600	¼ NPT	146 (5.75)	92 (3.62)	40 (1.58)	3.23 (7.12)
4"	300 ... 600	¼ NPT	175 (6.89)	92 (3.62)	40 (1.58)	5.57 (12.28)
5"	300 ... 600	¼ NPT	210 (8.27)	141 (5.55)	40 (1.58)	6.08 (13.4)
2"	300 ... 600	½ NPT	108 (4.25)	62 (2.44)	46 (1.81)	2.26 (4.98)
3"	300 ... 600	½ NPT	146 (5.75)	92 (3.62)	46 (1.81)	3.71 (8.18)
4"	300 ... 600	½ NPT	175 (6.89)	92 (3.62)	46 (1.81)	6.4 (14.11)
5"	300 ... 600	½ NPT	210 (8.27)	141 (5.55)	46 (1.81)	7 (15.43)

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Overview

Examples of typical measuring arrangements for using the SITRANS P320/420 pressure transmitter with and without remote seal are illustrated in this section.

Formulas for calculating lower range value and upper range value are listed for each example.

Mounting

Remote seals in sandwich design are mounted between the connecting flange of the measuring point and a blank flange. Remote seals in flange design are mounted directly to the connecting flange of the measuring point. The respective pressure rating of the blank flange or of the remote seal, flange type must be taken into consideration.

The pressure transmitter should be mounted below the connecting flange; pressure transmitters for differential pressure should be mounted below the bottom connecting flange. This arrangement must be selected in the negative pressure range.

For measurements in the overpressure range, the pressure transmitter can also be mounted above the connecting flange.

For a good transmission characteristic, the capillaries between remote seal and pressure transmitter should be kept as short as possible.

Shifting the measuring range

If the two connecting flanges are installed at different heights for measurements with two remote seals, additional differential pressure is generated due to the oil filling of the remote seal capillaries. This additional pressure causes a shift of the measuring range that has to be taken into consideration when setting the pressure transmitter.

A shift of the measuring range will also occur when you combine a remote seal with a pressure transmitter and when the remote seal is not installed at the height of the pressure transmitter.

Pressure transmitter output

When level, interface or density increase in closed vessels, the differential pressure and therefore the output signal of the pressure transmitter increases as well.

For a reverse relationship between differential pressure and output signal, the lower range value and upper range value must be reversed with SITRANS P320/420.

For open vessels, increasing pressure is usually assigned to an increase in level, interface or density.

Effect of ambient temperature

Try to avoid temperature differences between the individual capillaries and the individual remote seals.

Temperature fluctuations in the area of the measuring unit cause a change in the volume of the filling liquid and therefore measuring errors.

Notes

- For interface measurements, the interface must be located between the two nozzles. In addition, the fill level of the vessel must always be above the top nozzle.
- A constant level of the process medium is required for density measurement. The level should be above the top nozzle.

Possible combinations of pressure transmitters and remote seals

Mounting type	Pressure transmitter	Remote seal
A/B	7MF030.-... 7MF031.-... 7MF040.-... 7MF041.-...	7MF0800-... 7MF0810-...
C_1 and C_2	7MF032.-... 7MF042.-...	7MF0800-... 7MF0810-... (negative pressure service in all cases)
	7MF033.-... 7MF043.-...	7MF0801-... 7MF0811-...

Overview (continued)

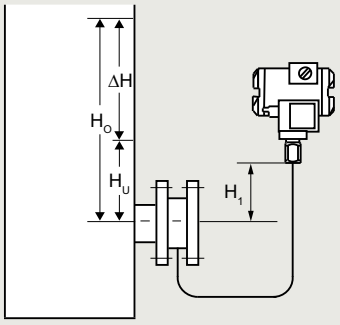
Mounting type	Pressure transmitter	Remote seal
D	7MF034.-... 7MF035.-... 7MF044.-... 7MF045.-...	7MF0802-... 7MF0812-...
E	7MF034.-... 7MF035.-... 7MF044.-... 7MF045.-...	7MF0813-...
G, H and J	7MF034.-... 7MF035.-... 7MF044.-... 7MF045.-...	7MF0802-... 7MF0812-...

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Dimensional drawings

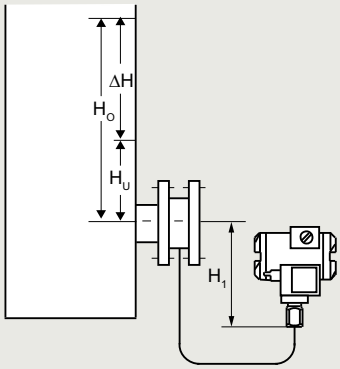
Mounting types for gauge pressure and level measurements (open vessels)

Installation type A



Pressure transmitter
above the measuring point

Installation type B



Pressure transmitter
below the measuring point

$H_1 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

Installation type A

Lower range value: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_1$

Upper range value: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_1$

Installation type B

Lower range value: $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{Oil} \cdot g \cdot H_1$

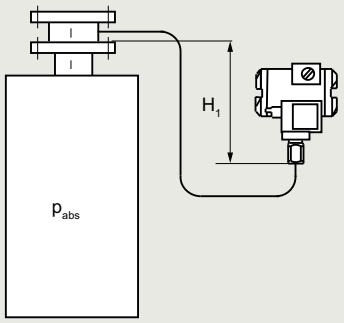
Upper range value: $p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{Oil} \cdot g \cdot H_1$

Legend

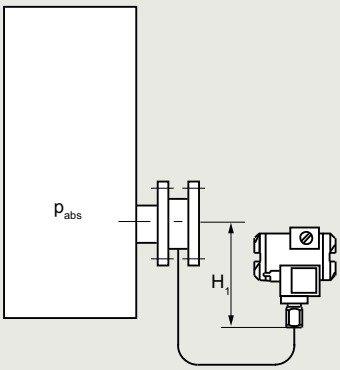
p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value
H_1	Distance between vessel flange and pressure trans.

Mounting type for absolute pressure measurements (closed vessels)

Installation type C_1



Installation type C_2



Pressure transmitter for absolute pressure always below the measuring point: $H_1 \geq 200$ mm (7.9 inch)

Installation type C_1 and C_2

Lower range value: $p_{MA} = p_{START} + \rho_{Oil} \cdot g \cdot H_1$

Upper range value: $p_{ME} = p_{END} + \rho_{Oil} \cdot g \cdot H_1$

Legend

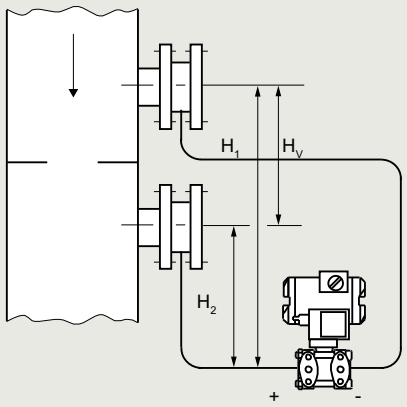
p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
p_{START}	Lower range value
p_{END}	Upper range value
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_1	Distance between vessel flange and pressure trans.

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Dimensional drawings (continued)

Mounting types for differential pressure and flow measurements

Installation type D Filter monitoring



Installation type D

Lower range value: $p_{MA} = p_{START} - \rho_{Oil} \cdot g \cdot H_V$

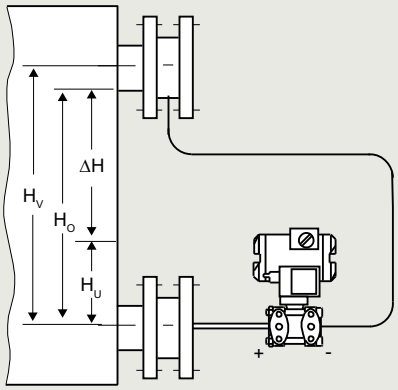
Upper range value: $p_{ME} = p_{END} - \rho_{Oil} \cdot g \cdot H_V$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
p_{START}	Lower range value
p_{END}	Upper range value
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_V	Distance between the measuring points (spigots)

Mounting type for level measurements (closed vessels)

Installation type E



Installation type E

Lower range value: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Upper range value: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

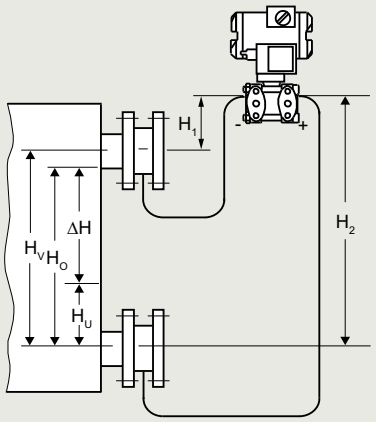
Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

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Dimensional drawings (continued)

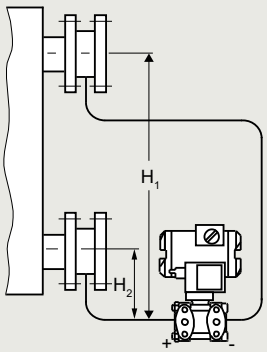
Installation type G



Pressure transmitter for differential pressure above the upper measuring point, no vacuum

$H_2 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

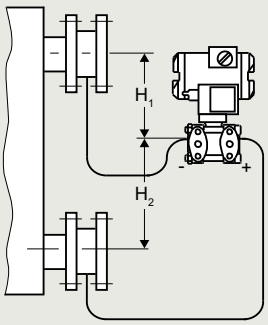
Installation type H



below the lower measuring point

Installation type for vacuum applications

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_2 \leq 4$ m (13.1 ft)

Installation type G, H and J

Lower range value:
$p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Upper range value:
$p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

p_{MA}	Lower range value to be set	g	Local acceleration due to gravity
p_{ME}	Upper range value to be set	H_U	Lower range value
ρ_{FL}	Density of medium in vessel	H_O	Upper range value
ρ_{Oil}	Density of filling oil in the capillary to the remote seal	H_V	Distance between the measuring points (spigots)

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Overview

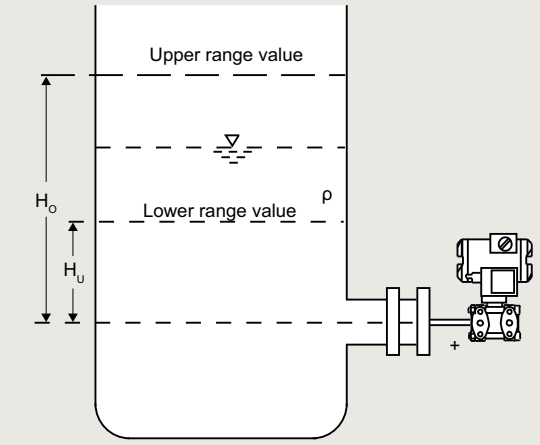
Notes

- For interface measurements, the interface must be located between the two nozzles. In addition, the fill level of the container must always be above the top nozzle.
- A constant level of the process medium is required for density measurement. The level should be above the top nozzle.

Dimensional drawings

Pressure transmitters for differential pressure for flanging

Measuring arrangements for open containers



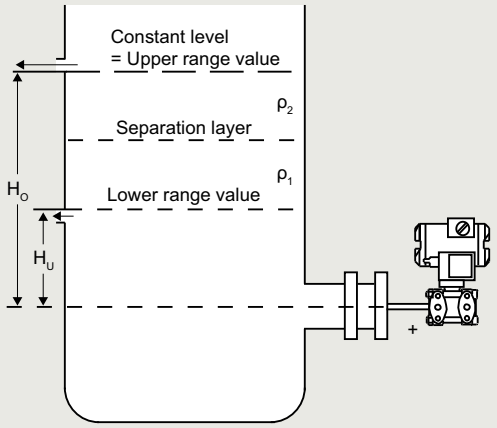
Level measurement

Lower range value: $p_{MA} = \rho \cdot g \cdot H_U$

Upper range value: $p_{ME} = \rho \cdot g \cdot H_O$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value



Separation layer measurement

Lower range value: $p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$

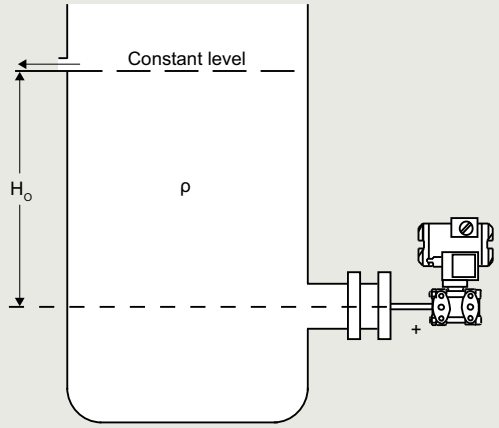
Upper range value: $p_{ME} = \rho_1 \cdot g \cdot H_O$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ_1	Density of heavier liquid
ρ_2	Density of lighter liquid
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value

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Dimensional drawings (continued)



Density measurement

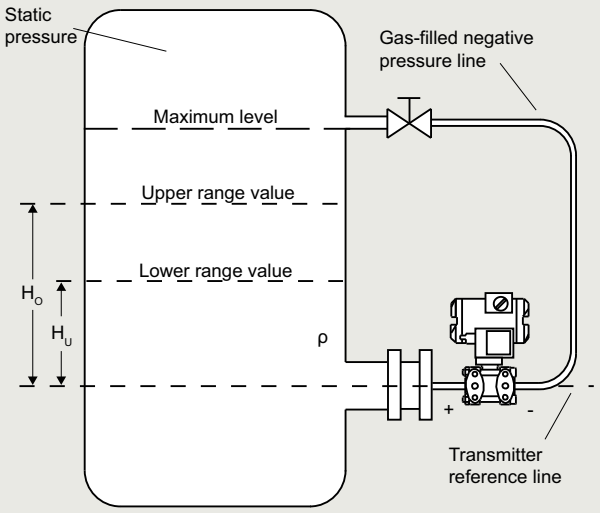
Lower range value: $p_{MA} = \rho_{MIN} \cdot g \cdot H_O$

Upper range value: $p_{ME} = \rho_{MAX} \cdot g \cdot H_O$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ_{MIN}	Minimum density of medium in vessel
ρ_{MAX}	Maximum density of medium in vessel
g	Local acceleration due to gravity
H_O	Upper range value in m

Measuring arrangements for closed containers



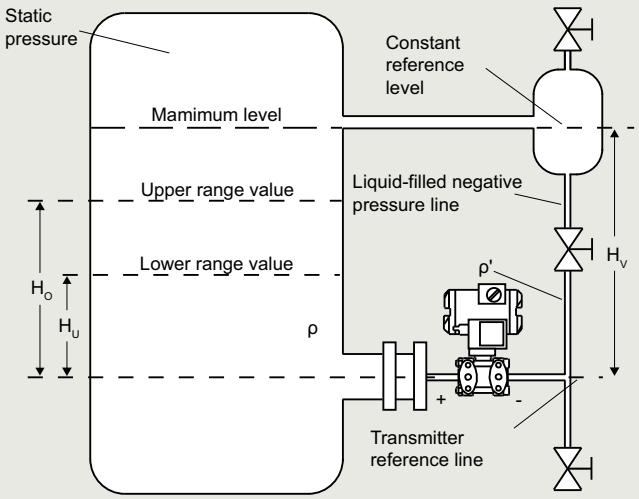
Level measurement, Version 1

Lower range value: $\Delta p_{MA} = \rho \cdot g \cdot H_U$

Upper range value: $\Delta pME = \rho \cdot g \cdot H_O$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value



Level measurement, Version 2

Lower range value: $\Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$

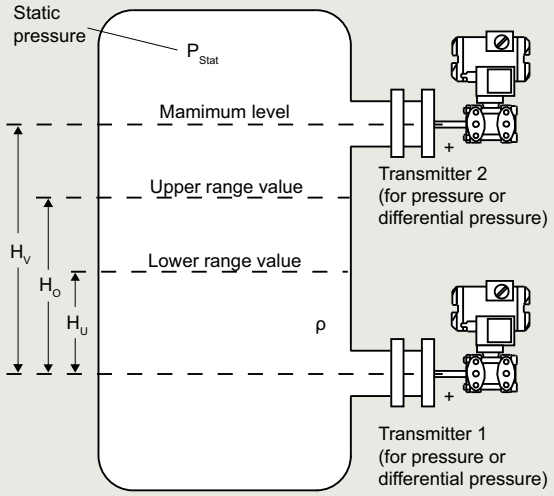
Upper range value: $\Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range value to be set
ρ	Density of medium in vessel
ρ'	Density of liquid in the negative pressure line (corresponding to the temperature existing there)
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

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Dimensional drawings (continued)



Level measurement, Version 3

Lower range value: $\Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

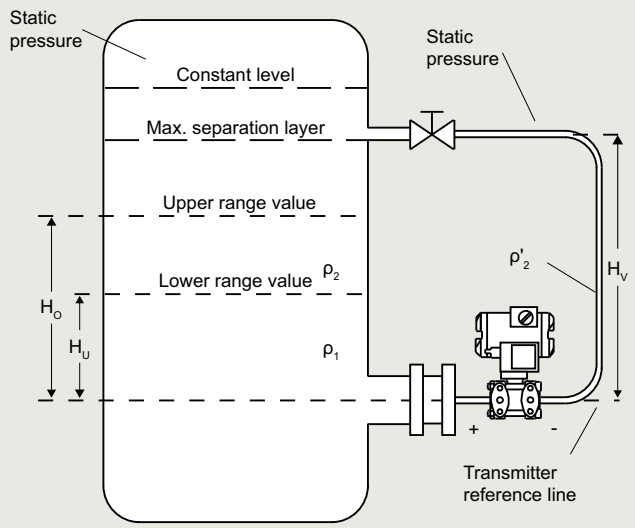
Upper range value: $\Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

The pressure measuring range (≙ level) will be calculated by subtraction of measuring range of transmitter 1 minus measuring range of transmitter 2 in the process control system.

Pressure transmitters for differential pressure for flanging, measuring arrangement for closed containers, level measurement



Separation layer measurement

Lower range value: $\Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$

Upper range value: $\Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range value to be set
ρ_1	Density of heavier liquid with separation layer in vessel
ρ_2	Density of lighter liquid with separation layer
ρ'_2	Density of liquid in the negative pressure line (corresponding to the temperature existing there)
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

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Overview

All shut-off fittings can be secured onto walls, racks (72 mm grid size) and vertical and horizontal pipes.

This offers the advantage when assembling a plant that the shut-off fittings can be secured first and the lines for the medium and differential pressure lines connected to them. It is then possible to check all connections for leaks and to blow out or flush the pipes in order to remove dirt (welding residues, shavings etc.).

Finally, when all piping is completed, the measuring instruments are screwed onto the shut-off fittings.

If a measuring instrument has to be removed for maintenance, the fittings and pipes remain intact. Only the valves have to be closed. The measuring instrument can then be detached and re-installed after maintenance.

Classification according to pressure equipment directive (PED 2014/68/EU):

The valves meet the requirements of article 4.3 (good engineering practice) for gases of fluid group 1 and for liquids of fluid group 1.

IEC 61518/EN 61518 standard

The flange connection between pressure transmitter and valve manifold was modified in the standard IEC 61518/EN 61518. The only connection thread approved for use in the process flanges of the pressure transmitter is $^{7}/_{16}$-20 UNF.

The valve manifolds for M12 screws, including the accessory sets, have therefore been deleted. The connection threads in the M10 process flanges are still available as replacements.

Material inspection certificate according to EN 10204-3.1 & NACE MR-0175

A material inspection certificate according to EN 10204-3.1 that can be called up online is provided for all shut-off valves. A NACE MR-0175 certificate is also provided for 7MF9011 and 7MF9411.

Minimum/maximum operating temperatures

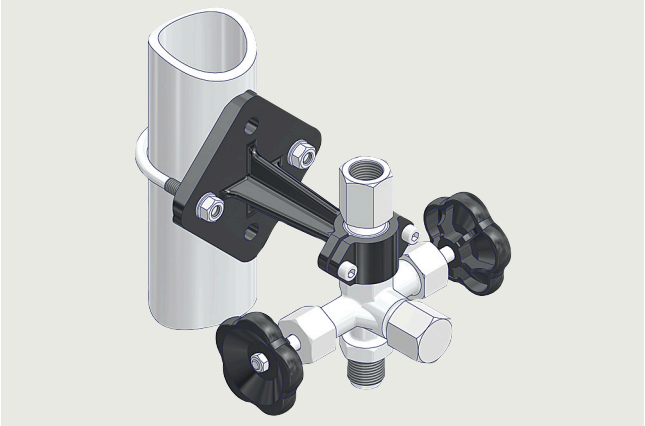
The maximum operating temperatures are given for each valve or valve manifold.

The minimum operating temperatures depend on the material used for the valves or valve manifold. They are:

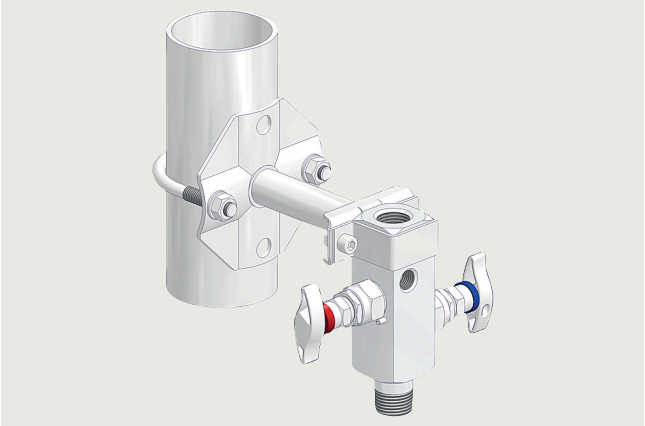
Material	Minimum operating temperature
Brass	-40 °C (-40 °F) according to EN 12516-4
Steel	-10 °C (+14 °F) according to AD200-W10
Stainless steel	-40 °C (-40 °F)

Overview (continued)

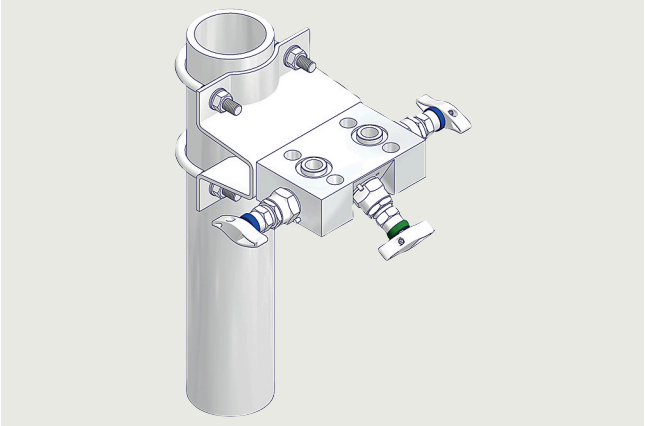
Pressure transmitters with shut-off fittings – mounting examples



SITRANS P transmitter for gauge pressure with double shut-off valve, DIN version



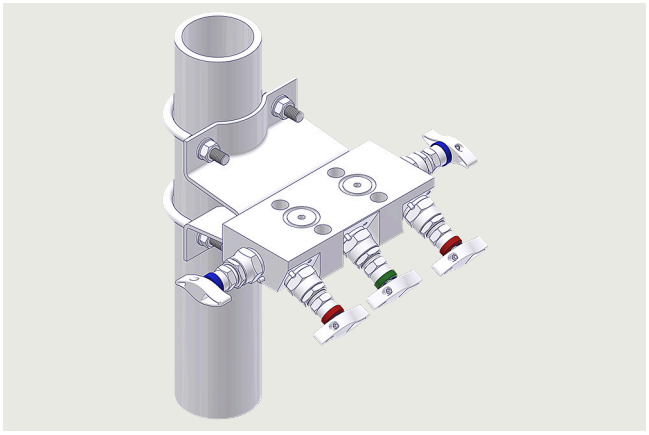
SITRANS P transmitter for gauge pressure with double shut-off valve, version for general applications



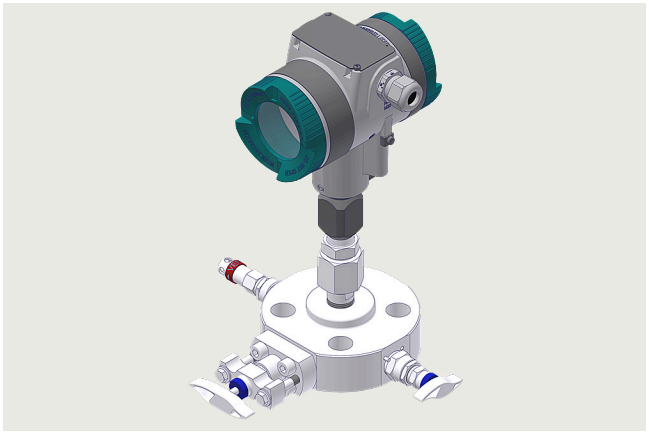
SITRANS P transmitter for differential pressure; mounting example for 3-spindle valve manifold

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Overview (continued)



SITRANS P transmitter for differential pressure; mounting example for 5-spindle valve manifold



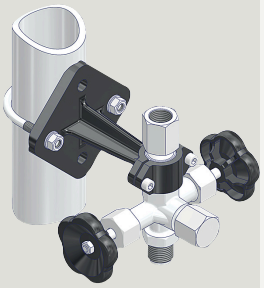
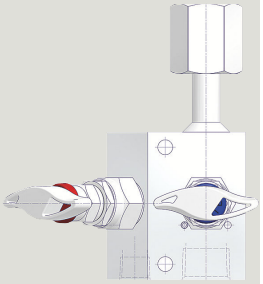
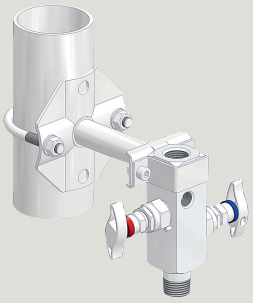
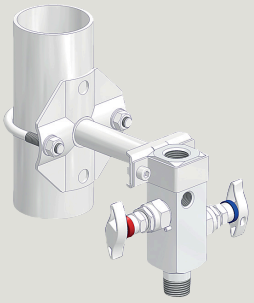
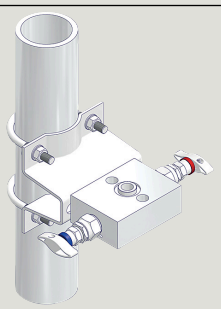
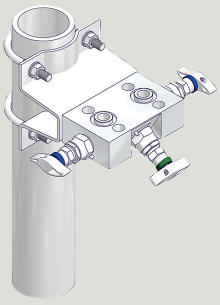
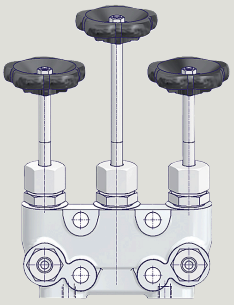
SITRANS P pressure transmitter mounted on "Monoflange" valve combination for direct connection to flange connections (available on request)

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Configuration

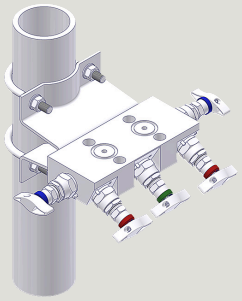
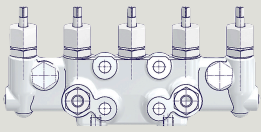
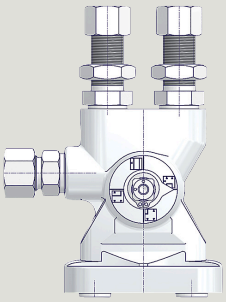
Selection aid

Selection of possible shut-off valves

Transmitters	Shut-off valves for general applications		Shut-off valves for special applications	
Gauge and absolute pressure transmitters with process connection G½" external thread e.g. • SITRANS P200 7MF1565-... • SITRANS P210 7MF1566-... • SITRANS P220 7MF1567-... • SITRANS P300 7MF802.-...0.-.... • SITRANS P 320/420 7MF030.-..D..-.... 7MF032.-..D..-.... 7MF040.-..D..-.... 7MF042.-..D..-....	Shut-off valves / double shut-off valves according to DIN 16270, DIN 16271, and DIN 16272		Shut-off valve with DN 5 venting for ½-NPT-F transition to nipple connection G½ 7MF9011-4EA	
Gauge and absolute pressure transmitters with process connection ½"-14 NPT internal or external thread e.g. • SITRANS P200 7MF1565-... • SITRANS P210 7MF1566-... • SITRANS P220 7MF1567- • SITRANS P300 7MF802.-...1.-.... • SITRANS P 320/420 7MF030.-..E..-.... 7MF030.-..F..-.... 7MF032.-..E..-.... 7MF032.-..F..-.... 7MF040.-..E..-.... 7MF040.-..F..-.... 7MF042.-..E..-.... 7MF042.-..F..-....	Shut-off valve with DN 5 venting 7MF9011-4EA, -4FA, -4GA, and -4KA		Shut-off valve with DN 5 venting for process connection ½-NPT 7MF9011-4HA	
Absolute pressure transmitter with process connection according to IEC 61518/EN 61518 e.g. • SITRANS P 320/420 7MF033.-.....-.... 7MF043.-.....-....	DN 5 2-spindle valve manifold 7MF9411-5A.			
Differential pressure transmitter with process connection according to IEC 61518/EN 61518 e.g. • SITRANS P 320/420 7MF034.-.....-.... 7MF044.-.....-....	DN 5 3-/5-spindle valve manifold 7MF9411-5B. and 7MF9411-5C.		DN 5 3-way valve manifold forged version 7MF9410-1..	

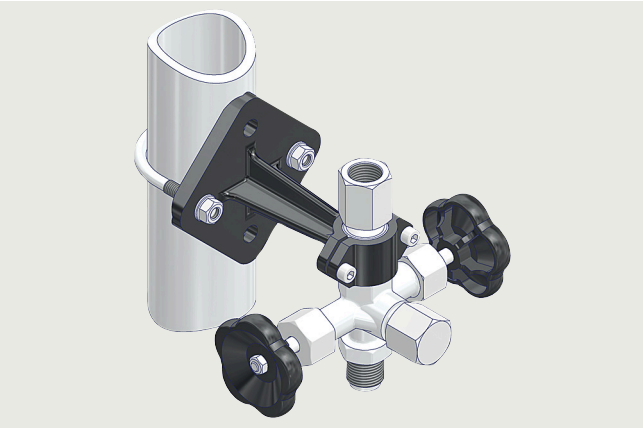
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Configuration (continued)

Transmitters	Shut-off valves for general applications		Shut-off valves for special applications	
Differential pressure transmitter with process connection according to IEC 61518/EN 61518 e.g. • SITRANS P 320/420 7MF034.-.....-.... 7MF044.-.....-....	DN 5 3-/5-spindle valve manifold 7MF9411-5B. and 7MF9411-5C.		DN 5 5-way valve manifold forged version 7MF9410-3..	
	PN 100 multiway cock 7MF9004-...			

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Overview



Double shut-off valve 7MF9401-...

The shut-off valves for gauge and absolute pressure transmitters as well as for pressure measuring devices are used to shut off the medium line for corrosive and non-corrosive gases, vapors, and liquids, to depressurize medium lines, and to check the connected pressure measuring devices, gauge pressure transmitters, and absolute pressure transmitters.

Design

A siphon is installed in front of the shut-off valve for media with temperatures above 120 °C. The form B shut-off valves have a shaft with which a measuring instrument holder can be attached. No adapter is therefore required for fastening these valves. With DN 5 double shut-off valves, the air-release/test connection can be shut off. This enables a zero point check on the pressure measuring device. In addition, a characteristic curve test can be conducted on the pressure measuring device using an external pressure sensor. The valve packing material is PTFE.

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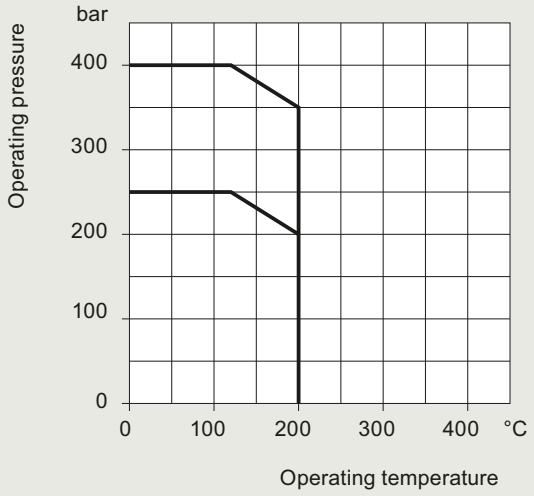
Selection and ordering data

Shut-off valves, form B, DIN 16270, DIN 16271 and DIN 16272		Article No.
Without test collar, connection shank		
Valve housing material	Max. permissible operating overpressure	
CW614N (CuZn39Pb3) (mat. no. 2.0402)	250 bar (3626 psi)	**7MF9401-7AA**
P250GH (mat. no. 1.0460)	400 bar (5800 psi)	**7MF9401-7AB**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-7AC**
Shut-off valves, form B, DIN 16271		
With test collar, connection shank		
Valve housing material	Max. permissible operating overpressure	
CW614N (CuZn39Pb3) (mat. no. 2.0402)	250 bar (3626 psi)	**7MF9401-7BA**
P250GH (mat. no. 1.0460)	400 bar (5800 psi)	**7MF9401-7BB**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-7BC**
Shut-off valves, form B, DIN 16270		
Without test collar, cutting ring fitting 12 S DIN EN ISO 8434-1		
Valve housing material	Max. permissible operating overpressure	
P250GH (mat. no. 1.0460)	400 bar (5800 psi)	**7MF9401-8AB**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-8AC**
Shut-off valves, form B, DIN 16271		
With test collar, cutting ring fitting 12 S DIN EN ISO 8434-1		
Valve housing material	Max. permissible operating overpressure	
P250GH (mat. no. 1.0460)	400 bar (5800 psi)	**7MF9401-8BB**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-8BC**
Double shut-off valves, form B, DIN 16272		
With test collar, connection shank, without certificate		
Valve housing material	Max. permissible operating overpressure	
CW614N (CuZn39Pb3) (mat. no. 2.0402)	250 bar (3626 psi)	**7MF9401-7DA**
P250GH (mat. no. 1.0460)	400 bar (5800 psi)	**7MF9401-7DB**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-7DC**
Double shut-off valves, form B, DIN 16272		
With test collar, cutting ring fitting 12 S DIN EN ISO 8434-1		
Valve housing material	Max. permissible operating overpressure	
P250GH (mat. no. 1.0460)	400 bar (5800 psi)	**7MF9401-8DB**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-8DC**
Certificates		
A material inspection certificate according to EN 10204-3.1 that can be called up online is provided for all shut-off valves.		

Measuring instrument holders, see under "Accessories for shut-off valves and double shut-off valves".

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Characteristic curves



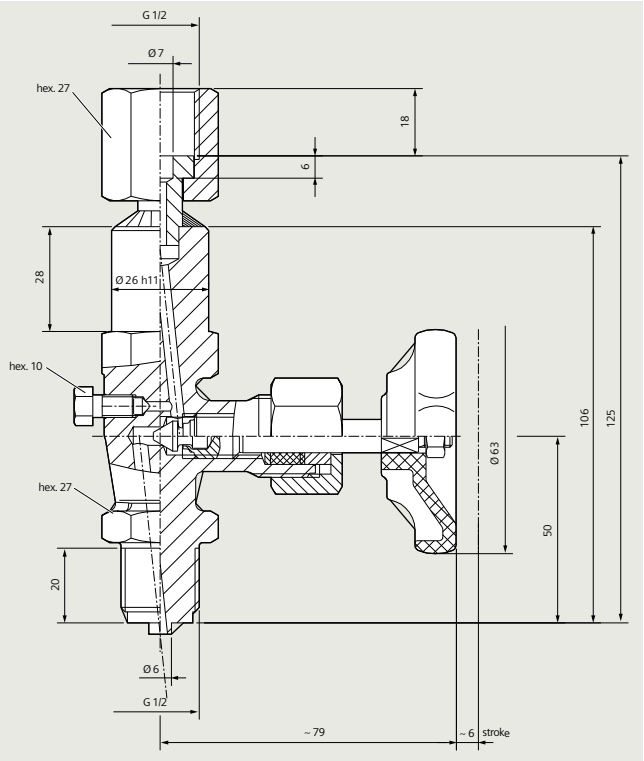
Steel or stainless steel version
400 bar (5800 psi) at 120 °C (248 °F)
350 bar (5076 psi) at 200 °C (392 °F)

Brass version
250 bar (3626 psi) at 120 °C (248 °F)
200 bar (2901 psi) at 200 °C (392 °F)

Permissible operating overpressure depends on the permissible operating temperature

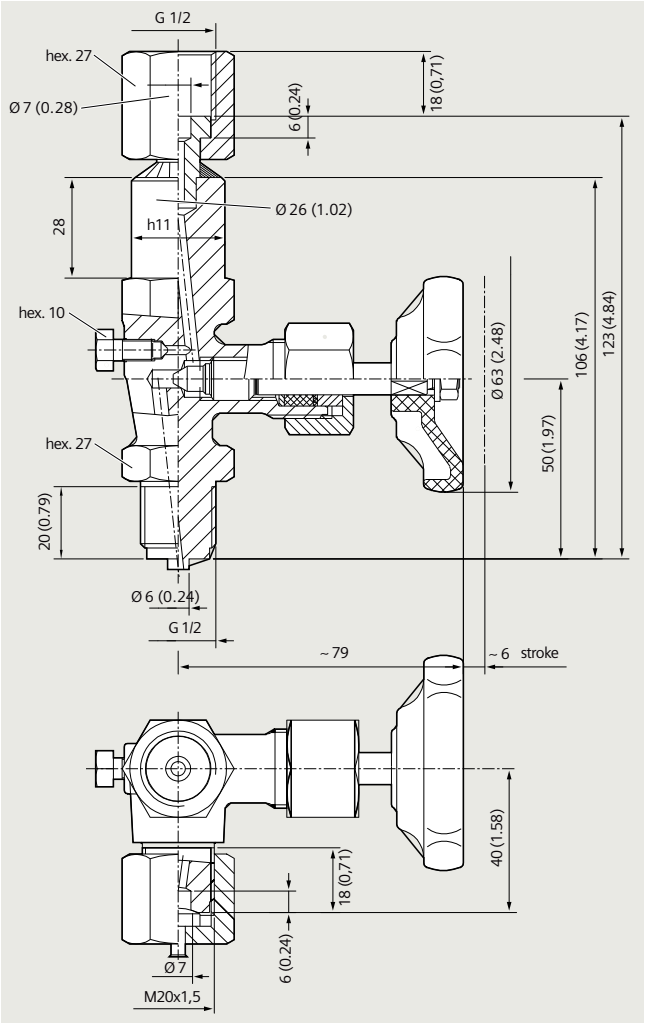
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Dimensional drawings



Shut-off valves, form B, according to DIN 16270 without test collar, with connection shank, 7MF9401-7AA, -7AB and -7AC

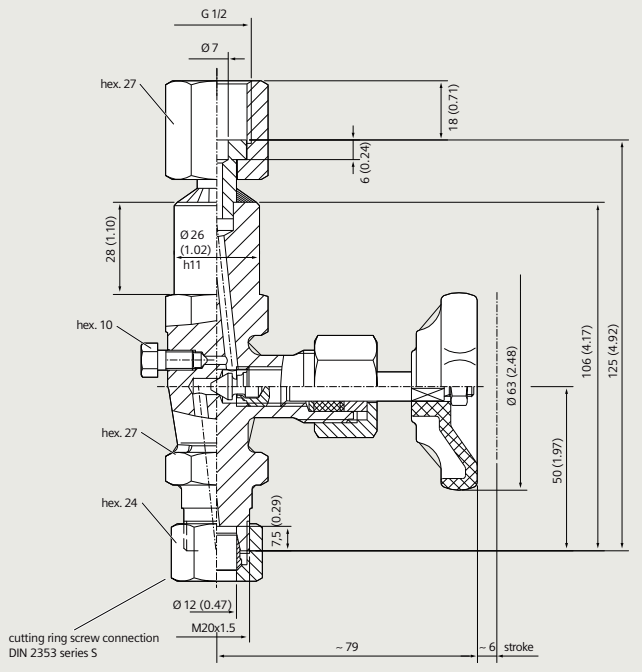
Dimensional drawings (continued)



Shut-off valve, form B, according to DIN 16271, with test collar and connection shank, 7MF9401-7BA, -7BB and -7BC

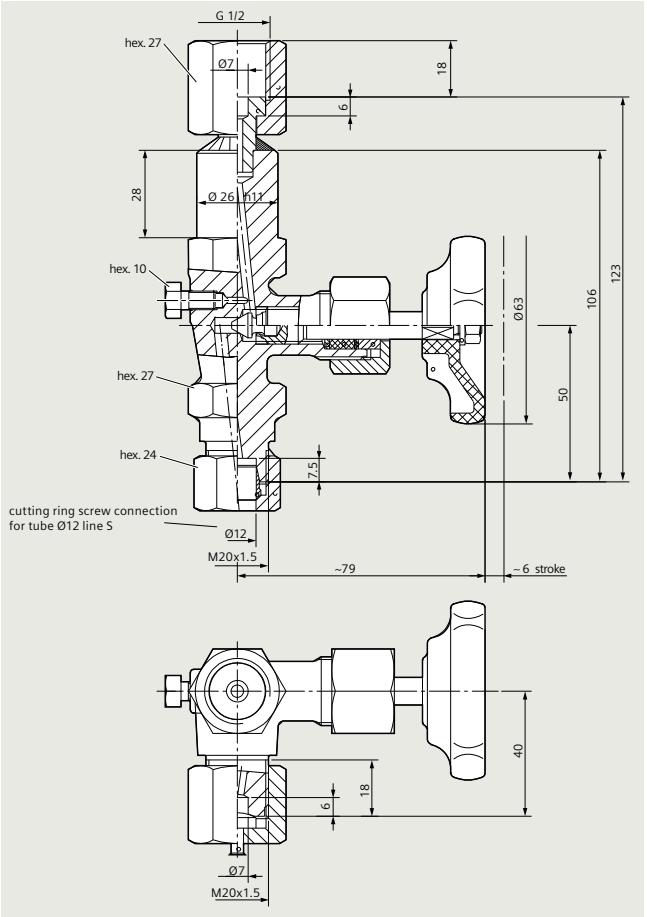
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Dimensional drawings (continued)



Shut-off valve, form B, according to DIN 16270, without test collar, with cutting ring screw connection, 7MF9401-8AB and -8AC

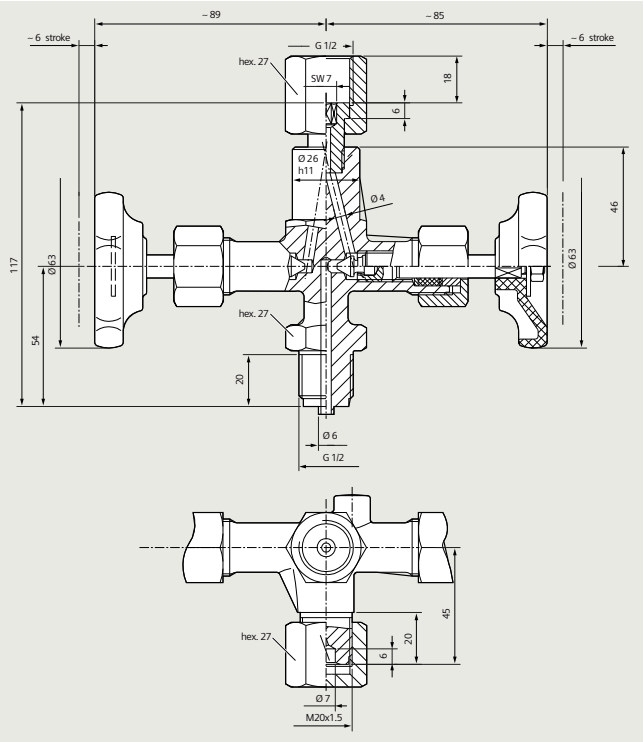
Dimensional drawings (continued)



Shut-off valve, form B, according to DIN 16271 with test collar and cutting ring screw connection, 7MF9401-8BB and -8BC

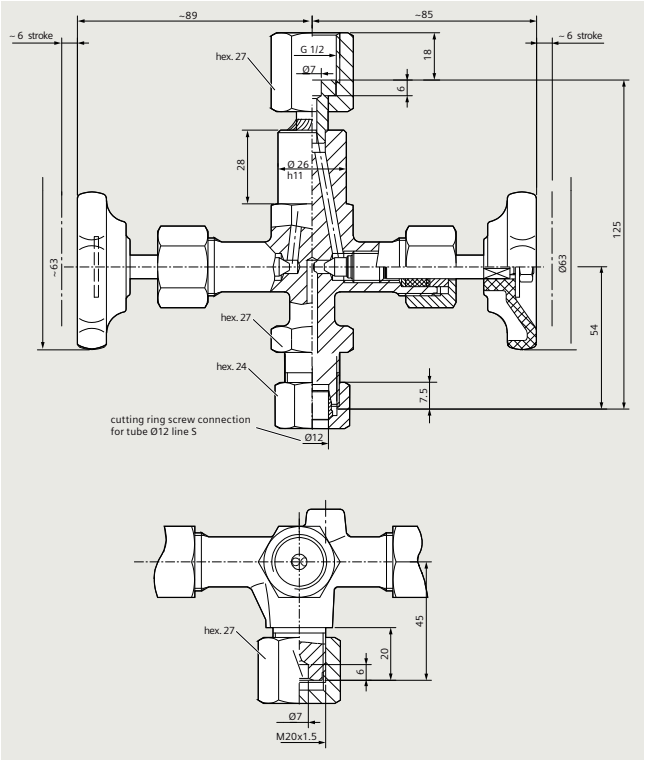
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Dimensional drawings (continued)



Double shut-off valve, form B, according to DIN 16272, with test collar and connection shank, 7MF9401-7DA, -7DB and -7DC

Dimensional drawings (continued)



Double shut-off valve, form B, according to DIN 16272, with test collar and cutting ring screw connection, 7MF9401-8DB and -8DC

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Overview

The double shut-off valves DN 5 are suitable for pressure measuring devices and pressure transmitters and available in 5 versions:

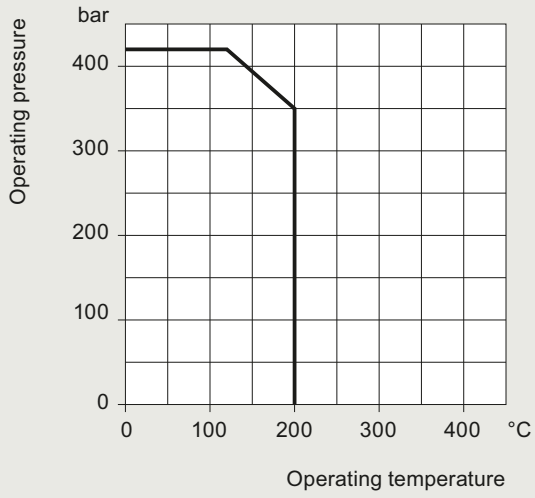
- Sleeve-nipple connection
- Sleeve-sleeve
- Sleeve-collar
- Collar-collar
- Collar-sleeve

The valve packing material is PTFE.

Selection and ordering data

DN 5 shut-off valves	Article No.
Material: X 6 CrNiMoTi 17 13 2 (mat. no. 1.4404/316L), max. permissible operating overpressure 420 bar (6092 psi)	
• Sleeve-sleeve	**7MF9011-3HA**
DN 5 double shut-off valves	
Material: X 6 CrNiMoTi 17 13 2 (mat. no. 1.4404/316L), max. permissible operating overpressure 420 bar (6092 psi)	
• Sleeve-nipple connection	**7MF9011-4EA**
• Sleeve-sleeve	**7MF9011-4HA**
• Sleeve-collar	**7MF9011-4FA**
• Collar-collar	**7MF9011-4GA**
• Collar-sleeve	**7MF9011-4KA**
Options	**Order code**
Add "**-Z**" to article number and specify order code.	
Oil-free and grease-free cleaned version for oxygen applications, suitable for hydrogen applications in ventilated environment. Max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)	**S12**
Suitable for hydrogen applications in ventilated environment	**S22**
Certificates	
A material inspection certificate according to EN 10204-3.1 & NACE MR-0175 that can be called up online is provided for all shut-off valves.	

Characteristic curves

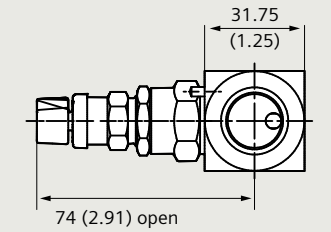


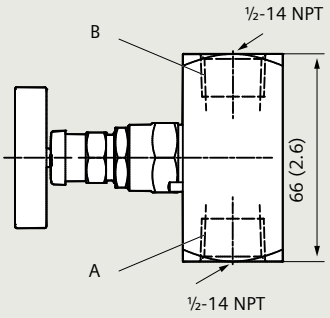
420 bar (6092 psi) at 120 °C (248 °F)
350 bar (5076 psi) at 200 °C (392 °F)

Permissible operating overpressure depends on the permissible operating temperature

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Dimensional drawings



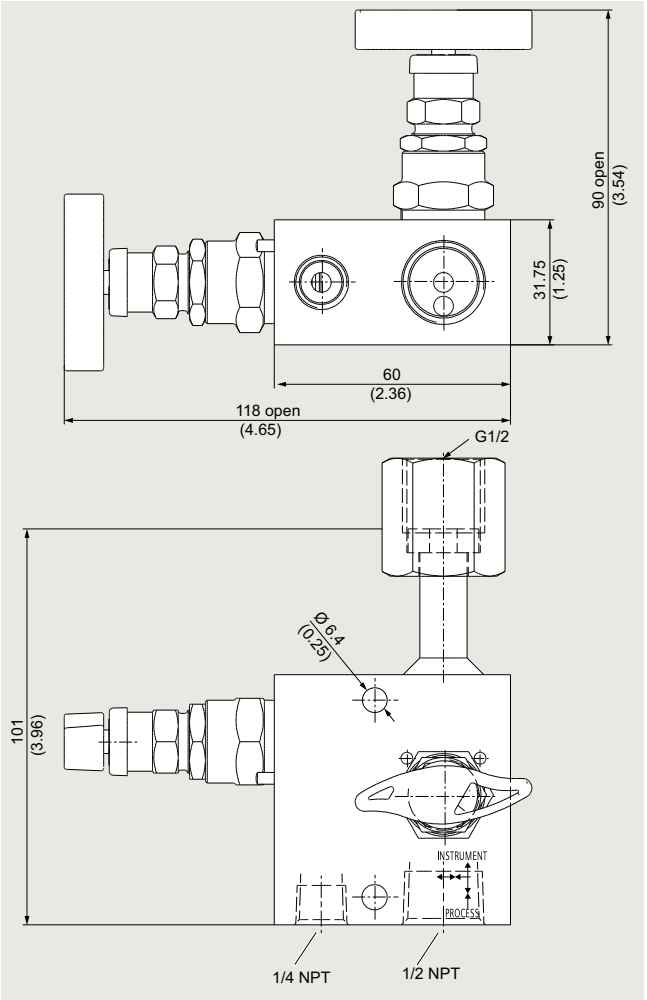


A Connection on device side: ½-14 NPT

B Connection on measurement side: ½-14 NPT

Shut-off valve DN 5 (sleeve-sleeve) 7MF9011-3HA, dimensions in mm (inch)

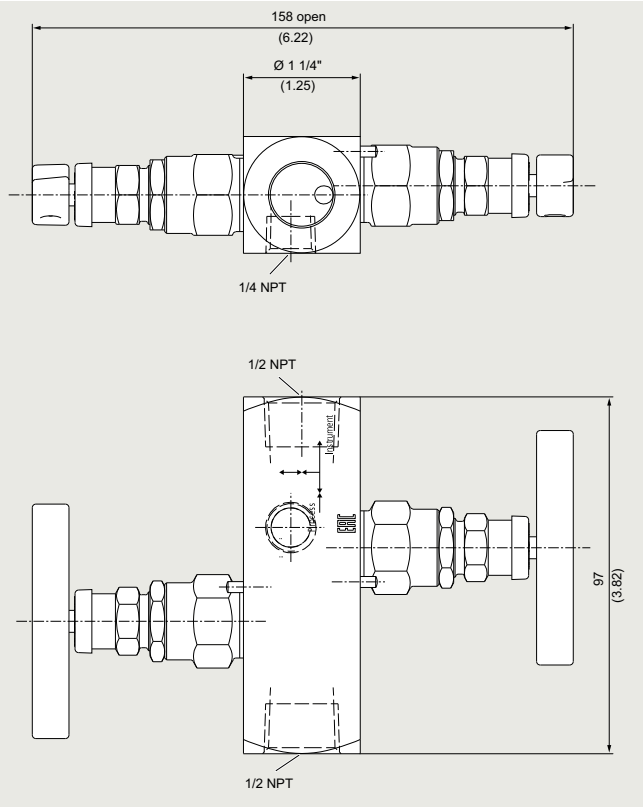
Dimensional drawings (continued)



Double shut-off valve DN5 (sleeve-nipple connection), 7MF9011-4EA, dimensions in mm

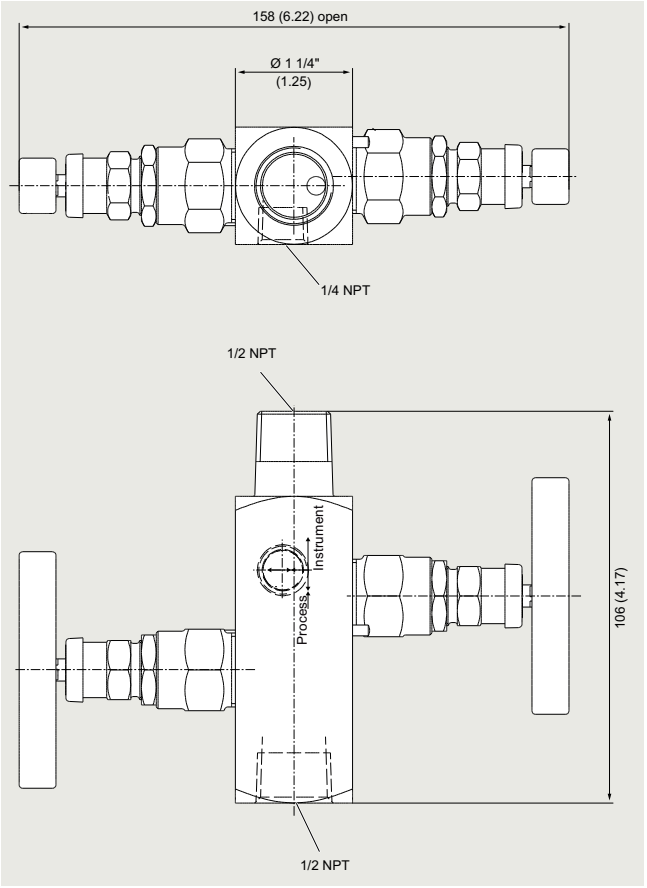
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Dimensional drawings (continued)



Double shut-off valve DN 5 (sleeve-sleeve) 7MF9011-4HA, dimensions in mm (inch)

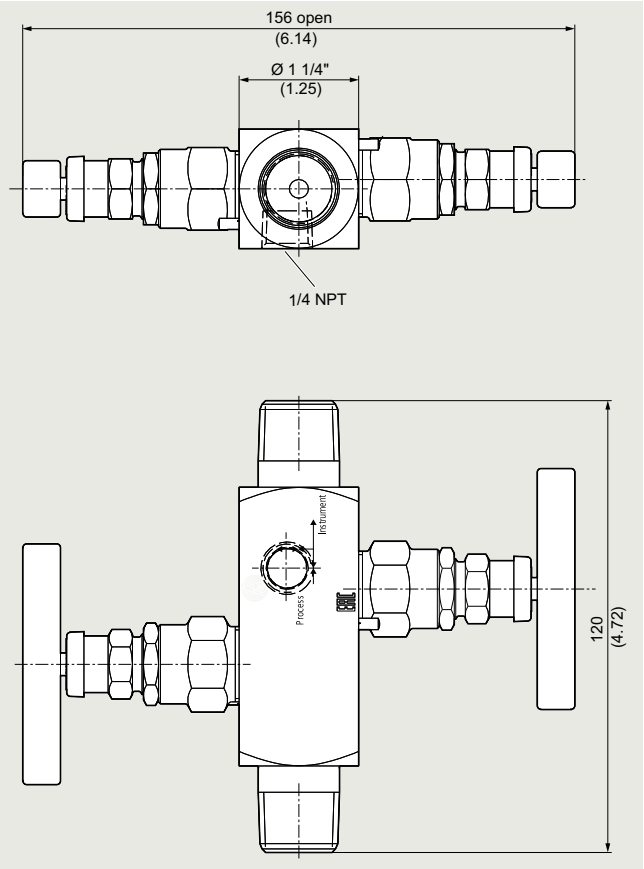
Dimensional drawings (continued)



Double shut-off valve DN 5 (sleeve-collar) 7MF9011-4FA, dimensions in mm (inch)

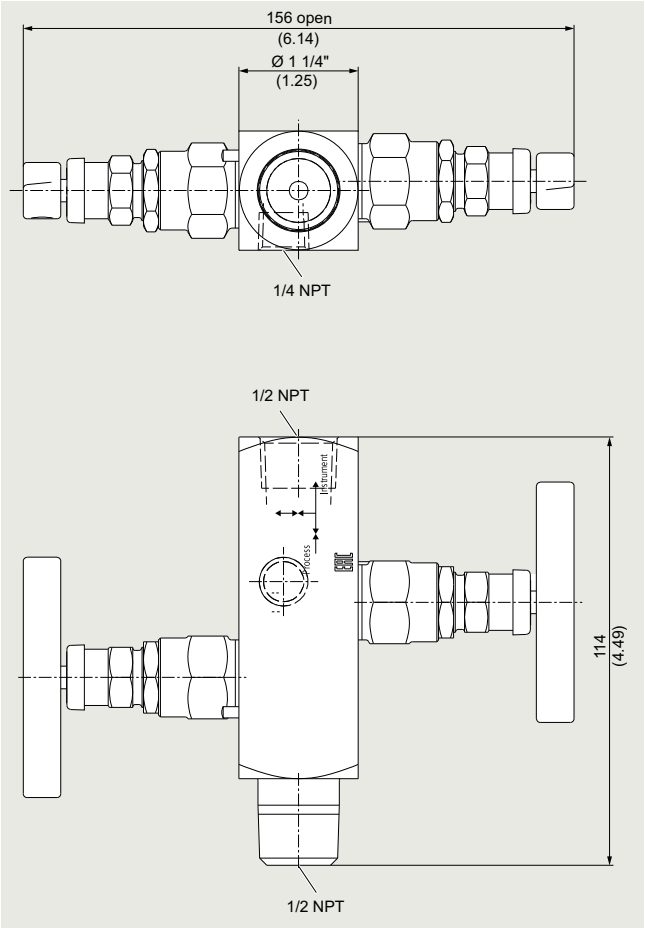
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Dimensional drawings (continued)



Double shut-off valve DN 5 (collar-collar) 7MF9011-4GA, dimensions in mm (inch)

Dimensional drawings (continued)



Double shut-off valve DN 5 (collar-sleeve) 7MF9011-4KA, dimensions in mm (inch)

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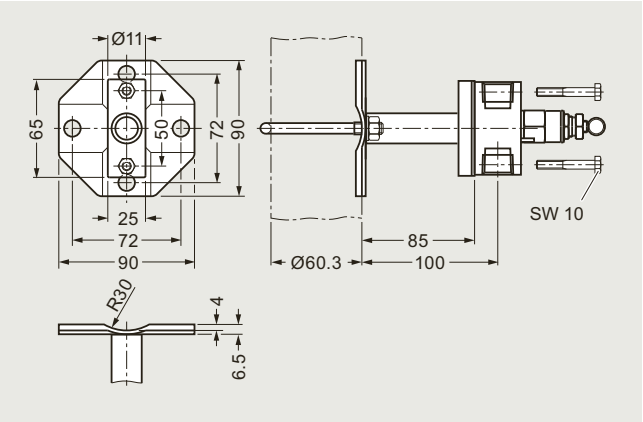
Overview

The mounting kit is suitable for the double shut-off valves 7MF9011-4.A and for wall, rack and pipe mounting.

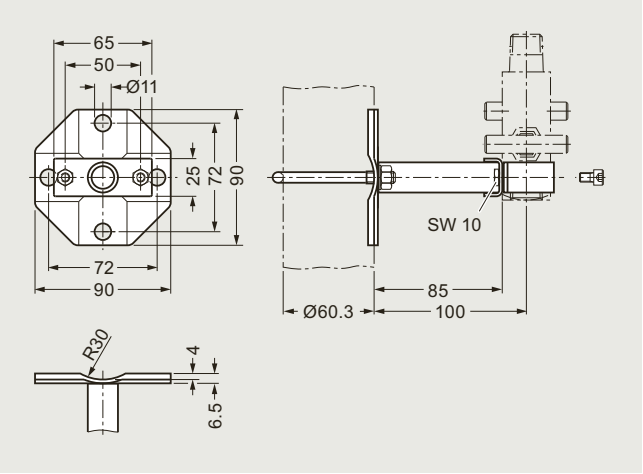
Selection and ordering data

Mounting kit for shut-off valves	Article No.
7MF9011-4DA and -4EA Made of stainless steel, scope of delivery: 1 × mounting brackets 2 × hexagon head screws M6x40 1 × mounting bracket 2 × washers 8.4 according to DIN 125 2 × hexagon nut M8 according to EN 24032	**7MF9011-8AB**
7MF9011-4FA, -4GA, 4HA, -4KA and -3HA Made of stainless steel, scope of delivery: 1 × mounting brackets 2 × hexagon head screws M6x10 1 × mounting bracket 2 × washers 8.4 according to DIN 125 2 × hexagon nut M8 according to EN 24032	**7MF9011-8AC**

Dimensional drawings



Mounting bracket (7MF9011-8AB) for shut-off valves 7MF9011-4DA and 7MF9011-4EA for wall, rack or pipe mounting, dimensions in mm



Mounting bracket (7MF9011-8AC) for shut-off valves 7MF9011-4FA and 7MF9011-4GA for wall, rack or pipe mounting, dimensions in mm

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Overview

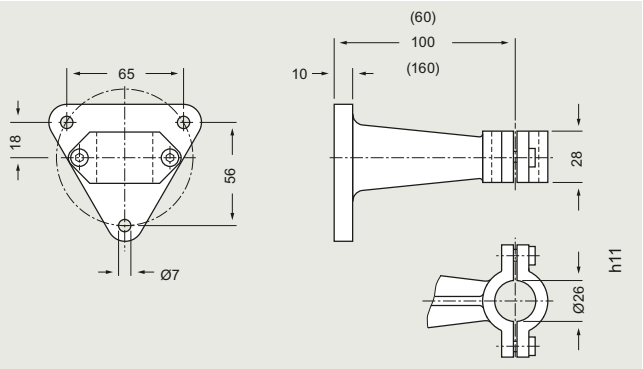
The measuring instrument holders are required to mount the following devices:

- Pressure measuring devices with threaded connection underneath
- Shut-off valves according to DIN 16270, DIN 16271 and DIN 16272 (7MF9401-7.. and 7MF9401-8..)

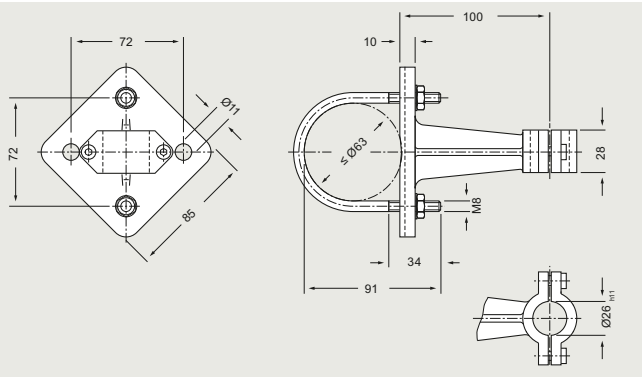
Selection and ordering data

	Article No.
Measuring instrument holder, form H, DIN 16281 (E.g. for pressure gauge) Out of aluminum alloy, painted black, for **wall mounting**, removable holder lid	
• Projection length 60 mm	**M56340-A0046**
• Projection length 100 mm	**M56340-A0047**
Measuring instrument holder, form A, DIN 16281 (E.g. for transmitter) Out of malleable cast iron, zinc-plated and primed; for **wall mounting**, fastened to a rack or mounting rail (horizontal/vertical); removable holder lid	**M56340-A0053**
Measuring instrument holder, form A, DIN 16281 (E.g. for transmitter) Out of malleable cast iron, zinc-plated and primed; with pipe collar for **wall and pipe mounting** (horizontal/vertical) removable holder lid	**M56340-A0079**

Dimensional drawings



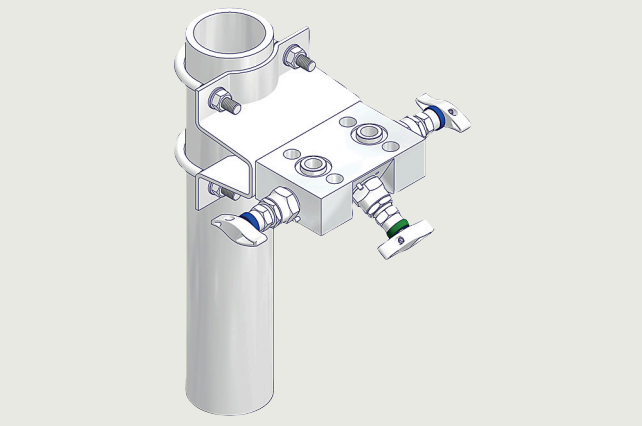
Measuring instrument holder form H for wall mounting M56340-A0046/-A0047, dimensions in mm

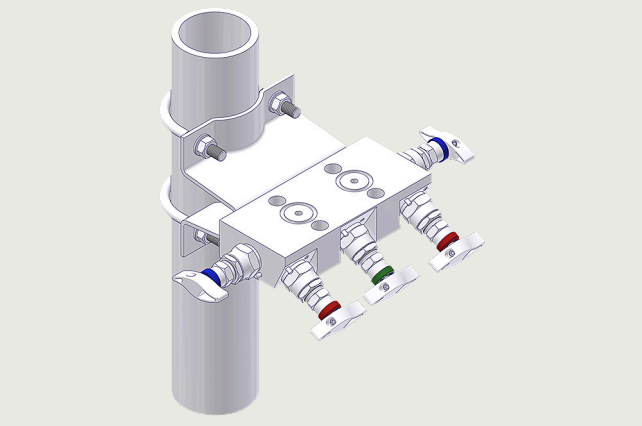


Measuring instrument holder form A for wall and pipe mounting M56340-A0053/-A0079, dimensions in mm

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Overview





The shut-off valves for differential pressure transmitters and valve manifold are used to shut off and depressurize the medium and differential pressure lines, as well as to check the zero point and the connected differential pressure transmitter.

The 2-spindle, 3-spindle, and 5-spindle valve manifolds 7MF9411-5.. are suitable for pressure transmitters for gauge, absolute, and differential pressure, whereby the 2-spindle and 5-spindle valve manifolds also allow depressurizing on the transmitter side and control of the characteristic curve of the pressure transmitter.

Benefits

- Max. operating overpressure 420 bar (6092 psi)
- Each available in version for oxygen

Application

The DN 5 spindle valve manifolds are designed for liquids and gases. A version for oxygen is also available on request.

Design

All versions of the valve manifolds have a process connection ½-14 NPT. The connection for the pressure transmitter is always designed as a flange connection according to IEC 61518/EN 61518, form B. The 2-spindle and the 5-spindle valve manifolds have a vent and test connection ¼-18 NPT in addition.

The valves have an external spindle thread.

Materials used

Component	Material	Mat. no.
Enclosure	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Monitoring of pressure transmitter zero point

Additional functions of the 2-spindle or 5-spindle valve manifolds via the venting and test connection:

- Venting on transmitter side
- Monitoring of the pressure transmitter characteristic curve

Note: Flange connections according to DIN 19213 with M10 screws only permissible up to PN160 (2321 psi).

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Selection and ordering data

DN 5 valve manifolds	Article No. 7MF9411-									●	●	A
Click the article number for online configuration in the PIA Life Cycle Portal.												
For liquids and gases, for flanging to pressure transmitter for absolute and differential pressure, max. operating overpressure 420 bar, (order accessory kit using order code)												
• 2-spindle valve manifold										5	A	
• 3-spindle valve manifold										5	B	
• 5-spindle valve manifold										5	C	

Accessory kit according to EN Add "-Z" to article number and specify order code.	Without cleaning	With cleaning for operation with oxygen and hydrogen
For valve manifold 7MF9411-5A.		
2 × screws $^{7}/_{16}$-20 UNF × 1¾ inch according to ASME B18.2.1; chromated steel 1 × flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K35** **7MF9411-7DB**	**K32** **7MF9411-7JB**
2 × screws $^{7}/_{16}$-20 UNF × 1¾ inch according to ASME B18.2.1; **stainless steel** 1 × flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K45** **7MF9411-7DC**	**K42** **7MF9411-7JC**
For valve manifolds 7MF9411-5B. and -5C.		
4 × screws $^{7}/_{16}$-20 UNF × 1¾ inch according to ASME B18.2.1; chromated steel 2 × flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K36** **7MF9411-5DB**	**K39** **7MF9411-5JB**
4 × screws $^{7}/_{16}$-20 UNF × 1¾ inch according to ASME B18.2.1; **stainless steel** 2 × flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K46** **7MF9411-5DC**	**K49** **7MF9411-5JC**

Accessory kit according to DIN[2]	Without cleaning	With cleaning for operation with oxygen and hydrogen
For valve manifold 7MF9411-5A.		
2 × screws M10×45 according to DIN EN 24014; chromated steel 2 × washers Ø 10.5 mm according to DIN 125; 1 × flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K15** **7MF9411-7BB**	**K12** **7MF9411-7HB**
2 × screws M10×45 according to DIN EN 24014; **stainless steel** 2 × washers Ø 10.5 mm according to DIN 125, **stainless steel**; 1 × flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K25** **7MF9411-7BC**	**K22** **7MF9411-7HC**
For valve manifolds 7MF9411-5B. and -5C.		
4 × screws M10×45 according to DIN EN 24014; chromated steel 4 × washers Ø 10.5 mm according to DIN 125; 2 × flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F); flange connection with M10 screws only permissible up to PN 160.	**K16** **7MF9411-6BB**	**K19** **7MF9411-6HB**
4 × screws M10×45 according to	**K26**	**K29**

Accessory kit according to DIN[2]	Without cleaning	With cleaning for operation with oxygen and hydrogen
DIN EN 24014; **stainless steel** 4 × washers Ø 10.5 mm according to DIN 125, **stainless steel**; 2 × flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F); flange connection with M10 screws only permissible up to PN 160.	**7MF9411-6BC**	**7MF9411-6HC**

Options[1]	Order code	Article No.
Add "**-Z**" to article number and specify order code.		
Mounting plate		
For valve manifold, made of zinc-plated sheet steel		
• For **wall mounting** or fastening on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 × mounting plate with fixing screws for mounting on valve manifold	**M11**	**7MF9006-6EA**
• For **pipe mounting**, weight 0.7 kg Scope of delivery: 1 × mounting plate M11, 2 × pipe collar with nuts and washers (for pipe with max. Ø 60.3 mm) and fixing screws for mounting on valve manifold	**M12**	**7MF9006-6GA**
For valve manifold, made of **stainless steel 316L**		
• For **wall mounting** or fastening on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 × mounting plate with fixing screws for mounting on valve manifold	**M21**	**7MF9006-6EC**
• For **pipe mounting**, weight 0.7 kg Scope of delivery: 1 × mounting plate M21, 2 × pipe collar with nuts and washers (for pipe with max. Ø 60.3 mm)	**M22**	**7MF9006-6GC**
Options for operation with oxygen and hydrogen		
Oil-free and grease-free cleaned version for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)		
• For 7MF9411-5A.	**S12**	
• For 7MF9411-5B.	**S13**	
• For 7MF9411-5C.	**S14**	
Suitable for hydrogen applications in a ventilated atmosphere (incl. certificate according to EN 10204-3.1)		
• For 2-spindle valve manifold 7MF9411-5A.	**S22**	
• For 3-spindle valve manifold 7MF9411-5B.	**S23**	
• For 5-spindle valve manifold 7MF9411-5C.	**S24**	
Certificates		
A material inspection certificate according to EN 10204-3.1 & NACE MR-0175 that can be called up online is provided for all shut-off valves.		

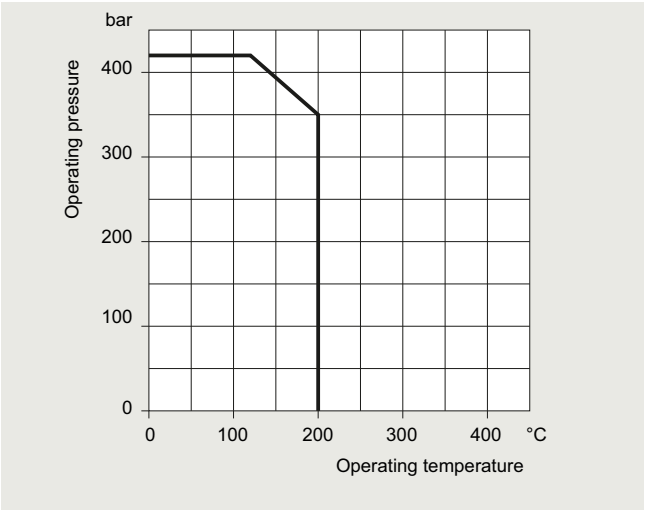
[1] If accessory kit or mounting brackets are ordered together with the valve manifolds, please use order code; otherwise, use the article number.
[2] Flange connections according to DIN 19213 only permissible up to PN 160 (2321 psi).

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Accessories

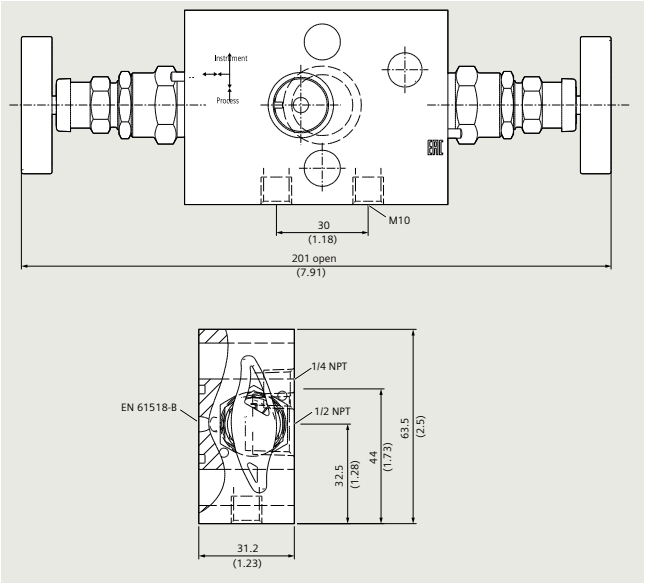
See Selection and ordering data

Characteristic curves

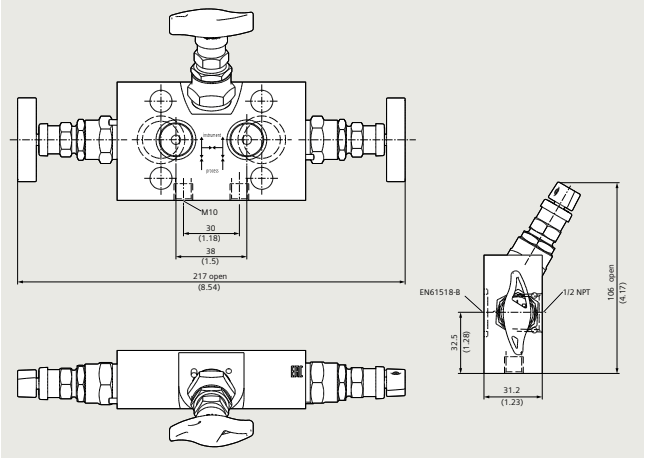


DN 5 (7MF9411-5..) valve manifolds, permissible operating overpressure depends on the permissible operating temperature

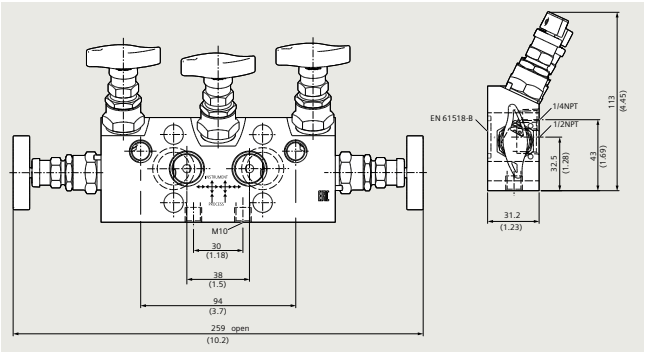
Dimensional drawings



2-spindle valve manifold DN 5 (7MF9411-5A.), dimensions in mm



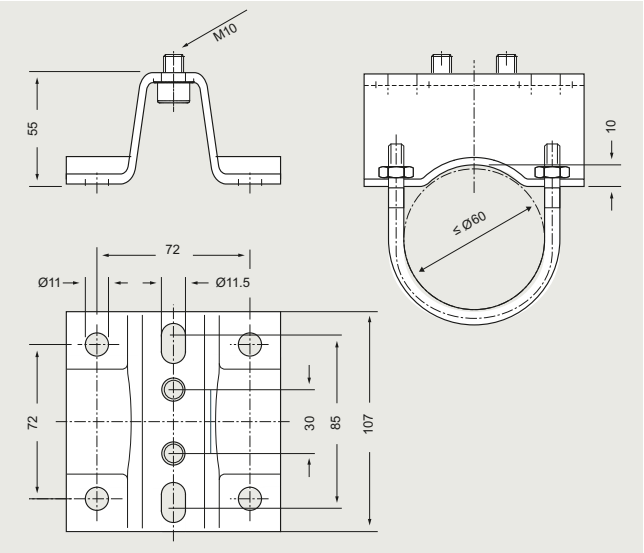
3-spindle valve manifold DN 5 (7MF9411-5B.), dimensions in mm



5-spindle valve manifold DN 5 (7MF9411-5C.), dimensions in mm

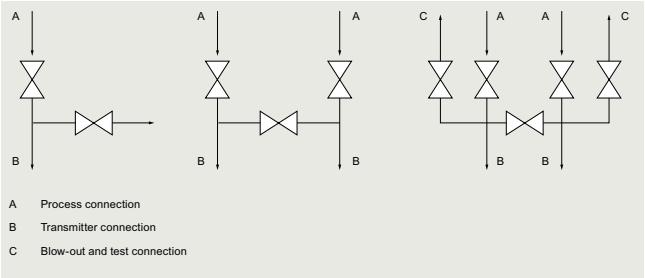
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Dimensional drawings (continued)



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

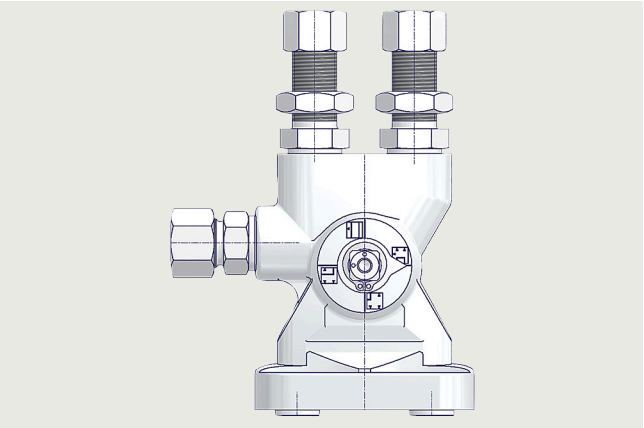
Circuit diagrams



DN 5 2-spindle, 3-spindle and 5-spindle valve manifolds, connections

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Overview



The PN 100 multiway cock (1450 psi) can be flanged to pressure transmitters for differential pressure.

Benefits

- Version for corrosive liquids, gases and vapors available
- Robust design
- Oil- and grease-free variant possible
- One-hand operation

Application

The PN 100 (1450 psi) multiway cock is available in versions for corrosive and non-corrosive liquids, gases and vapors.

Design

The multiway cock can be flanged with four screws to pressure transmitters for differential pressure.

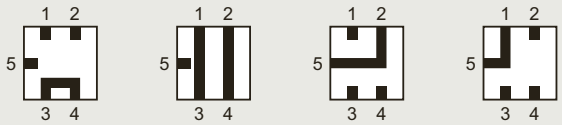
The PN 100 (1450 psi) has 2 process connections and one blow-out connection. A steel version of the multiway cock is available for non-corrosive media, and a stainless steel version for corrosive media. The enclosure is forged in one piece. The switching lever is removable.

Sealing can be improved during operation.

Note: An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter:

Function

- Shutting off the differential pressure lines
- Blowing out differential pressure lines
- Checking the zero point of the pressure transmitter.



Cock settings, the symbols are on the cock

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Selection and ordering data

PN 100 multiway cock (1450 psi)	Article No. 7MF9004-												
Click the article number for online configuration in the PIA Life Cycle Portal.													
For flanging to pressure transmitter, weight 2.5 kg (without accessory kit), without certificate													
For water and non-corrosive gases and vapors									1	P			
For corrosive liquids, gases and vapors									1	Q			

Accessories	
Factory certificate EN 10204-2.2	7MF9000-8AB
Material inspection certificate to EN 10204-3.1	7MF9000-8AD

Options[1]	Order code	Article No.
Add "**-Z**" to article number and specify order code.		
Accessory kit according to EN (Required for flanging, weight 0.2 kg) 4 × screws $^{7}/_{16}$-20 UNF × 1 inch according to ASME B18.2.1; chromated 2 × flat gaskets made of PTFE, max. permissible 80 °C (176 °F)	**L31**	**7MF9004-5CC**
Accessory kit according to DIN (Required for flanging, weight 0.2 kg) 4 × screws M10×25 according to EN 24017; chromated steel 4 × washers Ø 10.5 mm according to DIN 125;2 × flat gaskets made of PTFE, max. permissible 80 °C (176 °F)		
• Standard design	**L11**	**7MF9004-6AD**
• Version for oxygen (in connection with order code S11)	**L15**	**7MF9004-6AE**

Options[1]	Order code	Article No.
Multiway cock in oil-free and grease-free design Oil-free and grease-free cleaned version for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F), BAM-tested lubricant, sealing socket suitable for oxygen (only for Article No. 7MF9004-1Q. -Z)	**S11**	
Mounting brackets Required **for wall mounting** or for fastening on rack (72 mm grid); made of electrogalvanized sheet steel, weight 0.85 kg	**M13**	**7MF9004-6AA**
Certification according to NACE MR-0175 Including inspection certificate 3.1 according to EN 10204 (only for version 7MF9004-1QA)	**D07**	

[1] If accessory kit or mounting brackets are ordered together with the multiway cock, please use order code; otherwise, use the article number.

Accessories

Accessory set for PN 100 multiway cock

- L31: 4 screws $^{7}/_{16}$-20 UNF × 1 inch, 2 flat sealing rings
- L11: 4 screws M10x25 according to EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10×25 according to DIN EN 24017, 4 washers, 2 flat sealing rings

Washers Ø 10.5 according to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

Multiway cock in oil-free and grease-free design

- S11: Cleaned to remove all oil and grease for oxygen applications (only for corrosive liquids, gases, and vapors (7MF9004-1Q.)): Max. PN 63 (914 psi) (in place of PN 100 (1450 psi)), BAM-certified lubricant, sealing socket suitable for use with oxygen

Mounting brackets

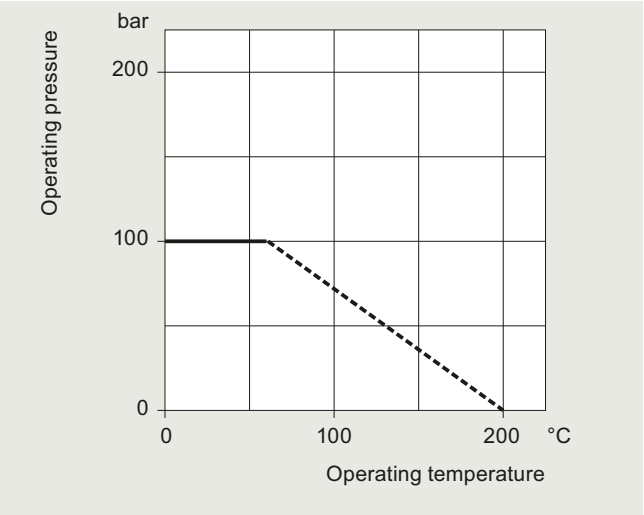
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

Technical specifications

PN 100 multiway cocks		
Measured medium	**Water, non-corrosive liquids and gases**	**Corrosive liquids, gases and vapors**
Material	P250GH, mat. no.: 1.0460	X 6 CrNiMoTi 17 12 2, mat. no. 1.4571/316Ti
Connections	Steel, for pipe Ø 12 mm, schedule L	Stainless steel, for pipe Ø 12 mm, schedule L
• Process connection	2 bulkhead glands	
• Connection for blowing out	Cutting ring fitting	
Max. permissible working temperature	200 °C (392 °F)	
Max. permissible operating overpressure	100 bar (1450 psi) (up to max. 60 °C (140 °F))	
Weight	2.5 kg	

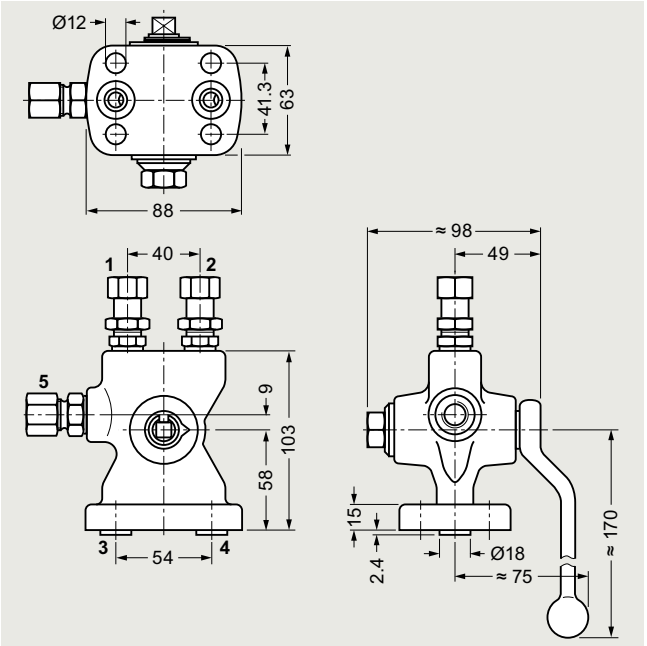
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Characteristic curves



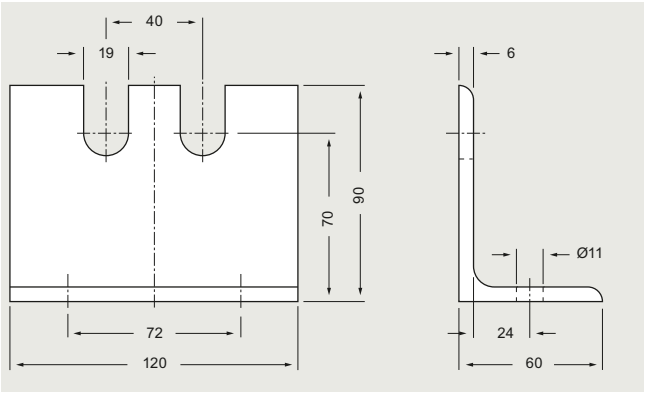
PN 100 multiway cock (1450 psi), permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



1 and 2 Process connections
3 and 4 Transmitter connections (IEC 61518, form A)
5 Connections for blowing out

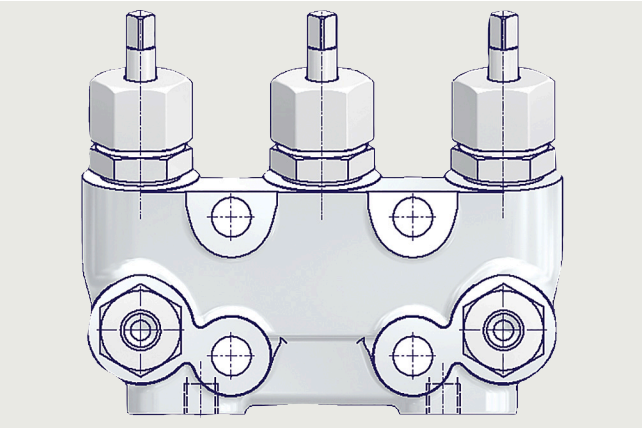
Multiway cock 7MF9004-1P. for flanging to pressure transmitter for differential pressure, dimensions in mm

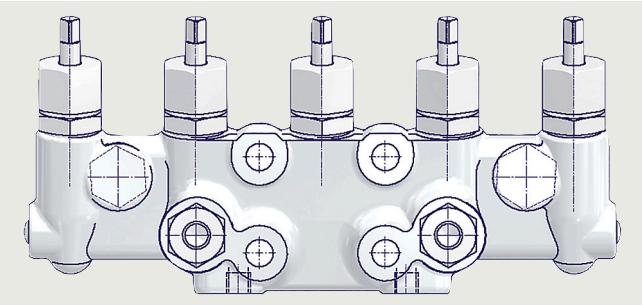


Mounting bracket 7MF9004-6AA (M13), dimensions in mm

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Overview





The DN 5 (7MF9410-1../-3..) 3-way and 5-way valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero point.

The 5-way valve manifold also enables blowing out of differential pressure lines.

Benefits

- Available for corrosive and non-corrosive liquids and gases
- Max. working pressure 420 bar (6092 psi), with version for oxygen max. 100 bar (1450 psi)

Application

The 3-way and 5-way valve manifolds are available in versions for corrosive and non-corrosive liquids and gases.

Wall mounting, securing on rack and pipe mounting are possible with the appropriate mounting plate.

Design

The process connection of the 3-way and 5-way valve manifolds is a pipe union with cutting ring.

Both valve manifolds have 2 flange connections for connecting a pressure transmitter.

The 5-way valve manifold also has 2 blowout connections.

Depending on the version, the valve manifold has 3 or 5 valves, each with an internal spindle thread.

Materials used

	For non-corrosive liquids and gases		For corrosive liquids and gases	
Component	Material	Mat. no.	Material	Mat. no.
Enclosure	P250GH	1.0460	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Head parts	C 35	1.0501		
Spindles	X 12 CrMoS 17	1.4104		
Cones	X 35 CrMo 17 hardened and tempered	1.4122		
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/316Ti		
Packings	PTFE	-	PTFE	-

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Function

- Shutting off the differential pressure lines
- Monitoring of transmitter zero point
- The 5-way valve manifold also enables blowing out of differential pressure lines.

Selection and ordering data

DN 5 3-way valve manifold	Article No. 7MF9410-	●	●	A
Click the article number for online configuration in the PIA Life Cycle Portal.				
For flanging to pressure transmitter for differential pressure, process connection: Pipe union with cutting ring, max. operating overpressure 420 bar (6092 psi), weight 2.9 kg (order accessory kit and mounting plate using order code)				
• For non-corrosive liquids and gases		1	E	
• For corrosive liquids and gases		1	F	
DN 5 5-way valve manifold				
Click the article number for online configuration in the PIA Life Cycle Portal.				
For flanging to pressure transmitter for differential pressure, process connection: Pipe union with cutting ring, max. operating overpressure 420 bar (6092 psi), weight 4.4 kg (order accessory kit and mounting plate using order code)				
• For non-corrosive liquids and gases		3	E	
• For corrosive liquids and gases		3	F	

Certificates
A material inspection certificate according to EN 10204-3.1 that can be called up online is provided for all shut-off valves.

Options[1]	Order code	Article No.
Add "**-Z**" to article number and specify order code.		
Accessory kit according to EN (Required for flanging, weight 0.2 kg)		
4 × screws $^{7}/_{16}$ -20 UNF × $2^{1}/_{8}$ inches according to ASME B18.2.1; chromated steel 2 × flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**B31**	**7MF9010-5CC**
4 × screws $^{7}/_{16}$ -20 UNF × $2^{1}/_{8}$ inches according to ASME B18.2.1; chromated steel 2 × O-rings according to DIN 3771, 20 × 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	**B34**	**7MF9410-5CA**
Accessory kit according to DIN[2] (Required for flanging, weight 0.2 kg) 4 × screws M10×55 according to EN 24014; chromated steel 4 × washers Ø 10.5 mm according to DIN 125; 2 × flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)		
• Standard design	**B11**	**7MF9010-6AD**
• Version for oxygen	**B15**	**7MF9010-6AE**
4 × screws M10×55 according to EN 24014; chromated steel 4 × washers Ø 10.5 mm according to DIN 125; 2 × O-rings according to DIN 3771, 20 × 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	**B16**	**7MF9010-6CC**
Mounting plate For valve manifold, made of zinc-plated sheet steel		

Options[1]	Order code	Article No.
For **wall mounting** or for fastening on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 × mounting plate with bolts for mounting on valve manifold	**M11**	**7MF9006-6EA**
For **pipe mounting**, weight 0.7 kg Scope of delivery: 1 × mounting plate M11, 2 × pipe collars with nuts and washers (for pipes with max. Ø 60.3 mm)	**M12**	**7MF9006-6GA**
Options for operation with oxygen Oil-free and grease-free cleaned version for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)		
For 7MF9410-1F.	**S13**	
For 7MF9410-3F.	**S14**	

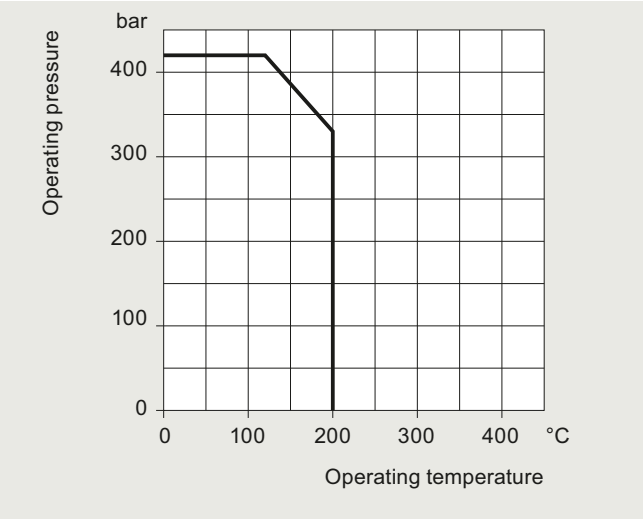
[1] If accessory kit or mounting brackets are ordered together with the valve manifolds, please use order code; otherwise, use the article number.
[2] Flange connections according to DIN 9213 only permissible up to PN 160 (2321 psi)!

Accessories

See Selection and ordering data

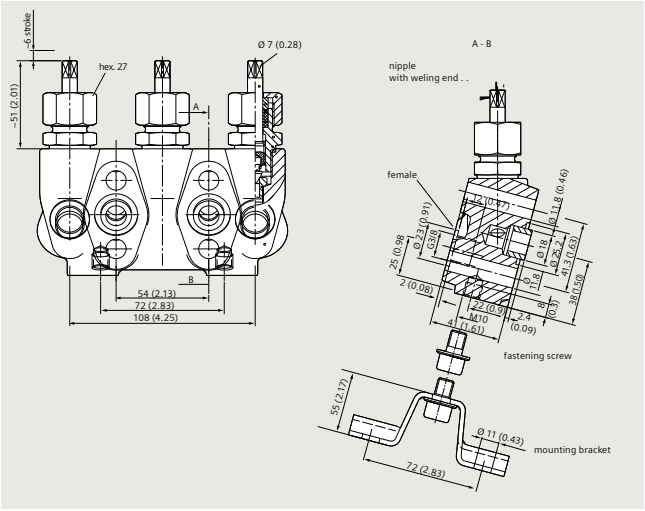
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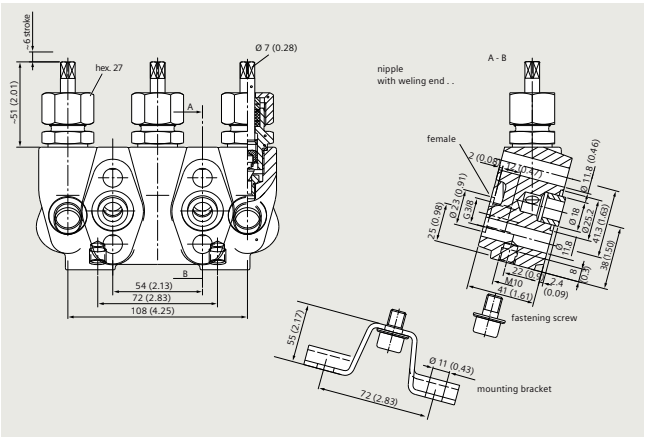
Characteristic curves



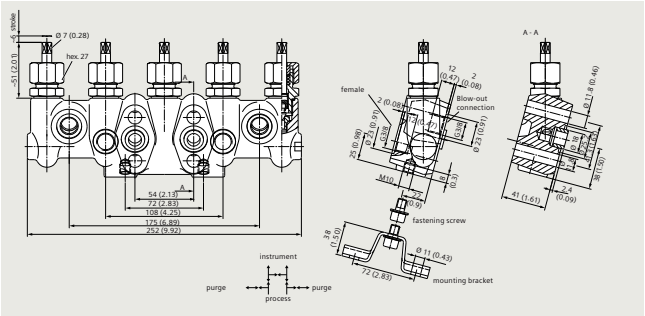
Permissible operating overpressure depends on the permissible operating temperature

Dimensional drawings



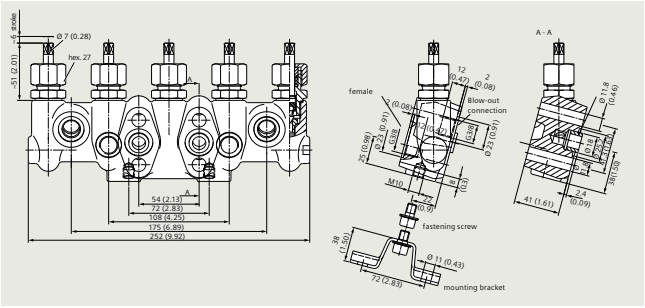


3-way valve manifold DN 5 (7MF9410-1..), dimensions in mm

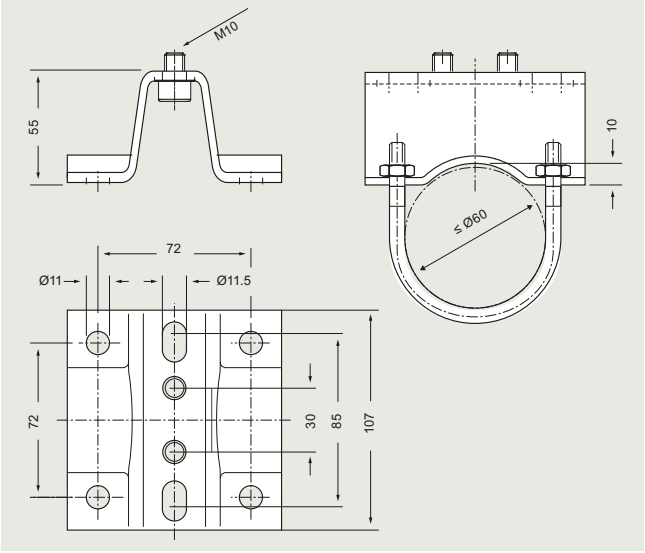


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Dimensional drawings (continued)

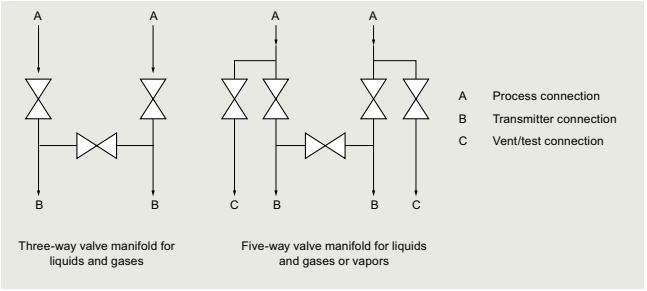


5-way valve manifold DN 5 (7MF9410-3..), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

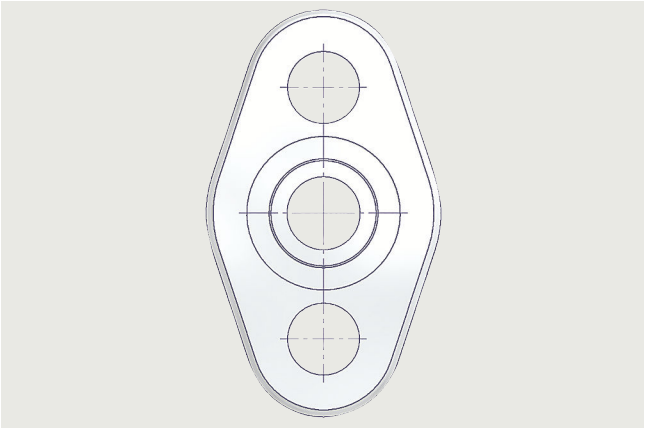
Circuit diagrams



3-way and 5-way valve manifolds, schematic diagram

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Overview



The Accessories category includes a wide variety of mechanical accessories which may be necessary for adapting to the prevailing process conditions.

The 7MF9408-2C. oval flange for pressure transmitters for absolute pressure and differential pressure has a ½-14 NPT internal thread and is designed for a max. operating overpressure of 420 bar (6092 psi).

Selection and ordering data

Oval flange	Article No.
With internal thread ½-14 NPT, max. working gauge pressure 420 bar (6092 psi), flange connection according to IEC 61518/DIN EN 61518, form A, scope of delivery 1 unit	
Material	
P250GH, mat. no. 1.0460	**7MF9408-2CE**
X 2 CrNiMo 17 13 2, mat. no. 1.4404/316L	**7MF9408-2CL**

Accessories	
Factory certificate EN 10204-2.2	**7MF9000-8AB**
Material inspection certificate to EN 10204-3.1	**7MF9000-8AD**

Options[1]	Order code	Article No.
Add "**-Z**" to article number and specify order code.		
Accessory kit according to EN		
2 × screws $^{7}/_{16}$-20 UNF × 1½ inches according to ASME B 18.2.3; chromated steel 1 × flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**E36**	**7MF9408-5DA**
2 × screws $^{7}/_{16}$-20 UNF × 1½ inches according to ASME B 18.2.3; chromated steel 1 × O-ring according to DIN 3771, 20 × 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	**E34**	**7MF9408-5CA**
Accessory kit according to DIN		
2 × screws M10×40 according to DIN EN 4762; chromated steel 2 × washers Ø 10.5 mm according to DIN 125; 1 × O-ring according to DIN 3771, 20 × 2.65 - S - FPM90, max. permissible 160 bar (2321 psi), 120 °C (248 °F)	**E13**	**7MF9408-6AA**
2 × screws M10×40 according to DIN EN 4762; chromated steel 2 × washers Ø 10.5 mm according to DIN 125; 1 × flat gasket made of PTFE, max. permissible 160 bar (2321 psi), 80 °C (176 °F)[2]	**E16**	**7MF9408-6BA**
Certification according to NACE MR-0175 Including inspection certificate 3.1 according to EN 10204	**D07**	

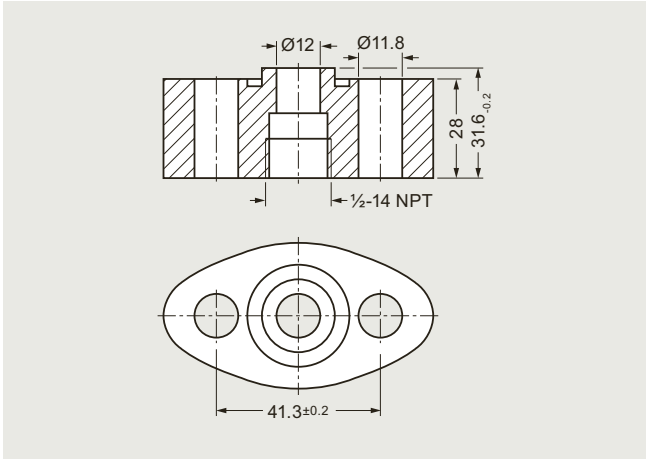
[1] If accessory kit is ordered together with the oval flange, please use order code; otherwise, use the article number.
[2] Flange connections with screws M10 only permissible up to PN 160 (2321 psi).

Accessories

See Selection and ordering data

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Dimensional drawings



Oval flange 7MF9408-2C., dimensions in mm

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Overview

Connection pieces enable, for example, a transition from measured medium connections with NPT thread to shut-off valves according to DIN 16270 ... 16272 or to pipes in connection with a connection gland (e.g. 7MF9008).

Design

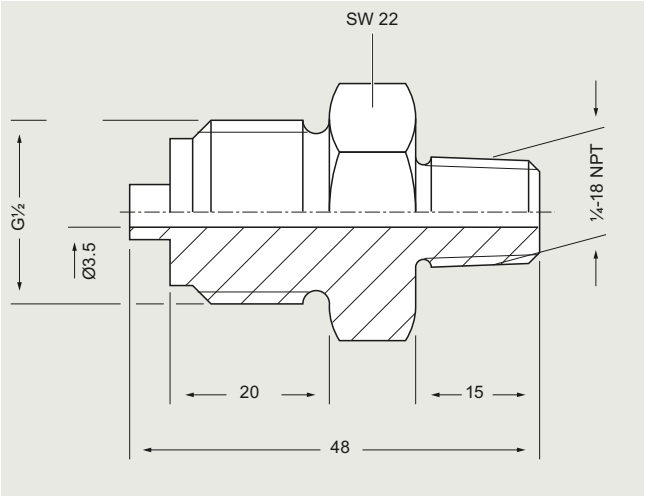
The connection pieces are made of X 6 CrNiMoTi 17 12 2, mat. no. 1.4571 and are available in 3 versions:

- Thread ¼-18 NPT and connection shank G½ according to EN 837-1
- Thread ½-14 NPT and connection shank G½ according to EN 837-1
- Thread ½-14 NPT and thread ½-14 NPT

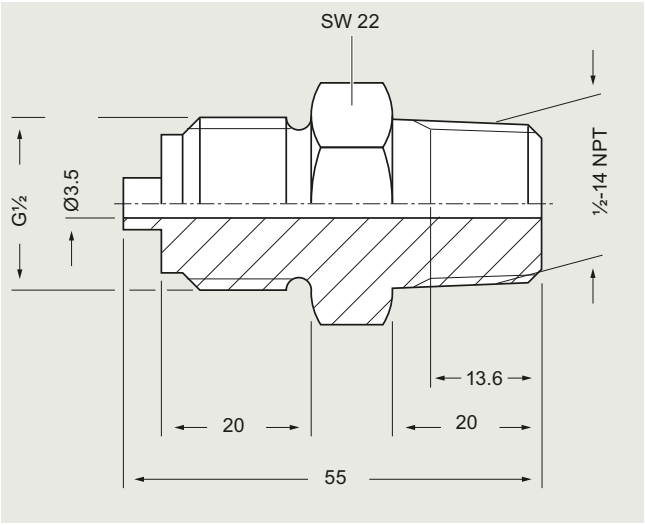
Selection and ordering data

Connection piece	Article No.
Max. operating pressure: 689 bar (10 000 psi), weight: 0.2 kg	
With thread	
Thread ¼-18 NPT – G½, scope of delivery 1 unit	**7MF9001-1AA**
Thread ½-14 NPT – G½, scope of delivery 1 unit	**7MF9001-1CA**
Thread ½-14 NPT – ½-14 NPT, scope of delivery 1 unit	**7MF9001-1DA**
Thread ½-14 NPT – M20 x 1.5, scope of delivery 1 unit	**7MF9001-1EA**
With cutting ring fitting	
Cutting ring fitting 12 S, max. operating pressure 630 bar (9 100 psi), Ø 12 mm – ½-14 NPT	
• 9 SMnPb 28, mat. no. .0718, scope of delivery 1 unit	**7MF9008-1CA**
• X 6 CrNiMoTi 17 122, mat. no. 1.4571, scope of delivery 2 units	**7MF9008-1CB**
Cutting ring fitting 14 S, max. operating pressure 630 bar (9 100 psi), Ø 14 mm – ½-14 NPT	
• 9 SMnPb 28, mat. no. 1.0718, scope of delivery 1 unit	**7MF9008-1CC**
• X 6 CrNiMoTi 17 122, mat. no. 1.4571, scope of delivery 2 units	**7MF9008-1CD**

Dimensional drawings



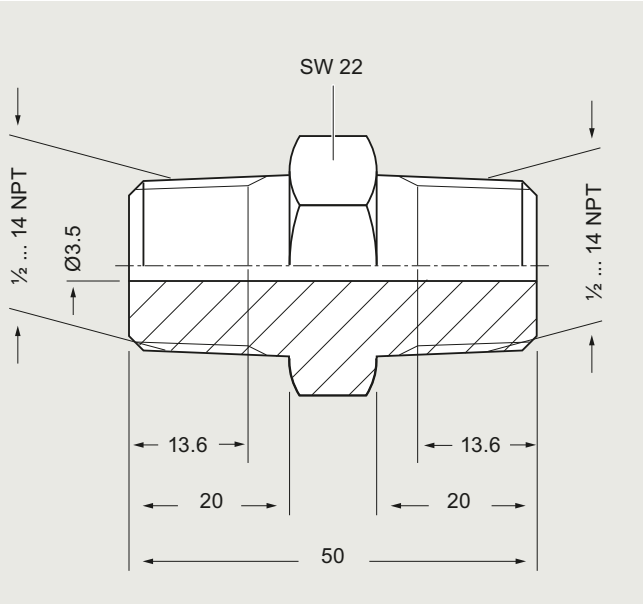
Connection piece with thread ¼-18 NPT and connection shank G½ (7MF9001-1AA), dimensions in mm



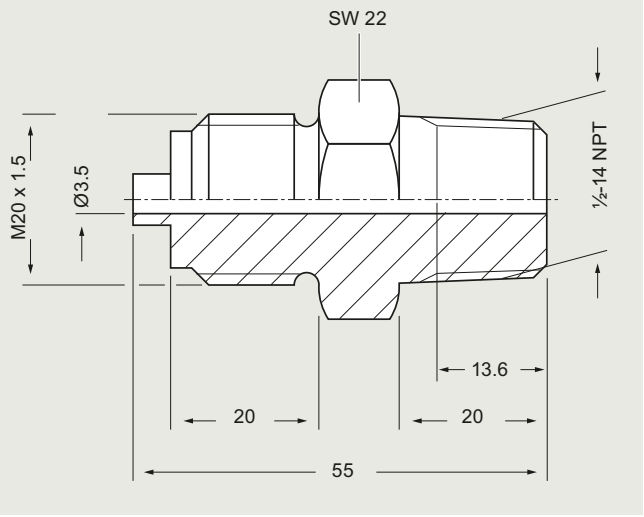
Connection piece with thread ½-14 NPT and connection shank G½ (7MF9001-1CA), dimensions in mm

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Dimensional drawings (continued)

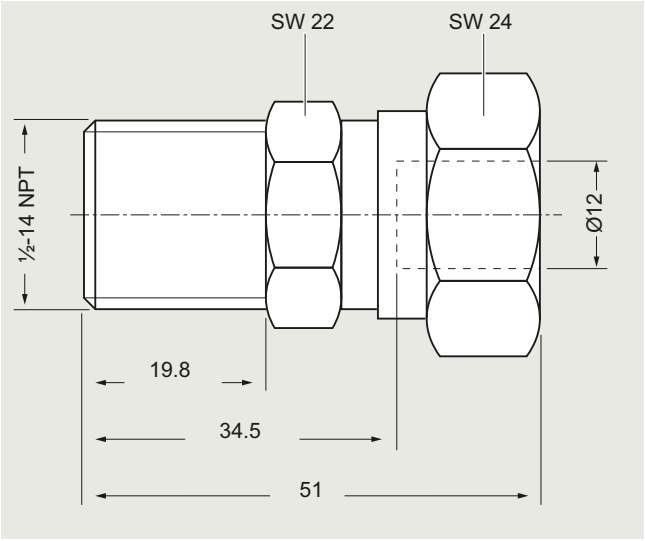


Connection piece with ½-14 NPT thread and ½-14 NPT thread (7MF9001-1DA), dimensions in mm

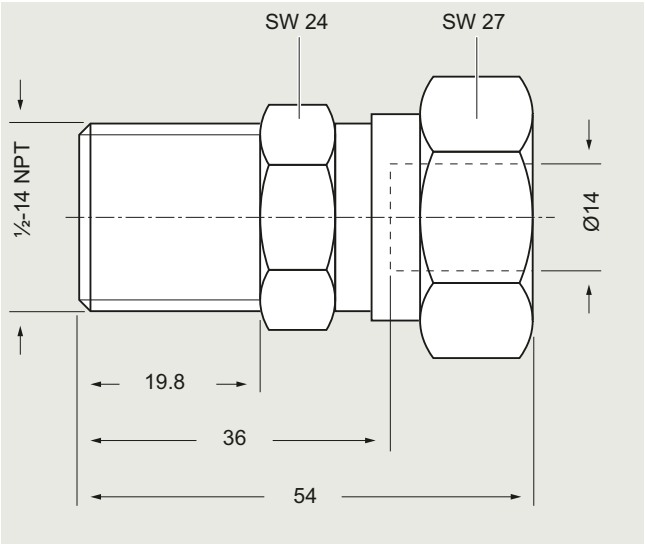


Connection piece with thread ½-14 NPT and connection shank M20 x 1.5 (7MF9001-1EA), dimensions in mm

Dimensional drawings (continued)



Connection piece with cutting ring fitting 12 S, Ø12 mm and thread ½-14 NPT (7MF9008-1CA and -1CB), dimensions in mm



Connection piece with cutting ring fitting 14 S, Ø14 mm and thread ½-14 NPT (7MF9008-1CC and -1CD), dimensions in mm

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Overview

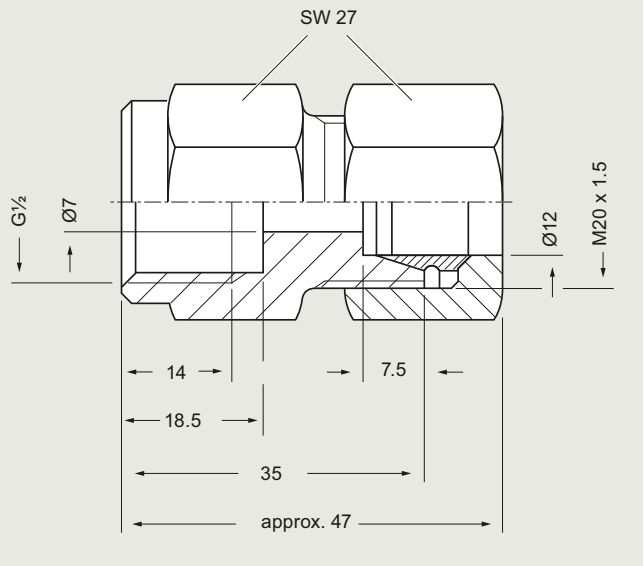
Connection glands for connecting measured-medium or differential pressure lines to connection shank G½ according to EN 837-1

- For rated pressures up to PN 630 (9137 psi)
- For oxygen only up to PN 250 (3626 psi)

Selection and ordering data

Connection glands for pipes		Article No.
(weight 0.2 kg), scope of delivery 1 unit		
Material	Version	
11SMn30 (mat. no. 1.0715)	Normal	**7MF9008-1GA**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	Normal	**7MF9008-1GB**
X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	Grease-free	**7MF9008-1GC**

Dimensional drawings



Connection gland 7MF9008-1G., dimensions in mm

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Overview

Connection parts G½ for pressure measuring devices and shut-off valves are available in 3 versions:

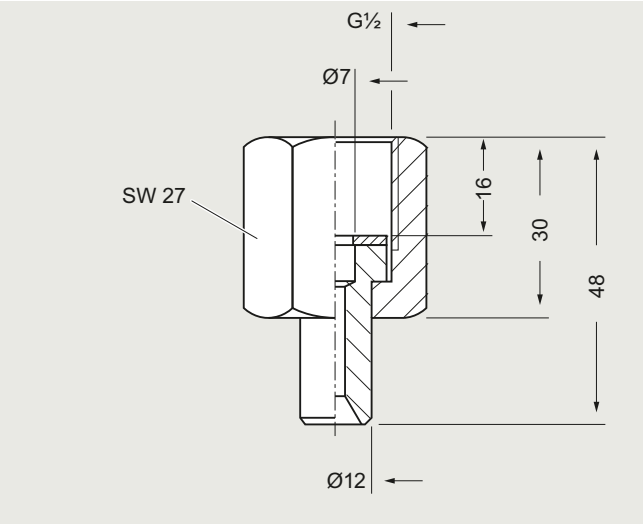
- Nipple connection
- Clamping sleeve
- Collar connection piece

Selection and ordering data

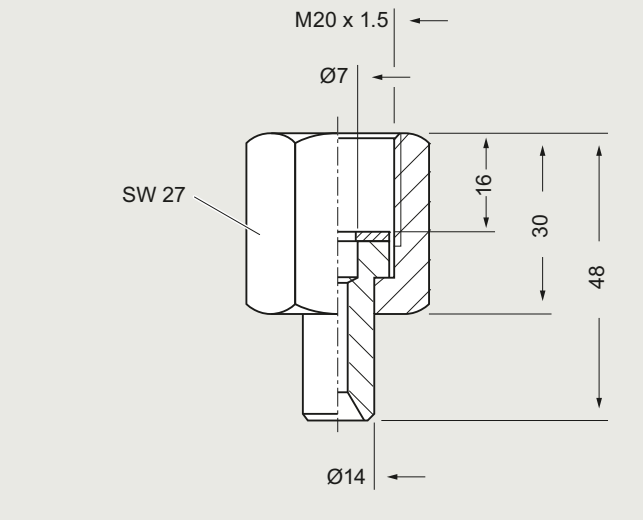
Connection parts G½		Article No.
For pressure measuring devices and shut-off valves		
Nipple connection G½ according to DIN 16284 (union nut with nipple and gasket); max. operating overpressure 400 bar (5802 psi); weight 0.1 kg; connection: G½ according to DIN EN 837-1; internal thread G½, scope of delivery 1 unit		
Material	Mat. no.	
CuZn39Pb3	CW 614N	**M56340-A0001**
Nipple: RSt 37-2	1.0037	
Union nut: X 8 CrNiS 18 9	1.4305	**M56340-A0003**
Nipple: X 6 CrNiMoTi 17 12 2	1.4571/316Ti	
Nipple connection M20 × 1.5 according to DIN 16284 (union nut with nipple and gasket); max. operating overpressure 400 bar (5802 psi); weight 0.1 kg; connection: M20 × 1.5 according to DIN EN 837-1; internal thread M20 × 1.5, scope of delivery 1 unit		
Material	Mat. no.	
Union nut: X 8 CrNiS 18 9	1.4305	**M56340-A0008**
Nipple: X 6 CrNiMoTi 17 12 2	1.4571/316Ti	
Clamping sleeve G½ according to DIN 16283; max. operating overpressure 400 bar (5802 psi); weight 0.1 kg; connections: G½ according to DIN EN 837-1; internal thread: G½ right, G½ left, scope of delivery 1 unit		
Material	Mat. no.	
9 SMn 28 k	1.0715	**M56340-A0005**

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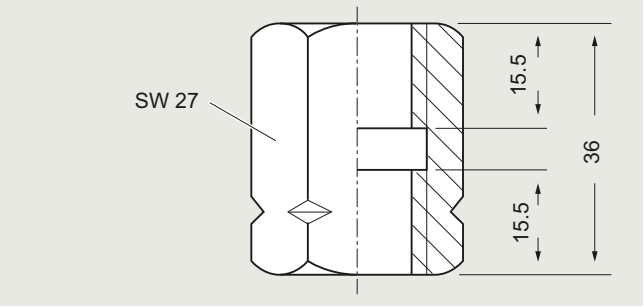
Dimensional drawings



Clamping sleeve (M56340-A0005), dimensions in mm

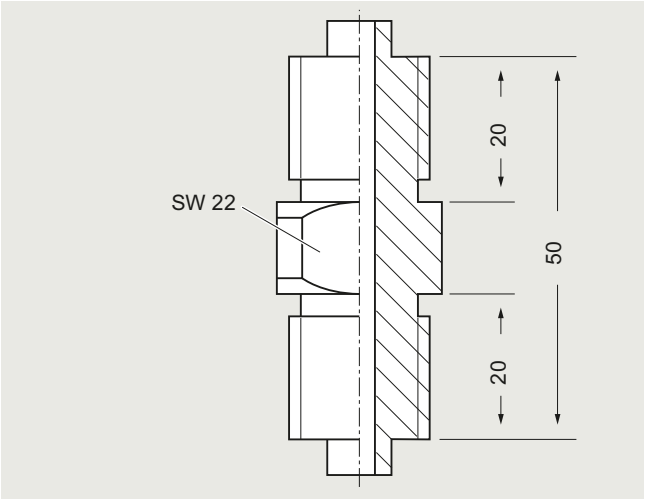


M20 x 1.5 nipple connection (M56340-A0008), dimensions in mm



Clamping sleeve (M56340-A0005), dimensions in mm

Dimensional drawings (continued)



Collar connection piece (M56340-A0006/-A0007), dimensions in mm

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Overview

Water traps protect pressure measuring devices and shut-off fittings from heating up (e.g. by steam) by the water column produced by the water trap.

The max. operating temperature is 120 °C (248 °F) at 100 bar (1450 psi), 300 °C (572 °F) at 80 bar (1160 psi), 400 °C (752 °F) at 63 bar (914 psi). If the temperature of the measured medium is higher, a sufficiently long line has to be connected upstream of the trap to enable heat dissipation.

Design

The water traps are available in U form (type B) or in circular form (type D) according to DIN 16282. On the measuring cell side, they consist of a weld-in end Ø 20 mm × 2.6 mm. The connection on the device side is a clamping sleeve G½ to DIN 16283.

The water traps are made of steel (P250GH) or stainless steel (X 6 CrNiMoTi 17 12 2)

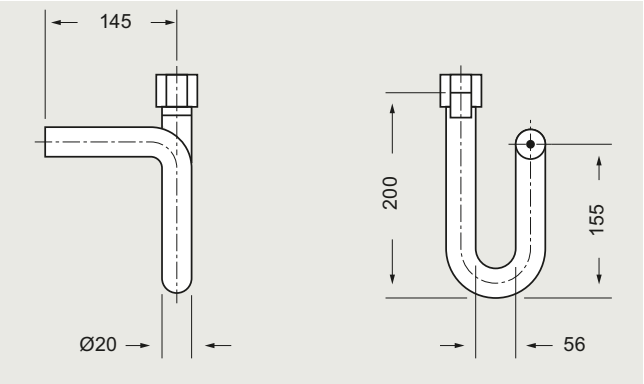
Water traps are designed as standard for max. operating temperature 120 °C (248 °F) at a max. operating pressure of 100 bar (1450 psi) (300 °C (572 °F) at 80 bar (1160 psi), 400 °C (752 °F) at 63 bar (914 psi)). Water traps for higher operating pressures and temperatures are available on request.

Selection and ordering data

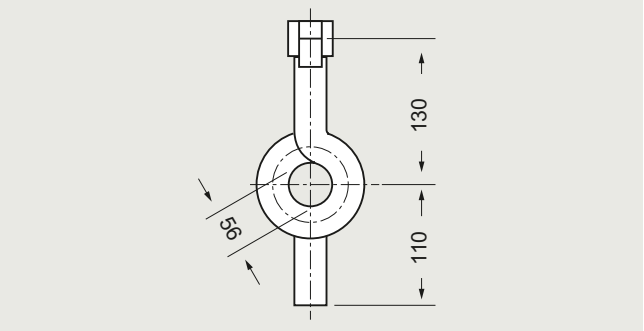
Water traps		Article No.
For pressure measuring devices and pressure transmitters; max. operating temperature 120 °C (248 °F), max. operating pressure 100 bar (1450 psi) (or 300 °C (572 °F) at 80 bar (1160 psi), or 400 °C (752 °F) at 63 bar (914 psi)), weight 0.7 kg		
Water trap B according to DIN 16282		
Material	Mat. no.	
P235GH	1.0345	**M56340-A0043**
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	**M56340-A0061**
Water trap D according to DIN 16282		
Material	Mat. no.	
P235GH	1.0345	**M56340-A0045**
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	**M56340-A0063**

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Dimensional drawings



Water traps, type B, M56340-A0043/-A0061, measurements in mm



Water traps, type D, M56340-A0045/-A0063, measurements in mm

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Overview

The pressure surge reducer protects the pressure measuring device from damage, premature wear-and-tear, and an imprecise or vibrating display.

Application

The pressure surge reducer is used when pulsations of the measured medium occur (e.g. in slow-running steam engines, piston pumps and compressors) or when sudden pressure increases and drops of the measured medium can be expected (e.g. in hydraulic presses and tensile testing machines).

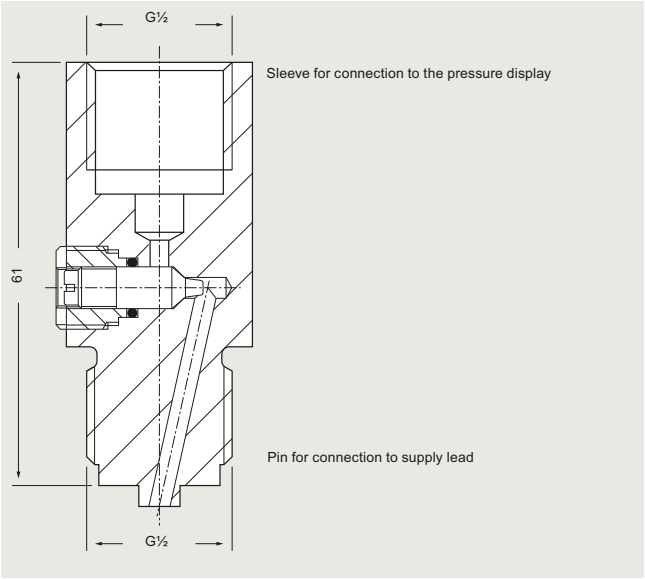
Design

- Brass or stainless steel enclosure (mat. no. 1.4571)
- Adjustable nozzle
- Sleeve for connection to the pressure measuring device
- Shank for connection to the supply line

Selection and ordering data

Pressure surge reducers			Article No.
Weight approx. 0.21 kg			
Material	**Full-scale value**	**Weight approx. in kg**	
Brass	250 bar (3626 psi)	0.21	**M56340-A0054**
Stainless steel	600 bar (8702 psi)	0.21	**M56340-A0059**

Dimensional drawings



Pressure surge reducer, dimensions in mm

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Overview

Connection parts are available in the following versions:

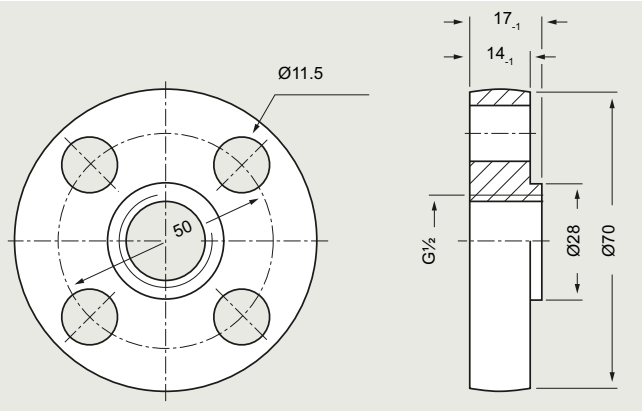
- G½ threaded flange pair with stainless steel gasket
- G½ nipple connection, form V to DIN 19207
- G½ C 35 union nut to DIN 16284
- B½ sealing ring (grooved) to DIN 19207

All connection parts are also available grease-free for oxygen.

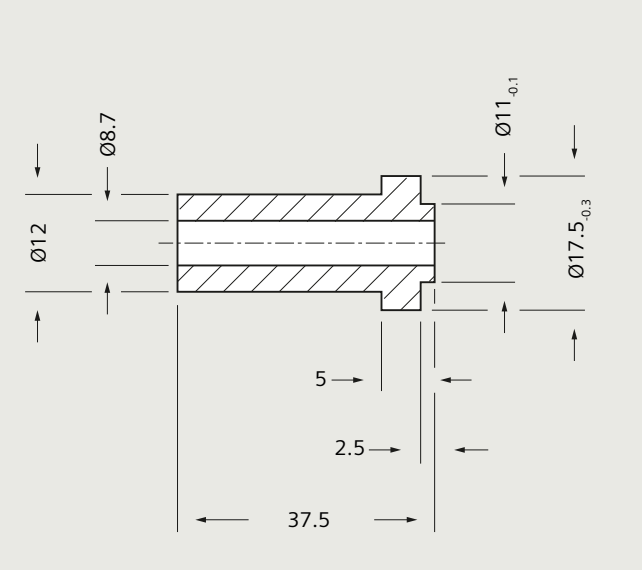
Selection and ordering data

	Article No.
Threaded flange pair G½	
• With stainless steel gasket	**7MF9007-4CA**
• Grease-free for oxygen, with stainless steel gasket	**7MF9007-4DA**
Scope of delivery: 2 × threaded flange G½ according to DIN 19207; material: P250GH (mat. no. 1.0460) 4 × hexagonal screws M10×45 According to EN 24014; material: C35E (mat. no. 1.1181) 4 × hexagon nut M10 according to EN 24032 1 × sealing ring G½ (7MF9007-6BA) grooved, according to DIN 19207; material: X 6 CrNiMoTi 17 12 2 (mat. no. 14571/316Ti); only for 7MF9007-4CA! 1 × sealing ring G½ (7MF9007-6CA), grease-free for oxygen, grooved, according to DIN 19207; material: X 6 CrNiMoTi 17 12 2 (mat. no. 14571/316Ti); only for 7MF9007-4DA!	
Nipple G½	
According to DIN 19207, scope of delivery 1 unit	
• Material: 16 Mo 3 (mat. no. 1.5415)	**7MF9007-4KA**
• Grease-free for oxygen; material: X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	**7MF9007-4LA**
Union nut G½	
According to DIN 16284, scope of delivery 1 unit	
• Material: C35E (mat. no. 1.1181)	**7MF9007-4MA**
• Grease-free for oxygen; material: X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	**7MF9007-4NA**
Sealing ring G½	
According to DIN 19207, grooved, scope of delivery 1 unit	
• Material: X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	**7MF9007-6BA**
• Grease-free for oxygen; material: X 6 CrNiMoTi 17 12 2 (mat. no. 1.4571/316Ti)	**7MF9007-6CA**

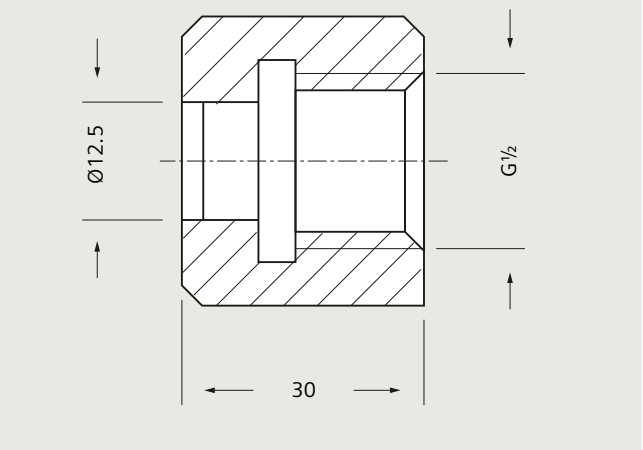
Dimensional drawings



Threaded flange 7MF9007-4CA/-4DA, dimensions in mm



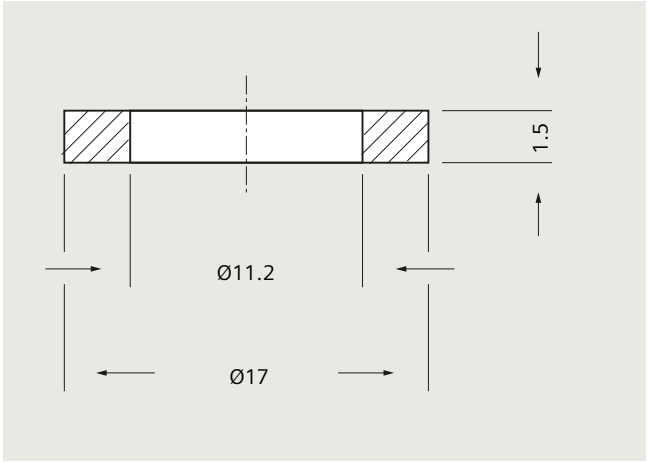
G½ nipple connection, 7MF9007-4KA/-4LA, dimensions in mm



G½ union nut 7MF9007-4MA/-4N, dimensions in mm

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Dimensional drawings (continued)



Sealing ring 7MF9007-6BA/-6CA, dimensions in mm

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2/163	Compact and head transmitters

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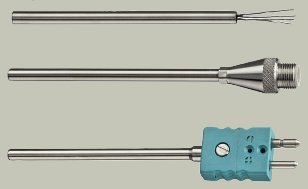
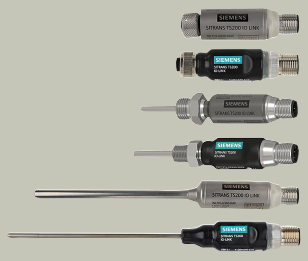
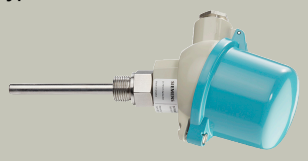


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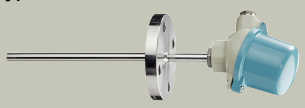
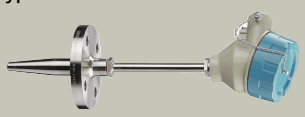
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Overview

SITRANS TS temperature sensors		
Type	**Description**	**Software for parameterization**
TS100 	• Cable version • Universal use • For cramped spaces • Mineral-insulated	
TS200 Compact 	• Compact version • Universal use • For cramped spaces • Mineral-insulated • Optionally with M12 extension cable	-
TS200 IO-Link 	• Use in automated industrial plants • Three operating modes for device configuration: IO-Link, 4 ... 20 mA loop-powered passive system and output for alarm thresholds (SIO) • SDCI (Single Drop Communication Interface) data transmission • Use of the device as a programmable thermostat thanks to the SIO operating mode • Variants optionally available with a plastic or stainless steel enclosure • LED for operating status diagnostics • Firmware can be updated • Sensor type: Pt100	-
TS300 	Resistance thermometer for food, pharmaceuticals and biotechnology • Modular design, for installation in pipes and vessels • Clamp-on design, for mounting on pipe mainly for sterilization processes	-
TS500, Type 2 	• For the process industry (pipes and vessels) • Tubular thermowell for low to medium stress • Thermowell according to DIN 43772, type 2, without process connection • Without extension X, plug-in or use with moveable compression fitting	-
TS500, Type 2N 	• For the process industry (pipes and vessels) • Tubular thermowell for low to medium stress • Thermowell type 2N similar to DIN 43772, screwed design • Without extension X, connection head non-adjustable	-
TS500, Type 2G 	• For the process industry (pipes and vessels) • Tubular thermowell for low to medium stress • Thermowell according to DIN 43772, type 2G, screwed design • With extension X	-

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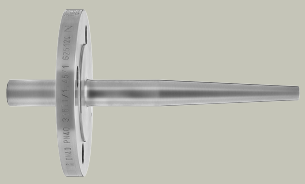
Overview (continued)

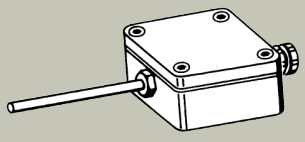
SITRANS TS temperature sensors		
TS500, Type 2F 	• For the process industry (pipes and vessels) • Tubular thermowell for low to medium stress • Thermowell according to DIN 43772, type 2F with flange • With extension X	-
TS500, Type 3 	• For the process industry (pipes and vessels) • Tubular thermowell for low to medium stress • Thermowell according to DIN 43772, type 3 without process connection, improved response time • Without extension X, plug-in or use with moveable compression fitting	-
TS500, Type 3G 	• For the process industry (pipes and vessels) • Tubular thermowell for low to medium stress • Thermowell according to DIN 43772, type 3G, screwed design, improved response time • With extension X	-
TS500, Type 3F 	• For the process industry (pipes and vessels) • Tubular thermowell for low to medium stress • Thermowell according to DIN 43772, type 3F with flange, improved response time • With extension X	-
TS500, Type 4 	• For the process industry (pipes and vessels) • Barstock thermowell for medium to extreme stress • Thermowell according to DIN 43772 • Type 4 for welding • Type 4F with flange	-
TS500, Type 4F 	• For the process industry (pipes and vessels) • Barstock thermowell for medium to extreme stress • Thermowell according to DIN 43772 • Type 4 for welding • Type 4F with flange	-
TS500, installation 	• For the process industry (pipes and vessels) • For installation in existing thermowells • Suitable for thermowells according to DIN 43772 as well as ASME B40.92001 • With extension X, European type or American type	-

SITRANS TSinsert - measuring inserts for temperature sensors		
Type	**Description**	**Software for parameterization**
European type 	• Replaceable • Mineral-insulated	-
American type 	• Replaceable • Mineral-insulated	-

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Overview (continued)

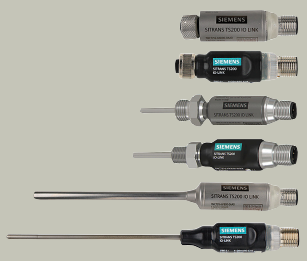
SITRANS TSthermowell - thermowells for temperature sensors		
Type	**Description**	**Software for parameterization**
Screw-in connection 	• Straight • Staggered • Tapered	-
Weld-in connection 	• Straight • Staggered • Tapered	-
Flange connection 	• Straight • Staggered • Tapered	-

Thermocouples/resistance thermometers - Temperature sensors for combustion processes and damp rooms		
Type	**Description**	**Software for parameterization**
Straight thermocouples 	Largest measuring range: 0 to 1250 °C (32 to 2282 °F)	-
Flue gas resistance thermometer 	Largest measuring range: -50 ... +600 °C (-58 ... +1112 °F)	-
Resistance thermometer for damp rooms 	Largest measuring range: -30 ... +80 °C (-22 ... +140 °F)	-

Compact and head-mounted transmitters				
Type	**Description**	**Mounting of transmitter with Ex protection**		**Software for parameterization**
		Transmitters	**Sensor**	
SITRANS TH100 Slim 	For temperature measurement in combination with Pt 100 compact resistance thermometers	-	-	SIPROM T

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Overview (continued)

Compact and head-mounted transmitters				
SITRANS TS200 IO-Link 	• Use in automated industrial plants • Three operating modes for device configuration: IO-Link, 4 ... 20 mA loop-powered passive system and output for alarm thresholds (SIO) • SDCI (Single Drop Communication Interface) data transmission • Use of the device as a programmable thermostat thanks to the SIO operating mode • Variants optionally available with a plastic or stainless steel enclosure • LED for operating status diagnostics • Firmware can be updated • Measuring range: -200 ... 800 °C (-328 ... 1472 °F) • Transmitters for Pt100/Pt1000		-	Configuration only possible in IO-Link mode
SITRANS TH320 	2-wire head-mounted transmitter with and without HART communication interface. With 1 input for connection to resistance thermometers, linear resistors, potentiometers, thermocouples, and DC voltages up to 1.7 V • 4 to 20 mA • HART 7 • Universal • SIL2/3 according to IEC 61508	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	SIMATIC PDM or SIPROM T (depending on SITRANS TH320 type used)
SITRANS TH420 	Transmitters with two inputs for connection to resistance thermometers, linear resistors, potentiometers, thermocouples, and DC voltages up to 1.7 V • Drift detection function • HART 7 • Universal • SIL2/3 according to IEC 61508 • High input availability	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	SIMATIC PDM

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Overview (continued)

Rail transmitters

Type	Description	Mounting of transmitter with Ex protection		Software for parameterization
		Transmitters	Sensor	
SITRANS TR320 	2-wire rail transmitter with and without HART communication interface With 1 input for connection to resistance thermometers, linear resistors, potentiometers, thermocouples, and DC voltages up to 1.7 V • 4 to 20 mA • HART 7 • Universal • SIL2/3 according to IEC 61508	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	SIMATIC PDM (depending on SITRANS TR320 type used)
SITRANS TR420 	Transmitters with 2 inputs for connection to resistance thermometers, linear resistors, potentiometers, thermocouples, and DC voltages up to 1.7 V • Drift detection function • HART 7 • Universal • SIL2/3 according to IEC 61508 • High input availability	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	• Zone 2 • Zone 1 • Zone 0 • Zone 21 • Zone 20 • M1 • DIV 1 • DIV 2	SIMATIC PDM

Field transmitter

Type	Description	Mounting of transmitter with Ex protection		Software for parameterization
		Transmitters	Sensor	
SITRANS TF320 	Transmitters for connection to resistance thermometers, resistance-based sensors, thermocouples and DC voltages up to 1.7 V • In field enclosure for heavy industrial use • 4 to 20 mA • HART 7 • Universal • SIL2/3 according to IEC 61508	• Zone 2 • Zone 1 • Zone 21 • Zone 22 • DIV 1 • DIV 2	• Zone 2 • Zone 1 • Zone 0 • Zone 20 • Zone 21 • Zone 22 • DIV 1 • DIV 2	Local operation with buttons. SIMATIC PDM local with HART modem or SIPROM T (depending on SITRANS TH320 type used)

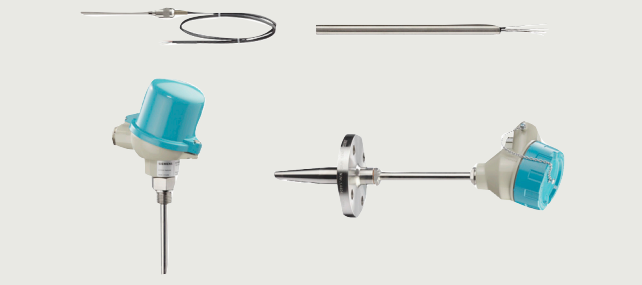
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Overview (continued)

Field transmitter				
SITRANS TF420 	Transmitters for connection to resistance thermometers, resistance-based sensors, thermocouples and DC voltages up to 1.7 V • In field enclosure for heavy industrial use • HART 7 • Universal • SIL2/3 according to IEC 61508 • High input availability	• Zone 2 • Zone 1 • Zone 21 • Zone 22 • DIV 1 • DIV 2	• Zone 2 • Zone 1 • Zone 0 • Zone 20 • Zone 21 • Zone 22 • DIV 1 • DIV 2	Local operation with buttons. SIMATIC PDM locally with HART modem.

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Overview



The temperature sensors of the SITRANS TS product family are used for measuring temperatures in industrial plants.
Siemens offers the following temperature sensors:

- SITRANS TS100
  - General use
  - Compact design with connection cable
- SITRANS TS200 Compact
  - General use
  - Compact design with plug/wire ends
  - Optionally with M12 extension cable
- SITRANS TS200 IO-Link
  - General use
  - Particularly suitable for use in automated industrial plants
- SITRANS TS300
  - Use in food, pharmaceuticals and biotechnology
  - Modular or clamp-on design
- SITRANS TS500
  - General use
  - Modular design with connection head and thermowell

Benefits

The modular design makes it possible to customize the temperature sensor for most applications, while still being able to use many standardized individual components.

Application

Depending on the specification, sensors can be combined with different connection heads, extensions (neck pipe) and process connections. As a result, the sensors can be used in a large number of technical applications, e.g. in the following industries:

- Chemical industry
- Petrochemical industry
- Power engineering
- Basic material industry
- Pharmaceutical industry
- Biotechnology
- Food manufacturing

SITRANS TS100 and SITRANS TS200 Compact

Temperature sensors of the SITRANS TS100 series are cable thermometers with different electrical connection options (e.g. plug, soldered connection, connecting cable). The SITRANS TS200 series of compact thermometers is characterized by a compact design. Both are suitable for the following:

- Measurements of temperatures of solids, where additional thermowells are not required for replacements done during ongoing operations, e.g. bearing bracket temperature.
- Measurements which are particularly critical with regard to response times. The advantages offered by an additional thermowell are intentionally omitted.
- Measuring points which must be easy to convert or relocate.
- Surface temperature measurements: The temperature sensor is used in conjunction with a surface connection piece.
- Cost-effective transport: The mineral-insulated design of the sensors allows for economical transport even over large lengths. As of a length of 0.8 m, the sensors can be delivered rolled or bent.

SITRANS TS200 IO-Link 7MC7216

This temperature sensor is particularly suitable for use in automated industrial plants in areas such as HVAC (heating, ventilation and air-conditioning), industrial cooling systems, agriculture and animal husbandry, meteorology, etc.

- Choice of three operating modes for device configuration:
  - IO-Link
  - 4 ... 20 mA loop-powered (passive system)
  - Output for alarm thresholds (SIO).
- Support for two-way SDCI (Single Drop Communication Interface) data transmission.
- Exchange of process data, parameters, diagnostics information and status messages via the IO-Link interface; any IO-Link Master can be used for the configuration.
- Use of the device as a programmable thermostat thanks to the SIO operating mode with configurable NPN or PNP output
- LED indicator to indicate the operating status: IO-Link and SIO modes.
- Variants optionally available with a plastic (PA6) or (AISI 316L) stainless steel enclosure

SITRANS TS300 temperature sensors for food, pharmaceuticals and biotechnology

The temperature sensors of the SITRANS TS300 series are thermometers especially designed for measurements with high

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Application (continued)

hygienic demands, such as in the food, pharmaceutical and biotechnology industries. The basic versions are:

- Thermometers in modular design with replaceable measuring insert and process connections usual in the industry
- Clamp-on thermometers for measurement of the pipe surface temperature without interrupting the process

SITRANS TS500 temperature sensors as a module system

Due to their modular design, temperature sensors of the SITRANS TS500 series are well suited to a large number of applications.

The replaceable measuring insert makes it possible to conduct maintenance work even during ongoing operations. These devices are used particularly frequently in pipes and vessels in the following industries:

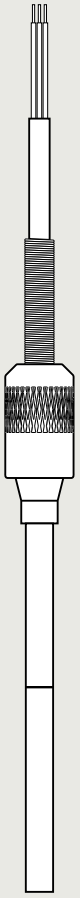
- Power stations
- Chemical industry
- Petrochemical industry
- General process engineering
- Water, waste water

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Design

SITRANS TS100 7MC71xx

The following figure shows the available versions of SITRANS TS100 temperature sensors.



SITRANS TS100, mineral-insulated (MIC)
Degree of protection:
- Plug-in connection type: see table
- Transition sensor/cable IP68 (2h/2.5 m [98.5 inch]) for PVC and silicone cable, otherwise IP66

Version	Degree of protection
Flying leads	IP00
LEMO coupling 1S	IP50
M12 device plugs	IP54
Thermocouple coupling	IP20

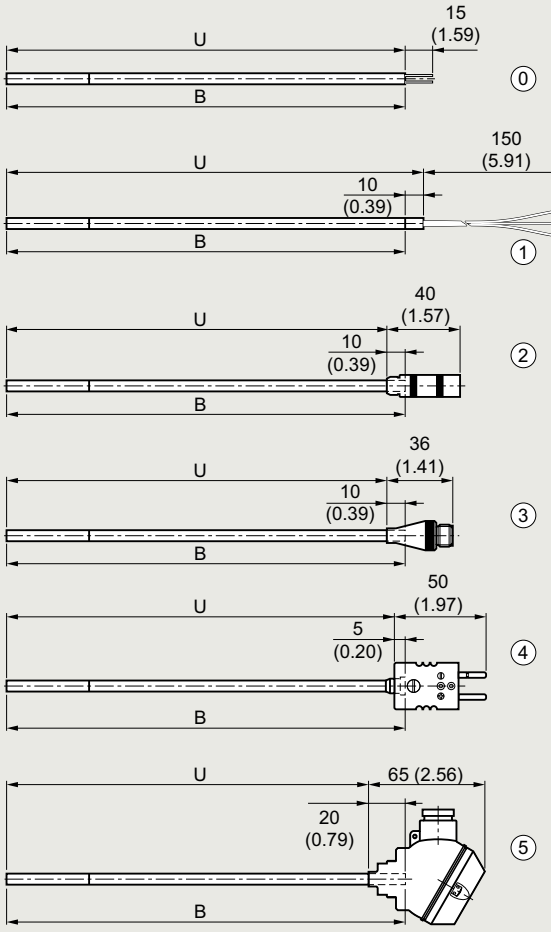
SITRANS TS100

The following types of process connections can be implemented:

- Compression fitting
- Spring-loaded compression fitting
- Soldering nipple
- Direct soldering/welding in

SITRANS TS200 Compact 7MC72xx

The following figure shows the available versions of SITRANS TS200 temperature sensors.



B Measuring insert length
H Head height
U Insertion length

			IP level sensor	IP level terminals
0	Basic sensor	**U = B**	IP65	IP00
1	Flying leads	**U = B + 10 (0.39)**	IP65	IP00
2	LEMO coupling 1S	**U = B - 10 (0.39)**	IP65	IP50
3	M12 device plugs	U = B - 10 (0.39)	IP65	IP54
4	Thermocouple coupling	**U = B - 5 (0.20)**	IP65	IP20
5	Mini connection head	U = B - 20 (0.79)	IP54	IP65

SITRANS TS200, dimensions in mm (inch)

The following types of process connections can be implemented:

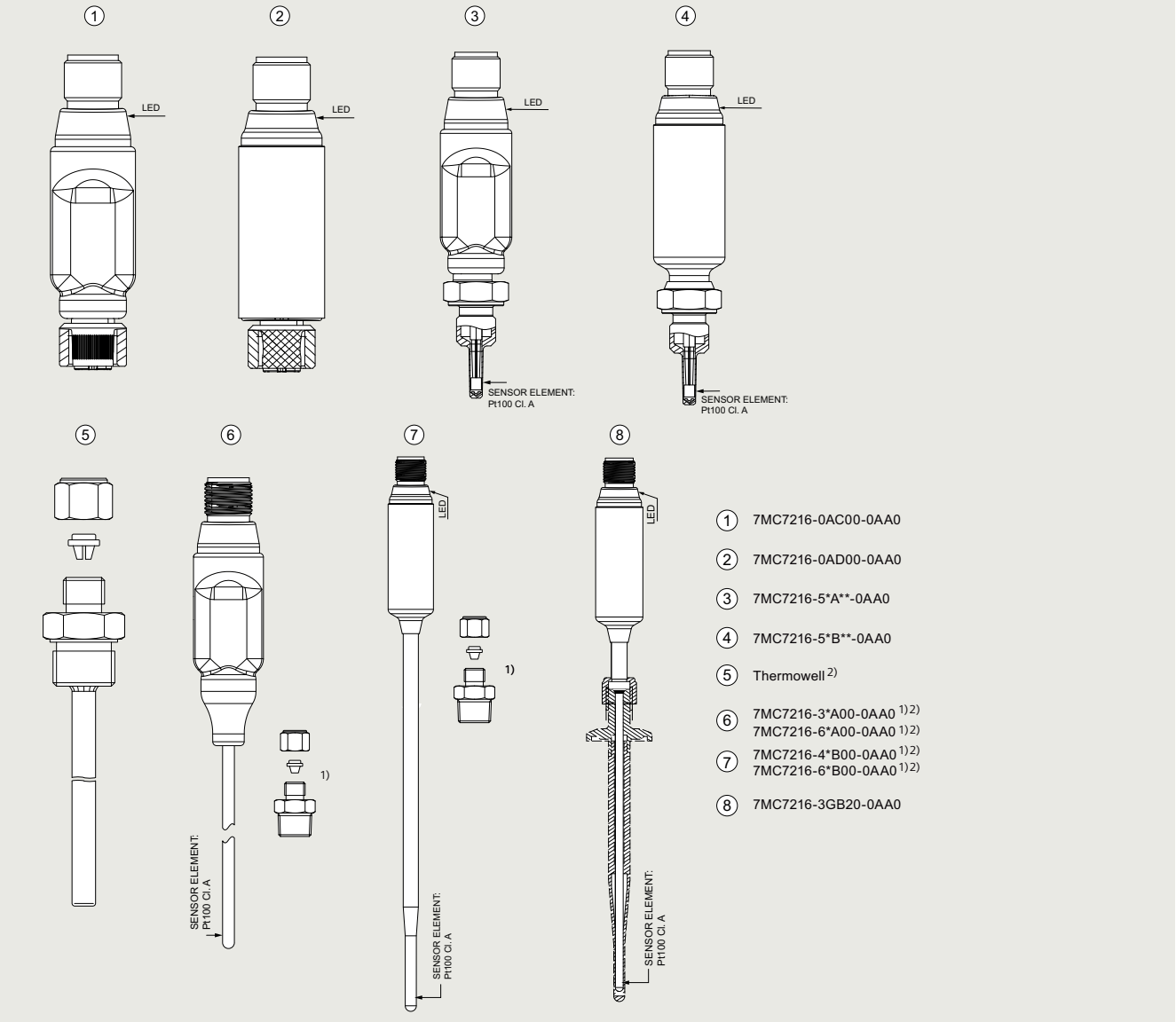
- Compression fitting
- Spring-loaded compression fitting
- Soldering nipple
- Direct soldering/welding in

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Design (continued)

SITRANS TS200 IO-Link 7MC7216

The following figure shows the available versions of SITRANS TS 4...20 mA/IO-Link temperature sensors.



SITRANS TS200 IO-Link, comparison of connections: For dimensions, see the dimensional drawings at SITRANS TS200 IO-Link/stainless steel enclosure or plastic enclosure.

1) Optional compression fitting; see "SITRANS TS200 compression fittings"
2) Optional thermowells; see "SITRANS TS200 thermowell"

The following variants are available for IO-Link:

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Design (continued)

7MC7216-0AD00-0AA0

- Metal enclosure (steel AISI 316L)
- Operational range -40 ... 80 °C (-40 ... 176 °F)
- Measuring range of the input sensor: -200 ... 800 °C (-328 ... 1472 °F)
- Sensor circuit, typical: 0.1 mA
- R_{max} input sensor wire: 20 Ω / wire
- Influence of the input sensor wire:
  - 2 wires: Compensation of the loop, adjustable 0 ... 40 Ω
  - 3 wires: Negligible for wires with same resistance
  - 4 wires: Negligible
- Accuracy at 25 °C (77 °F):
  - 4 ... 20 mA: Peak value between ±0.15 K and ±0.15% of the set measuring range
  - IO-Link / SIO: ±0.1 K in the range from -200 ... 400 °C (-328 ... 752 °F) and ±0.2 K in > 400 °C (752 °F)
- Connection of an external PT100/PT1000 input sensor via M12 connection socket according to IEC 61076-2-101

7MC7216-**B00-0AA0

- Metal enclosure (steel AISI 316L)
- Operational range -40 ... 80 °C (-40 ... 176 °F)
- Measuring range of the input sensor: -50 ... 350 °C (-58 ... 662 °F)
- The sensor element is installed in the tip of the shank
- The shank (pipeline made of AISI 316L steel) CANNOT be bent
- PT100 Kl. Output bit temperature sensor with optimized response time, variable sensor lengths and integrated process connection
  - Sensor diameter 6 mm
  - Sensor diameter 6 mm tapered to 4.4 mm for optimized response times
- Accuracy at 25 °C (77 °F) (add the error of Pt100 in Class A according to IEC 60751 to the specified value: ± (0.15 + 0.002 × |t|), where |t| is the absolute value of the process temperature):
  - 4 ... 20 mA: Peak value between ±0.15 K and ±0.15% of the set measuring range
  - IO-Link / SIO: ±0.1 K in the range from -50 ... 350 °C (-58 ... 662 °F)
- Response time / T63:
  - < 5 s for tapered sensor diameter 4.4 mm
  - < 13 s for sensor diameter 6 mm

7MC7216-5*B**-0AA0

- Metal enclosure (steel AISI 316L)
- Operational range of cylindrical section -40 ... 80 °C (-40 ... 176 °F)
- Measuring range of the input sensor: -50 ... 120 °C (-58 ... 248 °F)
- Suitable für measurements in liquid; not recommended for measurements in air
- If intended to be installed in a pipe, the ideal immersion length is half the pipe diameter
- Max. operating pressure (in relation to sensor length L 13/24 mm): PN 100 BAR
- In the case of cylindrical threads, the use of a thread sealing compound or seal is recommended
- PT100 Kl. Output bit temperature sensor with fast response time, short sensor lengths and integrated process connection
  - Sensor diameter 3.5 mm tapered to 3 mm for faster response times
- Accuracy at 25 °C (77 °F) (add the error of Pt100 in Class A according to IEC 60751 to the specified value: ± (0.15 + 0.002 × |t|), where |t| is the absolute value of the process temperature):
  - 4 ... 20 mA: Peak value between ±0.15 K and ±0.15% of the set measuring range
  - IO-Link / SIO: ±0.1 K
- Response time / T63: < 3.5 s

7MC7216-3*B**-0AA0

- Metal enclosure (steel AISI 316L)
- Operational range of cylindrical section -40 ... 80 °C (-40 ... 176 °F)
- Measuring range of the input sensor: -50 ... 350 °C (-58 ... 662 °F)
- PT100 Kl. Output bit temperature sensor with fast response time, variable sensor lengths and integrated protective tube connection
  - Sensor diameter 3 mm
- Accuracy at 25 °C (77 °F) (add the error of Pt100 in Class A according to IEC 60751 to the specified value: ± (0.15 + 0.002 × |t|), where |t| is the absolute value of the process temperature):
  - 4 ... 20 mA: Peak value between ±0.15 K and ±0.15% of the set measuring range
  - IO-Link / SIO: ±0.1 K in the range from -50 ... 350 °C (-58 ... 662 °F)

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Design (continued)

7MC7216-0AC00-0AA0

- PA6 plastic enclosure
- Operational range -40 ... 70 °C (-40 ... 158 °F)
- Measuring range of the input sensor: -200 ... 800 °C (-328 ... 1472 °F)
- Sensor circuit, typical: 0.1 mA
- R_{max} input sensor wire: 20 Ω / wire
- Accuracy at 25 °C (77 °F):
  - 4 ... 20 mA: Peak value between ±0.15 K and ±0.15% of the set measuring range
  - IO-Link / SIO: ±0.1 K in the range from -200 ... 400 °C (-328 ... 752 °F) and ±0.2 K in > 400 °C (752 °F)
- Influence of the input sensor wire:
  - 2 wires: Compensation of the loop, adjustable 0 ... 40 Ω
  - 3 wires: Negligible for wires with same resistance
  - 4 wires: Negligible
- Connection of an external PT100/PT1000 input sensor via M12 connection socket according to IEC 61076-2-101

7MC7216-**A00-0AA0

- PA6 plastic enclosure
- Operational range -40 ... 70 °C (-40 ... 158 °F)
- Measuring range of the input sensor: -50 ... 350 °C (-58 ... 662 °F)
- The sensor is flexible: The bending radius must not be less than 3 times the sensor diameter, with the exception of the sensitive end piece, which cannot be bent over a length of ~ 30 mm
- The sensor element is installed in the tip of the shank
- To ensure correct temperature measurement, the immersion depth of the shaft in the process must be at least 6 times the diameter
- Max. operating pressure (in relation to sensor length): PN 100 BAR
- PT100 Kl. Output bit temperature sensor with variable sensor lengths
  - Sensor diameter 6 mm
  - Sensor diameter 3 mm for faster response times
- Accuracy at 25 °C (77 °F) (add the error of Pt100 in Class A according to IEC 60751 to the specified value: ± (0.15 + 0.002 × |t|), where |t| is the absolute value of the process temperature):
  - 4 ... 20 mA: Peak value between ±0.15 K and ±0.15% of the set measuring range
  - IO-Link / SIO: ±0.1 K in the range from -50 ... 350 °C (-58 ... 662 °F)
- Response time / T63:
  - < 3.5 s for sensor diameter 3 mm
  - < 13 s for sensor diameter 6 mm

7MC7216-5*A**-0AA0

- PA6 plastic enclosure
- Operational range -40 ... 70 °C (-40 ... 158 °F) in IO-Link operating mode
- Measuring range of the input sensor: -50 ... 110 °C (-58 ... 230 °F)
- Suitable für measurements in liquid; not recommended for measurements in air
- If intended to be installed in a pipe, the ideal immersion length is half the pipe diameter
- Max. operating pressure (in relation to sensor length L 13/24 mm): PN 100 BAR
- In the case of cylindrical threads, the use of a thread sealing compound or seal is recommended
- PT100 Kl. Output bit temperature sensor with fast response time, short sensor lengths and integrated process connection
  - Sensor diameter 3.5 mm tapered to 3 mm for faster response times
- Accuracy at 25 °C (77 °F) (add the error of Pt100 in Class A according to IEC 60751 to the specified value: ± (0.15 + 0.002 × |t|), where |t| is the absolute value of the process temperature):
  - 4 ... 20 mA: Peak value between ±0.15 K and ±0.15% of the set measuring range
  - IO-Link / SIO: ±0.1 K
- Response time / T63: < 3.5 s

SITRANS TS300

SITRANS TS300 modular design

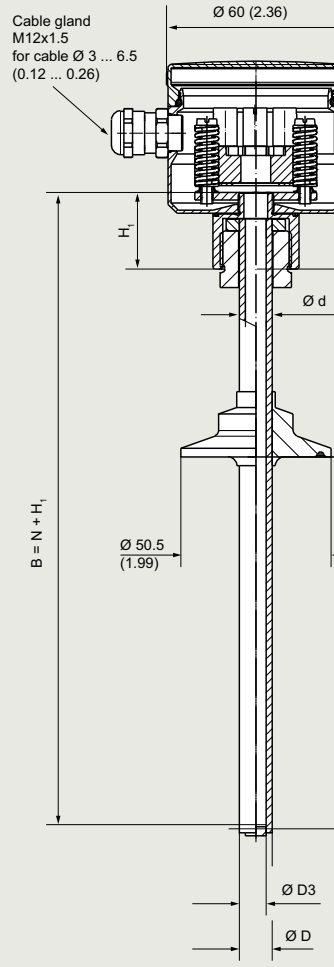
The resistance thermometer is intended for installation in vessels and pipes for hygienic requirements.

- Modular design consisting of thermowell, measuring insert, connection head and optional transmitter for replacement during operation
- Hygiene version, design according to recommendations of the EHEDG
- Transmitter can be integrated (4 to 20 mA, HART, PROFIBUS PA)

The following figure shows the available versions and components of SITRANS TS300 temperature sensors in modular design.

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Design (continued)



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Thermowell inner diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length

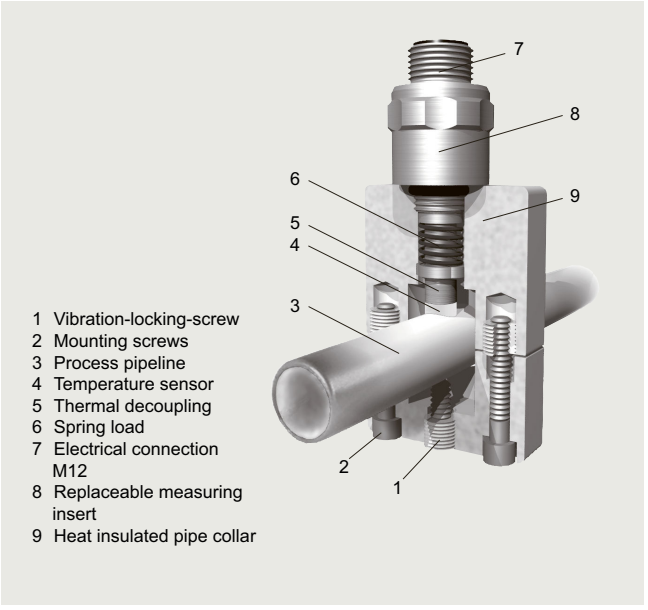
SITRANS TS, temperature sensors, TS300 modular design, dimensions in mm (inch)

SITRANS TS300 Clamp-on

The temperature is recorded via a modified, fast response Pt100 measuring element that is positioned and insulated by a pipe collar made of temperature-resistant plastic.

The measuring insert contains a special temperature sensor made of silver that is constantly pressed onto the pipe by a spring.

A force-guided operation of the replaceable measuring insert ensures a constant fit on the pipe and thus provides for a reproducible measuring result.



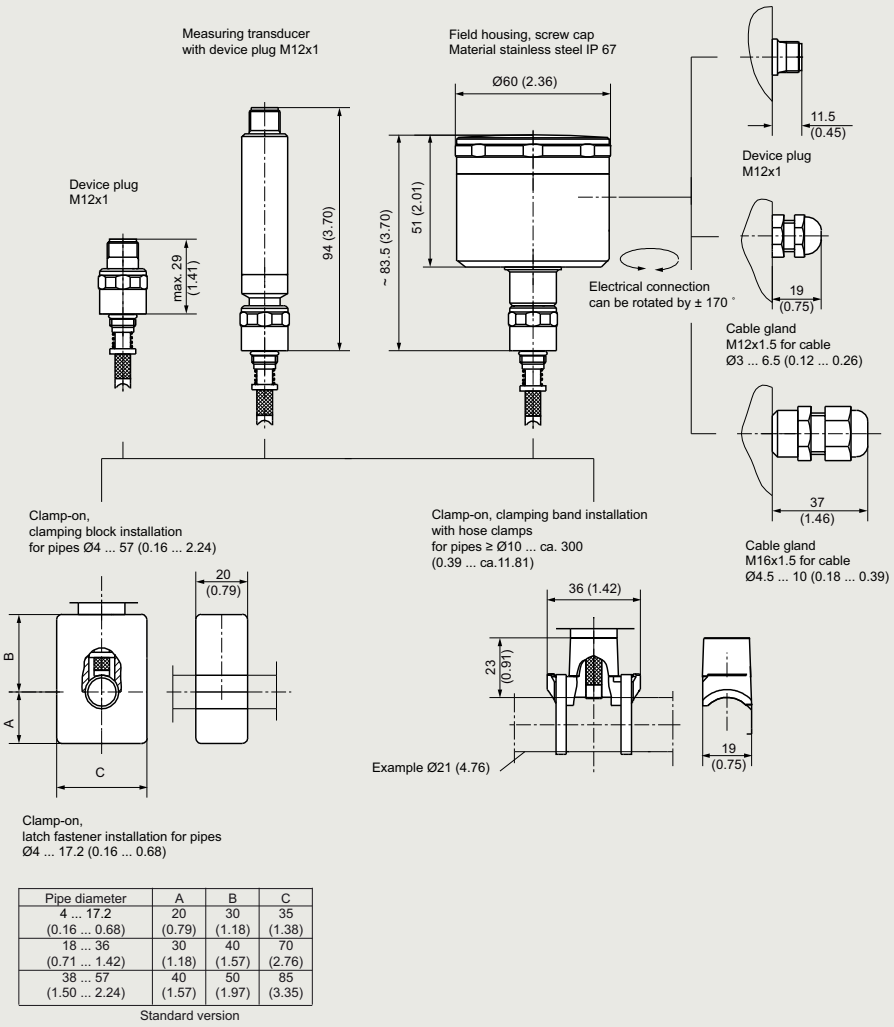
Structural design	
Measuring insert	• Special measuring insert made of stainless steel; hygienic design • Measuring element made of silver; thermal decoupling by plastic insert Measuring insert screwed into collar with spring tension. Use thermo-lubricant (see accessories) prior to mounting the device.
Pipe collar	• Collar made from temperature-resistant, high-performance plastic with integrated insulation system in hygienic design • Ambient temperature influence: Approx. 0.2%/10 K

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Design (continued)

The pipe diameter of the measuring pipe is required for correct device selection. For special sizes, you start by selecting the appropriate collar size and entering the desired size in plain text. Space-saving designs (clamping bracket version) are available optionally for installation in restricted spaces (e.g., pipe bundles). For correct assignment after recalibration, the collar as well as the measuring insert are marked with the serial number and pipe diameter. This information can also be engraved.

The following figure shows the available versions and components of SITRANS TS300 temperature sensors in clamp-on design:



Pipe diameter	A	B	C
4 ... 17.2 (0.16 ... 0.68)	20 (0.79)	30 (1.18)	35 (1.38)
18 ... 36 (0.71 ... 1.42)	30 (1.18)	40 (1.57)	70 (2.76)
38 ... 57 (1.50 ... 2.24)	40 (1.57)	50 (1.97)	85 (3.35)

Standard version

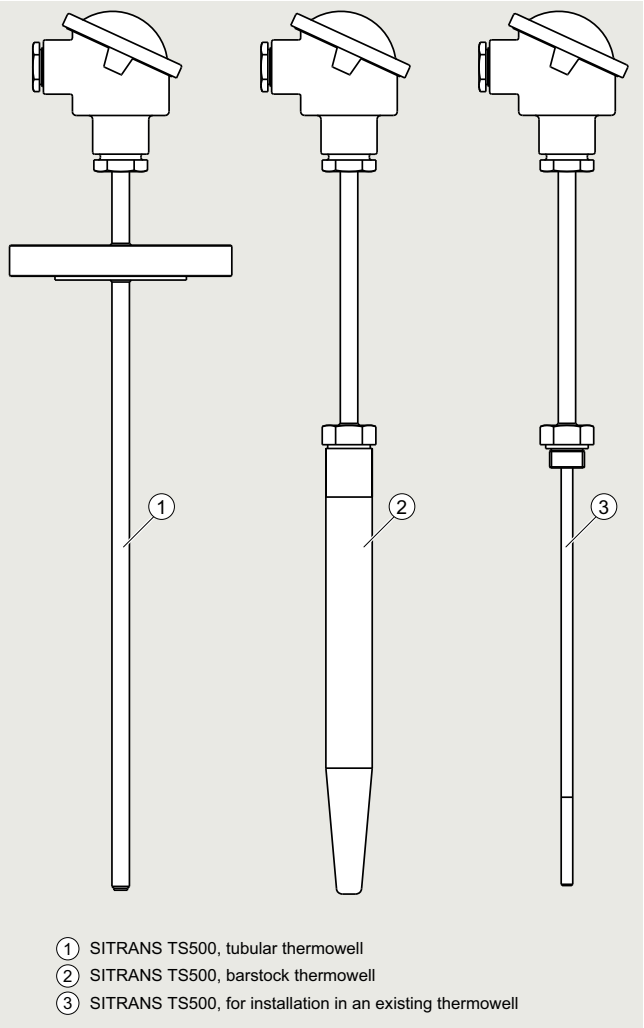
SITRANS TS300 clamp-on design, device plug, field enclosure, cable gland, variants, dimensions in mm (inch)

SITRANS TS500 7MC75xx

The following figure illustrates the available designs and components for SITRANS TS500 temperature sensors:

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Design (continued)



① SITRANS TS500, tubular thermowell
② SITRANS TS500, barstock thermowell
③ SITRANS TS500, for installation in an existing thermowell

SITRANS TS500 temperature sensors; the IP degree of protection depends on the connection head

The temperature sensors of the SITRANS TS500 series are available in three different versions:

Version	Description	Application	Process connection
1	• Tubular thermowell • Thermowell and extension made from a pipe; closed at tip with welded-in base plug	Minimal to medium process requirements	• Connection with thread or flange • Thread is welded on, or compression fitting
2	• Barstock thermowell • Barstock thermowell, tubular extension; extension screwed into thermowell	Medium to extreme process requirements	• Directly welded into pipe • With welded-on flange • With external thread
3	• For installation in existing thermowell • Tubular extension	Process requirements depending on the thermowell design	Screwed into an existing thermowell

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Function

A complete measuring point consists of a measuring insert which contains the basic sensors, the protective fitting and an optional measured value processor (transmitter).

Basic sensors

Basic sensors are:

- Resistance thermometers:
  Temperature measurement is based on the temperature dependency of the installed measurement resistance.
- Thermocouples:
  Temperature measurement is based on the Seebeck effect. A thermocouple which subjected to a temperature drop produces thermoelectric voltage that can be measured.

Transmitters

The optional Siemens transmitters assume the following functions:

- Optimum measurement processing
- Strengthening of weak sensor signals directly on site
- Transmit standardized signals
- Protect against electromagnetic interspersion
- Option to conduct measuring point diagnostics

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Configuration

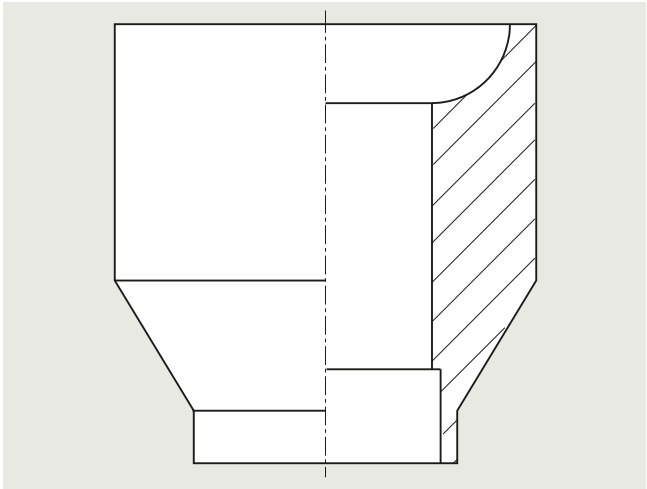
Components: Process connections

This catalog is limited to the standard versions. Special designs are available on request. The technical specifications are provided to assist the user. It is the responsibility of the ordering party to make the correct selection of suitable devices.

Welding in

The welding in of the thermowell provides a permanent, secure and highly resilient process connection, assuming a respective welding quality.

It is not possible to accidentally open the process connection. Additional gaskets are not required. If the pipe is not thick enough to ensure a secure welded joint, appropriate weld-in sockets are used. With weld-in sockets in suitable length, it is also possible to standardize a plant's measuring points to a large extent. Stocks of spare parts can therefore be reduced to a minimum.

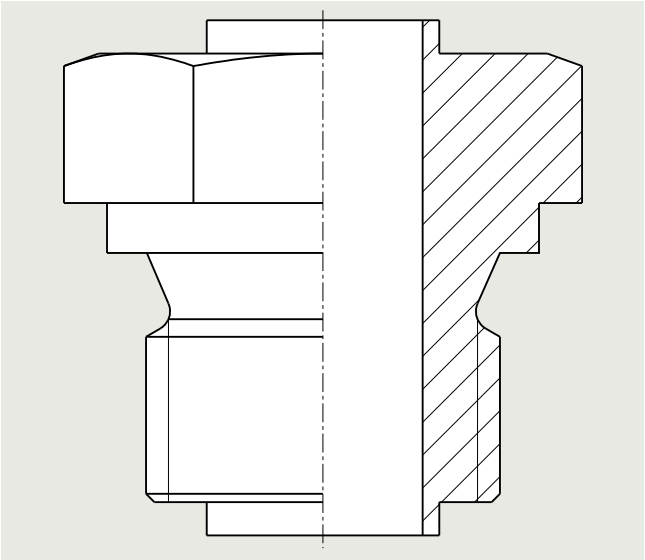


Weld-in sockets

Thread

Mounting type: Screw-in thread

Screw-in threads of different thread types and sizes are firmly welded to the thermowell.



Screw-in thread

Mounting type: Compression fittings

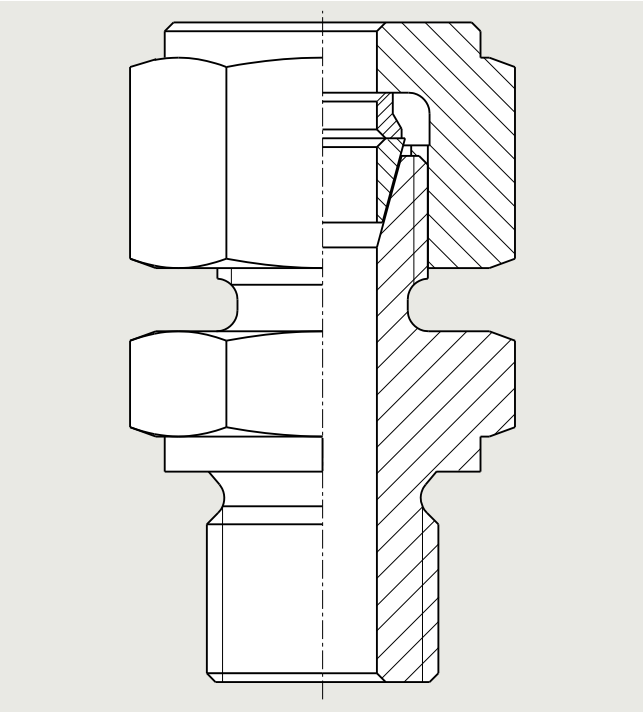
Compression fittings are available as accessories. They fit the diameter of the thermowell and provide for flexible installation. The installation length can be selected on site. When installed correctly, compression fittings are well suited for low and medium pressure.

The difference between the standard and spring-loaded version is as follows:

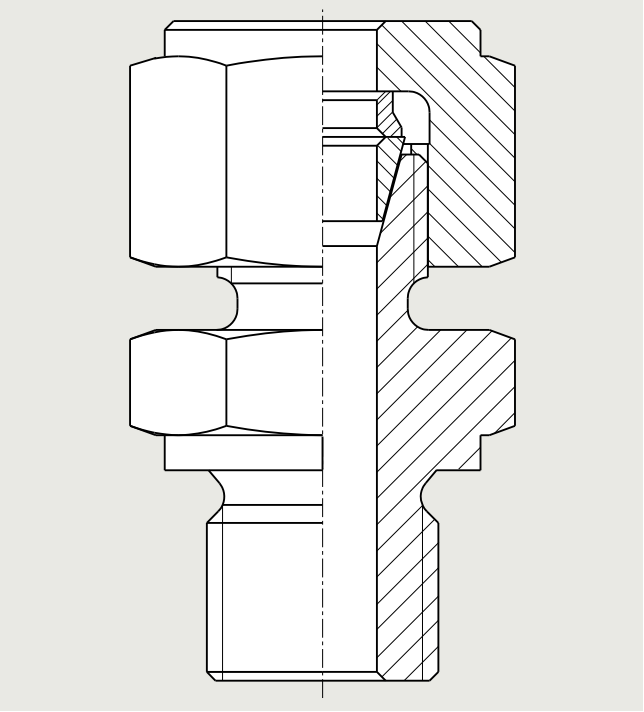
In the case of the spring-loaded compression fitting, the sensor is pressed against the measured object or the base of the thermowell. thus achieving particularly good heat contact.

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Configuration (continued)



Compression fitting

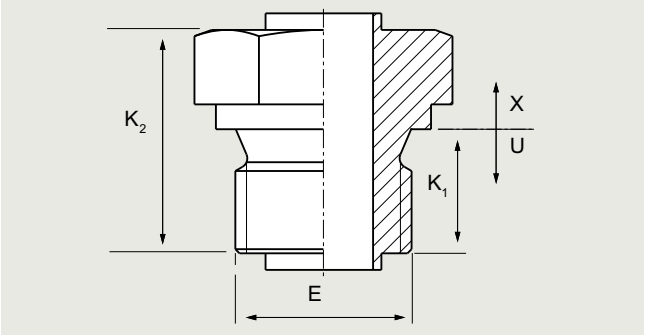


Spring-loaded compression fitting

Thread form:

Cylindrical thread

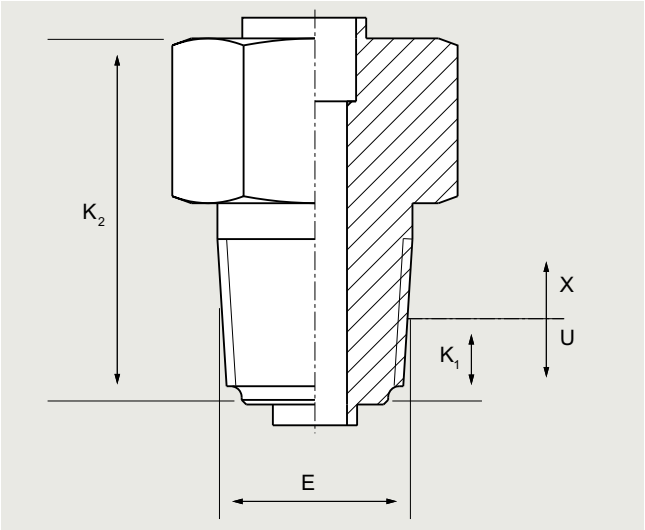
Cylindrical threads do not seal in the thread but due to an additional sealing surface or seal. For example, threads with the short form "G" (as per ISO 228) feature a thread form with a defined screw gauge.



Cylindrical thread

Tapered thread

By contrast, tapered threads, such as the American "NPT" thread, seal metallic in the thread. The relevant length information in the catalog refers to the "fully-tightened point (hand-tight)" of the thread, which cannot be defined exactly due to standard-related tolerances. However, the spring-load of the measuring insert compensates for the differences in length.



NPT thread

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Configuration (continued)

	Thread form:	E / E_1	K_1	K_2
Thermowells Form 2G + 3G	Cylindrical	G ½"	15	27
		G ¾"	16	34
		G1	30	46
		M20 × 1.5	12	26
		M27 × 2	16	34
		M33 × 2	18	36
	Tapered	NPT ½"	9	30
		NPT ¾"	9	32.5
		NPT 1"	10	40
Extensions 7MC7500	Cylindrical	G ½"	12	27
		M14 × 1.5	12	23
		M18 × 1.5	12	25
		M20 × 1.5	12	25
	Tapered	NPT ½"	9	33

X = extension length
U = installation length
E_1 = Neck pipe/process connection
K_1 = Screw-in depth
K_2 = Length of the process connection

Flanges

The different properties of the flanges are as follows:

- Standard series EN 1092, ASME 16.5,..
- Rated pressure
- Nominal diameter
- Sealing surface

This information is also stamped into the flange, along with the material code and batch number for "3.1 Material". For flange thermowells made of expensive materials, wetted parts of the thermowell and the so-called flanged wheel are designed with the required material. The flanged wheel is welded in front of the flange sealing surface in this case. Non-wetted parts are listed in 316L.

Industry-specific process connections

Special process connections have become popular in different industries. For example, hygiene technology: clamp-on connections, dairy connections and others.

Components: Thermowell

Tubular or barstock thermowells fulfill two basic functions:

- They protect the measuring insert from corrosive media
- They make it possible to replace units during ongoing operation

This catalog is limited to the standard versions. Special designs are available on request. The large number of available types can be classified as follows.

Tubular thermowells

Tubular thermowells are also described as "welded" or "multi-part" thermowells (not to be confused with "multi-part protective fittings"). They are suitable for low to medium process loads and can be manufactured on a cost-effective basis.
Versions:

- Form 2N similar to DIN 43772
  with straight tip and shortest possible extension length
  non-adjustable connection head
- Form 2 as per DIN 43772
  with straight tip and extension
  adjustable connection head
  Form 2: without process connection
  Form 2G: Threaded connection
  Form 2F: Flange connection
- Form 3 according to DIN 43772
  Version with tapered tip and extension
  Adjustable connection head
  For these thermowells, the thermowell tip is tapered by rotary swaging. This results in an excellent fit with the measuring insert and very good response times.
  Like with form 2, versions 3G/3F are also available for form 3

Barstock thermowells acc. to DIN 43772

Where process loads are too great, or where a thermowell cannot have a welded seam, deep-hole drilled barstock thermowells are used. Thermowells of form 4 according to DIN 43772 are widely used. Forms D1-D5 of the previous standard DIN 43763 have been integrated into form 4 of DIN 43772:

Design DIN 43763 invalid	Design 4 DIN 43772 current	
	L in mm	U in mm
D1	140	65
D2	200	125
D4	200	65
D5	260	125

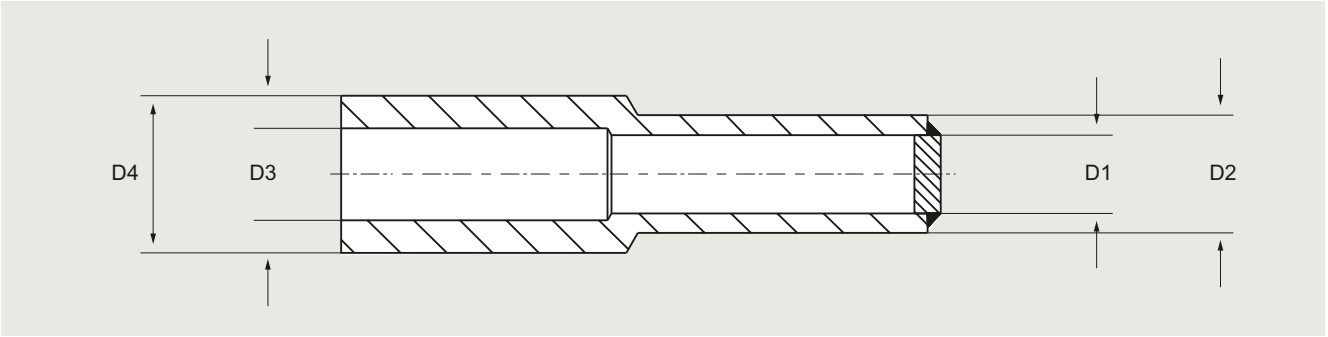
Tubular and barstock thermowells: Dimensions

The following table shows the dimensions of the different thermowells.

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Configuration (continued)

Thermowell type, design	Tip Inner diameter [mm (inch)] D_1	 Outer diameter [mm (inch)] D_2	Process connection Inner diameter [mm (inch)] D_3	 Outer diameter [mm (inch)] D_4
2N/2/2G/2F, pipe	7 (0.28)	9 (0.35)	7 (0.28)	9 (0.35)
2/2G/2F, pipe	7 (0.28)	12 (0.47)	7 (0.28)	12 (0.47)
3/3G/3F, pipe	6 (0.24) Tolerances acc. to DIN 43772	9 (0.35)	7 (0.28)	12 (0.47)
4/4F, barstock	7 (0.28)	12.5 (0.49)	7 (0.28)	24 (0.94)
4/4F, fast response, barstock	3.5 (0.14)	9 (0.35)	3.5 (0.14)	18 (0.71)



Dimensions of thermowells

Barstock thermowells according to ASME B40.9

Thermowells according to ASME are distinguished by their form: straight, reduced (staggered) or tapered along the entire installation length.

Coarse subdivisions can also be made in the type of process connection: Screwed design, for welding in, with flange, or with the so-called Van Stone connection.

For the Van Stone connection, a small flange sealing surface exists directly at the barstock thermowell. This prevents any welding seams in the area touching the media. The thermowell is fixed by a collar flange that presses the sealing surface against the plant-side flange. Another advantage of this design is the optimized spare parts inventory. A thermowell fits onto multiple connecting flanges; the only difference is in the collar flanges.

Components: Extension (neck pipe)

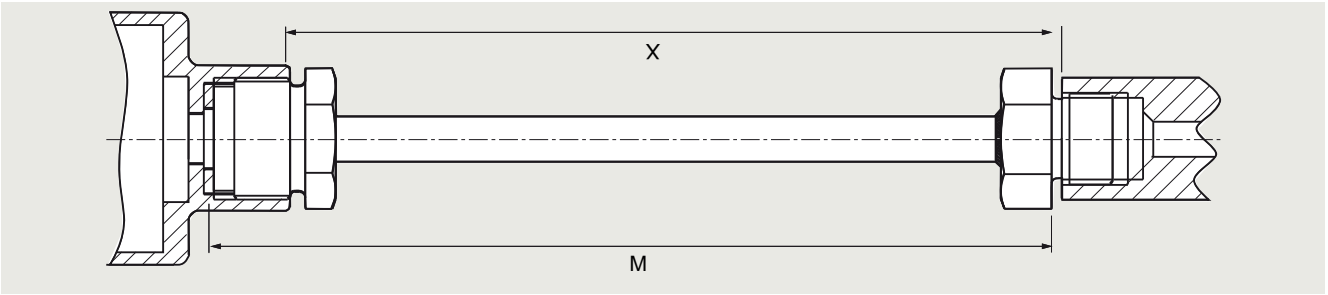
The extension is the section from the lower edge of the connection head to the fixed point of the process connection or thermowell. There are a variety of terms for this component, e.g. neck pipe. For this reason the term extension has been selected as a standardized term for the different designs. Function is the deciding factor:

- Thermal decoupling of connection head from process temperature
- Installation of connection head over existing insulation
- Simple standardization of measuring inserts: In general, the length of the extension may be freely selected. However, when using standardized installation lengths, the option "Extension as per DIN 43772" is recommended. This ensures that measuring inserts which are quickly available can be used. In the case of special installation lengths, it is possible to standardize the measuring insert length through a clever combination with the respective special extension length. This allows customers to optimize their costs in purchasing and logistics.
- For American-type sensors, the extension also undertakes the spring load of the measuring insert.
- Depending on the version, the extension can also enable the adjustment of the connection head
- The form of the extension depends on the form of the thermowell:
  - Tubular thermowell
    The extension and thermowell usually consist of one continuous pipe. The process connection is welded on (= one-piece protective fitting).
  - Barstock thermowells
    Extension and the thermowell consist of two components which are screwed together. The process connection is attached to the thermowell (= multi-piece protective fitting).

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Configuration (continued)

Thermowell type	X [mm (inch)]	M [mm (inch)]	Divisible
2G	129 (5.08)	145 (5.71)	No
2F	64 (2.52)	80 (3.15)	No
3G	131 (5.19)	147 (5.79)	No
3F	66 (2.60)	82 (3.23)	No
4 (only L=110)	139 (5.47)	155 (6.10)	Yes
4 (others)	149 (5.87)	165 (6.50)	Yes



Extensions as per DIN 43772

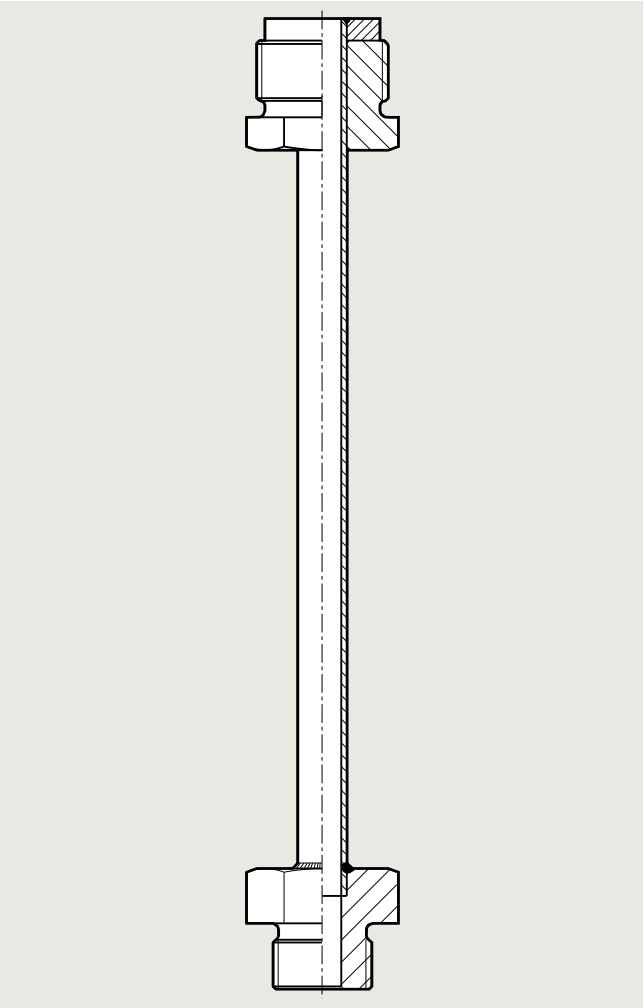
Versions

With regard to their function, extensions can be classified into two types:

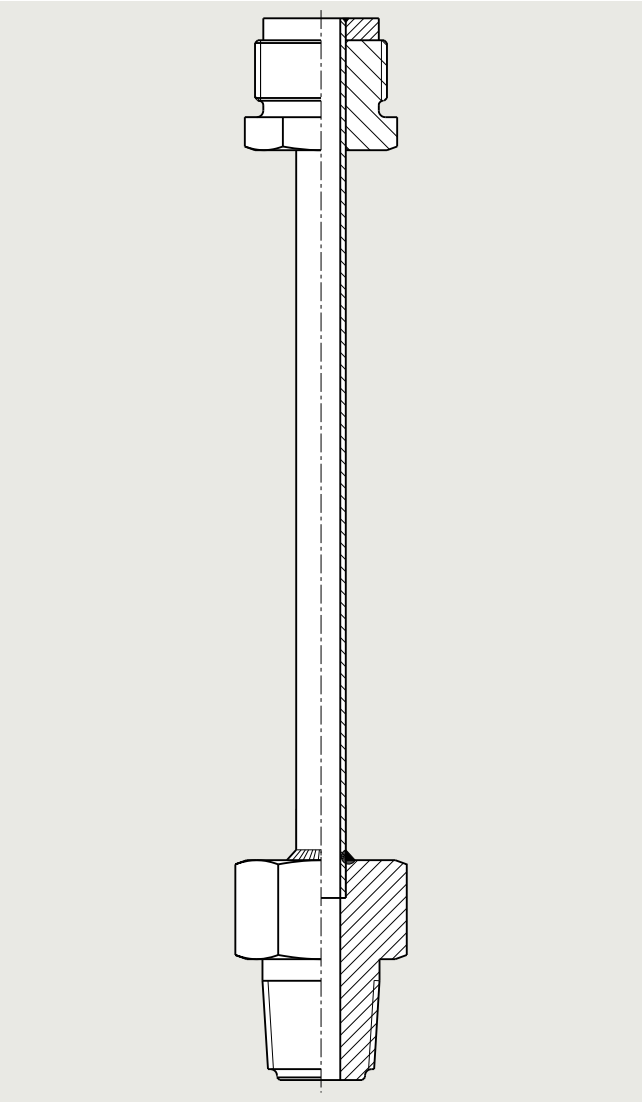
- Adjustable /non-adjustable:
  Function of the extension to align the connection head to the desired direction
- Integrated measuring insert spring load:
  In the case of American-type sensors, the spring load of the measuring insert is integrated into the extension. Measuring insert and extension form one unit.

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Configuration (continued)



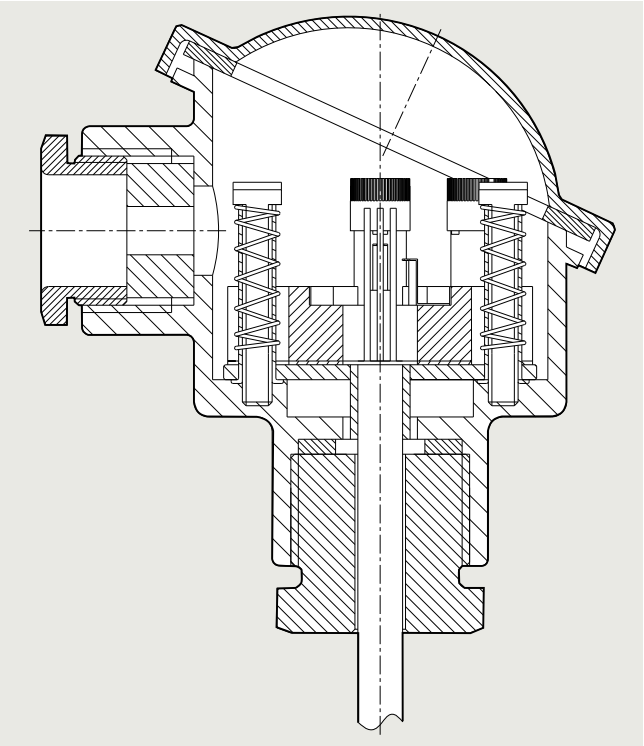
European type: Adjustable, cylindrical



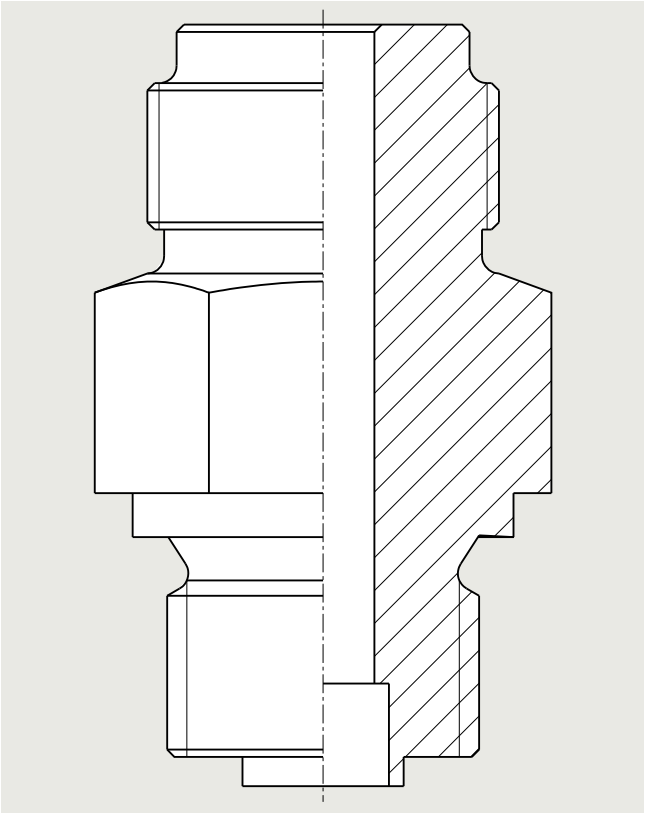
European type: Adjustable, tapered

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Configuration (continued)



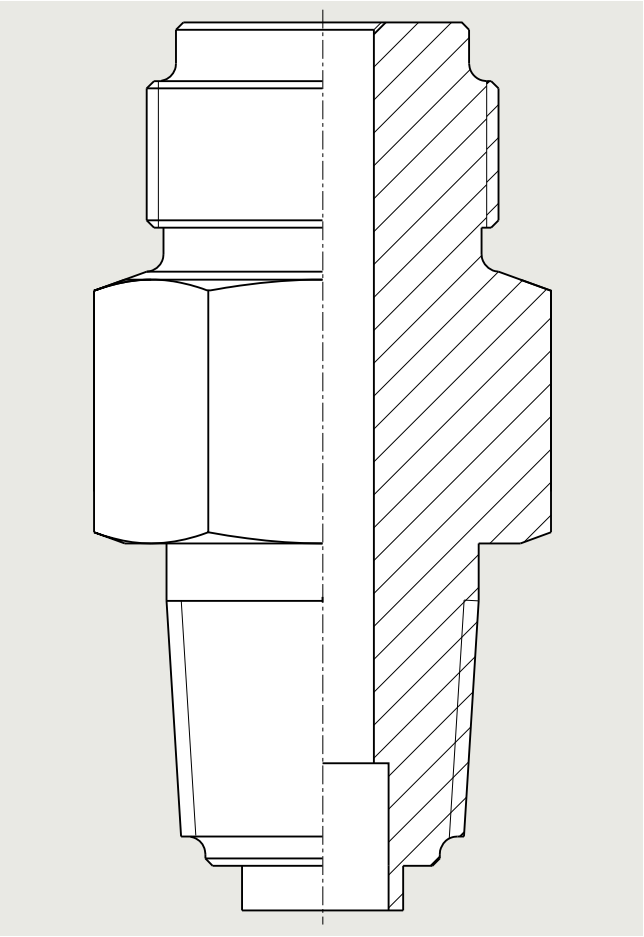
Without extension, without thread (optional sealing screw)



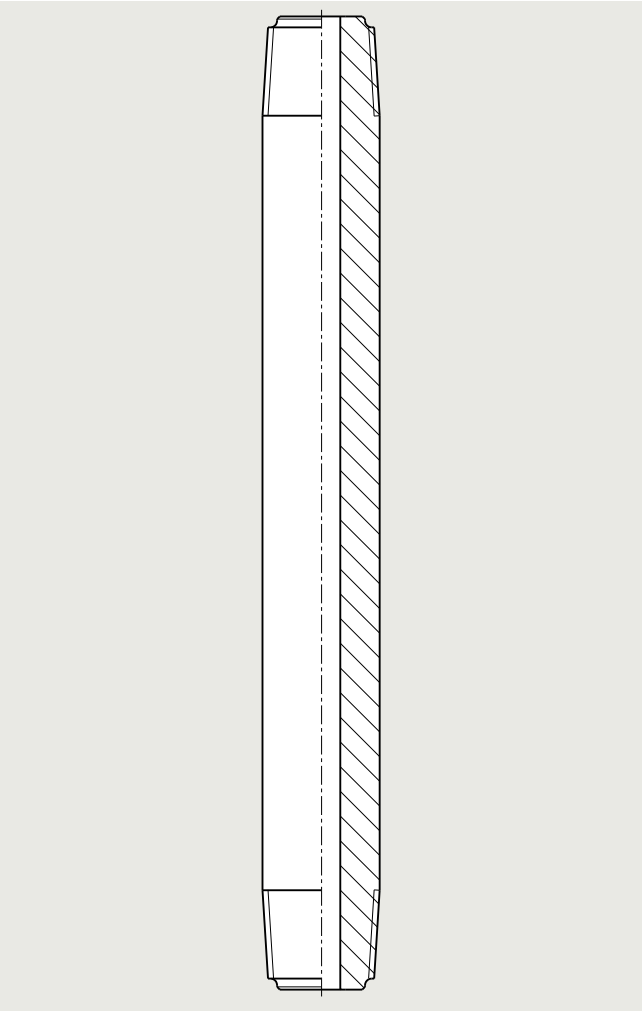
European type: Non-adjustable, cylindrical

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Configuration (continued)



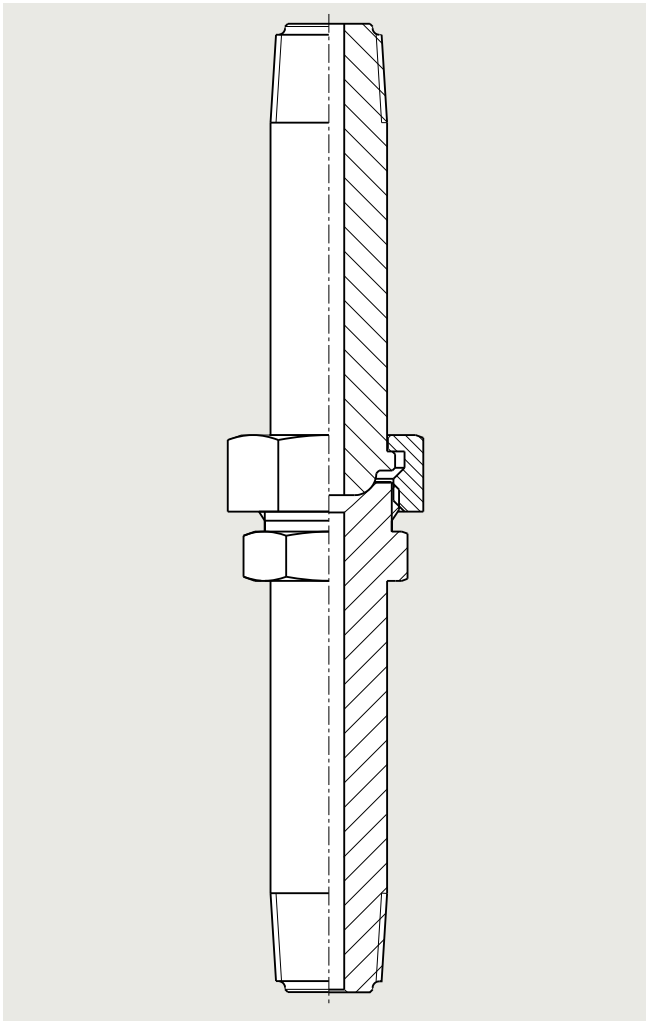
European type: Non-adjustable, tapered



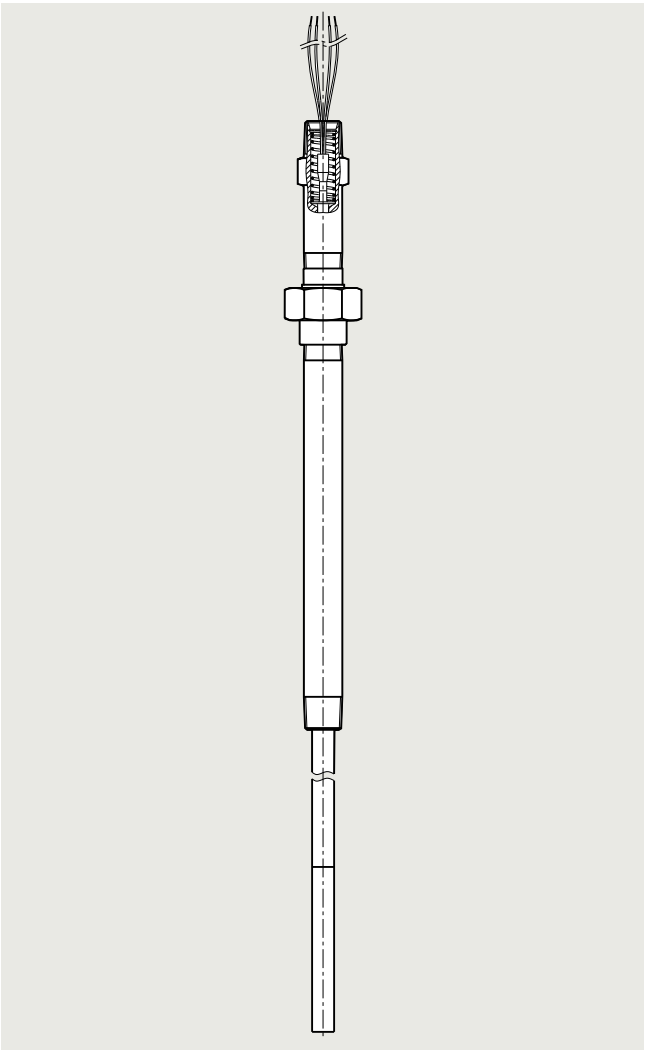
European type: Non-adjustable, Nipple (NIP)

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Configuration (continued)



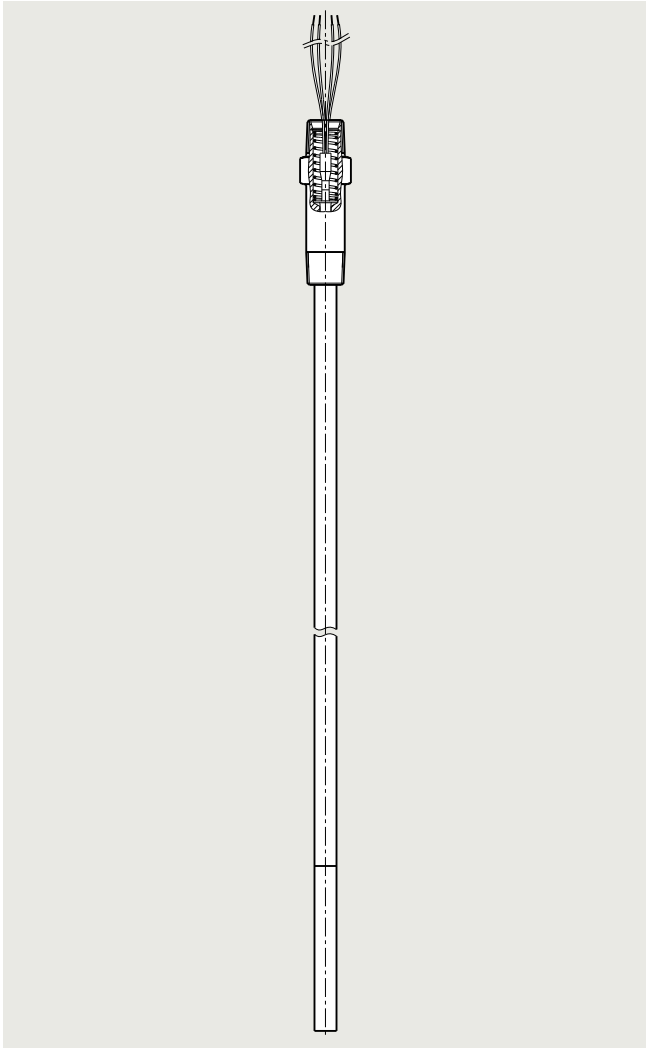
European type: Adjustable, Nipple-Union-Nipple (NUN)



American type: Adjustable, Nipple-Union-Nipple (NUN)

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Configuration (continued)



American type: Non-adjustable, Nipple (NIP)

Versions; in the case of heavy stainless steel connection heads in conjunction with vibrations, a short extension length should be chosen or external support should be provided.

Components: Connection head

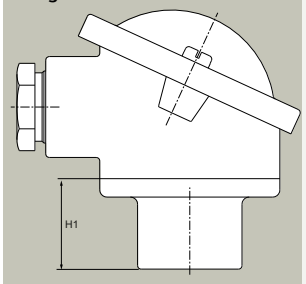
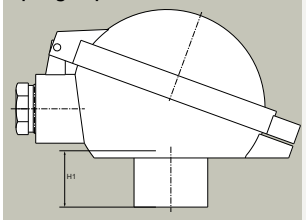
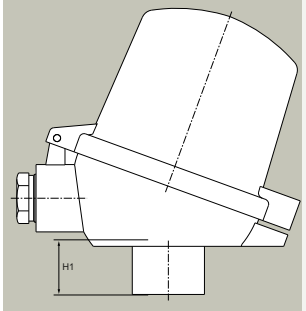
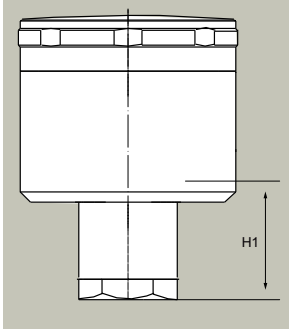
Connection head

the connection head protects the terminal compartment. The connection head features sufficient room for mounting a clamping base or transmitter.

Different connection heads are used depending on the application and preference. Where cable glands and thread adapters are included in the scope of the order, they will be supplied with the device.

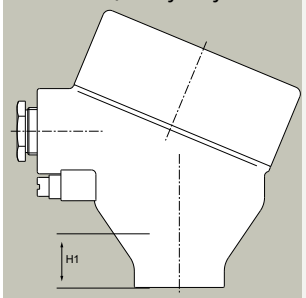
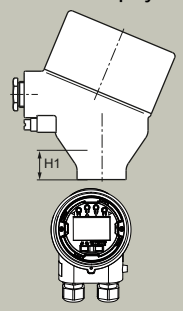
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Configuration (continued)

Connection head label	Type Material	Cable gland	Degree of protection [corrosion protection corresponding to ISO 12944-2]	Transmitter installation	Connection height H1 [mm (inch)]	Explosion protection optional
Flange cover 	BA0 aluminum	M20 × 1.5 Not Ex: Plastic Ex i/Ex n: Brass	IP65 [C2, durability H; C3, durability M]	Measuring insert	26 (1.02)	Ex i
Spring flap low 	BB0 aluminum	M20 × 1.5 Not Ex: Plastic Ex i/Ex n: Brass	IP65 [C2, durability H; C3, durability M]	Measuring insert	26 (1.02)	Ex i
Spring flap high 	BC0 aluminum BC0 plastic	M20 × 1.5 Not Ex: Plastic Ex i/Ex n: Brass	IP65 [For aluminum: C2, durability H; C3, durability M] [For plastic: not applicable]	Measuring insert and/or spring flap	26 (1.02)	Ex i
Screw cover made of stainless steel 	BS0 stainless steel	M12 × 1.5 polyamide	IP67 [For stainless steel: not applicable]	Measuring insert	26 (1.02)	Ex i

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Configuration (continued)

Connection head label	Type Material	Cable gland	Degree of protection [corrosion protection corresponding to ISO 12944-2]	Transmitter installation	Connection height H1 [mm (inch)]	Explosion protection optional
Screw cover, heavy-duty 	AG0 aluminum AU0 stainless steel AISI 316 (1.4401)	M20 × 1.5 Not Ex: Plastic Ex i/Ex n: Brass Ex d: without cable gland	IP66/68 (IP68: 1.5 m; 2 h) NEMA 4X [For aluminum: C2, C3, C4, for stainless steel: not applicable]	Measuring insert	41 (1.61)	Ex i, Ex d
Screw cover, window, heavy duty, with local display 	AH0 aluminum AV0 stainless steel AISI 316 (1.4401)	M20 × 1.5 Not Ex: plastic Ex i/Ex n: brass Ex d: without cable gland	IP66/68 (IP68: 1.5 m; 2 h) NEMA 4X [For aluminum: C2, C3, C4, for stainless steel: not applicable]	Measuring insert	41 (1.61)	Ex i, Ex d

Components: Measuring insert

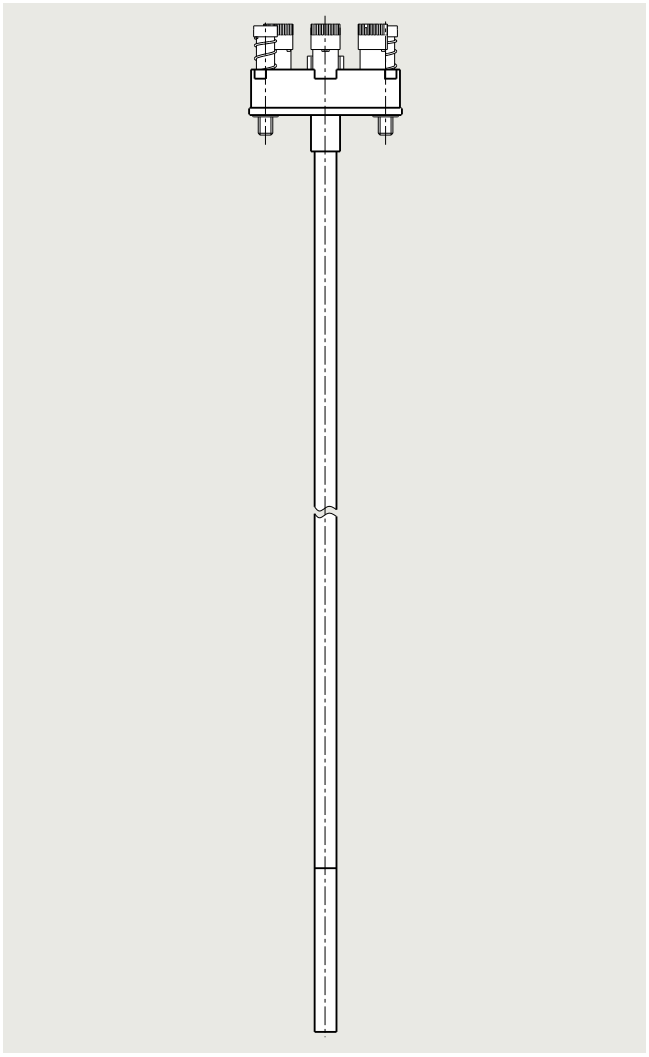
The measuring insert of the temperature sensor is built into the protective fitting (thermowell, extension and connection head). The basic sensor is located in the measuring insert, where it is protected. The spring load of the measuring inserts provide good thermal contact with the tip of the thermowell, and vibration resistance is significantly increased. Only highly resistant mineral-insulated cables (so-called MIC or plastic-sheathed) are used for the electrical connection between the basic sensor and connection head. The highly compacted insulation of magnesium oxide achieves excellent levels of vibration resistance. The following measuring insert designs are the most widely used on the world market:

European type

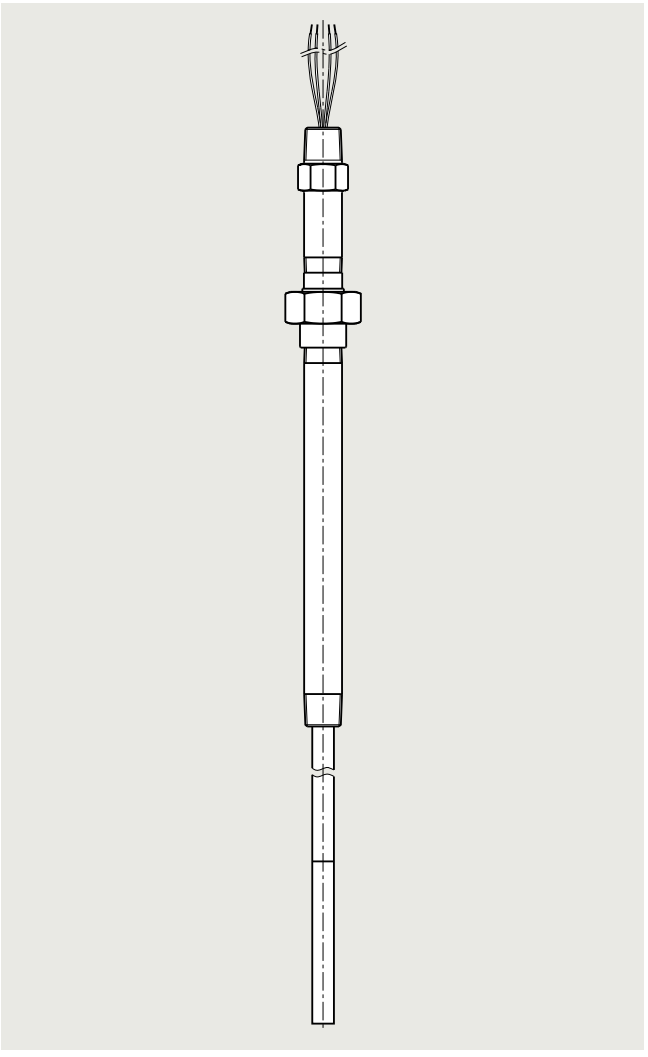
European type measuring inserts can be replaced without having to dismantle the connection head. The springs are located either on the transmitter or the terminal base. This makes it possible to achieve an 8 to 10 mm (0.315 to 0.394 inches) spring range. If a transmitter is not attached, a ceramic base is located at this position. Order option G01 can be used to select a version with flying leads instead of the ceramic base for mounting of head-mounted transmitters.

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Configuration (continued)



European type



American type

American type

American-type measuring inserts feature a large spring range. These measuring inserts are ideal for use with NPT threads that feature high tolerances. In this configuration, the extension function is partially or fully integrated (nipple-union-nipple). Moreover, it is also possible to directly mount field devices, e.g. SITRANS TF.

Components: Transmitters

SITRANS TH head-mounted transmitters process weak, non-linear sensor signals and transmit a stable and temperature-linear standard signal. thereby minimizing sensor signal disruptions.

The transmitters permanently monitor the temperature sensors and transmit diagnostics data to higher-level systems.

Because of the low energy feed of the SITRANS TH head-mounted transmitters, self-heating of the temperature sensors is at a minimal level.

The galvanic isolation and integrated reference junction ensure that temperature sensors with thermocouples provide reliable measurements at a low cost.

SITRANS TH product family

For detailed technical specifications on the SITRANS TH transmitters, please refer to this catalog.

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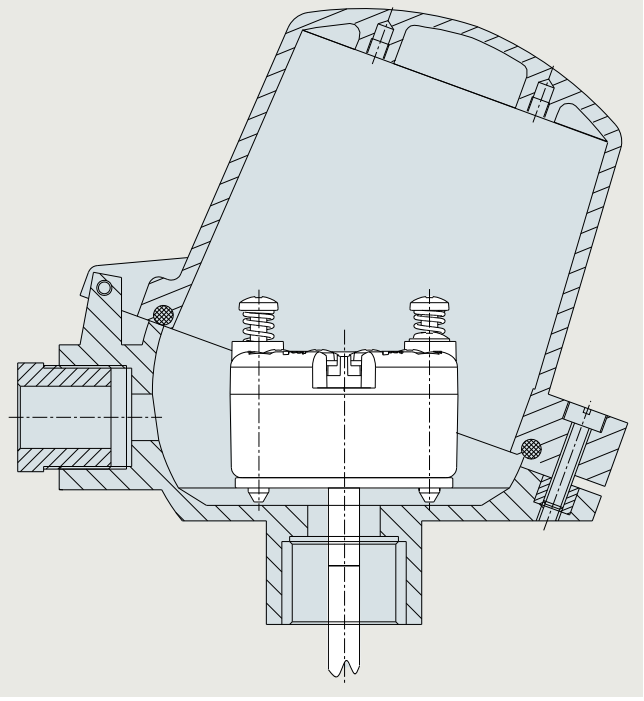
Configuration (continued)

- TH100 - the basic device
  - Output: 4 ... 20 mA
  - 1 × Pt100 input
  - Can be configured using simple software
- TH320 - the universal device
  - Output 4 ... 20 mA or:
  - Output 4 ... 20 mA/HART
  - 1 × resistance thermometer, thermocouple input
  - Can be configured using simple software
- TH420 – Twice as safe
  - Output 4 ... 20 mA/HART
  - Output PROFIBUS PA
  - 2 × resistance thermometer, thermocouple input; hot backup and drift detection, etc. can be achieved as a result
  - Extended diagnostics functions

Installation types

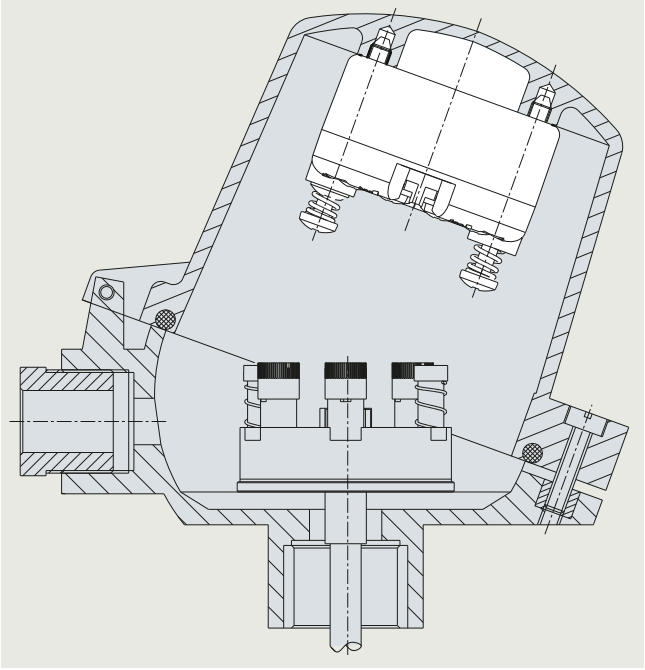
All SITRANS TH transmitters can be installed in type B connection heads. The following installation forms are used:

- Measuring insert installation
  Our standard version offers the following advantages
  - Small vibrating masses and compact design
  - Measuring insert-transmitter unit can be replaced quickly



Installation of measuring insert

- Spring flap installation
  - Standard for head type BC0 and BP0
  - Advantage: Measuring insert and transmitter can be repaired/maintained separately (recalibration).



Spring flap installation

Measuring technology: Basic sensors

The diverse application spectrum for industrial temperature measuring technology requires different sensor technologies.

Resistance thermometer

Basic sensors made of other basic materials, with different basic values or different underlying standards, are available on request. Resistance thermometers can be classified as follows:

- Basic design:
  The sensor element is built with thin layer technology. The resistance material is applied in the form of a thin layer on a ceramic carrier material.
- Versions with increased vibration resistance:
  In addition to the basic design: Measures to improve vibration resistance.
- Versions with expanded measuring range:
  Elements in wire-wound design. The wire winding is embedded in a ceramic body.

Thermocouples

Thermocouples based on other thermocouples or underlying standards are available upon request.

The most common base-metal thermocouples are:

- Type N (NiCrSi-NiSi) high degree of stability even in the upper temperature range
- Type K (NiCr-Ni) more stable than type J, but drifts in upper range
- Type J (Fe-CuNi) narrow application band

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Configuration (continued)

Measuring technology: Measuring range

The measuring range describes the temperature limits within which the thermometer can be used in a way that is meaningful for measurement purposes. Depending on the loads present, the thermowell materials and the desired accuracy levels, among other things, the actual application range for the thermometer may be smaller.

Resistance thermometer [°C (°F)]	
Basic version and increased vibration resistance	-50 ... +400 (-58 ... +752)
Expanded measuring range	-196 ... +600 (-320.8 ... +1112)

Thermocouple [°C (°F)]	
Type N	-270 ... +1 100 (-167 ... +2 012)
Type K	-270 ... +1 100 (-167 ... +2 012)
Type J	-210* ... +750 (-134* ... +1 382)

* According to IEC 60 584: recommended 0 ... +750 °C

Measuring technology: Measuring accuracy

Resistance thermometer

The tolerance classes of the resistance thermometers correspond to IEC 751/EN 60751:

Tolerance	Δt
Basic accuracy, Class B	± (0.30 °C +0.0050|t[°C]|) 0.54 °F +0.0050x|t[°F]-32|
Increased accuracy, Class A	± (0.15 °C +0.0020|t[°C]|) 0.27 °F +0.0020x|t[°F]-32|
High accuracy, Class AA (1/3 B)	± (0.10 °C +0.0017|t[°C]|) ± 0.18 °F +0.0017x|t[°F]-32|

The following tables provide an overview of the scope of these tolerances. If the specified limits are exceeded with a resistance thermometer, the values of the next lower accuracy class permanently apply:

Resistance thermometer, Basic version [°C (°F)]	
Tolerance	**Range**
Basic accuracy, Class B	-50 ... +400 (-58 ... +752)[1)]
Increased accuracy, Class A	-30 ... +300 (-22 ... +572)
High accuracy, Class AA (1/3 B)	0 ... 150 (32 ... 302)

Resistance thermometer, Increased vibration resistance [°C (°F)]	
Tolerance	**Range**
Basic accuracy, Class B	-50 ... +400 (-58 ... +752)[1)]
Increased accuracy, Class A	-30 ... +300 (-22 ... +572)
High accuracy, Class AA (1/3 B)	0 ... 150 (32 ... 302)

Resistance thermometer, Expanded measuring range [°C (°F)]	
Tolerance	**Range**
Basic accuracy, Class B	-196 ... +600 (-321 ... +1 112)
Increased accuracy, Class A	-100 ... +450 (-148 ... +842)
High accuracy, Class AA	-50 ... +250 (-58 ... +482)

1) The requirements of IEC 60751 are observed. In the event of high requirements regarding long-term stability, Pt 100 sensors "expanded measuring range" should be used for temperatures above 350 °C (662 °F).

Thermocouples

The tolerance classes of the thermocouples correspond with IEC 584/EN 60584:

Catalog versions

Type	Basic accuracy, Class 2	Increased accuracy, Class 1
N	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 1200 °C ±0.0075x|t[°C]| (631 °F ... 2192 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 1000 °C ±0.004x|t[°C]| (707 °F ... 1832 °F ±0.004x|t[°F]-32|)
K	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 1200 °C ±0.0075x|t[°C]| (631 °F ... 2192 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 1000 °C ±0.004x|t[°C]| (707 °F ... 1832 °F ±0.004x|t[°F]-32|)
J	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 750 °C ±0.0075x|t[°C]| (631 °F ... 1382 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 750 °C ±0.004x|t[°C]| (707 °F ... 1382 °F ±0.004x|t[°F]-32|)

Other thermocouples, ignoble

Type	Basic accuracy, Class 2	Increased accuracy, Class 1
T	-40 °C ... 133 °C ±1 °C (-40 °F ... +271 °F ±1.8 °F) 133 °C ... 350 °C ±0.0075x|t[°C]| (271 °F ... 662 °F ±0.0075x|t[°F]-32|)	-40 °C ... +125 °C ±0.5 °C (-40 °F ... +257 °F ±0.9 °F) 125 °C ... 350 °C ±0.004x|t[°C]| (257 °F ... 662 °F ±0.004x|t[°F]-32|)
E	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 900 °C ±0.0075x|t[°C]| (631 °F ... 1652 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 800 °C ±0.004x|t[°C]| (707 °F ... 1472 °F ±0.004x|t[°F]-32|)

Other thermocouples, noble

Type	Basic accuracy, Class 2	Increased accuracy, Class 1
R and S	0 °C ... 600 °C ±1.5 °C (32 °F ... 1112 °F ±2.7 °F) 600 °C ... 1600 °C ±0.0025x|t[°C]| (1112 °F ... 2912 °F ±0.0025x|t[°F]-32|)	0 °C ... 1100 °C ±1 °C (32 °F ... 2012 °F ±1.8 °F) 1100 °C ... 1600 °C ± [1 + 0.003 x (t - 1100)] °C (2012 °F ... 2912 °F ±1.8 + 0.003x(t[°F]-2012))
B	600 °C ... 1 700 °C ±0.0025x|t[°C]| (1 112 °F ... 3 092 °F ±0.0025x|t[°F]-32|)	

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Configuration (continued)

SITRANS TS300 Clamp-on

Measuring accuracy	
Reference conditions	
• Pipe	Pipe 13 × 1.5 mm (0.51 × 0.06 inches) made of stainless steel using thermal paste
• Ambient temperature	20 °C (68 °F)
• Medium	Water 120 °C (248 °F)
• Flow velocity	3 m/s (9.84 ft/s)
Measuring accuracy when using thermal paste The accuracy depends on the geometry of the pipe, the medium and the ambient conditions T_M = Medium temperature; T_A = Ambient temperature	Process-optimized for steam sterilization
• Class A according to IEC 60751	-40 ... +150 °C (-40 ... 302 °F) $(T_A-T_M) \times 0.02$

Measuring technology: Response times

Response time describes the speed of the measurement system in the case of a temperature change, and is typically indicated as T0.5 or T0.9. The values indicate the time in which a measured value has increased to 50% or 90% of the actual temperature increase.

The main variables which affect response time are as follows:

- Thermowell geometry, ideal are:
  - Very little material at the tip
  - Use of conductive material
- Thermal connection of measuring insert to the thermowell: Because of design changes implemented for the measuring insert (small gap width, spring system), Siemens measuring inserts feature very good response behavior. Due to the good fit, additional contact materials are not usually required except in certain applications, e.g. attachment of a surface sensor.
- Size of temperature increase
- Medium and flow velocity

Resistance thermometer

Typical values as per EN 60751 in water at 0.4 m/s can be found in the following table.

Thermowell form	Diameter [mm (inch)]	T0.5	T0.9
None	6 (0.24)	6	15
Straight (2)	9 (0.35)	34	90
	12 (0.47)	45	143
Tapered (3)	12 (0.47)	15	31
Barstock (4), U/C = 65	24 (0.95)	40	100
Barstock (4), U/C = 125	24 (0.95)	40	110

Thermocouples

Typical values as per EN 60751 in water at 0.4 m/s can be found in the following table.

Thermowell form	Diameter [mm (inch)]	T0.5	T0.9
None	6 (0.24)	2	4
Straight (2)	9 (0.35)	20	63
	12 (0.47)	19	66
Tapered (3)	12 (0.47)	7	22
Barstock (4), U/C = 65	24 (0.95)	22	73
Barstock (4), U/C = 125	24 (0.95)	20	53

Measuring technology: Mounting depth

Measuring insert

Type	Temperature-sensitive length (TSL) [mm (inch)]	Non-bendable length [mm (inch)]
Basic	20 (0.79)	30 (1.82)
Increased vibration resistance	20 (0.79)	30 (1.82)
Expanded measuring range	50 (1.97)	60 (2.36)
Thermocouple	20 (0.79)	5 (0.20)

Immersion depth/contact with medium

The "heat transfer error" arises depending on the ambient conditions (temperature/weather/insulation) and the size of the thermowell, process connection and pipe.

To prevent such an error, the immersion depth and diameter of the thermowell tip are defined. The temperature-sensitive length (TSL) of the thermowell must also be taken into account. The following rule of thumb can be used:

- Water
  Immersion depth ≥ TSL + 5 × thermowell diameter
- Air
  Immersion depth ≥ TSL + 10 ... 15 × thermowell diameter
- Recommendations
  - Select largest possible immersion depth
  - Select measuring location with higher flow velocity
  - Insulate outer components of thermometer
  - Smallest possible surface for outer components
  - Insertion in pipe bends
  - Direct measurement without additional thermowell if no suitable solution can be found using other measures

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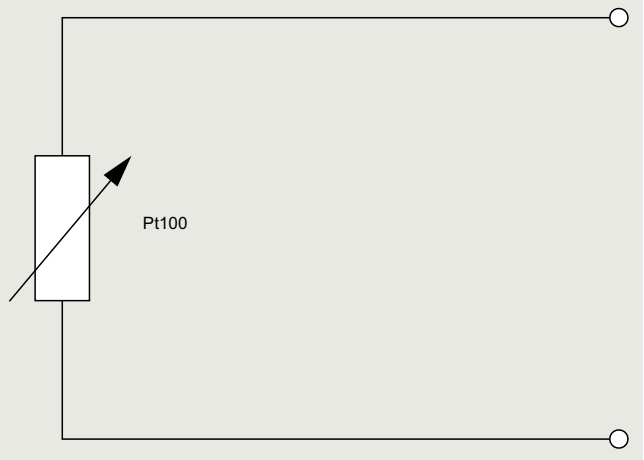
Configuration (continued)

Measuring technology: Connection types

For resistance thermometers, the type of sensor connection directly affects the level of accuracy:

2-wire connection

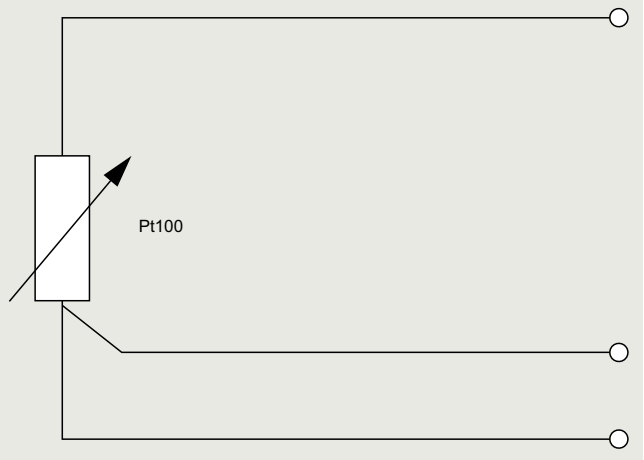
The resistance of sensor lines is included in the measurement result as an error. Adjustments are recommended in this case.



Pt100 2-wire connection

3-wire connection

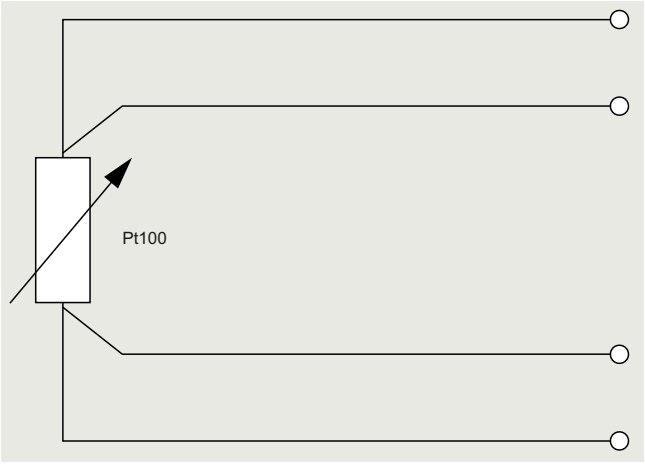
Line resistance is not included in the measurement result. Requirement: All terminal and wire resistances (corrosion) are at the same level, and terminals are at the same temperature level. Unfortunately, this is often not the case in practice.



Pt100 3-wire connection

4-wire connection

Line resistance is not included in the measurement result. This type of connection is the most secure and most accurate.



Pt100 4-wire connection

Siemens measuring inserts can be used to implement all types of connections for Pt100 devices. In the standard version, these are always supplied as 1 × 4-wire or 2 × 3-wire.

Even 2 × 4-wire are available using order option "G30". Our SITRANS TH420 transmitters offer the unique possibility to connect 2 × 4-wire resistance thermometers. The user therefore no longer has to live with the disadvantages of the 3-wire circuit when redundant sensor designs are required at the same time for safety reasons. If a complete second measuring point had to be instrumented in these cases, this work is now eliminated.

Temperature influence

At connection head TS500 [1)]

	Without transmitter [°C (°F)]	With suitable transmitter [°C (°F)]
A heads AG0/AH0/AU0/AV0 non-SIL[2)]	-50 ... +100 (-58 ... +212)	-50 ... +80 (-58 ... +176)
Aluminum or stainless steel	-40 ... +100 (-40 ... +212)	-40 ... +80 (-40 ... +176)
Plastic	-40 ... +85 (-40 ... +185)	-40 ... +80 (-40 ... +176)

[1)] In the case of applications in hazardous areas, observe information in manual.

[2)] Check cable gland and transmitter (e.g. not for Han 7 device plugs, M12).

Special climatic conditions

SITRANS TS200 Compact, TS500 and TSinsert achieve the following classes of application according to IEC 60654-1 for use in tropical climates:

- C3 for sheltered locations
- D2 for outdoor locations

At the TS200 plug-in connection/cable connection site

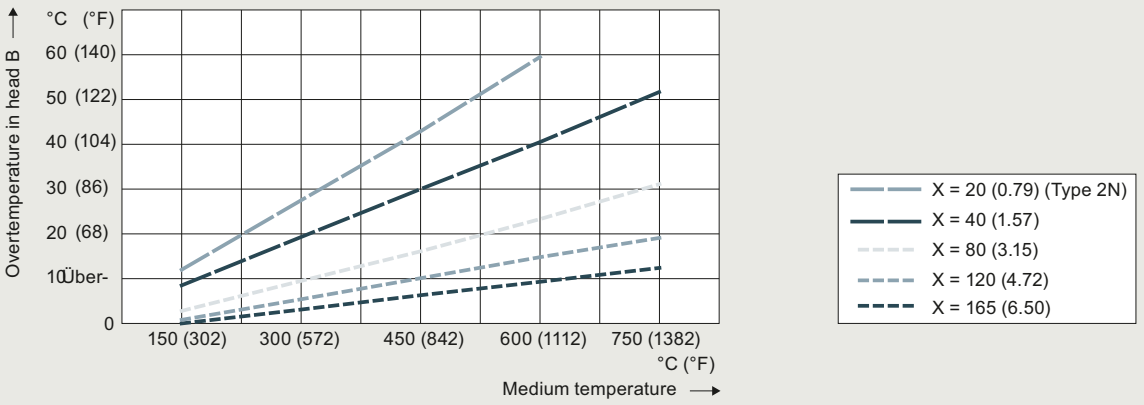
The specified measuring range applies to the hot side of the sensor. The maximum permissible temperature at the cold end depends on the cables and plugs used. < 80 °C (176 °F) is considered non-critical here.

Influence of extension

The illustration below assists you in selecting the right length for the neck pipe. In this case, the following applies: Connection head temperature = Ambient temperature + Overtemperature. The temperature in the connection head can thus be assessed as follows:

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Configuration (continued)



Extension length X, influence on temperature, dimensions in mm (inch)

Note that guidance values may change due to local conditions. Consider these potential changes particularly with respect to explosion protection.

Also note that the accuracy of the transmitter also depends on the temperature in the connection head.

SITRANS TS300 Clamp-on

Structural design	
Measuring insert	• Special measuring insert made of stainless steel; hygienic design • Measuring element made of silver; thermal decoupling by plastic insert Measuring insert screwed into collar with spring tension. Use thermo-lubricant (see accessories) prior to mounting the device.
Pipe collar	
Material	Temperature-resistant, high-performance plastic with integrated insulation system in hygienic design
Ambient temperature influence	Approx. 0.2%/10 K

Process connection/thermowell

Process parameters may only allow one specific technology for the selection of process connections. You also have to observe regional, standard-based and customer-specific requirements. The range of products therefore includes a broad selection of standard connections.

In the case of redesigned or newly designed plants, it is possible to achieve cost savings by implementing various measures:

- Use of standard lengths through clever selection of screw-in, weld-in or flange sockets
- Moveable compression fittings

The thermal stability of a material for process connection and thermowell also limits the application area of the temperature sensor. The temperature range specified on the nameplate always refers to the measuring insert, not the material which comes into contact with media. Two aspects must be considered when assessing temperature stability:

- What maximum temperature may the material reach without a load?
- What is the behavior under load?

Pressure Equipment Directive

This device does not fall under the Pressure Equipment Directive; classification according to Pressure Equipment Directive (PED 2014/68/EU), Guideline 1/40; Article 1, Paragraph 2.5

Hydrogen applications

Our solutions with austenitic materials (especially 316L/1.4404 in this case) are suitable for measuring temperatures in hydrogen. In principle, all productive tube and process connection types can be used for this purpose. Due to the large material thicknesses, H2 diffusion is small and usually does not pose a problem. For particularly high requirements for high diffusion tightness, full-penetration-welded flange connections or the weld-free Vanstone designs are available.

Process load

Because of the large variety of possible applications and variables, it is not possible to make general binding statements regarding the resilience of components which comes into contact with media. The load diagrams below can be used for common applications. However, where operating conditions vary significantly, contact our technical support team.

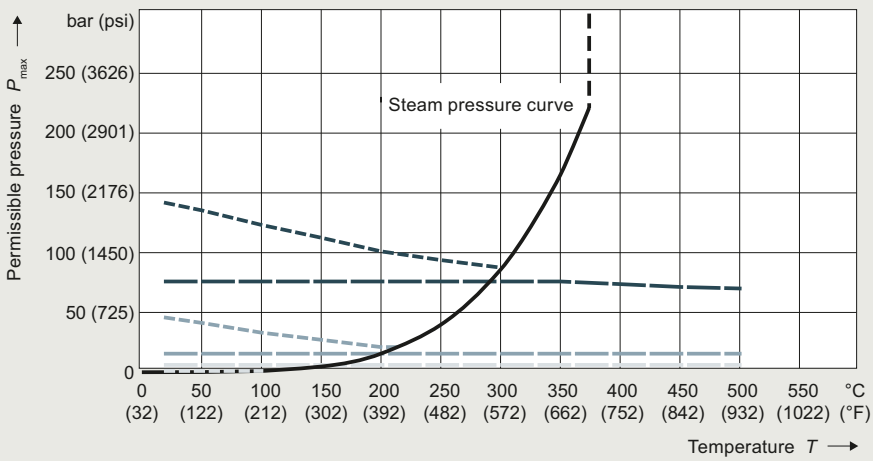
Load on the thermowell and remedies:

The process itself	Correction options
Temperature	Material selection
Pressure	Thermowell design
Flow velocity	Installation length, thermowell form
Viscosity	Installation length, thermowell form
Vibration	Support against vibration
Corrosiveness	Material selection, coating, covering
Abrasion (e.g. carbon dust)	Sensing rod, coating

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Configuration (continued)

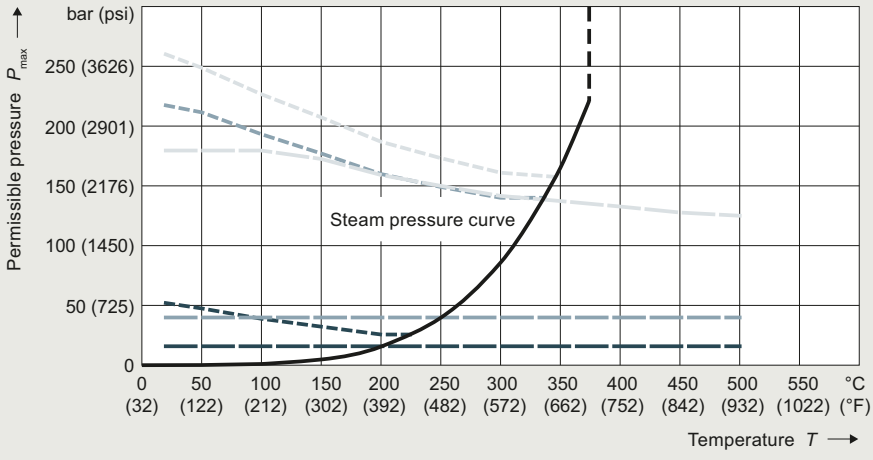
Load diagrams



Form 2/2G/2N/2F Ø9x1 (0.35x0.04)
Material No. 1.4571

	U	Speed v
– – –	140 (5.51)	v_W = 3 m/s (9.84 ft/s)
– – –	315 (12.40)	
– – –	510 (20.08)	
———	140 (5.51)	v_L = 25 m/s (82.02 ft/s)
———	315 (12.40)	
———	510 (20.08)	

Thermowells with diameter 9 × 1 mm (0.35 × 0.04 inches), dimensions in mm (inch)



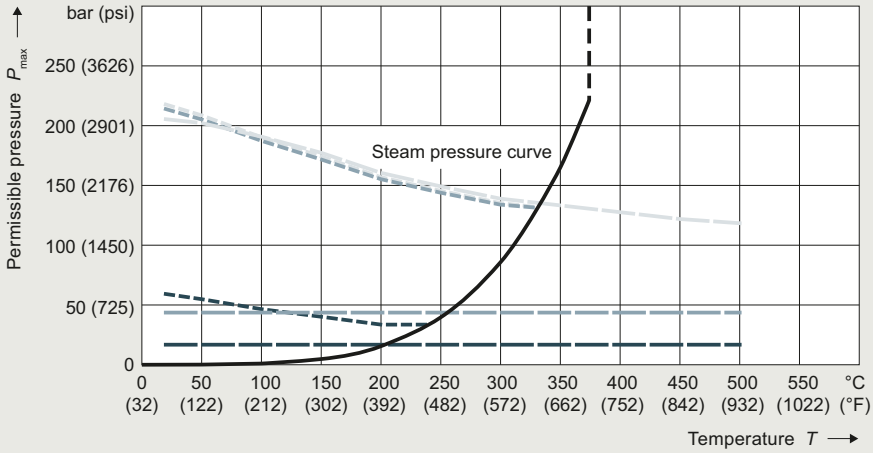
Form 2/2G/2N/2F Ø12x2.5 (0.47x0.10)
Material No. 1.4571

	U	Speed v
– – –	140 (5.51)	v_W = 3 m/s (9.84 ft/s)
– – –	315 (12.40)	
– – –	510 (20.08)	
———	140 (5.51)	v_L = 25 m/s (82.02 ft/s)
———	315 (12.40)	
———	510 (20.08)	

Thermowells with diameter 12 × 2.5 mm (0.47 × 0.10 inches), dimensions in mm (inch)

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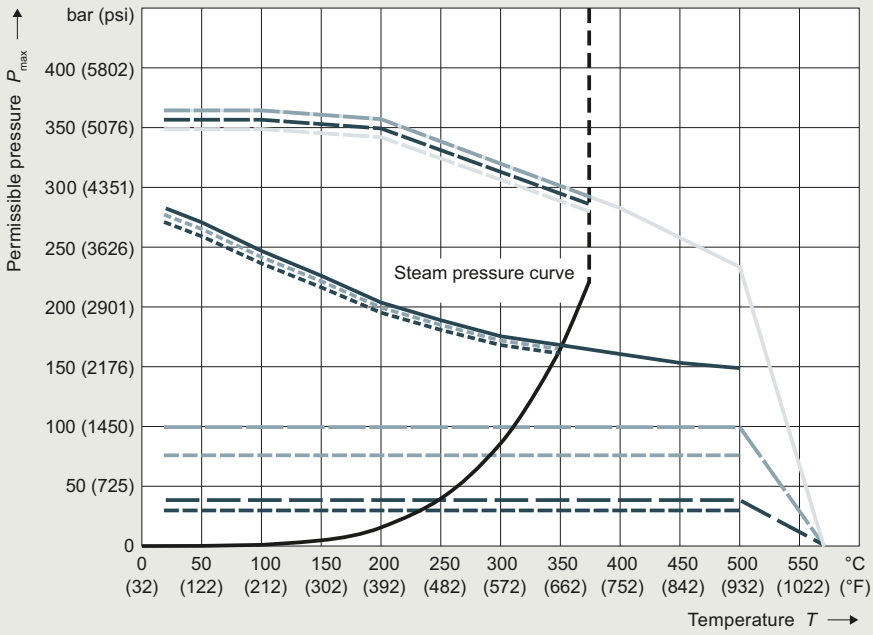
Configuration (continued)



Form 3/3G/3F Ø12x2.5 (0.47x0.10)
Material No. 1.4571

	U	Speed v
	140 (5.51) 315 (12.40) 510 (20.08)	v_W = 3 m/s (9.84 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 25 m/s (82.02 ft/s)

Thermowells with diameter 12 × 2.5 mm (0.47 × 0.10 inches) and 14 × 2.5 mm (0.55 × 0.10 inches), dimensions in mm (inch)



Form 4/4F Ø24 (0.94); C=65 (2.56)
Material No. 1.4571

	U	Speed v
	140/510 (5.51/20.08) 315 (12.40)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

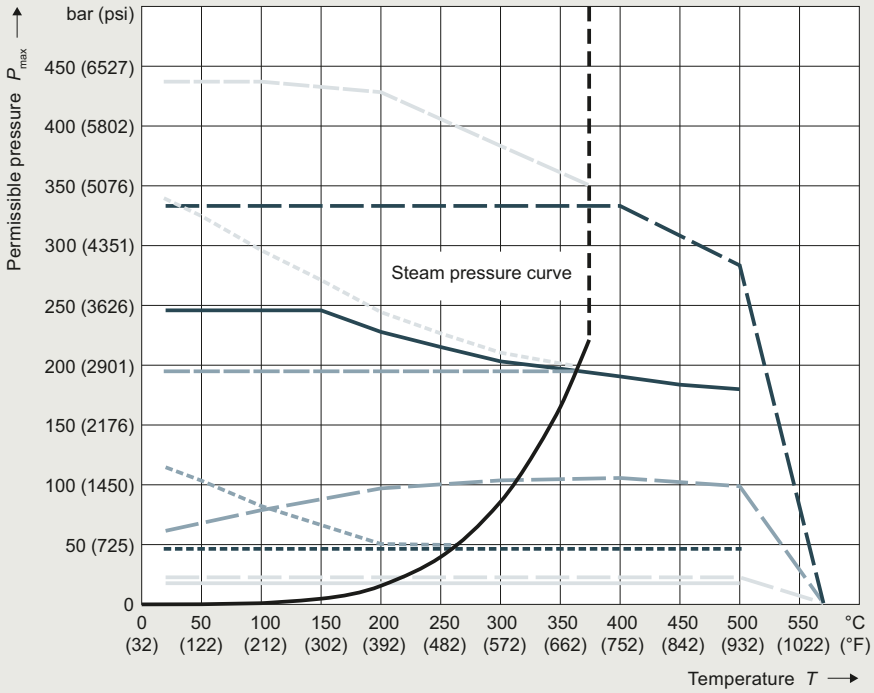
Form 4/4F Ø24 (0.94); C=65 (2.56)
Material No. 1.7335

	U	Speed v
	140 (5.51) 315 (12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Thermowells with diameter 24 mm (0.95 inches), C = 65 mm (2.60 inches), dimensions in mm (inch)

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Configuration (continued)



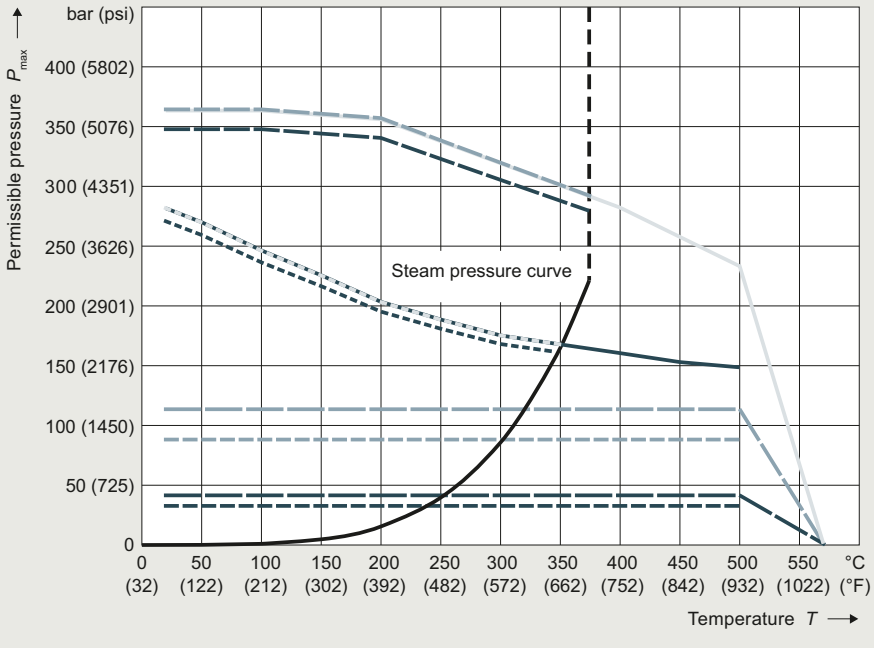
Form 4/4F Ø18 (0.71); C=65 (2.56)
Material No. 1.4571

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Form 4/4F Ø18 (0.71); C=65 (2.56)
Material No. 1.7335

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Thermowells with diameter 18 mm (0.71 inches), C = 65 mm (2.60 inches), dimensions in mm (inch)



Form 4/4F Ø24 (0.94); C=125 (4.92)
Material No. 1.4571

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Form 4/4F Ø24 (0.94); C=125 (4.92)
Material No. 1.7335

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Thermowells with diameter 24 mm (0.95 inches), C = 125 mm (4.92 inches), dimensions in mm (inch)

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Configuration (continued)

Thermowell calculation

Properly applied load diagrams will provide a sufficient degree of security for the thermowell dimensioning of most applications.

However, there are cases in which operating conditions deviate too greatly from standard parameters. In this case, a customized thermowell calculation can be displayed.

Another reason for doing this calculation is the fact that flowing media can create turbulence at the thermowell tip under certain conditions. The thermowell will then vibrate and may even be destroyed if not configured correctly. This is the most frequent cause of thermowell failure.

Siemens can offer thermowell calculations according to the two recognized procedures upon request.

- Dittrich/Klotter method
- ASME PTC19.3-TW2016 method
  This method also computationally accounts for turbulence formation, among other things.

Both methods provide a high degree of security with regard to thermowell configuration; however, they do not provide a guarantee against failures. A recalculation may be necessary in case of changes to the process parameters.

Materials

With regard to areas of application, the materials AISI 316Ti and 316L (1.4571 and 1.4404) have practically the same properties. For this reason, our offering of 1.4571 is limited, for protective tube shapes 3F and 4/4F, for example. For more detailed technical specifications, please see our SiePortal.

Material descriptions/Standards comparison				Max. temperature [°C (°F)] (unloaded)	Properties	Applications
Material no.	AISI/Trade name:	EN 10028-2:	Description			
1.4404 or 1.4435	AISI 316L	X2CrNiMo18-14-3	Austenitic stainless steel	550 (1 022)	Very good corrosion resistance, good weldability	Chemical industry, waste treatment, paper and cellulose industry, food industry
1.4571	AISI 316 Ti	X6CrN-iMoTi1712-2	Austenitic stainless steel	550 (1 022)	High corrosion resistance, good weldability	Chemical industry, textile industry, paper and cellulose industry, water supply, food and pharmaceuticals
1.5415	A 204 Gr.A	16Mo3	Carbon steel, high-alloy	500 (932)	Resistant at higher temperatures, well suited for welding	Steam turbines, steam lines, water pipes
1.7335	A 182 F11	13CrMo4-5	Carbon steel, high-alloy	540 (1 004)	Resistant at higher temperatures, well suited for welding	Steam turbines, steam lines, water pipes
1.4841	SS 314	X15CrNiSi25-20	Austenitic heat-resistant stainless steel	1 100 (2 012)	Resistant at high temperatures, also resistant against low-oxygen gasses and gasses containing nitrogen.	Flue gasses, petrochemical industry, chemicals industry, power plants
1.4762	446	X10CrAl24	Ferritic heat-resistant steel	1 100 (2 012)	Resistant at high temperatures, in oxidizing and reducing sulfur-containing atmosphere	Chemical industry, power plants, steel industry, waste gas treatment
2.4819	Hastelloy C 276	NiMo16Cr15W	Nickel-Chrome-Molybdenum alloy	1 100 (2 012)	Resistant at high temperatures, in oxidizing and reducing atmosphere, resistant against pitting and crevice corrosion, good corrosion resistance after welding	Chemicals industry, paper and cellulose industry, waste treatment, waste incinerators, emissions controls, shipbuilding and offshore industry
2.4360	Monel 400	NiCu30Fe	Nickel-copper alloy	500 (932)	Excellent corrosion resistance, particularly against chloride-induced cold crack corrosion	Chemical industry, offshore industry, nuclear technology, petrochemical industry
Similar to 1.0305	A105		Carbon steel	400 (752)		Steam turbines, steam lines, water pipes
1.4410	Similar to A2507	X2CrNiMoN 22-7-4	Austenitic-ferritic super duplex steel	300 (572)	Excellent resistance especially to chloride-related gap and pitting corrosion	Chemical Industry and petroleum chemistry, seawater desalination plants, paper pulp industry
1.4462	Similar to AISI 318 LN	X2CrNiMoN22-5-3	Austenitic-ferritic duplex steel	250 (482)	Resistance especially to chloride-related gap and pitting corrosion	Chloride contaminated water, acidic gas conditions, petrochemicals, marine technology

Where cost-intensive materials are used with flange thermowells, cost savings can be achieved by using a so-called flanged wheel. A thin disk of the material which comes into contact with media is applied prior to the flange (ordinary stainless steel).

Materials of sensor pipe/measuring insert:

- SITRANS TSinsert, TS200 Compact
  - Resistance thermometer Cr-Ni-Mo
  - Thermocouple 2.4816/Inconel600

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Configuration (continued)

Vibration resistance of measuring insert, cable sensor

Similar to the thermowell, the equipment also creates inner (Karman vortices) and outer vibration inducements which act on the measuring insert. For this reason, a special assembly of measurement elements is required. Other than a few exceptions for cable and compact thermometers, Siemens only produces sensors with a mineral-insulated plastic-sheathed cable. Together with precautions taken when installing the measuring element, the Siemens basic version already exceeds EN 60751 by more than a factor of 3. Pursuant to the measurement methods of this standard, the following values are obtained (tip-tip):

- 10 g: Basic version and expanded measuring range
- 60 g: Increased vibration resistance and thermocouple

Bending ability of measuring insert/cable sensor

All Siemens SITRANS TSinsert measuring inserts are made with a mineral-insulated plastic-sheathed cable (MIC). The same applies to a portion of the cable and compact thermometer. In addition to the already described properties, another advantage of the plastic-sheathed cable is its bending ability. This makes it possible to install these thermometers even in mounting locations that are difficult to access. Ensure that the following minimum bending radius is observed:

MIC diameter [mm] (inch)	R_{max} = 4x MIC diameter [mm] (inch)
3 (0.12)	12 (0.48)
6 (0.24)	24 (0.95)

Where a smaller bending radius is required due to installation conditions, subsequent testing of the insulation resistance is recommended.

The bending ability of the mineral-insulated design allows for economical transport even of large lengths. As of a length of 0.8 m, the sensors can be delivered rolled or bent. If slight bends have arisen due to mechanical loads during transport or handling, the quality and function of the sensor are not impacted by this. The bends can easily be straightened.

Electrical stability

Insulation resistance

The insulation resistance between each measuring circuit and the fitting is tested at a voltage of 500 V DC at room temperature.

$R_{iso} \geq 100$ MΩ

Due to the property of the mineral-insulated cable, the insulation resistance decreases as temperature increases. Because of the special production method, however, it is possible to achieve very good values even at high temperatures.

Wire resistance

For 2-wire connections, the wire resistance is considered in the measurement result. The following rule of thumb can be used:

- Measuring insert diameter 3 mm (0.12 inches) 5 Ω/m or 12.8 °C (55.04 °F)
- Measuring insert diameter 6 mm (0.24 inches) 2.8 Ω/m or 7.1 °C (44.78 °F)

Therefore, a 3 or 4-wire connection is urgently recommended.

Tests

In addition, statutory, standards-based or operating specifications also require additional testing. The results are attested in certificates according to EN 10204:

- According to EN 10204-2.1, order conformity (C35)
  Certificate in which Siemens confirms that the delivered products correspond to the requirements of the order, without specification of test results. The testing does not have to be carried out on the delivered devices.
- According to EN 10204-3.1
  Certificate in which Siemens confirms that the delivered products meet the requirements set out in the order, with indication of the specified values. Testing is carried out by an organization which is independent of production. The inspection certificate 3.1 replaces 3.1.B of the previous edition.
- Material certificate for parts which come into contact with media (C12)
  This certificate confirms the properties of the material and guarantees traceability up to the melting batch.
- Pressure test (C31)
  Hydrostatic pressure test on thermowell. Internal pressure for thread and weld-in, external pressure for flange forms.
- Helium leak test (C32)
  This test can be used to detect even the smallest leaks in thermowells and weld seams.
- Dye-penetration test (C33)
  The color penetration method can detect tears and other surface defects.
- Comparative test (calibration) (Y33)
  The test object is measured in one temperature direction against a highly precise thermometer, and the measured values of test object and normal object are documented. However, calibration requires the measuring insert to be of a certain minimum length. Measuring inserts can be calibrated together with the associated transmitter. Calibration values can be stored in the transmitter in order to increase the measuring accuracy of the system.
- According to EN 10204-3.2
  This type of acceptance certificate can be prepared on request, together with an acceptance representative of the ordering party or a representative indicated by official requirements (e.g. TÜV). It confirms that the delivered products meet the requirements set out in the order; it also contains the test results.
- Welding documentation
  Documentation such as WPS and PQR is available on our web page.

Approvals

Explosion protection

Due to the variety of requirements, all flameproof versions, as well as those complying with CSA and FM, are supplied without cable glands. The Ex markings can be found in the current manual A5E03920348, section "Certificates and approvals".

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Configuration (continued)

Designator	Additional information	Region	Standard	Type of protection	For Zone	For Division
TSinsert TS200 Compact	E00	EU/AU/NZ	CE/RCM	Without Ex protection		-
	E17	US/CA	cCSAus			-
	E54	CN				-
	E80	EAC	TR			-
	E01	EU/AU/NZ	ATEX, IECEx	Intrinsic safety "i"/"IS"	0...2/20...22	-
	E18	US/CA	cCSAus		0...2/20...22	1/2
	E55	CN	NEPSI		0...2/20...22	-
	E81	EAC	EACEx		0...2/20...22	-
TS500	E00	EU/AU/NZ	CE/RCM	Without Ex protection		-
	E10	US/CA	cFMus			-
	E17	US/CA	cCSAus			-
	E54	CN				-
	E80	EAC	TR			-
	E01	EU/AU/NZ	ATEX, IECEx	Intrinsic safety "i"/"IS"	0*...2/20*...22	-
	E18	US/CA	cCSAus		0*...2/20*...22	1/2
	E55	CN	NEPSI		0*...2/20*...22	-
	E81	EAC	EACEx		0*...2/20*...22	-
	E03	EU/AU/NZ	ATEX, IECEx	Flameproof enclosure "d"/"XP"	0*...2/20*...22	-
	E13 (7MC750, NPT only)	US/CA	cFMus	dust protection through enclosure "t"/"DIP" only with connection heads code AG0, AH0, AU0, AV0	1/21	1/2 (aluminum head)
	E14 (metric)	US/CA	cFMus		1/21	1/2 (aluminum head)
	E20 (NPT)	US/CA	cCSAus		0*...2/20*...22	1/2
	E21 (metric)	US	CSAus		0*...2/20*...22	-
	E56	CN	NEPSI		0*...2/20*...22	-
	E82	EAC	EACEx		0*...2/20*...22	-
	E04	EU/AU/NZ	ATEX, IECEx	Non-sparking "ec"	2	-
	E16	US/CA	cFMus	Non-sparking "nA"/"NI"	2	-
	E23	US/CA	cCSAus		2	2
	E57	CN	NEPSI		2	-
	E83	EAC	EACEx		2	-

* Zone 0 to process connection, outside Zone 1

AU = Australia; CA = Canada; CN = China; EAC = Eurasian Customs Union; EU = Europe; US = USA

Marine approvals

Designator	Additional information	Approval
TSinsert TS200 Compact TS500	D01	Det Norske Veritas Germanischer Lloyd (DNV GL)

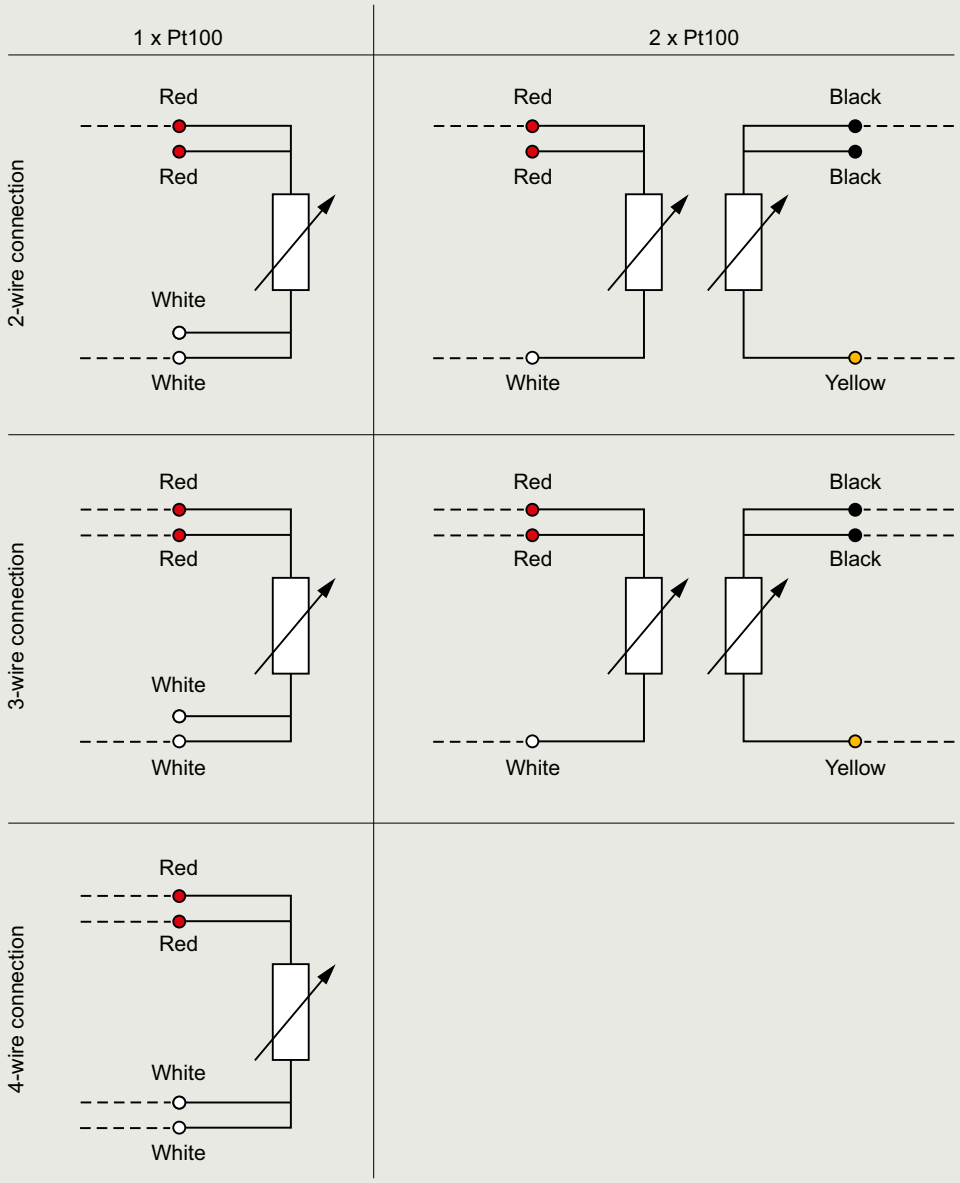
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Circuit diagrams

Resistance thermometer connection

SITRANS TSinsert measuring inserts are, unless otherwise mentioned, designed as single Pt100 measuring inserts with a 4-wire connection. This makes it possible to implement all of the aforementioned connection types.

Double Pt100 measuring inserts (only possible with 6 mm outer diameter) are designed as 3-wire connection.

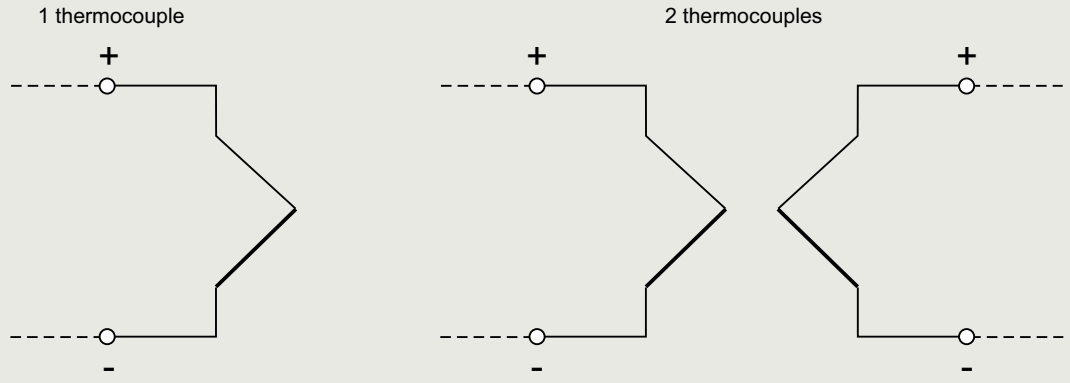


Circuit diagrams 1 x Pt100-2W to 2 x Pt100-4W

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Circuit diagrams (continued)

Thermocouple connection



Type	+	-
J	Black	White
K	Green	White
N	Pink	White
E	Purple	White
T	Brown	White

Circuit diagram for thermocouple

If thermocouples are used, the use of head-mounted transmitters offers particular advantages: The reference junction is already integrated in the universal transmitter. There is no need for expensive extension or compensating cables. This also removes a number of possible error sources. The weak millivolt signal of the thermocouple is already converted into a stable and temperature-linear DC or bus signal on site. This drastically reduces the effects of electromagnetic factors on the measurement result.

If a head-mounted transmitter is not installed, the sensor supply cable consists of the appropriate extension or compensating cable. The thermo line is made from the thermocouple material of the relevant thermocouple, while the compensating cable uses a cost-effective substitute material. The electrical behavior of the compensating cable is similar to that of the thermo line within a limited temperature range of up to 200 °C.

A wide spectrum of color coding exists for thermocouples on an international level. This must be taken into account during the connecting process.

Country Standard	International/Germany Not intrinsically safe[1]			North America Compensating cable[2]			UK/Czech Republic BS 1843		
	Jacket	+	-	Jacket	+	-	Jacket	+	-
N	PN	PN	WH	OG	OG	RD	OG	OG	BU
K	GN	GN	WH	YE	YE	RD	RD	BR	BU
J	BK	BK	WH	BK	WH	RD	BK	YE	BU
T	BR	BR	WH	BU	BU	RD	BU	WH	BU
E	VT	VT	WH	VT	VT	RD	BR	BR	BU
R+S	OG	OG	WH		BK	RD	GN	WH	BU
B	GY	GY	WH	GY	GY	RD	-	-	-

1) For intrinsically safe cable as per IEC 584-3, the jacket is always blue.
2) With thermo lines as per ANSI MC96, the jacket is always blue.

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Circuit diagrams (continued)

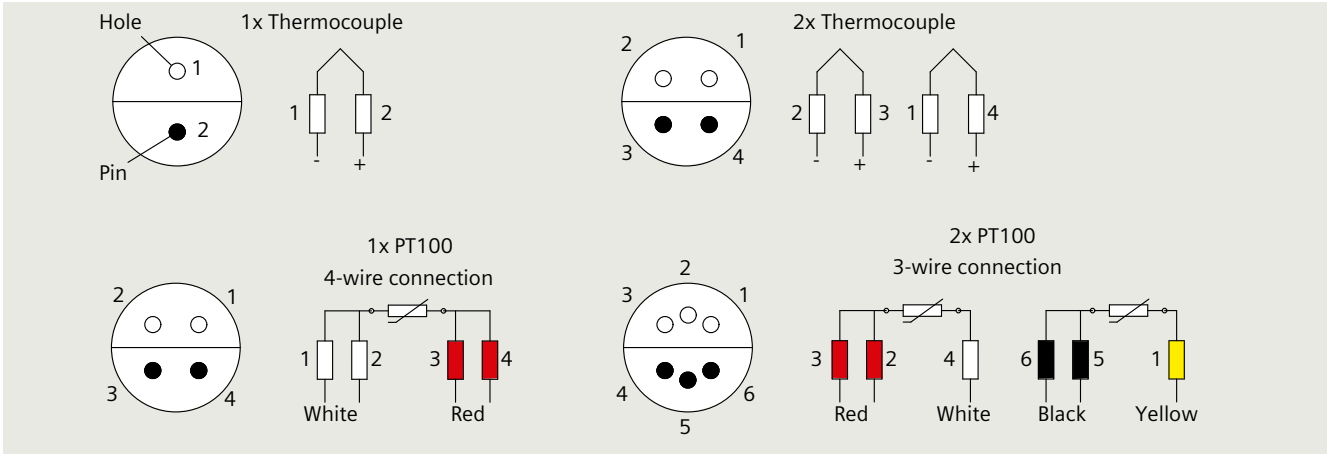
Country Standard	Netherlands DIN 43714			Japan ISC 1610-198			France NF C42-323		
	Jacket	+	-	Jacket	+	-	Jacket	+	-
N	-	-	-	-	-	-	-	-	-
K	GN	RD	GN	BU	RD	WH	VT	VT	YE
J	BU	RD	BU	YE	RD	WH	BK	BK	YE
T	BR	RD	BR	BR	RD	WH	BU	BU	YE
E	BK	RD	BK	VT	RD	WH	OG	OG	YE
R+S	WH	RD	WH	BK	RD	WH	GN	GN	YE
B	GY	RD	GY	GY	RD	WH	-	-	-

Abbreviation for colors				
BK: black	BR: brown	BU: blue	GD: gold	GN: green
GY: gray	OG: Orange	PN: pink	RD: red	SR: silver
TQ: turquoise	VT: Violet	WH: white	YE: yellow	

Device plug

In some cases, sensors are not connected directly but using device plugs. The connection is made according to the figures below.

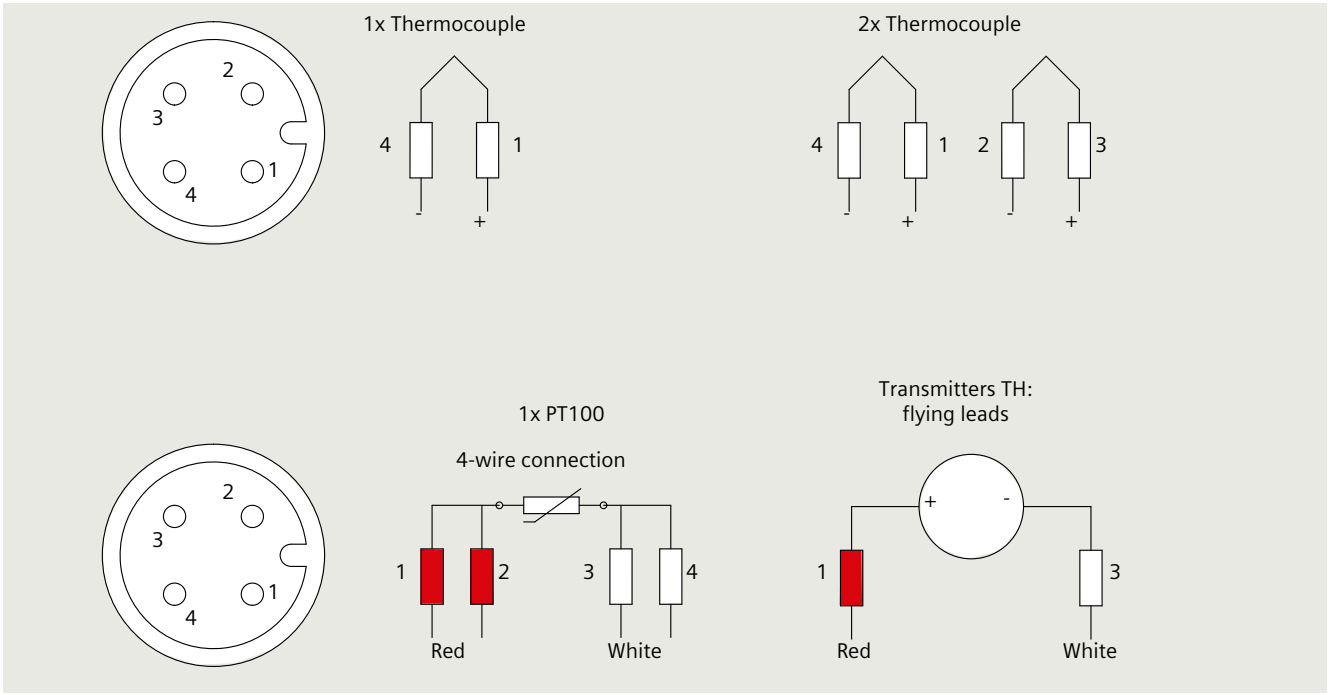
Lemo 1S coupling (SITRANS TS100/TS200 Compact)



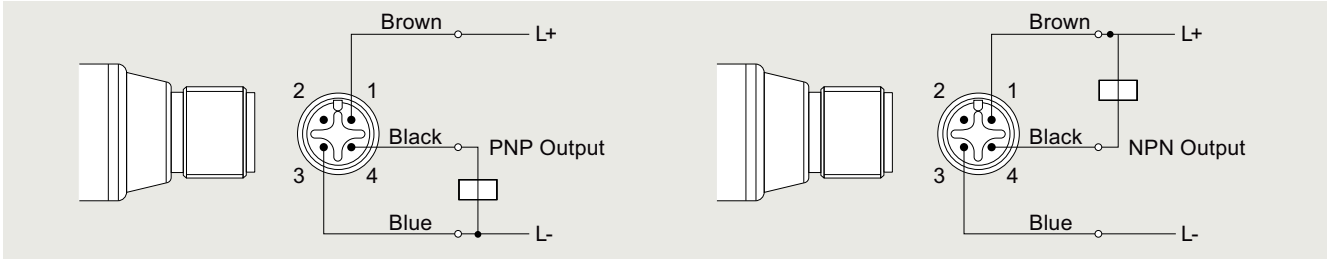
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Circuit diagrams (continued)

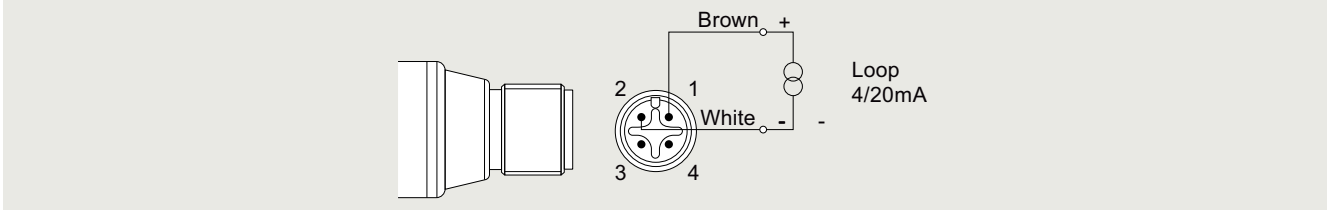
M12 device plug for single sensors (SITRANS TS200 Compact/TS500)



Connections for SITRANS TS200 IO-Link



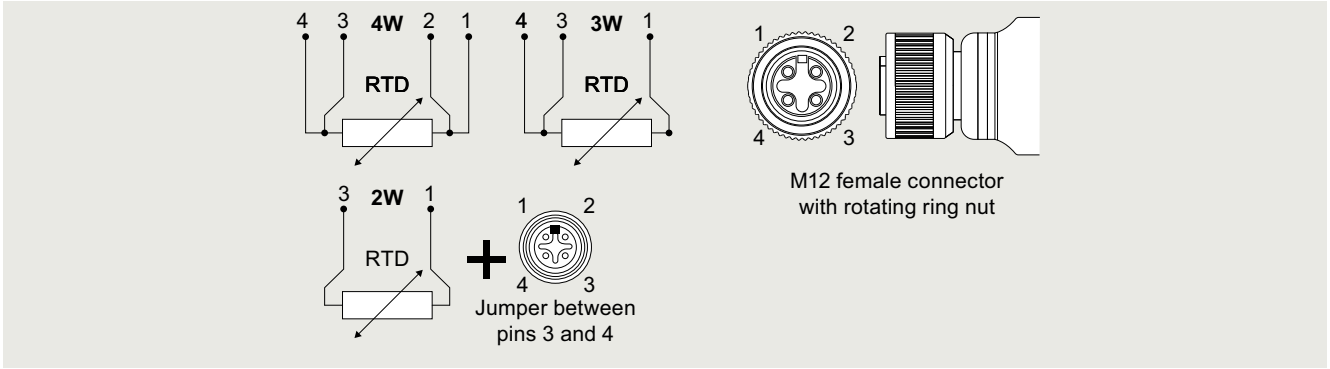
Operating mode with switchable output (SIO)



Operating mode 4...20 mA (loop-powered)

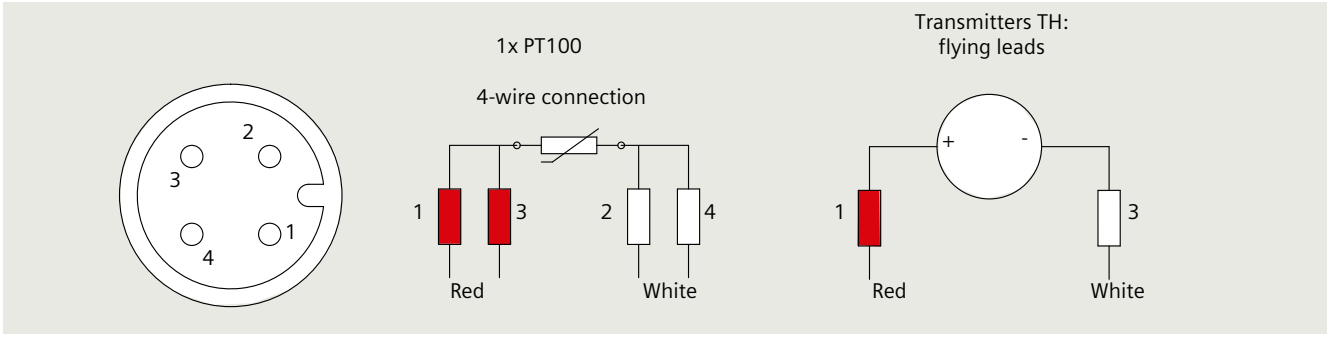
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Circuit diagrams (continued)

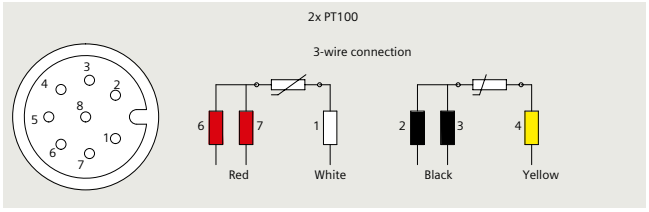


Assignment of the pins for the Pt100 plug (only for models 7MC7216-0AC00-0AA0 and 7MC7216-0AD00-0AA0)

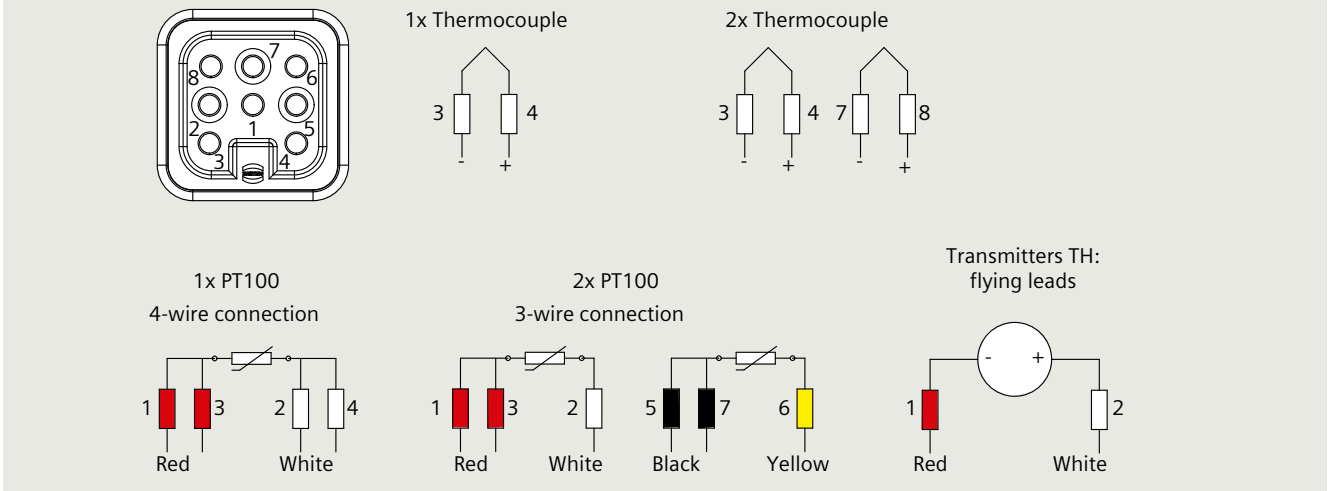
M12 device plug for single sensors (SITRANS TS300)



M12 device plug for dual sensors (SITRANS TS100)



Han 7D device plug (SITRANS TS500)



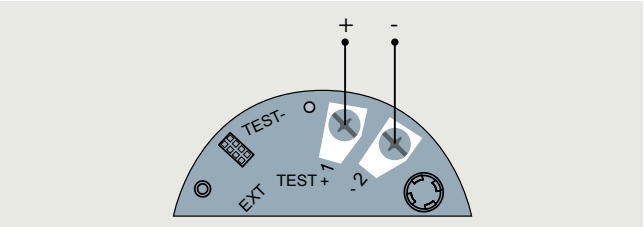
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Circuit diagrams (continued)

Transmitter connection

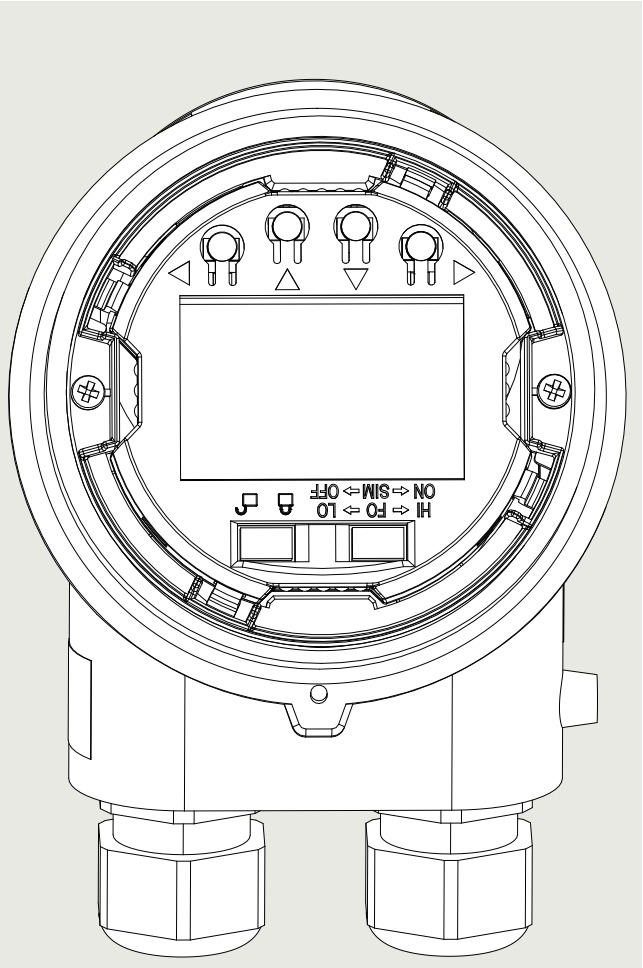
If SITRANS TH transmitters are used in the connection head of the temperature sensor, they are already wired on the sensor side. On the output side, the terminals for plus (1) and minus (2) are marked on the device.

Transmitter SITRANS TH



SITRANS TH100/320/420 connection diagram

Display with local operation TS500



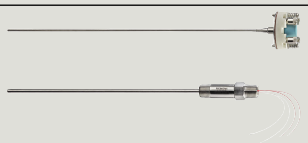
An optional local display is connected to the SITRANS TH320 and TH420 transmitter via a plug. It communicates process and diagnostic data directly from the transmitter. The display can be removed without tools for convenient wiring and can be rotated in 90° increments. 4 ... 20 mA HART and PROFIBUS PA transmitters can also be conveniently configured with 4 control keys.

In addition, our transmitters also allow for a large number of other possible connections (e.g. difference, mean value, 2 sensors). More information can be obtained at:

http://www.siemens.com/temperature

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Overview

Type	TSinsert	TS100
Description	Measuring inserts	Temperature sensors in cable version
Application	Replaceable	Universal use
Version	Mineral-insulated version	Mineral-insulated version
Type	As European or American type	For cramped spaces
Figure		
Article No.	7MC70*	7MC711*
Wetted material	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconnel600)	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconnel600)
Thermowell forms	Order separately	Without/with separate thermowell
Process connections	-	• Compression fittings • Soldering nipple: - G ¼, G ½ - ½ NPT - M8 × 1, M18 × 1.5 • Surface connection piece for installation on flat surfaces/pipes
Sensor elements	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire	• 1 × 4-wire • 2 × 3-wire
Sensor accuracy	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2
Connection heads	Type B (Type A flameproof)	• Cable, optional with misc. plugs
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	Intrinsic safety "i"/"IS"	Intrinsic safety "i"/"IS"
Output signal	Sensor signal: • 4 ... 20 mA (TH100/TH200) • HART (TH300) • PA (TH400) • FF (TH400)	Sensor signal
Application	Spare parts	• Mechanical engineering • Storage temperature • Surfaces
Limit temperatures[1] [°C (°F)]	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1100 °C (-40 ... +2012 °F) (type dependent)
Max. nominal pressure[1] (static pressure at 20 °C)	-	Compression fitting max. 5 bar (73 psi) Compression fitting: PTFE gasket, temperature min./max. -20 ... +150 °C (-4 ... +302 °F)
Min. response time $t_{0.5}$	2 ... 6 s	2 ... 6 s
Degree of protection	IP54	See drawing in "Temperature sensors" - "Structure"

[1] Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Additional temperature limits result, for example, from thermowell materials with lower limits [e.g. 1.4571 pressure resilient, 450 .... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)].

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Overview (continued)

Type	TS200 IO-Link	TS200 Compact
Description	Temperature sensors in compact version with integrated 4 ... 20 mA/IO-Link temperature transmitter	Temperature sensors in compact version
Application	Universal use	Universal use
Version	Mineral-insulated version	Mineral-insulated version
Type	For cramped spaces	For cramped spaces
Figure		
Article No.	7MC7216-*	7MC7212-*
Wetted material	316L/1.4404	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconnel600)
Thermowell forms	Without/with separate thermowell (accessories)	Without/with separate thermowell
Process connections	• Compression fittings (accessories) • Soldering nipple: - G ¼, G 1/8 - ¼, 1/8 NPT • Union nut M10×1.0 • Surface connection piece for installation on flat surfaces/pipes as accessories	• Compression fittings • Soldering nipple: - G ¼, G ½ - ½ NPT - M8 × 1, M18 × 1.5 • Surface connection piece for installation on flat surfaces/pipes
Sensor elements	Pt100 + Pt1000 (external only)	Pt100 + thermocouples
Sensor connection	• External sensor: 1 × 2-/3-/4-wire • Integrated sensor: 1 × 4-wire	• 1 × 4-wire • 2 × 3-wire
Sensor accuracy	Integrated sensor: Class A	• Class AA • Class A • Class B • Class 1 • Class 2
Connection heads	M12×1 connection, plastic or stainless steel enclosure	• Flying leads • Miscellaneous plugs • Optional connecting cable (M12)
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	n/a	Intrinsic safety "i"/"IS"
Output signal	• Analog output: 4 ... 20 mA, or • Digital output: IO-Link or PNP or NPN (SIO)	Sensor signal
Application	• Mechanical engineering • Storage temperature • Surfaces	• Mechanical engineering • Storage temperature • Surfaces
Limit temperatures[1] [°C (°F)]	• Pt100/ Pt1000 external: -200 ... +800 °C (-xx... +xx °F) • Pt100 integrated: -50 ... +110/120/500 °C (-xx ... +xx °F), depending on selected type	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range:-196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)
Max. nominal pressure[1] (static pressure at 20 °C)	100 bar @ ambient temperature in variants with integrated process connection 7MC7216-5*A**-0AA0 und 7MC7216-5*B**-0AA0	Compression fitting max. 5 bar (73 psi) Compression fitting: PTFE gasket, temperature min./max. -20 ... +150 °C (-4 ... +302 °F)
Min. response time $t_{0.5}$	< 3.5 s (3 mm), < 5 s (4.4 mm) < 13 s (6 mm)	2 ... 6 s
Degree of protection	IP67, IP69K	See drawing in "Temperature sensors" - "Structure"

[1] Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Additional temperature limits result, for example, from thermowell materials with lower limits [e.g. 1.4571 pressure resilient, 450 .... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)].

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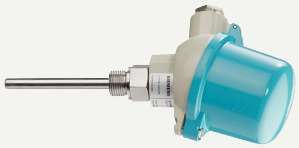
Overview (continued)

Type	TS300 Modular	TS300 Clamp-on
Description	Temperature sensors for food, pharmaceuticals and biotechnology	Temperature sensors for food, pharmaceuticals and biotechnology
Application	Measurements immersed in medium (pipes and vessels)	Clamp-on measurement of pipe surface temperature
Version	Thermowell similar to DIN 43772, type 2F and tapered design	Thermowell similar to DIN 43772, type 2F and tapered design
Type		
Figure		
Article No.	7MC8005*	7MC8016
Wetted material	1.4404 or 1.4435 (316L)	1.4404 or 1.4435 (316L)
Thermowell forms	Similar to 2F	Similar to 2F
Process connections	DIN 11851, clamp-on connection (Tri-Clamp/ISO 2852/DIN 32676), Varivent, Ingold socket (Fermenter connection), Neumo Biocontrol, spherical weld-in sleeve Seals are not included in the scope of delivery	Clamp-on connections suitable for the following pipe diameters: • Collar 4 ... 57 mm (0.16 ... 2.24 inches) • Clamping band 50 ... 200 mm (1.97 ... 7.87 inches)
Sensor elements	Pt100	Pt100
Sensor connection	• 1 × 4-wire • 2 × 3-wire	• 1 × 4-wire
Sensor accuracy	Class A	Class A
Connection heads	Type B	Type B
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	-	-
Output signal	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • Profibus PA hot backup	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • Profibus PA hot backup
Application	Surface roughness: Standard applications Ra < 1.5 µm (5.9 10^{-5} inches)	Surface roughness: Standard applications Ra < 1.5 µm (5.9 10^{-5} inches)
Limit temperatures[1] [°C (°F)]	-20 ... +400 °C (-4 ... +752 °F)	-40 ... +150 °C (-40 ... +302 °F)
Max. nominal pressure[1] (static pressure at 20 °C) Dimensions in mm (inch)	0 ... 150 (0 ... 5.91), at 50 bar 150 ... 300 (5.91 ... 11.81), at 40 bar	No pressure load due to clamp-on design
Min. response time $t_{0.5}$	20 ... 34 s	4 s (see "Reference conditions SITRANS TS300 Clamp-on")
Degree of protection	IP54 ... IP68 depending on connection head	IP65 for pipe collar, IP67 for electrical connection

[1] Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Additional temperature limits result, for example, from thermowell materials with lower limits (e.g. 1.4571 pressure resilient, 450 .... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)).

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Overview (continued)

Type	TS500 for installation	TS500 Type 2	TS500 Type 2N
Description	Temperature sensors for the process industry (pipes and vessels)	Temperature sensors for the process industry (pipes and vessels)	Temperature sensors for the process industry (pipes and vessels)
Application	Temperature sensors for installation in existing thermowells	Tubular thermowell for low to medium stress	Tubular thermowell for low to medium stress
Version	Suitable for thermowells according to DIN 43772 as well as ASME B40.9-2001	Thermowell according to DIN 43772, type 2, without process connection	Thermowell type 2N similar to DIN 43772, screwed design
Type	With extension • European type • American type	• Without extension, plug-in • Use with moveable compression fittings	Without extension
Figure			
Article No.	No. 7MC750*	7MC751*-0*(A/B)**-0***	7MC751*-1****-0***
Wetted material	None: Measuring insert made of 1.4571, 1.4404 or 1.4435 (RTD); 2.4816 (TC) (316L; Inconnel600)	1.4404 or 1.4435 (316L)	1.4404 or 1.4435 (316L)
Thermowell forms	Order separately	Form 2	Form 2N (similar to Form 2)
Process connections	Connection to the thermowell: • M14 × 1.5 • M18 × 1.5 • G ½ • ½ NPT	Compression fittings • G ½ • ½ NPT For welding	• G ½ • ½ NPT
Installation length	• 110 mm (4.33 inches) • 140 mm (5.51 inches) • 200 mm (7.87 inches) • 260 mm (10.24 inches) • 410 mm (16.14 inches)	Variable	• 100 mm (3.94 inches) • 160 mm (6.30 inches) • 230 mm (9.06 inches) • 360 mm (14.17 inches) • 510 mm (20.08 inches)
Neck pipe length	According to DIN 43772	According to DIN 43772	Non-adjustable X=20 mm (0.79 inches)
Sensor elements	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire
Sensor accuracy	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2
Connection heads	Type B (Type A flameproof)	Type B (Type A flameproof)	Type B (Type A flameproof)
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"
Output signal	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup
Application	Pipes and vessels	Pipes and vessels	Pipes and vessels
Limit temperatures[1] [°C (°F)]	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2 012 °F) (type dependent)	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)
Max. nominal pressure[1] (static pressure at 20 °C) Dimensions in mm (inch)	See thermowell	Pipe diameter 9 (0.35): • 0 ... 150 (0 ... 5.91), at 50 bar • 150 ... 300 (5.91 ... 11.81), at 40 bar • Compression fitting, at 5 bar Pipe diameter 12 mm (0.47 inches): • 0 ... 150 (0 ... 5.91), at 75 bar • 150 ... 300 (5.91 ... 11.81), at 60 bar • Compression fitting, at 5 bar: PTFE gasket, temperature min./max. -20 ... +150 °C (-4 ... +302 °F)	Pipe diameter 9 (0.35): • 0 ... 150 (0 ... 5.91), at 50 bar • 150 ... 300 (5.91 ... 11.81), at 40 bar

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Overview (continued)

Type	TS500 for installation	TS500 Type 2	TS500 Type 2N
Min. response time $t_{0.5}$	See thermowell	20 ... 45 s	20 ... 34 s
Degree of protection	IP54 ... IP68 depending on connection head	IP54 ... IP68 depending on connection head	IP54 ... IP68 depending on connection head

[1] Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Additional temperature limits result, for example, from thermowell materials with lower limits (e.g. 1.4571 pressure resilient, 450 .... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)).

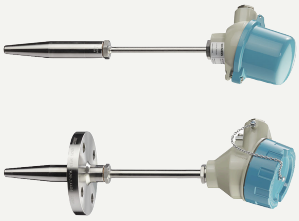
Type	TS500 Type 2G	TS500 Type 2F	TS500 Type 3
Description	Temperature sensors for the process industry (pipes and vessels)	Temperature sensors for the process industry (pipes and vessels)	Temperature sensors for the process industry (pipes and vessels) Faster response than Form 2
Application	Tubular thermowell for low to medium stress	Tubular thermowell for low to medium stress	Tubular thermowell for low to medium stress
Version	Thermowell according to DIN 43772, type 2G, screwed design	Thermowell according to DIN 43722, type 2F with flange	Thermowell according to DIN 43722, type 3 without process connection, improved response time
Type	With extension	With extension	• Without extension, plug-in • Use with moveable compression fittings
Figure			
Article No.	7MC751*-1*(A/B)**-1***	7MC751*-2*(A/B)**-1***	7MC751*-0*K**-0***
Wetted material	1.4404 or 1.4435 (316L)	1.4404 or 1.4435 (316L)	1.4404 or 1.4435 (316L)
Thermowell forms	Form 2G	Form 2F	Form 3
Process connections	Screw-in thread welded on: • G 1 • G ½ • ½ NPT	Welded flange • DN 25, PN10 ... 40 • 1RF150 • 1.5RF150 • 1.5RF300	Compression fittings • G ½ • ½ NPT For welding
Installation length	• 160 mm (6.30 inches) • 250 mm (9.84 inches) • 400 mm (15.75 inches)	• 225 mm (8.86 inches) • 315 mm (12.40 inches) • 465 mm (18.31 inches)	• 225 mm (8.86 inches) • 315 mm (12.40 inches) • 465 mm (18.31 inches)
Neck pipe length	According to DIN 43772	According to DIN 43772	According to DIN 43772
Sensor elements	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire
Sensor accuracy	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2
Connection heads	Type B (Type A flameproof)	Type B (Type A flameproof)	Type B (Type A flameproof)
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"
Output signal	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup
Application	Pipes and vessels	Pipes and vessels	Pipes and vessels
Limit temperatures[1] [°C (°F)]	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2 012 °F) (type dependent)

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Overview (continued)

Type	TS500 Type 2G	TS500 Type 2F	TS500 Type 3
Max. nominal pressure[1] (static pressure at 20 °C) Dimensions in mm (inch)	Pipe diameter 9 (0.35): • 0 ... 150 (0 ... 5.91), at 50 bar • 150 ... 300 (5.91 ... 11.81), at 40 bar • Compression fitting, at 5 bar Pipe diameter 12 (0.47): • 0 ... 150 (0 ... 5.9), at 75 bar • 150 ... 300 (5.91 ... 11.81), at 60 bar	Pipe diameter 9 (0.35): • 0 ... 150 (0 ... 5.91), at 50 bar • 150 ... 300 (5.91 ... 11.81), at 40 bar Pipe diameter 12 (0.47): • 0 ... 150 (0 ... 5.91), at 75 bar • 150 ... 300 (5.91 ... 11.81), at 60 bar Note restriction imposed by PN of the flange	Pipe diameter 12 (0.47): • 0 ... 200 (0 ... 7.87), at 75 bar • 200 ... 300 (7.87 ... 11.81), at 60 bar • Compression fitting, at 5 bar: PTFE gasket, temperature min./max. -20 ... +150 °C (-4 ... +302 °F)
Min. response time $t_{0.5}$	20 ... 34 s	20 ... 34 s	7 ... 15 s
Degree of protection	IP54 ... IP68 depending on connection head	IP54 ... IP68 depending on connection head	IP54 ... IP68 depending on connection head

[1] Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Additional temperature limits result, for example, from thermowell materials with lower limits (e.g. 1.4571 pressure resilient, 450 .... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)).

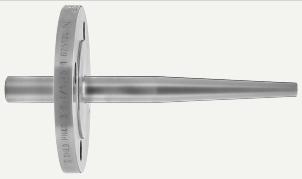
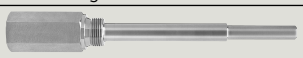
Type	TS500 Type 3G	TS500 Type 3F	TS500 Type 4/4F
Description	Temperature sensors for the process industry (pipes and vessels) Faster response than Form 2	Temperature sensors for the process industry (pipes and vessels) Faster response than Form 2	Temperature sensors for the process industry (pipes and vessels) Fast response version available
Application	Tubular thermowell for low to medium stress	Tubular thermowell for low to medium stress	Barstock thermowell for medium to extreme stress
Version	Thermowell according to DIN 43772, type 3G, screwed design	Thermowell according to DIN 43772, type 3F with flange	Thermowell according to DIN 43772: • Type 4 for welding • Type 4F with flange
Type	With extension	With extension	With extension
Figure			
Article No.	7MC751*-1*K**-1***	7MC751*-2*K**-1***	7MC752*
Wetted material	1.4404 or 1.4435 (316L)	1.4404 or 1.4435 (316L)	Form 4F: 1.4404 or 1.4435; 1.4571 (316L; 316TI) Form 4 additionally: 1.7335; 1.5415 (A 182 F11; A 204 Size A)
Thermowell forms	Form 3G	Form 3F	• Form 4 • Form 4F
Process connections	Screw-in thread welded on: • G 1 • G ½ • ½ NPT	Welded flange • DN 25, PN10 ... 40 • 1RF150 • 1.5RF150 • 1.5RF300	Form 4 for welding, Form 4F with flange: • DN 25, PN10 ... 40 • 1RF150 • 1RF300 • 1.5RF150 • 1.5RF300
Installation length	• 160 mm (6.30 inches) • 220 mm (8.66 inches) • 280 mm (11.02 inches)	• 225 mm (8.86 inches) • 285 mm (11.22 inches) • 345 mm (13.58 inches)	Form 4F: as per customer specification Form 4: • 110 mm (4.33 inches) fast • 140 mm (5.51 inches) fast/normal • 200 mm (7.87 inches) fast/normal • 260 mm (10.23 inches) normal
Neck pipe length	According to DIN 43772	According to DIN 43772	According to DIN 43772
Sensor elements	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire	• 1 × 4-wire • 2 × 3-wire • 2 × 4-wire
Sensor accuracy	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2
Connection heads	Type B (Type A flameproof)	Type B (Type A flameproof)	Type B (Type A flameproof)

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Overview (continued)

Type	TS500 Type 3G	TS500 Type 3F	TS500 Type 4/4F
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Dust protection by enclosure "t"/"DIP" • Non-sparking "ec"/"nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "ec"/"nA"/"NI"
Output signal	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup	Sensor signal: • 4 ... 20 mA • HART standard • HART hot backup • PROFIBUS PA hot backup
Application	Pipes and vessels	Pipes and vessels	Pipes and vessels
Limit temperatures[1] [°C (°F)]	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)	• Pt100 basic: -50 ... +400 °C (-58 ... +752 °F) • Pt100 expanded measuring range: -196 ... +600 °C (-321 ... +1112 °F) • Thermocouple: -40 ... +1 100 °C (-40 ... +2012 °F) (type dependent)
Max. nominal pressure[1] (static pressure at 20 °C) Dimensions in mm (inch)	Pipe diameter 12 (0.47): • 0 ... 200 (0 ... 7.87), at 75 bar • 200 ... 300 (7.87 ... 11.81), at 60 bar	Pipe diameter 12 (0.47): • 0 ... 200 (0 ... 7.87), at 75 bar • 200 ... 300 (7.87 ... 11.81), at 60 bar Note restriction imposed by PN of the flange	Mat. (1.4404; 1.4571): • 65 (2.56), at 450 bar • 125 (4.92), at 350 bar Mat. (1.7335; 1.5415): • 65 (2.56), at 500 bar • 125 (4.92), at 400 bar form 4F: Note restriction imposed by PN of the flange
Min. response time $t_{0.5}$	7 ... 15 s	7 ... 15 s	Diameter 24 mm (0.95 inches): 20 ... 45 s
Degree of protection	IP54 ... IP68 depending on connection head	IP54 ... IP68 depending on connection head	IP54 ... IP68 depending on connection head

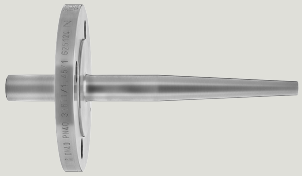
[1] Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Additional temperature limits result, for example, from thermowell materials with lower limits (e.g. 1.4571 pressure resilient, 450 .... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)).

Type	SITRANS TSthermowell 7MT14..	SITRANS TSthermowell 7MT2..	SITRANS TSthermowell 7MT3..
Description	Thermowells for the process industry	Thermowells for the process industry	Thermowells for the process industry
Application	Barstock thermowell for medium to extreme stress	Barstock thermowell for medium to extreme stress	Barstock thermowell for medium to extreme stress
Version	Thermowell according to DIN 43772	Thermowell according to ASME B40.9	Thermowell according to ASME B40.9
Type	With flange connection or for welding in	Screwed design	For welding
Figure			
Article No.	7MT14..	7MT21.. (straight) 7MT22.. (reduced) 7MT23.. (tapered)	7MT31.. (straight) 7MT32.. (reduced) 7MT33.. (tapered)
Wetted material	• 316Ti/1.4571 • 316L/1.4404 • Hastelloy C276/2.4819 • 1.5415 Heat-resistant • 1.7335 Heat-resistant • PFA coating (thermowell made of 316/TI/L) • ECTFE (HALAR) (thermowell made of 316/TI/L) • Stellite coating (thermowell made of 316/TI/L)	• 316L/1.4404 • Carbon steel • 304L/1.4306 • 321/1.4541	• 316L/1.4404 • Carbon steel • 304L/1.4306 • 321/1.4541
Thermowell forms	• Straight/tapered	• Straight • Reduced (staggered) • Tapered	• Straight • Reduced (staggered) • Tapered

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Overview (continued)

Type	SITRANS TSthermowell 7MT14..	SITRANS TSthermowell 7MT2..	SITRANS TSthermowell 7MT3..
Process connections	• Without (for direct welding) • Flange connection • EN 1092-1: DN 40, 50/PN 10-16, 25-40 • ASME B16.5: 1.5" 2"/Class 150, 300, 600	• M20 × 1.5 • M27 × 2.0 • M33 × 2.0 • ½-14 NPT • ¾ NPT • 1 NPT • G½ • G¾ • G1 • R½ • R¾ • R1	• 26.7 mm • 33.4 mm • 48.3 mm
Installation length	Standard lengths and free configuration		
Extension length	Standard lengths and free configuration		
Explosion protection	Not Ex-relevant, but offers zone separation when wall thickness of 1 mm for anti-corrosive materials, or otherwise 3 mm, is observed. Not for coated versions.		
Application	Pipes and vessels		
Limit temperatures	Material-dependent		
Max. static pressure	Material-dependent		
Min. response time	20 s ... several minutes		
Degree of protection	When installed correctly, IP68 is achieved between extension and thermowell		

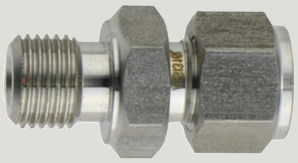
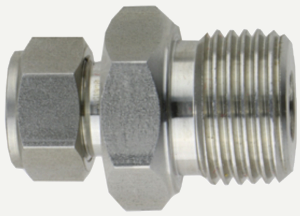
Type	SITRANS TSthermowell 7MT4..	SITRANS TSthermowell 7MT5..
Description	Thermowells for the process industry	Thermowells for the process industry
Application	Barstock thermowell for medium to extreme stress	Barstock thermowell for medium to extreme stress
Version	Thermowell according to ASME B40.9	Thermowell according to ASME B40.9
Type	With flange connection	Van Stone version
Figure		
Article No.	7MT41.. (straight) 7MT42.. (reduced) 7MT43.. (tapered)	7MT51.. (straight) 7MT52.. (reduced) 7MT53.. (tapered)
Wetted material	• 316L/1.4404 • Carbon steel • Hastelloy C276/2.4819 • Hastelloy C22/2.4602 • 304L/1.4306 • 321/1.4541 • Monel alloy 400/2.4360 • Tantalum (barrel, thermowell made of 316/TI/L) • Duplex/1.4462 • Super duplex • PFA coating (thermowell made of 316/TI/L) • ECTFE (HALAR) (thermowell made of 316/TI/L) • Stellite coating (thermowell made of 316/TI/L)	• 316L/1.4404 • Hastelloy C276/2.4819 • Hastelloy C22/2.4602 • 304L/1.4306 • 321/1.4541 • Monel alloy 400/2.4360 • Duplex/1.4462 • Super duplex • Tantalum coating on 316 • PFA coating (thermowell made of 316/TI/L) • ECTFE (HALAR) (thermowell made of 316/TI/L) • Stellite coating (thermowell made of 316/TI/L)
Thermowell forms	• Straight • Reduced (staggered) • Tapered	• Straight • Reduced (staggered) • Tapered
Process connections	• EN 1092-1: nom. diam. 25, 40, 50/ PN 10-16, 25-40 • ASME B16.5: 1", 1.5", 2", 3", 4"/ Class 150, 300, 600	• 33.4 mm/51 mm • 48.3 mm/73 mm • 60.3 mm/92 mm + collar flanges ASME B16.5: 1", 1.5, "2"/ Class 150, 300, 600
Installation length	Standard lengths and free configuration	
Extension length	Standard lengths and free configuration	
Explosion protection	Not Ex-relevant, but offers zone separation when wall thickness of 1 mm for anti-corrosive materials, or otherwise 3 mm, is observed. Not for coated versions.	

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Overview (continued)

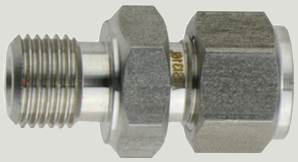
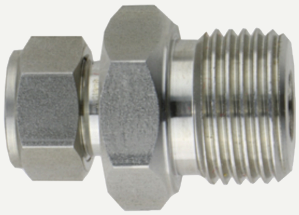
Type	SITRANS TSthermowell 7MT4..	SITRANS TSthermowell 7MT5..
Application	Pipes and vessels	
Limit temperatures	Material-dependent	
Max. static pressure	Material-dependent	
Min. response time	20 s ... several minutes	
Degree of protection	When installed correctly, IP68 is achieved between extension and thermowell	

SITRANS TS200 compression fittings

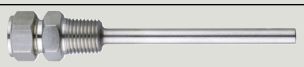
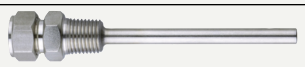
Type	SITRANS TS200 compression fittings 7MC7905-0A*03-0AA0	SITRANS TS200 compression fittings 7MC7905-0A*06-0AA0
Description	Compression fittings unsprung with VA-ring for sensor diameter Ø 3 mm	Compression fittings unsprung with VA-ring for sensor diameter Ø 6 mm
Application	Specially developed for direct immersion of the whole range of temperature sensors with mineral insulation	Specially developed for direct immersion of the whole range of temperature sensors with mineral insulation
Figure		
Barrel	VA-ring	VA-ring
Sheath diameter	Ø 3 mm	Ø 6 mm
For sensor diameter	Ø 3 mm	Ø 6 mm
Process connection	• with thread 1/8" G • with thread 1/8" NPT • with thread 1/4" G • with thread 1/4" NPT • with thread 3/8" G • with thread 3/8" NPT • with thread 1/2" G • with thread 1/2" NPT	• with thread 1/4" G • with thread 1/4" NPT • with thread 3/8" G • with thread 3/8" NPT • with thread 1/2" G • with thread 1/2" NPT • with thread 3/4" G • with thread 3/4" NPT
Material of the part in contact with the measured part	AISI 316L	AISI 316L
Type of leak tightness	Barrel made of stainless steel PN max. 100 bar; tighten 3/4 turn	Barrel made of stainless steel PN max. 100 bar; tighten 3/4 turn

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Overview (continued)

Type	SITRANS TS200 compression fittings 7MC7905-0B*03-0AA0	SITRANS TS200 compression fittings 7MC7905-0B*06-0AA0
Description	Compression fittings unsprung with PTFE-ring + stainless steel pressing bush for sensor diameter Ø 3 mm	Compression fittings unsprung with PTFE-ring + stainless steel pressing bush for sensor diameter Ø 6 mm
Application	Specially developed for direct immersion of the whole range of temperature sensors with mineral insulation	Specially developed for direct immersion of the whole range of temperature sensors with mineral insulation
Figure		
Barrel	PTFE-ring + stainless steel packing	PTFE-ring + stainless steel packing
Sheath diameter	Ø 3 mm	Ø 6 mm
For sensor diameter	Ø 3 mm	Ø 6 mm
Process connection	• with thread 1/8" G • with thread 1/8" NPT • with thread 1/4" G • with thread 1/4" NPT • with thread 3/8" G • with thread 3/8" NPT • with thread 1/2" G • with thread 1/2" NPT	• with thread 1/4" G • with thread 1/4" NPT • with thread 3/8" G • with thread 3/8" NPT • with thread 1/2" G • with thread 1/2" NPT
Material of the part in contact with the measured part	AISI 316	AISI 316
Type of leak tightness	Ring PTFE PN max. 20 bar (T max. 100 °C (212 °F))	Ring PTFE PN max. 20 bar (T max. 100 °C (212 °F))

SITRANS TS200 thermowell

Type	SITRANS TS200 thermowell 7MC7908-1A*1*-0AA0	SITRANS TS200 thermowell 7MC7908-1A*1*-0AA0
Description	SITRANS TS200 thermowell; material 1.4404 AISI 316L incl. compression fitting unsprung with VA-ring for sensor diameter Ø 3 mm	SITRANS TS200 thermowell; material 1.4404 AISI 316L incl. compression fitting unsprung with VA-ring for sensor diameter Ø 6 mm
Application	Enables fast replacement of the sensor without draining the process • Suitable for insertion of temperature sensors with a diameter of 3 mm • Large selection of process connections • Sealing system with compression fitting which enables repeated tightening without damaging the temperature sensor	Enables fast replacement of the sensor without draining the process • Suitable for insertion of temperature sensors with a diameter of 6 mm • Large selection of process connections • Sealing system with compression fitting which enables repeated tightening without damaging the temperature sensor
Figure		
Material, diameter of protective tube	(AD / ID) 5 / 3.5 mm AISI 316L	(AD / ID) 9 / 7 mm AISI 316L
Sensor mounting mechanism	Compression fitting unsprung with VA-ring	Compression fitting unsprung with VA-ring
For sensor diameter	Ø 3 mm	Ø 6 mm
Process connection	• with thread 1/8" G (K = 10 mm) • with thread 1/8" NPT (K = min. 4.0; max. 6.5 mm) • with thread 1/4" G (K = 10 mm) • with thread 1/4" NPT (K = min. 5.5; max. 10 mm) • with thread 3/8" G (K = 15 mm) • with thread 3/8" NPT (K = min. 6; max. 10 mm) • with thread 1/2" G (K = 15 mm) • with thread 1/2" NPT (K = min. 8; max. 13.5 mm)	• with thread 3/8" G (K = 15 mm) • with thread 3/8" NPT (K = min. 6; max. 10 mm) • with thread 1/2" G (K = 15 mm) • with thread 1/2" NPT (K = min. 8; max. 13.5 mm) • with thread 1/4" G (K = 10 mm) • with thread 1/4" NPT (K = min. 5.5; max. 10 mm)
Material of the part in contact with the measured part	AISI 316L	AISI 316L

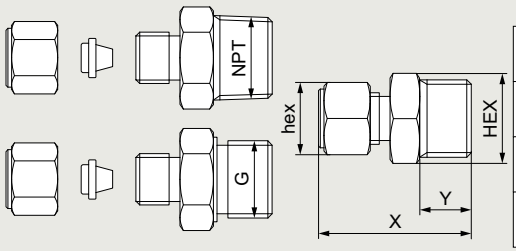
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Overview (continued)

Type	SITRANS TS200 thermowell 7MC7908-1A*1*-0AA0	SITRANS TS200 thermowell 7MC7908-1A*1*-0AA0
Length of the spindle U = U2+K; U2 = "K" see section "Process connection"	• 50 mm • 100 mm • 150 mm • 200 mm • 300 mm • 400 mm	• 50 mm • 100 mm • 150 mm • 200 mm • 300 mm • 400 mm
Notes on the dimensions	Lengths other than those listed can be manufactured for minimum quantities to be agreed upon (according to our feasibility study)	Lengths other than those listed can be manufactured for minimum quantities to be agreed upon (according to our feasibility study)
Maximum operating pressure	PN 100 bar (350 °C (662 °F))	PN 100 bar (350 °C (662 °F))

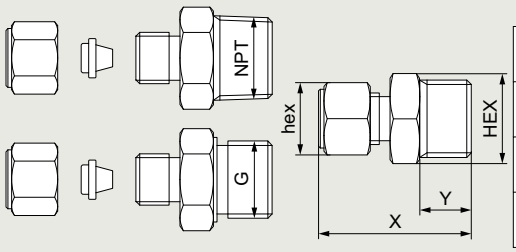
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Dimensional drawings



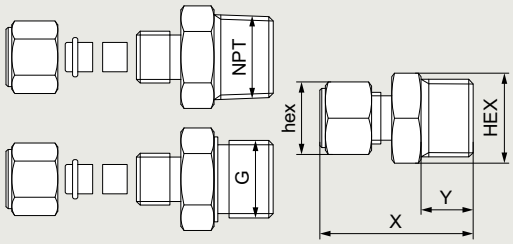
		Y mm	X mm	HEX mm	hex mm
1/8	NPT	10	~35	12	13
	G	10	~35	14	
1/4	NPT	15	~45	17	
	G	10	~40	17	
3/8	NPT	15	~45	17	
	G	15	~45	22	
1/2	NPT	20	~50	22	
	G	15	~45	24	

SITRANS TS200 IO-Link compression fittings unsprung with VA-ring for sensor diameter Ø 3 mm



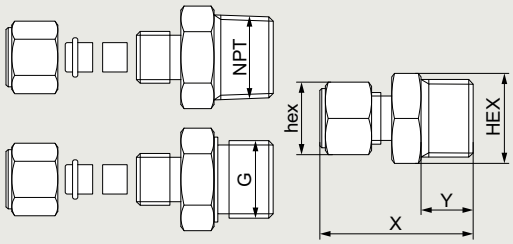
		Y mm	X mm	HEX mm	hex mm
1/8	NPT	15	~45	17	17
	G	10	~40	17	
1/4	NPT	15	~45	17	
	G	15	~45	22	
3/8	NPT	20	~50	22	
	G	15	~45	24	
1/2	NPT	20	~50	27	
	G	20	~50	32	

SITRANS TS200 IO-Link compression fittings unsprung with VA-ring for sensor diameter Ø 6 mm



		Y mm	X mm	HEX mm	hex mm
1/8	NPT	10	~35	12	13
	G	10	~35	14	
1/4	NPT	15	~45	17	
	G	10	~40	17	
3/8	NPT	15	~45	17	
	G	15	~45	22	
1/2	NPT	20	~50	22	
	G	15	~45	24	

SITRANS TS200 IO-Link compression fittings unsprung with PTFE-ring + stainless steel pressing bush for sensor diameter Ø 3 mm

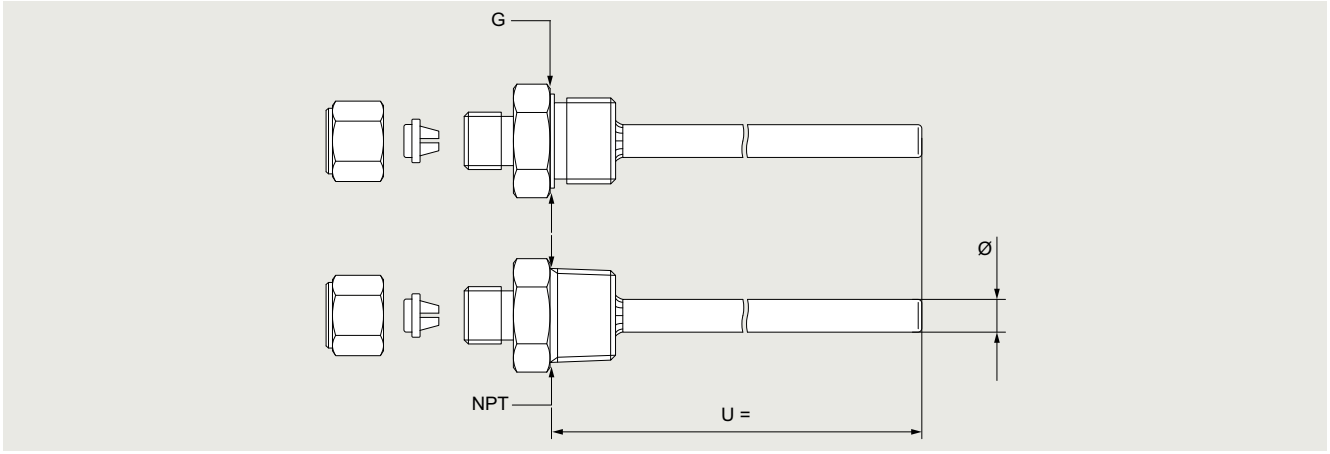


		Y mm	X mm	HEX mm	hex mm
1/8	NPT	15	~45	17	17
	G	10	~40	17	
1/4	NPT	15	~45	17	
	G	15	~45	22	
3/8	NPT	20	~50	22	
	G	15	~45	24	
1/2	NPT	20	~50	27	
	G	20	~50	32	

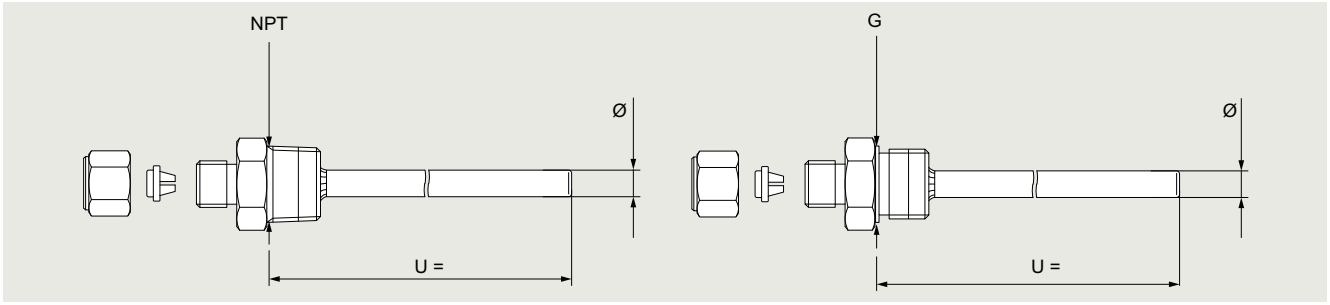
SITRANS TS200 IO-Link compression fittings unsprung with PTFE-ring + stainless steel pressing bush for sensor diameter Ø 6 mm

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Dimensional drawings (continued)



SITRANS TS200 thermowell; incl. compression fitting unsprung with VA-ring for sensor diameter Ø 3 mm



SITRANS TS200 thermowell; incl. compression fitting unsprung with VA-ring for sensor diameter Ø 6 mm

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Selection and ordering data

SITRANS TS200 Compact Temperature sensors in compact version, for universal use, mineral-insulated version, for unfavorable space conditions	Article No. 7MC7212-	●	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.						
Sensor diameter						
6 mm (0.24 inches)		6				
Length of the basic sensor B Effective length U = B-10, see "Dimensional drawings"						
200 mm (7.87 inches)			C			
500 mm (19.68 inches)			D			
750 mm (29.53 inches)			E			
Customer-specific length of the basic sensor B Effective length U = B-10, see "Dimensional drawings" Specify customer-specific length with Y44, see order codes						
85 ... 100 mm (2.76 ... 3.94 inches) Initial: 100 mm (3.94 inches)			B			
101 ... 250 mm (3.98 ... 9.84 inches) Initial: 200 mm (7.87 inches)			C			
251 ... 500 mm (9.88 ... 19.68 inches) Initial: 500 mm (19.68 inches)			D			
501 ... 750 mm (19.72 ... 29.53 inches) Initial: 750 mm (29.53 inches)			E			
751 ... 1 000 mm (19.72 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)			F			
1 001 ... 1 500 mm (39.4 ... 59.00 inches) Initial: 1 500 mm (59.00 inches)			G			
Special length: < 70 mm (2.76 inches) or >1 500 mm (59.00 inches)			X			
Sensor[1] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"						
Pt100, Basic, -50 ... +400 °C (-58 ... +752 °F)				A		
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)				B		
Pt100, extended range, -196 ... +600 °C (-320.8 ... +1 112 °F)				C		
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)				K		
Type J thermocouple, -40 ... +750 °C -0 ... +750 °C (-18 ... +1 382 °F)				J		
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"						
Single, basic accuracy (Class 2/Class B)					1	
Single, increased accuracy (Class 1/Class A)					2	
Single, maximum accuracy (Class AA)					3	
Double, basic accuracy (Class 2/Class B)					4	
Double, increased accuracy (Class 1/Class A)					5	
Double, maximum accuracy (Class AA)					6	
Type of connection side						
Solid wire ends (basic sensor)						0
Flying leads						1
Coupling LEMO 1S						2
M12 device plug, not for double Pt100						3
Thermocouple coupling, made of thermal material (2 × TC on request)						4
Mini connection head aluminum, not for double Pt100						5

[1] Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

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Selection and ordering data (continued)

Options	Order code
Add **"-Z"** to article number and specify options; separate multiple expansions with "+"	
Process connection	
Soldering nipple enclosed	
• G¼"	**A20**
• G½"	**A21**
• NPT½"	**A22**
• M18x1.5	**A23**
Compression fitting enclosed	
• G¼"	**A30**
• G½"	**A31**
• NPT½"	**A32**
Surface connection piece	
• Aluminum, enclosed (non-Ex)	**A50**
Certificates and approvals	
Inspection certificate EN 10204-3.1: Wetted material	**C12**
Inspection certificate EN 10204-3.1: Visual, dimensional and function check	**C34**
Inspection certificate EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for oxygen applications, for example)	**C51**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Intrinsic safety ia,"ic" according to KCC/KCS (Korea)	**E70**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Device settings	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Perform factory calibration at one point, specify desired temperature in plain text. Notice: For devices with built-in head-mounted transmitter, select test points within the set measuring range.	**Y33**
Special length of the basic sensor B Effective length U = B-10, see "Dimensional drawings" Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Customer-specific plain text	
Handling number of the special design	**Y99**

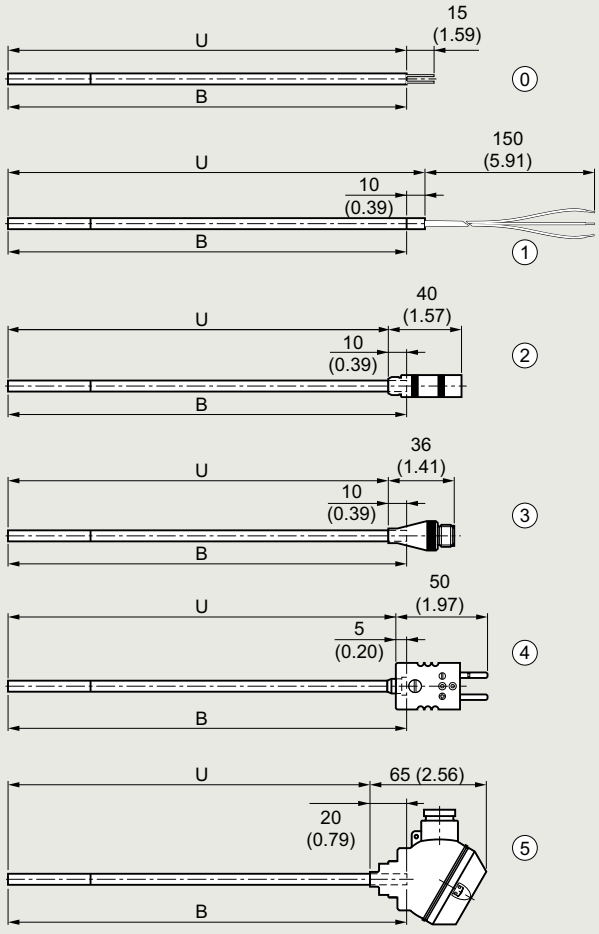
[1] Please select Ex i version of the optional transmitter.

For ordering examples, see "Temperature sensors"/"Ordering examples".

For accessories, see "Accessories"/"Additional accessories for assembly, connection and transmitter configuration".

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Dimensional drawings



B Measuring insert length
H Head height
U Insertion length

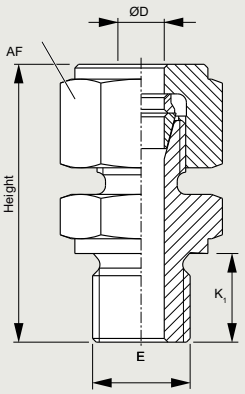
			IP level sensor	IP level terminals
0	Basic sensor	**U = B**	IP65	IP00
1	Flying leads	**U = B + 10 (0.39)**	IP65	IP00
2	LEMO coupling 1S	**U = B - 10 (0.39)**	IP65	IP50
3	M12 device plugs	U = B - 10 (0.39)	IP65	IP54
4	Thermocouple coupling	**U = B - 5 (0.20)**	IP65	IP20
5	Mini connection head	U = B - 20 (0.79)	IP54	IP65

SITRANS TS200 Compact, temperature sensors in cable version, for universal use, mineral-insulated version, for unfavorable space conditions, dimensions in mm (inch)

Dimensional drawings (continued)

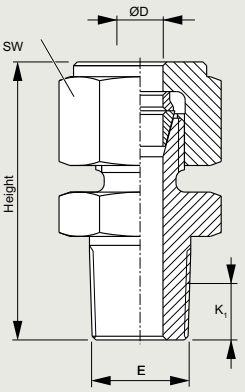
Process connection

Size	Code	Height
G1/4"	A30	37 (1.46)
G1/2"	A31	45 (1.77)
G1/2"	A41	53 ... 63 (2.09 ... 2.48)



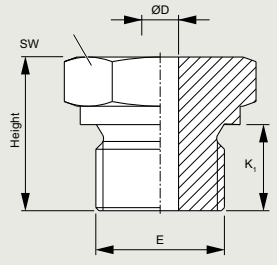
Cylindrical compression fitting (A30, A31, A41), dimensions in mm (inch)

Size	Code	Height
NPT 1/2"	A32	43 (1.69)



Compression fitting NPT (A32), dimensions in mm (inch)

Size	Code	Height
G1/4"	A20	20 (0.79)
G1/2"	A21	27 (1.06)
M18x1.5	A23	24.5 (0.96)

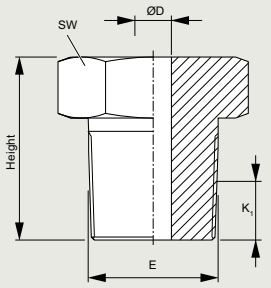


Cylindrical soldering nipple (A20, A21, A23), dimensions in mm (inch)

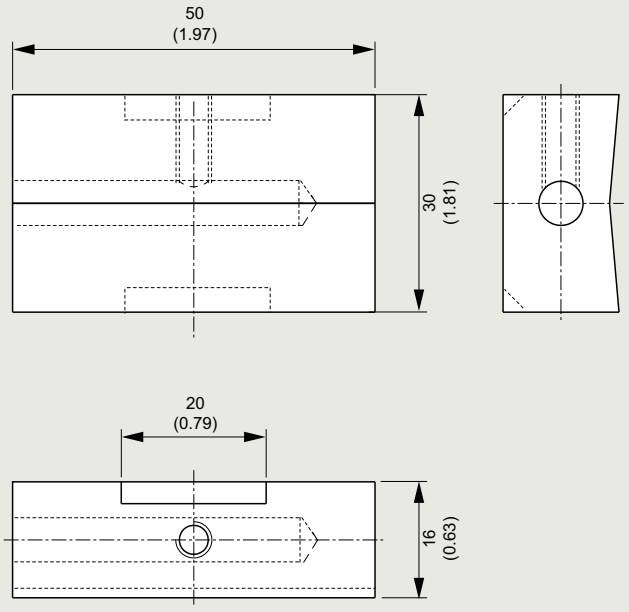
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Dimensional drawings (continued)

Size	Code	Height
NPT 1/2"	A22	30 (1.18)



Soldering nipple NPT (A22), dimensions in mm (inch)



Surface connection piece (A50), dimensions in mm (inch)

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Overview



- Compact temperature sensor with IO-Link / 4 ... 20 mA / switching output
- Quick and optimized response time
- LED for device status display at a glance
- Cybersecurity for the entire product lifecycle
- M12 connection for external sensors

Benefits

- Thanks to the LED, the device provides a quick overview of the device status (in IO-Link mode) as well as the process and device status (in SIO mode).
- The cybersecurity for the entire product lifecycle is guaranteed by regular firmware updates
- Updates are remote-controlled via the IO-Link Master
- Sensor diameters of 3 mm, 4 mm and 6 mm are available for a quick and optimized process response time
- The robust and compact design includes a miniaturized transmitter and a flexible, mineral-insulated sensor
- Plastic enclosure for non-corrosive and stainless steel enclosure for corrosive media
- Three output modes are available: IO-Link, 4 ... 20 mA and Switch-IO (SIO)
- Switch-IO mode (SIO): NPN pr PNP output to switch external devices, e.g. fans or pumps

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Selection and ordering data

	Article No.	
Transmitter for external sensors		
SITRANS TS200 temperature transmitter for external Pt100 and Pt1000 temperature sensors with IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	**7MC7216-0AC00-0AA0**	
SITRANS TS200 temperature transmitter for external Pt100 and Pt1000 temperature sensors with IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-0AD00-0AA0**	
Fast response time and thermowell connection		
SITRANS TS200 temperature sensor (Ø 3 mm) Pt100 class A with fast response time, sensor length 115 mm and integrated M10 thermowell connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-3GB20-0AA0**	
Optimized response time		
SITRANS TS200 temperature sensor (Ø 6/4.4 mm) Pt100 class A with optimized response time, sensor length 100 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-4FB00-0AA0**	
SITRANS TS200 temperature sensor (Ø 6/4.4 mm) Pt100 class A with optimized response time, sensor length 150 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-4HB00-0AA0**	
SITRANS TS200 temperature sensor (Ø 6/4.4 mm) Pt100 class A with optimized response time, sensor length 250 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-4MB00-0AA0**	
SITRANS TS200 temperature sensor (Ø 6/4.4 mm) Pt100 class A with optimized response time, sensor length 350 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-4PB00-0AA0**	
SITRANS TS200 temperature sensor (Ø 6/4.4 mm) Pt100 class A with optimized response time, sensor length 500 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-4SB00-0AA0**	
SITRANS TS200 temperature sensor (Ø 6/4.4 mm) Pt100 class A with optimized response time, sensor length 750 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-4XB00-0AA0**	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with optimized response time, sensor length 100 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-6FB00-0AA0**	

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Selection and ordering data (continued)

	Article No.	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with optimized response time, sensor length 150 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	7MC7216-6HB00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with optimized response time, sensor length 250 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	7MC7216-6MB00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with optimized response time, sensor length 350 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	7MC7216-6PB00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with optimized response time, sensor length 500 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	7MC7216-6SB00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with optimized response time, sensor length 750 mm. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	7MC7216-6XB00-0AA0	
SITRANS TS200 temperature sensor (Ø 3 mm) Pt100 class A with sensor length 100 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-3FA00-0AA0	
SITRANS TS200 temperature sensor (Ø 3 mm) Pt100 class A with sensor length 150 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-3HA00-0AA0	
SITRANS TS200 temperature sensor (Ø 3 mm) Pt100 class A with sensor length 250 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-3MA00-0AA0	
SITRANS TS200 temperature sensor (Ø 3 mm) Pt100 class A with sensor length 350 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-3PA00-0AA0	
SITRANS TS200 temperature sensor (Ø 3 mm) Pt100 class A with sensor length 500 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-3SA00-0AA0	
SITRANS TS200 temperature sensor (Ø 3 mm) Pt100 class A with sensor length 750 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-3XA00-0AA0	
Optimized response time		
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with sensor length 100 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-6FA00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with sensor length 150 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-6HA00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with sensor length 250 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-6MA00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with sensor length 350 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-6PA00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with sensor length 500 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-6SA00-0AA0	
SITRANS TS200 temperature sensor (Ø 6 mm) Pt100 class A with sensor length 750 mm. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-6XA00-0AA0	
Fast response time and process connection		
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated G 1/8" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	7MC7216-5BB10-0AA0	

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Selection and ordering data (continued)

	Article No.	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated G 1/8" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-5CB10-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated NPT 1/8" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-5BB13-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated NPT 1/8" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-5CB13-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated G 1/4" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-5BB11-0AA0**	

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Selection and ordering data (continued)

	Article No.	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated G 1/4" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-5CB11-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated NPT 1/4" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-5BB14-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated NPT 1/4" process connection. Including IO-Link/output 4 ... 20 mA, 316L stainless steel enclosure	**7MC7216-5CB14-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated G 1/8" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	**7MC7216-5BA10-0AA0**	

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Selection and ordering data (continued)

	Article No.	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated G 1/8" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	**7MC7216-5CA10-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated NPT 1/8" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	**7MC7216-5BA13-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated NPT 1/8" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	**7MC7216-5CA13-0AA0**	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated G 1/4" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	**7MC7216-5BA11-0AA0**	

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Selection and ordering data (continued)

	Article No.	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated G 1/4" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-5CA11-0AA0	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 13 mm and integrated NPT 1/4" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-5BA14-0AA0	
SITRANS TS200 temperature sensor (Ø 3.5/3 mm) Pt100 class A with fast response time, sensor length 24 mm and integrated NPT 1/4" process connection. Including IO-Link/output 4 ... 20 mA, PA6 plastic enclosure	7MC7216-5CA14-0AA0	

Accessories

	Article No.
Clamping ring connection unsprung; VA-ring	
Clamping ring connection unsprung; VA-ring, process connection: G 1/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AB03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: NPT 1/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AJ03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: G 1/4"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AC03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: G 1/4"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0AC06-0AA0
Clamping ring connection unsprung; VA-ring, process connection: NPT 1/4"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AK03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: NPT 1/4"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0AK06-0AA0
Clamping ring connection unsprung; VA-ring, process connection: G 3/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AD03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: G 3/8"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0AD06-0AA0
Clamping ring connection unsprung; VA-ring, process connection: NPT 3/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AL03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: NPT 3/8"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0AL06-0AA0

	Article No.
Clamping ring connection unsprung; VA-ring, process connection: G 1/2"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AE03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: G 1/2"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0AE06-0AA0
Clamping ring connection unsprung; VA-ring, process connection: NPT 1/2"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0AM03-0AA0
Clamping ring connection unsprung; VA-ring, process connection: NPT 1/2"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0AM06-0AA0
Clamping ring connection unsprung; PTFE-ring	
Clamping ring connection unsprung; PTFE-ring; process connection: G 1/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BB03-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: NPT 1/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BJ03-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: G 1/4"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BC03-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: G 1/4"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0BC06-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: NPT 1/4"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BK03-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: NPT 1/4"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0BK06-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: G 3/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BD03-0AA0

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Selection and ordering data (continued)

	Article No.
Clamping ring connection unsprung; PTFE-ring; process connection: G 3/8"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0BD06-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: NPT 3/8"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BL03-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: NPT 3/8"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0BL06-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: G 1/2"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BE03-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: G 1/2"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0BE06-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: NPT 1/2"; clamping diameter: d = 3 mm; AISI 316L	7MC7905-0BM03-0AA0
Clamping ring connection unsprung; PTFE-ring; process connection: NPT 1/2"; clamping diameter: d = 6 mm; AISI 316L	7MC7905-0BM06-0AA0
SITRANS TS200 thermowell incl. clamping ring connection unsprung; VA-ring Diameter (OD, ID, SD) 9 / 7 / 6 mm	
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 60 mm	7MC7908-1AC21-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 55.5 mm, max. 60 mm	7MC7908-1AK21-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 65 mm	7MC7908-1AD21-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 56 mm, max. 60 mm	7MC7908-1AL21-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 65 mm	7MC7908-1AE21-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 58 mm, max. 63.5 mm	7MC7908-1AM21-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 110 mm	7MC7908-1AC22-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 105.5 mm, max. 110 mm	7MC7908-1AK22-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 115 mm	7MC7908-1AD22-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 106 mm, max. 110 mm	7MC7908-1AL22-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 115 mm	7MC7908-1AE22-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 108 mm, max. 113.5 mm	7MC7908-1AM22-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 160 mm	7MC7908-1AC23-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 155.5 mm, max. 160 mm	7MC7908-1AK23-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 165 mm	7MC7908-1AD23-0AA0

	Article No.
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 156 mm, max. 160 mm	7MC7908-1AL23-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 165 mm	7MC7908-1AE23-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 158 mm, max. 163.5 mm	7MC7908-1AM23-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 210 mm	7MC7908-1AC24-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 205.5 mm, max. 210 mm	7MC7908-1AK24-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 215 mm	7MC7908-1AD24-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 206 mm, max. 210 mm	7MC7908-1AL24-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 215 mm	7MC7908-1AE24-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 208 mm, max. 213.5 mm	7MC7908-1AM24-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 310 mm	7MC7908-1AC25-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 305.5 mm, 310 mm	7MC7908-1AK25-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 315 mm	7MC7908-1AD25-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 306 mm, max. 310 mm	7MC7908-1AL25-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 315 mm	7MC7908-1AE25-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 308 mm, 313.5 mm	7MC7908-1AM25-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 410 mm	7MC7908-1AC26-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 405.5 mm, max. 410 mm	7MC7908-1AK26-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 415 mm	7MC7908-1AD26-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 406 mm, max. 410 mm	7MC7908-1AL26-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = 415 mm	7MC7908-1AE26-0AA0

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Selection and ordering data (continued)

	Article No.
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 9 / 7 / 6; installation length U = min. 408 mm, max. 413.5 mm	7MC7908-1AM26-0AA0
SITRANS TS200 thermowell incl. clamping ring connection unsprung; VA-ring Diameter (OD, ID, SD) 5 / 3.5 / 3 mm	
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 60 mm	7MC7908-1AB11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 54 mm, max. 56.5 mm	7MC7908-1AJ11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 60 mm	7MC7908-1AC11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 55.5 mm, max. 60 mm	7MC7908-1AK11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 65 mm	7MC7908-1AD11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 56 mm, max. 60 mm	7MC7908-1AL11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 65 mm	7MC7908-1AE11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 58 mm, max. 63.5 mm	7MC7908-1AM11-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 110 mm	7MC7908-1AB12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 104 mm, max. 106.5 mm	7MC7908-1AJ12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 110 mm	7MC7908-1AC12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 105.5 mm, max. 110 mm	7MC7908-1AK12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 115 mm	7MC7908-1AD12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 106 mm, max. 110 mm	7MC7908-1AL12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 115 mm	7MC7908-1AE12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 108 mm, max. 113.5 mm	7MC7908-1AM12-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 160 mm	7MC7908-1AB13-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 154 mm, max. 156.5 mm	7MC7908-1AJ13-0AA0

	Article No.
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 160 mm	7MC7908-1AC13-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 155.5 mm, max. 160 mm	7MC7908-1AK13-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 165 mm	7MC7908-1AD13-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 156 mm, max. 160 mm	7MC7908-1AL13-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 165 mm	7MC7908-1AE13-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 158 mm, max. 163.5 mm	7MC7908-1AM13-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 210 mm	7MC7908-1AB14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 204 mm, max. 206.5 mm	7MC7908-1AJ14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 210 mm	7MC7908-1AC14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 205.5 mm, max. 210 mm	7MC7908-1AK14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 215 mm	7MC7908-1AD14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 206 mm, max. 210 mm	7MC7908-1AL14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 215 mm	7MC7908-1AE14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 208 mm, max. 213.5 mm	7MC7908-1AM14-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 310 mm	7MC7908-1AB15-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 304 mm, max. 306.5 mm	7MC7908-1AJ15-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 310 mm	7MC7908-1AC15-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 305.5 mm, max. 310 mm	7MC7908-1AK15-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 315 mm	7MC7908-1AD15-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 306 mm, max. 310 mm	7MC7908-1AL15-0AA0

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Selection and ordering data (continued)

	Article No.
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 315 mm	7MC7908-1AE15-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 308 mm, max. 313.5 mm	7MC7908-1AM15-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 410 mm	7MC7908-1AB16-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 404 mm, max. 406.5 mm	7MC7908-1AJ16-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 410 mm	7MC7908-1AC16-0AA0

	Article No.
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/4"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 405.5 mm, max. 410 mm	7MC7908-1AK16-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 415 mm	7MC7908-1AD16-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 3/8"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 406 mm, max. 410 mm	7MC7908-1AL16-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: G 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = 415 mm	7MC7908-1AE16-0AA0
SITRANS TS200 thermowells; material 1.4404 AISI 316L; clamping ring connection unsprung; VA-ring; process connection: NPT 1/2"; diameter (OD, ID, SD) 5 / 3.5 / 3; installation length U = min. 408 mm, max. 413.5 mm	7MC7908-1AM16-0AA0

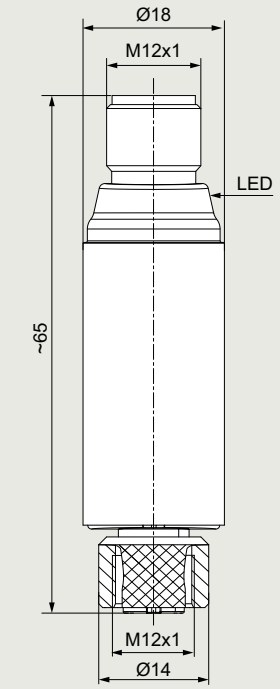
More information

Other accessories:

Here you can order the SITRANS TS200 compact as an accessory for the SITRANS TS 200 IO-Link.

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Dimensional drawings

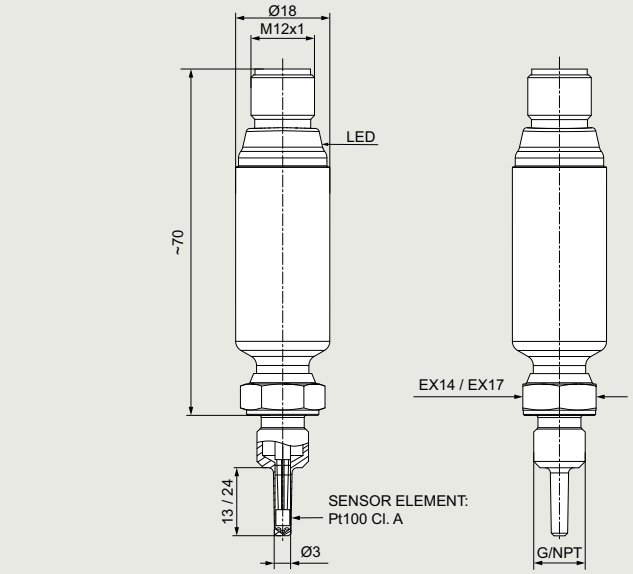


Tolerances (ISO 2768-m):
0.5÷6=±0.1 6÷30=±0.2 30÷120=±0.3

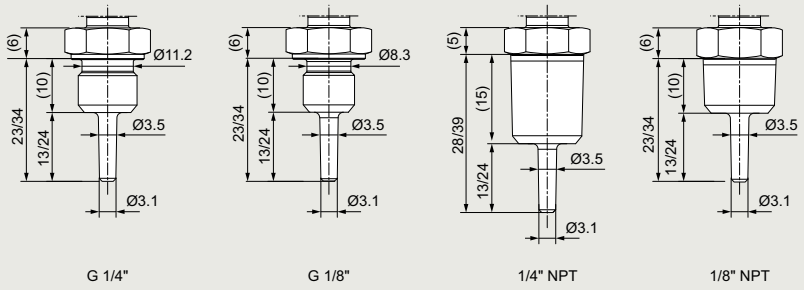
7MC7216-0AD00-0AA0

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Dimensional drawings (continued)

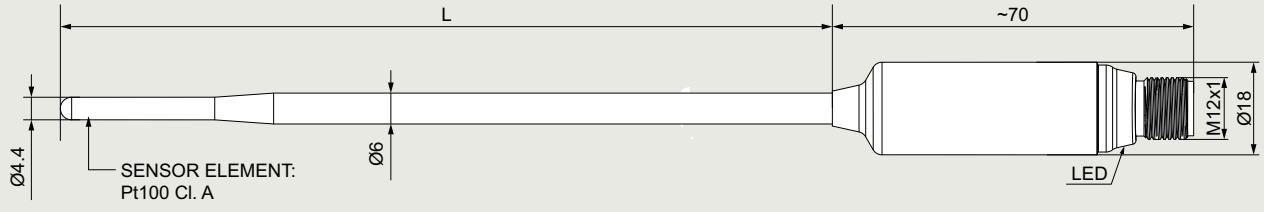


Possible process connections



Sensor length	G1/4"	G 1/8"	1/4" NPT	1/8" NPT
13mm	7MC7216-5BB11-0AA0	7MC7216-5BB10-0AA0	7MC7216-5BB14-0AA0	7MC7216-5BB13-0AA0
24mm	7MC7216-5CB11-0AA0	7MC7216-5CB10-0AA0	7MC7216-5CB14-0AA0	7MC7216-5CB13-0AA0

Tolerances (ISO 2768-m): 0.5÷6=±0.1 6÷30=±0.2 30÷120=±0.3



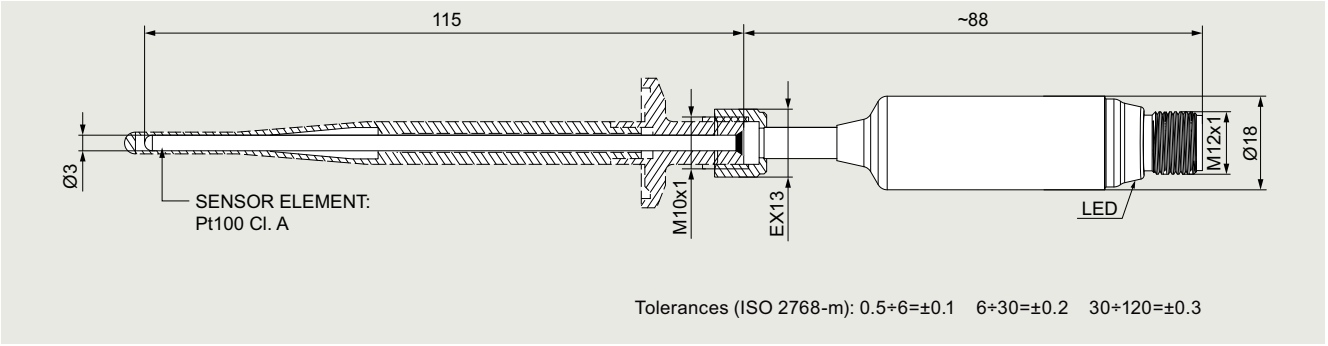
Tolerances (ISO 2768-m): 0.5÷6=±0.1 6÷30=±0.2 30÷120=±0.3

7MC7216-**B00-0AA0 [1)]

[1)] For optional compression fitting, see "Accessories" under "Detailed Product Overview"and under "IO-Link/7MC7216-*"

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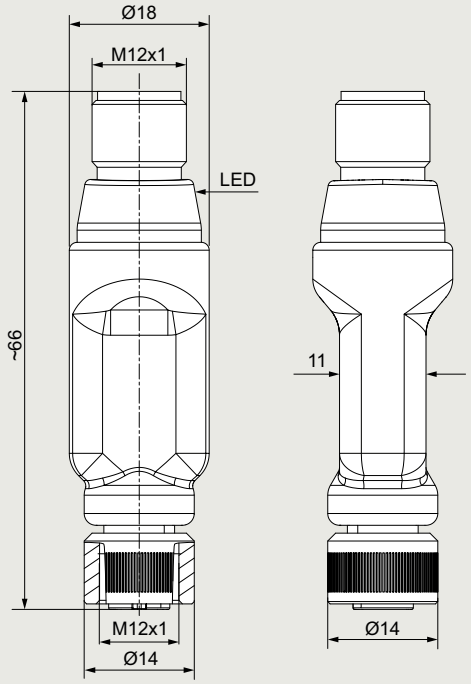
Dimensional drawings (continued)



7MC7216-3GB20-0AA0

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Dimensional drawings

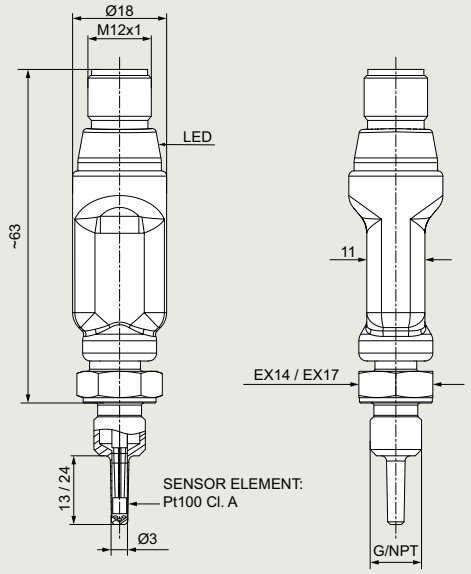


Tolerances (ISO 2768-m):
0.5÷6=±0.1 6÷30=±0.2 30÷120=±0.3

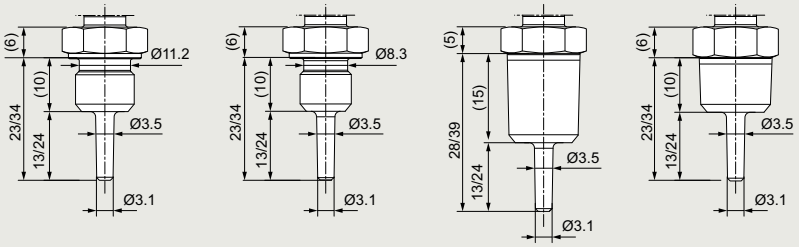
7MC7216-0AC00-0AA0

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Dimensional drawings (continued)

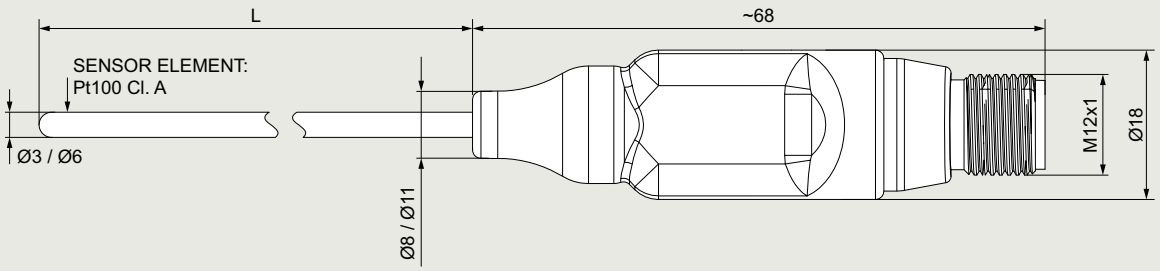


Possible process connections



Sensor length	G1/4"	G 1/8"	1/4" NPT	1/8" NPT
13 mm	7MC7216-5BA11-0AA0	7MC7216-5BA10-0AA0	7MC7216-5BA14-0AA0	7MC7216-5BA13-0AA0
24 mm	7MC7216-5CA11-0AA0	7MC7216-5CA10-0AA0	7MC7216-5CA14-0AA0	7MC7216-5CA13-0AA0

Tolerances (ISO 2768-m): 0.5÷6=±0.1 6÷30=±0.2 30÷120=±0.3



Tolerances (ISO 2768-m): 0.5÷6=±0.1 6÷30=±0.2 30÷120=±0.3

7MC7216-**A00-0AA0

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Selection and ordering data

SITRANS TS300 For food, pharmaceuticals and biotechnology Modular design, for installation in pipelines and vessels				Article No. 7MC8005-												Order code		
				●	●	●	●	0	-	●	●	●	0			●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.																		
Head																		
Stainless steel head, BS0, screw cover (standard version)				5														
Aluminum head, BA0, flange cap, standard				1														
Aluminum head, BB0, spring flap low, screw closure				3														
Aluminum head, BC0, spring flap high, screw closure				4														
Special design (specify order code and plain text)				9												H	1	Y
Process connection Material 1.4404 or 1.4435/316L																		
Dairy connection acc. to DIN 11851 with slotted union nut and nominal diameter/nominal pressure																		
DN 25/PN 40					A	A												
DN 32/PN 40					A	B												
DN 40/PN 40					A	C												
DN 50/PN 25					A	D												
Clamp connection																		
ISO 2852	DIN 32676	Tri-Clamp	Outer diameter D_6															
–	–	½ inch/ ¾ inch	25.0 mm (0.98 inch)		C	A												
DN 25/ 33.7/38	DN 25/32/40	1 inch, 1½ inches	50.5 mm (1.99 inches)		C	B												
DN 40/51	DN 50	2 inches	64.0 mm (2.52 inches)		C	C												
DN 63.5	–	2½ inches	77.5 mm (3.05 inches)		C	D												
DN 88.9	DN 80	–	106.0 mm (4.17 inches)		C	E												
Varivent connection (Tuchenhagen Co.)																		
Ø D_6 = 50 mm (1.97 inches), for Varivent enclosure DN 25 and DN 1"					K	U												
Ø D_6 = 68 mm (2.68 inches), for Varivent enclosure DN 40 ... DN 125 and 1½ ... 6 inches					K	V												
NEUMO/BioControl with O-ring																		
Size 25					B	A												
Size 50					B	B												
Size 65					B	C												
Ingold socket																		
DN 25 with hexagonal union nut G 1¼", installation length 40 mm (1.57 inches), diameter 24.8 mm (0.98 inches), incl. O-ring					J	A												
Weld-in piece [spherical diameter 30 × 40 mm (1.2 × 1.6 inches) long]					L	A												
Special design: Type of gland and nominal diameter (add order code and plain text)					Z	A										J	1	Y
Thermowell		**Measuring insert**																
Ø D = 6 mm (0.24 inch)		Ø 3/3.2 mm, (0.12/0.13 inch) mineral-insulated					1											
Ø D = 9 mm (0.35 inch)		Ø 6 mm (0.24 inch)					2											
Ø D = 9 mm (0.35 inch)		Ø 6 mm (0.24 inch) mineral-insulated					3											
Ø D = 9 mm (0.35 inch) tapered tip, D_2 = 5 Ø × 20 mm (0.2 × 0.79 inch)		Ø 3/3.2 mm, (0.12/0.12 inch,) mineral-insulated					4											
Special design (specify order code and plain text)							9									L	1	Y
Extension tube length X																		
65 mm (2.56 inches) [M = 80 mm (3.15 inches)]										1								
130 mm (5.12 inches) [M = 145 mm (5.71 inches)]										2								
Special design (add order code and plain text)										9						N	1	Y
Installation length "U" Specify customer-specific length with Y44, see order codes																		
15 mm (0.59 inches)											B							
16 ... 35 mm (0.63 ... 1.38 inches) Initial: 35 mm (1.38 inches)											C							
36 ... 50 mm (1.42 ... 1.97 inches) Initial: 50 mm (1.97 inches)											D							

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Selection and ordering data (continued)

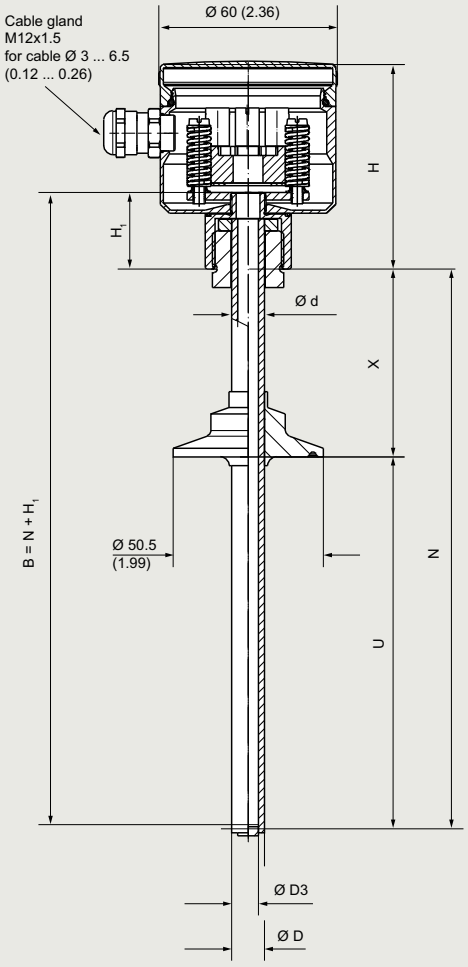
SITRANS TS300 For food, pharmaceuticals and biotechnology Modular design, for installation in pipelines and vessels	Article No. 7MC8005- ● ● ● ● 0 - ● ● ● 0	Order code ● ● ●
51 ... 100 mm (2.01 ... 3.94 inches) Initial: 100 mm (3.94 inches)	E	
101 ... 160 mm (3.98 ... 6.30 inches) Initial: 160 mm (6.30 inches)	F	
161 ... 250 mm (6.34 ... 9.84 inches) Initial: 250 mm (9.84 inches)	G	
251 ... 400 mm (9.88 ... 15.75 inches) Initial: 400 mm (15.75 inches)	H	
1 ... 4 inches, initial: 4 inches	J	
4 ... 6 inches, initial: 6 inches	K	
6 ... 9 inches, initial: 9 inches	L	
Special design (add order code and plain text)	Z	P 1 Y
Sensor		
Thin layer technology: Range of use -50 ... +400 °C (-58 ... +752 °F)		
2 × Pt100, Class A, 3-wire	G	
1 × Pt100, Class A, 4-wire	H	
Special design (specify order code and plain text)	Z	Q 1 Y

Options	Order code
Add **"-Z"** to article number and specify an order code.	
Certificates and approvals	
Transmitter test report (5 points)	**C11**
Inspection certificate EN 10204-3.1: Wetted material	**C12**
Roughness depth measurement R_a certified with a factory certificate according to EN 10204-3.1	**C18**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Type of protection (Ex)	
Manufacturer declaration for intrinsically safe circuits	**E01**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Hygiene version	
R_a < 0.8 µm (3.1 × 10^{-5} inches)	**H01**
Process connection	
Process connection: Completely extrapolated	**P01**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**

Options	Order code
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
Device settings (head-mounted transmitter options)	
Specify measuring range in plain text (Y11:+/-NNNN ... +/-NNNN C,F)	**Y11**
Tag plate made of stainless steel, specify label/tag no. in plain text	**Y15**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Test report (at 0, 50 and 100%); Specify measuring range in plain text. **Note** If optional head-mounted transmitters are installed, all calibration points must be in the set measuring range. If the points are outside the standard measuring range, a Y01 suffix is always required.	**Y33**
Installation length "U" customer-specific, select range, plain text specification of desired length (no specification = standard length)	**Y44**
Customer-specific plain text	
Specify special design in plain text	**Y98**
Handling number of the special design	**Y99**

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Dimensional drawings



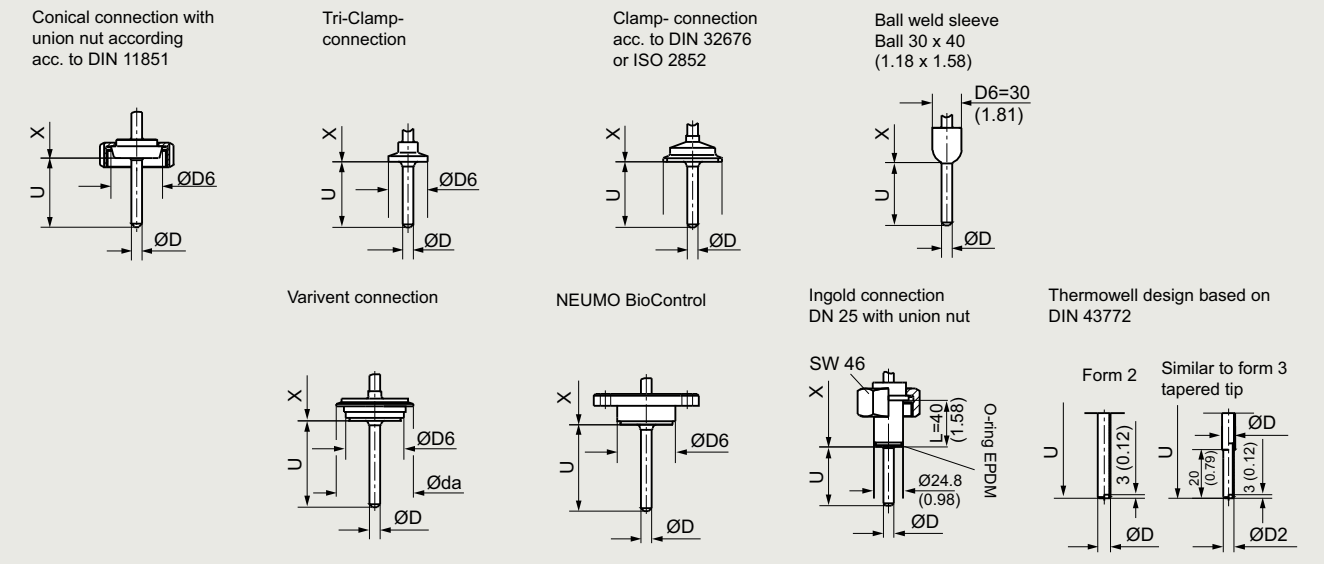
B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Thermowell inner diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length

SITRANS TS300, modular design, dimensions in mm (inch)

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Dimensional drawings (continued)

Process connection



SITRANS TS300 modular design, process connections, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS300 for food, pharmaceuticals and biotechnology Clamp-on design for measuring the pipe surface temperature		Article No. 7MC8016-					Order code		
		●	●	●	●	0	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.									
Type									
According to IEC 60751, Class A [-40 ... +150 °C (-40 ... +302 °F)]		1							
Connection type									
Device plug M12 × 1			A						
Connection head form B, stainless steel			B						
4 ... 20 mA compact transmitter SITRANS TH100 Slim (standard measuring range 0 ... 100 °C (32 ... 212 °F))			C						
Pipe collar mounting type									
Outer pipe diameter mm (inch)	Collar size mm (inch)								
4 (0.16)	50 × 35 × 20 (1.97 × 1.38 × 0.79)			A	1				
6 (0.24)				B	1				
6.35 (0.25)				C	1				
8 (0.31)				D	1				
9.35 (0.37)				E	1				
10 (0.39)				F	1				
10.2 (0.40)				G	1				
10.3 (0.41)				H	1				
12 (0.47)				J	1				
12.7 (0.50)				K	1				
13 (0.51)				L	1				
13.5 (0.53)				M	1				
13.7 (0.54)				N	1				
14 (0.55)				P	1				
15.88 (0.62)				Q	1				
16 (0.63)				R	1				
17.2 (0.68)				S	1				
18.0 (0.71)	70 × 70 × 20 (2.76 × 2.76 × 0.79)			A	2				
19.0 (0.74)				B	2				
19.05 (0.75)				C	2				
20.0 (0.79)				D	2				
21.3 (0.84)				E	2				
22.0 (0.87)				F	2				
23.0 (0.90)				G	2				
24.0 (0.94)				H	2				
25.0 (0.98)				J	2				
25.4 (1.00)				K	2				
26.7 (1.05)				L	2				
26.9 (1.06)				M	2				
28.0 (1.10)				N	2				
29.0 (1.14)				P	2				
30.0 (1.18)				Q	2				
31.8 (1.25)				R	2				
32.0 (1.26)				S	2				
33.4 (1.31)				T	2				
33.7 (1.33)				U	2				
34.0 (1.34)				V	2				
35.0 (1.38)				W	2				
36.0 (1.42)				X	2				

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Selection and ordering data (continued)

SITRANS TS300 for food, pharmaceuticals and biotechnology Clamp-on design for measuring the pipe surface temperature		Article No. 7MC8016- ● ● ● ● 0	Order code ● ● ●
38.0 (1.49)	90 × 85 × 20 (3.54 × 3.35 × 0.79)	**Y 2**	
38.1 (1.50)		**A 3**	
41.0 (1.61)		**B 3**	
42.4 (1.67)		**C 3**	
44.5 (1.75)		**D 3**	
48.3 (1.90)		**E 3**	
50.8 (2.00)		**F 3**	
53.0 (2.09)		**G 3**	
54.0 (2.13)		**H 3**	
57.0 (2.24)		**J 3**	
Always indicate outer pipe diameter for[1]: • Installation with pipe collar and deviating outer pipe diameter (S11-S19) • Clamping band installation (S31-S35)		**Z 0**	**K 1 Y**

[1] Special sizes for outer pipe diameters:
To process special sizes "Z0", two additional specifications are essential:
- Plain text specification of the desired diameter under "K1Y"
- Choice of corresponding pipe collar or clamping band size (order codes "S11" to "S35")

Recommendation

Recommended for all versions: Thermo-lubricant enclosed, silicon-free, injection 3 g, option L15 (see "Options" table)

Options	Order code
Add **"-Z"** to article number and specify order code.	
Certificates and approvals	
Transmitter test report (5 points)	**C11**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Type of protection (Ex)	
Manufacturer declaration for intrinsically safe circuits	**E01**
Other cable gland (only for connection head)	
Polyamide for cable diameter 4.5 ... 10 mm (0.18 ... 0.39 inches)	**K02**
Stainless steel for cable diameter 3 ... 6.5 mm (0.12 ... 0.25 inches)	**K03**
Device plug M12 × 1	**K11**
Additional options	
Assignment marking, engraving instead of adhesive label (serial number and pipe diameter on plug and plastic block)	**L11**
2 mm drain hole	**L12**
Sensor 4-wire connection	**L14**
Thermo-lubricant enclosed, silicon-free, injection 3 g (0.0066 lb)	**L15**
Pipe diameter deviating / Collar size; mm (inch)	
4 ... 17.9 (0.16 ... 0.71) / 50 × 35 (1.97 × 1.38)	**S11**
18 ... 37.50 (0.71 ... 1.48) / 70 × 70 (2.76 × 2.76)	**S12**
37.51 ... 57 (1.5 ... 2.24) / 90 × 85 (3.54 × 3.35)	**S13**
Larger nominal diameters on request	**S19**
Clamping band installation	
For outer pipe diameter; mm (inch):	
• 10 ... 57 (0.39 ... 2.24)	**S31**
• 58 ... 220 (2.28 ... 8.66)	**S32**
• Without clamping band installation	**S35**
Built-in head transmitter	
Measuring range to be set must be specified with plain text data "Y01".	

Options	Order code
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
Device settings (including head transmitter options)	
Specify measuring range in plain text (Y11:+/-NNNN ... +/-NNNN C,F)	**Y11**
Tag plate made of stainless steel, specify label/tag no. in plain text	**Y15**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Test report (at 0, 50 and 100%) Specify measuring range in plain text. **Note** If optional head transmitters are installed, all calibration points must be in the set measuring range. If the points are outside the standard measuring range, a Y01 suffix is always required.	**Y33**
Customer-specific plain text	
Specify special design in plain text	**Y98**
Handling number of the special design	**Y99**

Ordering examples

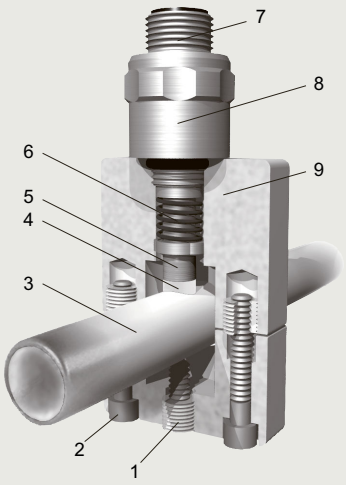
Other pipe diameter 28.5 mm:
7MC8016-1AZ00-Z K1Y + S12 {K1Y: 28.5 mm}

Space-saving mounting, pipe diameter 38 mm:
7MC8016-1AZ00-Z K1Y + S23 {K1Y: 38 mm}; as of diameter ≥ 18 mm, we recommend using the clamping band installation.

Clamping band installation, pipe diameter 111 mm:
7MC8016-1AZ00-Z K1Y + S32 {K1Y: 111 mm}

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Dimensional drawings



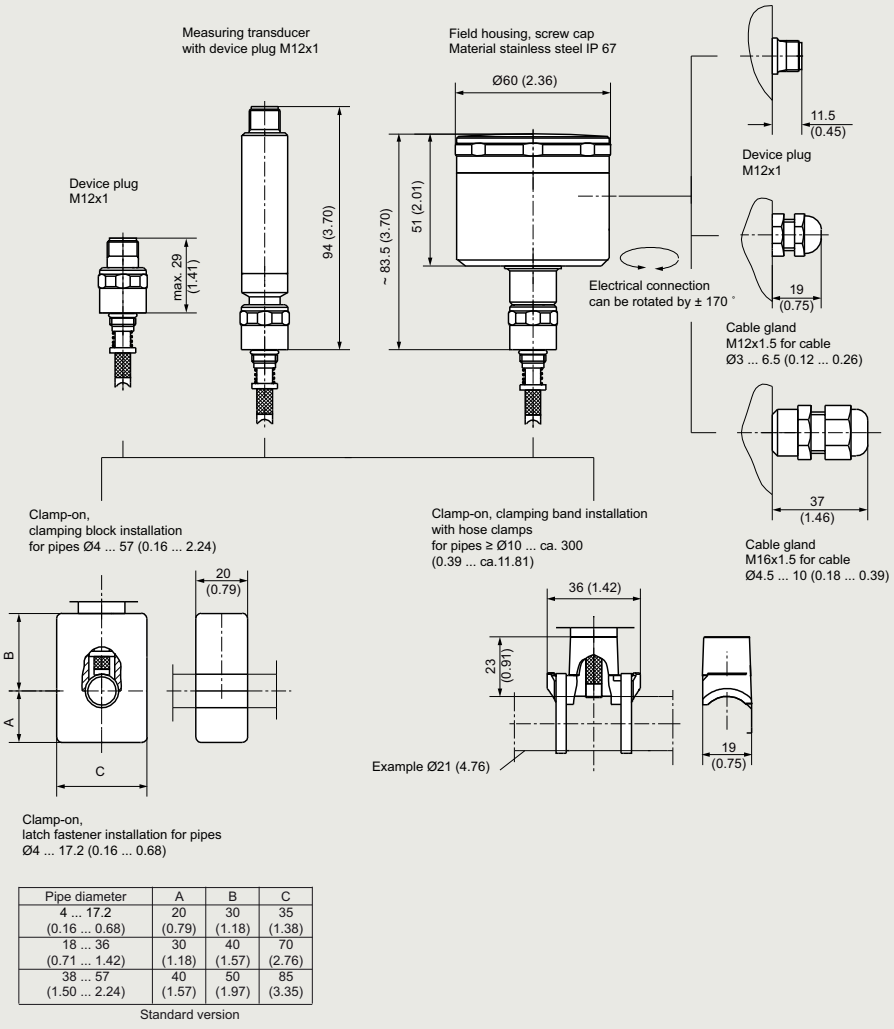
1 Vibration-locking-screw
2 Mounting screws
3 Process pipeline
4 Temperature sensor
5 Thermal decoupling
6 Spring load
7 Electrical connection M12
8 Replaceable measuring insert
9 Heat insulated pipe collar

Resistance thermometer with thermowell in clamp-on technology, dimensions in mm (inch)

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Dimensional drawings (continued)

Clamp-on design, device plug, field enclosure, cable gland, versions



Pipe diameter	A	B	C
4 ... 17.2 (0.16 ... 0.68)	20 (0.79)	30 (1.18)	35 (1.38)
18 ... 36 (0.71 ... 1.42)	30 (1.18)	40 (1.57)	70 (2.76)
38 ... 57 (1.50 ... 2.24)	40 (1.57)	50 (1.97)	85 (3.35)

Standard version

SITRANS TS300 in clamp-on design, device plug, field enclosure, cable gland, versions, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 **Tubular thermowell for low to medium stress, according to DIN 43772, Type 2, without process connection, without extension, plug-in or for use with sliding compression fittings**	Article No. 7MC751	● -	●	●	●	●	●	-	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.												
Wetted material												
316L (1.4404 or 1.4435)		2										
Process connection												
Without process connection (for compression fittings) N=U			0	N								
Thermowell form												
2; 9 mm (0.35 inches)					A							
2; 12 mm (0.47 inches)					B							
Installation length "U" (= N), standard												
160 mm (6.3 inches)						0	4					
250 mm (9.84 inches)						1	2					
400 mm (15.75 inches)						2	2					
Installation length "U" (= N), customer-specific Specify customer-specific length with Y44, see order codes												
80 ... 100 mm (3.15 ... 3.94 inches) Initial: 100 mm (3.94 inches)						0	1					
101 ... 120 mm (3.98 ... 4.72 inches) Initial: 120 mm (4.72 inches)						0	2					
121 ... 140 mm (4.76 ... 5.51 inches) Initial: 140 mm (5.51 inches)						0	3					
141 ... 160 mm (5.55 ... 6.30 inches) Initial: 160 mm (6.3 inches)						0	4					
161 ... 180 mm (6.34 ... 7.09 inches) Initial: 180 mm (7.09 inches)						0	5					
181 ... 200 mm (7.13 ... 7.87 inches) Initial: 200 mm (7.87 inches)						0	6					
201 ... 220 mm (7.91 ... 8.66 inches) Initial: 220 mm (8.66 inches)						0	7					
221 ... 240 mm (8.7 ... 9.45 inches) Initial: 225 mm (8.86 inches)						1	1					
241 ... 260 mm (9.49 ... 10.24 inches) Initial: 250 mm (9.84 inches)						1	2					
261 ... 280 mm (10.28 ... 11.02 inches) Initial: 280 mm (11.02 inches)						1	3					
281 ... 300 mm (11.06 ... 11.81 inches) Initial: 285 mm (11.22 inches)						1	4					
301 ... 320 mm (11.85 ... 12.6 inches) Initial: 315 mm (12.4 inches)						1	5					
321 ... 340 mm (12.64 ... 13.39 inches) Initial: 340 mm (13.39 inches)						1	6					
341 ... 360 mm (13.43 ... 14.17 inches) Initial: 360 mm (14.17 inches)						2	0					
361 ... 380 mm (14.21 ... 14.96 inches) Initial: 380 mm (14.96 inches)						2	1					
381 ... 400 mm (15 ... 15.75 inches) Initial: 400 mm (15.75 inches)						2	2					
401 ... 420 mm (15.79 ... 16.54 inches) Initial: 420 mm (16.54 inches)						2	3					
421 ... 440 mm (16.57 ... 17.32 inches) Initial: 440 mm (17.32 inches)						2	4					
441 ... 460 mm (17.36 ... 18.11 inches) Initial: 460 mm (18.11 inches)						2	5					
461 ... 480 mm (18.15 ... 18.90 inches) Initial: 465 mm (18.30 inches)						2	6					
481 ... 500 mm (18.94 ... 19.69 inches) Initial: 500 mm (19.69 inches)						2	7					
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 510 mm (20.08 inches)						3	1					
551 ... 600 mm (21.69 ... 23.62 inches) Initial: 600 mm (23.62 inches)						3	2					
601 ... 650 mm (23.66 ... 25.59 inches) Initial: 650 mm (25.59 inches)						3	3					
651 ... 700 mm (25.63 ... 27.56 inches) Initial: 700 mm (27.56 inches)						3	4					
701 ... 750 mm (27.6 ... 29.53 inches) Initial: 750 mm (29.53 inches)						3	5					
751 ... 800 mm (29.57 ... 31.50 inches) Initial: 800 mm (31.50 inches)						3	6					
801 ... 850 mm (31.5 ... 33.47 inches) Initial: 850 mm (33.47 inches)						3	7					

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Selection and ordering data (continued)

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 2, without process connection, without extension, plug-in or for use with sliding compression fittings	Article No. 7MC751	● -	● ● ● ● ● -	● ● ● ●
851 ... 900 mm (33.5 ... 35.43 inches) Initial: 900 mm (35.43 inches)			4 1	
901 ... 950 mm (35.47 ... 37.4 inches) Initial: 950 mm (37.4 inches)			4 2	
951 ... 1 000 mm (37.44 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)			4 3	
1 001 ... 1 100 mm (39.4 ... (43.30 inches) Initial: 1 100 mm (43.30 inches)			4 4	
1 101 ... 1 200 mm (43.35 ... 47.24 inches) Initial: 1 200 mm (47.24 inches)			4 5	
1 201 ... 1 300 mm (47.28 ... 51.18 inches) Initial: 1 300 mm (51.18 inches)			4 6	
1 301 ... 1 400 mm (51.22 ... 55.11 inches) Initial: 1 400 mm (55.11 inches)			4 7	
1 401 ... 1 500 mm (55.15 ... 59.05 inches) Initial: 1 500 mm (59.05 inches)			5 1	
Extension "X"				
Standard length for Type 2 according to DIN 43772 (without extension N=U)				0
Head				
Aluminum head, BA0, flange cap, standard				A
Aluminum head, BB0, spring flap low, screw closure				B
Aluminum head, BC0, spring flap high, screw closure				C
Aluminum head, AG0, screw cover, Ex d suitable[1]				G
Aluminum head, AH0, screw cover, Ex d suitable, local display[1]				H
Plastic head, BP0, spring flap high, screw closure				P
Stainless steel head, AU0, screw cover, Ex d suitable[1]				U
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1]				V
Sensor[2] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"				
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)				A
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)				B
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)				C
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)				K
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)				J
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)				N
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"				
Single, basic accuracy (Class 2/Class B)				1
Single, increased accuracy (Class 1/Class A)				2
Single, maximum accuracy (Class AA)				3
Double, basic accuracy (Class 2/Class B)				5
Double, increased accuracy (Class 1/Class A)				6
Double, maximum accuracy (Class AA)				7

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

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Selection and ordering data (continued)

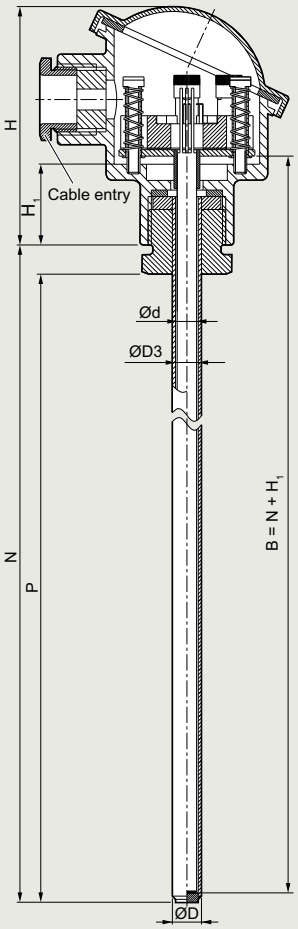
Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	**A02**
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	**A03**
Compression fitting enclosed	
G½"	**A31**
NPT½"	**A32**
Certificates and approvals	
Transmitter test report (5 points)	**C11**
EN 10204-3.1 Inspection certificate Wetted material	**C12**
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate Helium leak test	**C32**
EN 10204-3.1 Inspection certificate Surface tear test	**C33**
EN 10204-3.1 Factory certificate Visual, dimensional and function check	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
Wetted parts cleaned and grease-free (for oxygen applications, for example)	**C51**
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	**On request**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada) Basis FM	**E10**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	**E14**
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	**E16**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**

Options Add "-Z" to article number and specify order code	Order code
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	**G13**
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
SafeGuard 2 × Pt100 4-wire	**G30**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Customer-specific plain text	
Handling number of the special design	**Y99**

[1] Select Ex i version of the optional transmitter.
[2] Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

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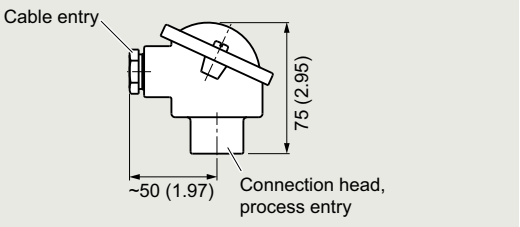
Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Thermowell internal diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
P	Space for process connection P ~ N - 9 (0.35), floor strength 3 mm

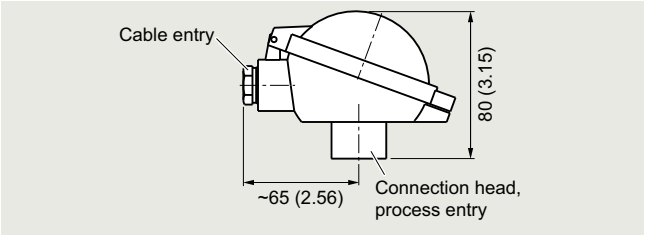
SITRANS TS500, temperature sensors for vessels and pipes, tubular thermowell for low to medium stress, without process connection, without extension, plug-in or for use with sliding compression fittings, dimensions in mm (inch)

Connection heads

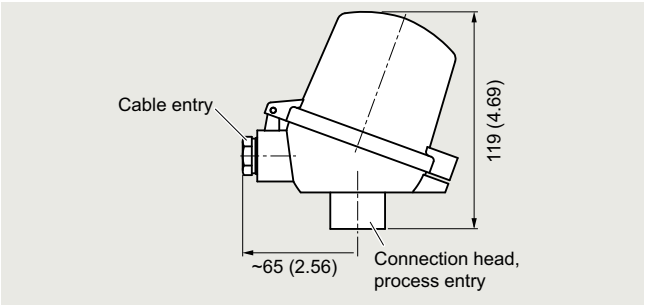


Connection head, aluminum, type BA0, dimensions in mm (inch)

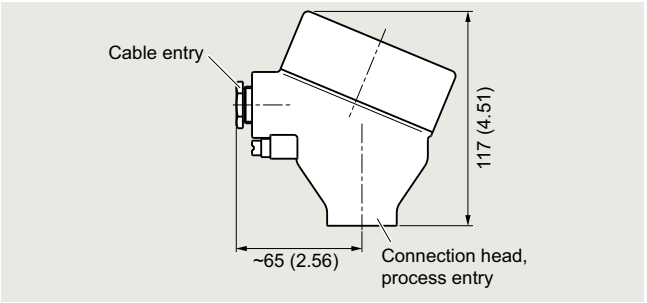
Dimensional drawings (continued)



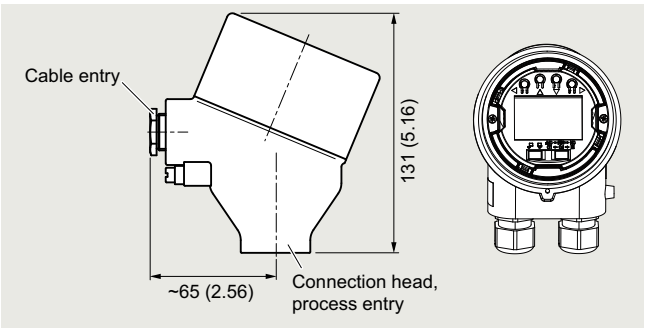
Connection head, aluminum, type BB0, dimensions in mm (inch)



Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 Tubular thermowell for low to medium stress, Type 2N similar to DIN 43772, screwed design, without extension	Article No. 7MC751	● -	● ● ● ● ● -	● ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.				
Wetted material				
316L (1.4404 or 1.4435)		2		
Process connection				
G ½" (½"BSPP)			1 C	
½" NPT			1 J	
Thermowell form				
2N, 9 mm (0.35 inches)			A	
Standard installation length "U"				
100 mm (3.97 inches)			0 1	
160 mm (6.30 inches)			0 4	
230 mm (9.06 inches)			1 0	
360 mm (14.17 inches)			2 0	
510 mm (20.08 inches)			3 1	
Installation length "U" customer-specific Specify customer-specific length with Y44, see order codes				
80 ... 100 mm (3.15 ... 3.94 inches) Initial: 100 mm (3.94 inches)			0 1	
101 ... 120 mm (3.98 ... 4.72 inches) Initial: 120 mm (4.72 inches)			0 2	
121 ... 140 mm (4.76 ... 5.51 inches) Initial: 140 mm (5.51 inches)			0 3	
141 ... 160 mm (5.55 ... 6.30 inches) Initial: 160 mm (6.3 inches)			0 4	
161 ... 180 mm (6.34 ... 7.09 inches) Initial: 180 mm (7.09 inches)			0 5	
181 ... 200 mm (7.13 ... 7.87 inches) Initial: 200 mm (7.87 inches)			0 6	
201 ... 220 mm (7.91 ... 8.66 inches) Initial: 220 mm (8.66 inches)			0 7	
221 ... 240 mm (8.70 ... 9.45 inches) Initial: 230 mm (9.06 inches)			1 0	
221 ... 240 mm (8.70 ... 9.45 inches) Initial: 225 mm (9.06 inches)			1 1	
241 ... 260 mm (9.49 ... 10.24 inches) Initial: 250 mm (9.84 inches)			1 2	
261 ... 280 mm (10.28 ... 11.02 inches) Initial: 280 mm (11.02 inches)			1 3	
281 ... 300 mm (11.06 ... 11.81 inches) Initial: 285 mm (11.22 inches)			1 4	
301 ... 320 mm (11.85 ... 12.6 inches) Initial: 315 mm (12.4 inches)			1 5	
321 ... 340 mm (12.64 ... 13.39 inches) Initial: 340 mm (13.39 inches)			1 6	
341 ... 360 mm (12.64 ... 13.39 inches) Initial: 360 mm (13.39 inches)			1 7	
341 ... 360 mm (13.43 ... 14.17 inches) Initial: 360 mm (14.17 inches)			2 0	
361 ... 380 mm (14.21 ... 14.96 inches) Initial: 380 mm (14.96 inches)			2 1	
381 ... 400 mm (15 ... 15.75 inches) Initial: 400 mm (15.75 inches)			2 2	
401 ... 420 mm (15.79 ... 16.54 inches) Initial: 420 mm (16.54 inches)			2 3	
421 ... 440 mm (16.57 ... 17.32 inches) Initial: 440 mm (17.32 inches)			2 4	
441 ... 460 mm (17.36 ... 18.11 inches) Initial: 460 mm (18.11 inches)			2 5	
461 ... 480 mm (18.15 ... 18.90 inches) Initial: 465 mm (18.30 inches)			2 6	
481 ... 500 mm (18.94 ... 19.69 inches) Initial: 500 mm (19.69 inches)			2 7	
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 510 mm (20.08 inches)			3 1	
551 ... 600 mm (21.69 ... 23.62 inches) Initial: 600 mm (23.62 inches)			3 2	
601 ... 650 mm (23.66 ... 25.59 inches) Initial: 650 mm (25.59 inches)			3 3	
651 ... 700 mm (25.63 ... 27.56 inches) Initial: 700 mm (27.56 inches)			3 4	

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Selection and ordering data (continued)

SITRANS TS500 Tubular thermowell for low to medium stress, Type 2N similar to DIN 43772, screwed design, without extension	Article No. 7MC751	● -	● ● ● ● ● -	● ● ● ●
701 ... 750 mm (27.6 ... 29.53 inches) Initial: 750 mm (29.53 inches)			3 5	
751 ... 800 mm (29.57 ... 31.50 inches) Initial: 800 mm (31.50 inches)			3 6	
801 ... 850 mm (31.5 ... 33.47 inches) Initial: 850 mm (33.47 inches)			3 7	
851 ... 900 mm (33.5 ... 35.43 inches) Initial: 900 mm (35.43 inches)			4 1	
901 ... 950 mm (35.47 ... 37.4 inches) Initial: 950 mm (37.4 inches)			4 2	
951 ... 1 000 mm (37.44 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)			4 3	
1 001 ... 1 100 mm (39.4 ... (43.30 inches) Initial: 1 100 mm (43.30 inches)			4 4	
1 101 ... 1 200 mm (43.35 ... 47.24 inches) Initial: 1 200 mm (47.24 inches)			4 5	
1 201 ... 1 300 mm (47.28 ... 51.18 inches) Initial: 1 300 mm (51.18 inches)			4 6	
1 301 ... 1 400 mm (51.22 ... 55.11 inches) Initial: 1 400 mm (55.11 inches)			4 7	
1 401 ... 1 500 mm (55.15 ... 59.05 inches) Initial: 1 500 mm (59.05 inches)			5 1	
Installation length (mm): U = special length less than 80 mm or larger than 1 500 mm (Y44, Y99 also required)			8 8	
Extension "X"				
Without extension (non-adjustable)				0
Head				
Aluminum head, BA0, flange cap, standard				A
Aluminum head, BB0, spring flap low, screw closure				B
Aluminum head, BC0, spring flap high, screw closure				C
Aluminum head, AG0, screw cover, Ex d suitable[1]				G
Aluminum head, AH0, screw cover, Ex d suitable, local display[1]				H
Plastic head, BP0, spring flap high, screw closure				P
Stainless steel head, AU0, screw cover, Ex d suitable[1]				U
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1]				V
Sensor[2] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"				
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)				A
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)				B
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)				C
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)				K
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)				J
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)				N
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"				
Single, basic accuracy (Class 2/Class B)				1
Single, increased accuracy (Class 1/Class A)				2
Single, maximum accuracy (Class AA)				3
Double, basic accuracy (Class 2/Class B)				5
Double, increased accuracy (Class 1/Class A)				6
Double, maximum accuracy (Class AA)				7

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

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Selection and ordering data (continued)

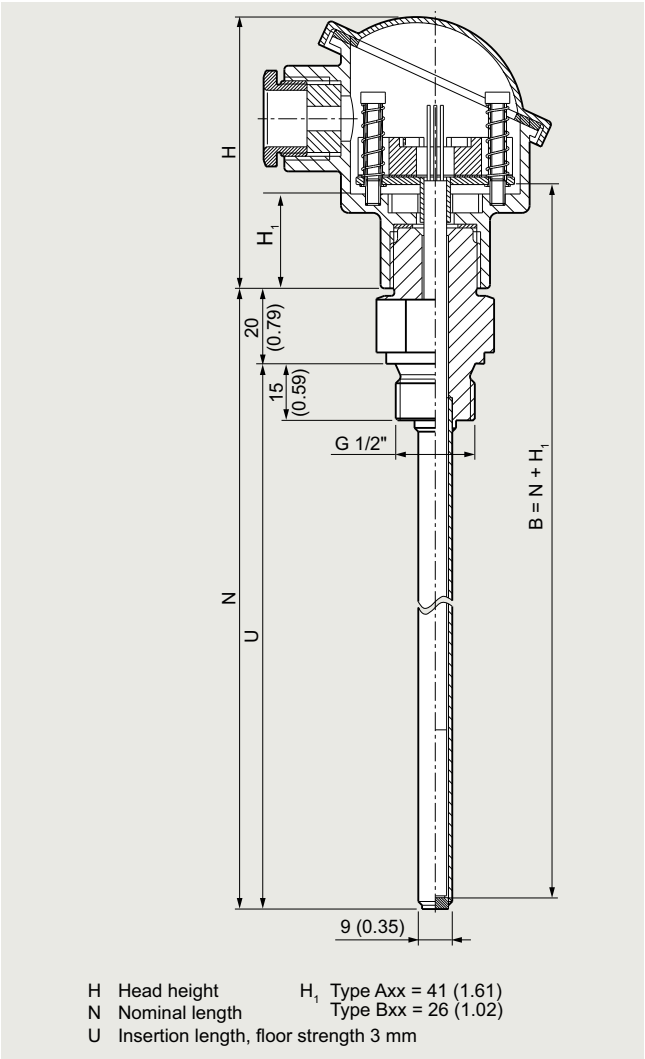
Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	**A02**
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	**A03**
Certificates and approvals	
Transmitter test report (5 points)	**C11**
EN 10204-3.1 Inspection certificate Wetted material	**C12**
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate Helium leak test	**C32**
EN 10204-3.1 Inspection certificate Surface tear test	**C33**
EN 10204-3.1 Factory certificate Visual, dimensional and function check	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
Wetted parts cleaned and grease-free (for oxygen applications, for example)	**C51**
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	**On request**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada) Basis FM	**E10**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	**E14**
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	**E16**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	**G13**
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
SafeGuard 2 × Pt100 4-wire	**G30**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Extension length X customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y45**
Customer-specific plain text	
Handling number of the special design	**Y99**

[1] Select Ex i version of the optional transmitter.
[2] Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

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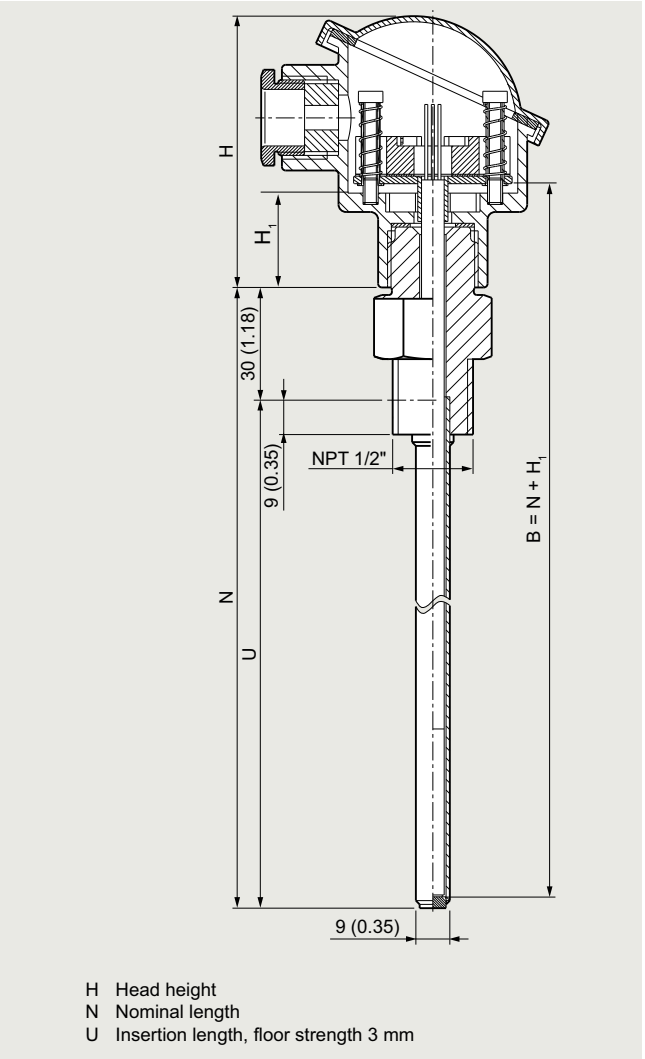
Dimensional drawings

SITRANS TS500, temperature sensors for vessels and pipes, tubular thermowell for low to medium stress, type 2N similar to DIN 43772, screwed design, without extension, non-adjustable connection head. For Ex-versions the maximum process temperature is 100 °C.



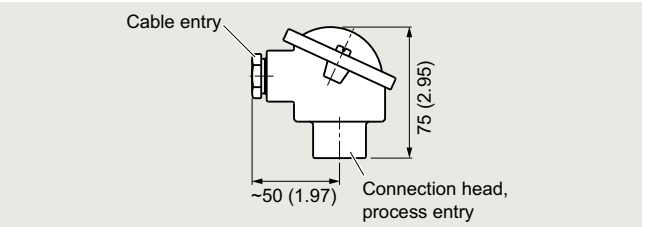
Connection type "G", dimensions in mm (inch)

Dimensional drawings (continued)



Connection type "NPT", dimensions in mm (inch)

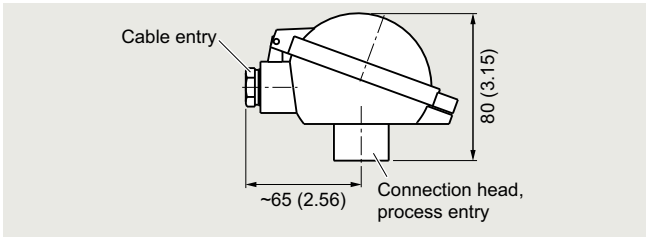
Connection heads



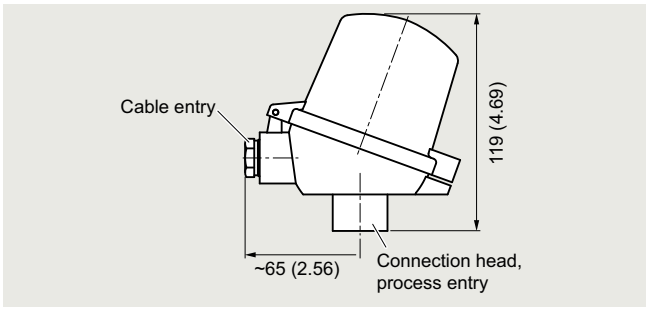
Connection head, aluminum, type BA0, dimensions in mm (inch)

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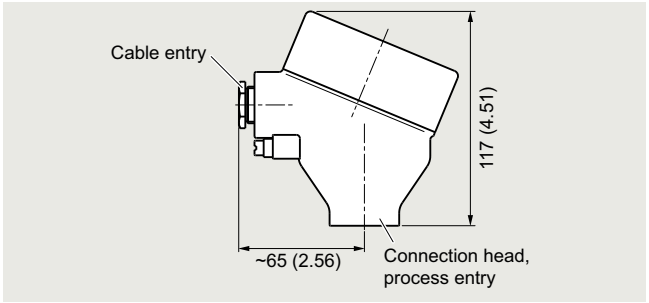
Dimensional drawings (continued)



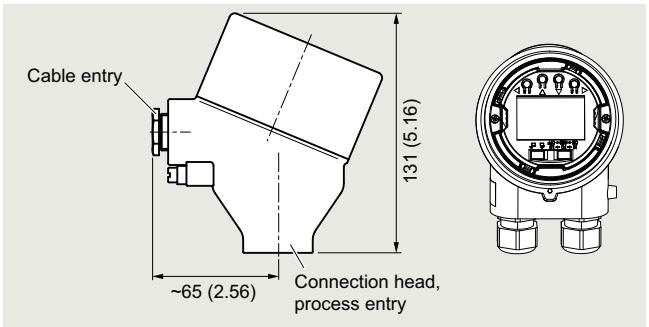
Connection head, aluminum, type BB0, dimensions in mm (inch)



Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

Selection and ordering data SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 2G, screwed design, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Wetted material		
316L (1.4404 or 1.4435)	2	
Process connection		
Cylindrical: G½" (½" BSPP)	1 C	
Cylindrical: G¾" (¾" BSPP)	1 D	
Cylindrical: G1" (1" BSPP)	1 E	
Tapered: NPT½"	1 J	
Tapered: NPT¾"	1 K	
Tapered: NPT1"	1 L	
Cylindrical: M20 × 1.5	1 V	
Cylindrical: M27 × 2.0	1 W	
Cylindrical: M33 × 2.0	1 Y	
Thermowell form		
2G, 9 mm (0.35 inches)	A	
2G, 12 mm (0.47 inches)	B	
Standard installation length "U"		
160 mm (6.30 inches)	0 4	
250 mm (9.84 inches)	1 2	
400 mm (15.75 inches)	2 2	
Installation length "U" customer-specific Specify customer-specific length with Y44, see order codes		
80 ... 100 mm (3.15 ... 3.94 inches) Initial: 100 mm (3.94 inches)	0 1	
101 ... 120 mm (3.98 ... 4.72 inches) Initial: 120 mm (4.72 inches)	0 2	
121 ... 140 mm (4.76 ... 5.51 inches) Initial: 140 mm (5.51 inches)	0 3	
141 ... 160 mm (5.55 ... 6.30 inches) Initial: 160 mm (6.3 inches)	0 4	
161 ... 180 mm (6.34 ... 7.09 inches) Initial: 180 mm (7.09 inches)	0 5	
181 ... 200 mm (7.13 ... 7.87 inches) Initial: 200 mm (7.87 inches)	0 6	
201 ... 220 mm (7.91 ... 8.66 inches) Initial: 220 mm (8.66 inches)	0 7	
221 ... 240 mm (8.70 ... 9.45 inches) Initial: 225 mm (8.86 inches)	1 1	
241 ... 260 mm (9.49 ... 10.24 inches) Initial: 250 mm (9.84 inches)	1 2	
261 ... 280 mm (10.28 ... 11.02 inches) Initial: 280 mm (11.02 inches)	1 3	
281 ... 300 mm (11.06 ... 11.81 inches) Initial: 285 mm (11.22 inches)	1 4	
301 ... 320 mm (11.85 ... 12.6 inches) Initial: 315 mm (12.4 inches)	1 5	
321 ... 340 mm (12.64 ... 13.39 inches) Initial: 340 mm (13.39 inches)	1 6	
341 ... 360 mm (13.43 ... 14.17 inches) Initial: 360 mm (14.17 inches)	2 0	
361 ... 380 mm (14.21 ... 14.96 inches) Initial: 380 mm (14.96 inches)	2 1	
381 ... 400 mm (15 ... 15.75 inches) Initial: 400 mm (15.75 inches)	2 2	
401 ... 420 mm (15.79 ... 16.54 inches) Initial: 420 mm (16.54 inches)	2 3	
421 ... 440 mm (16.57 ... 17.32 inches) Initial: 440 mm (17.32 inches)	2 4	
441 ... 460 mm (17.36 ... 18.11 inches) Initial: 460 mm (18.11 inches)	2 5	
461 ... 480 mm (18.15 ... 18.90 inches) Initial: 465 mm (18.30 inches)	2 6	
481 ... 500 mm (18.94 ... 19.69 inches) Initial: 500 mm (19.69 inches)	2 7	
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 510 mm (20.08 inches)	3 1	

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Selection and ordering data (continued)

Selection and ordering data SITRANS TS500	Article No. 7MC751														Order code			
Tubular thermowell for low to medium stress, according to DIN 43772, Type 2G, screwed design, with extension	●	-	●	●	●	●	●	-	●	●	●	●			●	●	●
551 ... 600 mm (21.69 ... 23.62 inches) Initial: 600 mm (23.62 inches)						3	2											
601 ... 650 mm (23.66 ... 25.59 inches) Initial: 650 mm (25.59 inches)						3	3											
651 ... 700 mm (25.63 ... 27.56 inches) Initial: 700 mm (27.56 inches)						3	4											
701 ... 750 mm (27.6 ... 29.53 inches) Initial: 750 mm (29.53 inches)						3	5											
751 ... 800 mm (29.57 ... 31.50 inches) Initial: 800 mm (31.50 inches)						3	6											
801 ... 850 mm (31.5 ... 33.47 inches) Initial: 850 mm (33.47 inches)						3	7											
851 ... 900 mm (33.5 ... 35.43 inches) Initial: 900 mm (35.43 inches)						4	1											
901 ... 950 mm (35.47 ... 37.4 inches) Initial: 950 mm (37.4 inches)						4	2											
951 ... 1 000 mm (37.44 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)						4	3											
1 001 ... 1 100 mm (39.4 ... (43.30 inches) Initial: 1 100 mm (43.30 inches)						4	4											
1 101 ... 1 200 mm (43.35 ... 47.24 inches) Initial: 1 200 mm (47.24 inches)						4	5											
1 201 ... 1 300 mm (47.28 ... 51.18 inches) Initial: 1 300 mm (51.18 inches)						4	6											
1 301 ... 1 400 mm (51.22 ... 55.11 inches) Initial: 1 400 mm (55.11 inches)						4	7											
1 401 ... 1 500 mm (55.15 ... 59.05 inches) Initial: 1 500 mm (59.05 inches)						5	1											
Extension "X"																		
Standard length for type 2G DIN 43772 (X=129 mm (5.08 inches))									1									
Extension length "X" customer-specific Specify customer-specific length with Y45, see page 2/68 order codes																		
75 ... 150 mm (2.95 ... 5.91 inches) Initial: 150 mm (5.91 inches)									9						N	1	D	
151 ... 300 mm (5.95 ... 11.81 inches) Initial: 300 mm (11.81 inches)									9						N	2	D	
301 ... 450 mm (11.85 ... 17.72 inches) Initial: 450 mm (17.72 inches)									9						N	3	D	
Head																		
Aluminum head, BA0, flange cap, standard										A								
Aluminum head, BB0, spring flap low, screw closure										B								
Aluminum head, BC0, spring flap high, screw closure										C								
Aluminum head, AG0, screw cover, Ex d suitable[1)]										G								
Aluminum head, AH0, screw cover, Ex d suitable, local display[1)]										H								
Plastic head, BP0, spring flap high, screw closure										P								
Stainless steel head, AU0, screw cover, Ex d suitable[1)]										U								
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1)]										V								
Sensor[2)] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"																		
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)											A							
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)											B							
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)											C							
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)											K							
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)											J							
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)											N							
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"																		
Single, basic accuracy (Class 2/Class B)												1						
Single, increased accuracy (Class 1/Class A)												2						
Single, maximum accuracy (Class AA)												3						
Double, basic accuracy (Class 2/Class B)												5						
Double, increased accuracy (Class 1/Class A)												6						

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Selection and ordering data (continued)

Selection and ordering data SITRANS TS500	Article No. 7MC751	Order code
Tubular thermowell for low to medium stress, according to DIN 43772, Type 2G, screwed design, with extension	● - ● ● ● ● ● - ● ● ● ●	● ● ●
Double, maximum accuracy (Class AA)	7	

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

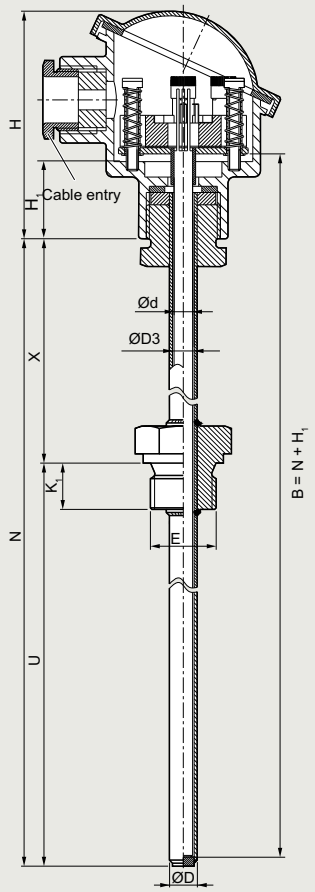
Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	**A02**
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	**A03**
Certificates and approvals	
Transmitter test report (5 points)	**C11**
EN 10204-3.1 Inspection certificate Wetted material	**C12**
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate Helium leak test	**C32**
EN 10204-3.1 Inspection certificate Surface tear test	**C33**
EN 10204-3.1 Factory certificate Visual, dimensional and function check	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
Wetted parts cleaned and grease-free (for oxygen applications, for example)	**C51**
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	**On request**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada) Basis FM	**E10**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	**E14**
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	**E16**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**

Options Add "-Z" to article number and specify order code	Order code
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	**G13**
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
SafeGuard 2 × Pt100 4-wire	**G30**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Customer-specific plain text	
Handling number of the special design	**Y99**

1) Select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

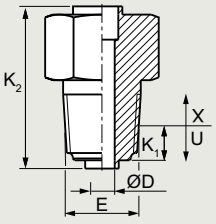
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Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer, diameter (6 (0.24))
ØD	Process connection, outer diameter
ØD3	Thermowell internal diameter
E	Process connection, thread size
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
K_1	Screw depth
N	Nominal length
U	Insertion length
X	Extension length, floor strength 3 mm

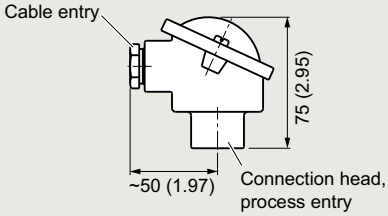
SITRANS TS500, temperature sensors for vessels and pipes, tubular thermowell for low to medium stress, according to DIN 43772, type 2G, screwed design, with extension, for screw-in depth dimensions, see "Technical reference", "Thread shapes" page, dimensions in mm (inch).



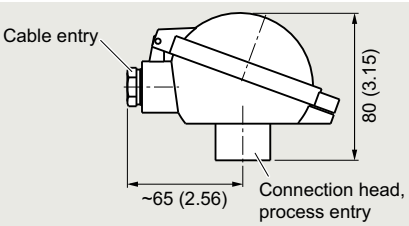
Process connection tapered, dimensions in mm (inch)

Dimensional drawings (continued)

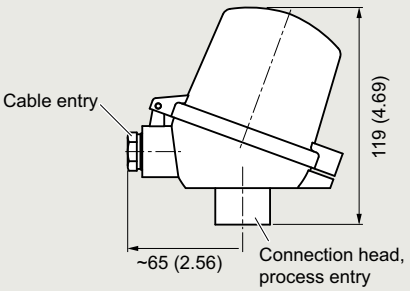
Connection heads



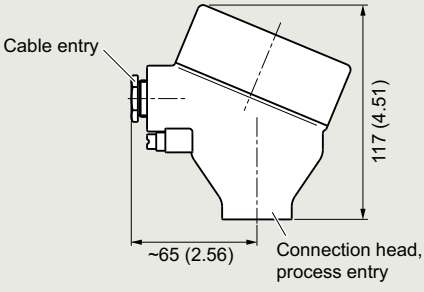
Connection head, aluminum, type BA0, dimensions in mm (inch)



Connection head, aluminum, type BB0, dimensions in mm (inch)



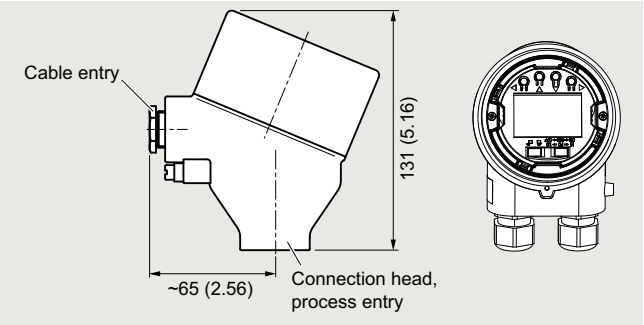
Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)

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Dimensional drawings (continued)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 2F, with flange, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Wetted material		
316L (1.4404 or 1.4435)	2	
Process connection		
Flange EN; DN 25 PN10 ... 40 B1	2 A	
Flange EN; DN 40 PN 40 B1	2 B	
Flange EN; DN 50 PN 40 B1	2 C	
Flange ASME; 1.0" RF 150	2 E	
Flange ASME; 1.0" RF 300	2 F	
Flange ASME; 1.5" RF 150	2 G	
Flange ASME; 1.5" RF 300	2 H	
Flange ASME; 2.0" RF 150	2 J	
Flange ASME; 2.0" RF 300	2 K	
Flange ASME; 1.0" RF 600	2 L	
Flange ASME; 1.5" RF 600	2 N	
Flange ASME; 1.5" RF 900	2 R	
Flange ASME; 2.0" RF 600	2 S	
Flange ASME; 2.0" RF 900	2 T	
Flange EN; DN 32 PN 40 B1	4 A	
Flange EN; DN 40 PN 100 B1	4 B	
Flange EN; DN 50 PN 16 B1	4 C	
Flange EN; DN 80 PN 16 B1	4 D	
Flange EN; DN 100 PN 16 B1	4 E	
Thermowell form		
2G, 9 mm (0.35 inches)	A	
2G, 12 mm (0.47 inches)	B	
Standard installation length "U"		
225 mm (8.86 inches)	1 1	
315 mm (12.40 inches)	1 5	
465 mm (18.31 inches)	2 6	
Installation length "U" customer-specific Specify customer-specific length with Y44, see order codes		
80 ... 100 mm (3.15 ... 3.94 inches) Initial: 100 mm (3.94 inches)	0 1	
101 ... 120 mm (3.98 ... 4.72 inches) Initial: 120 mm (4.72 inches)	0 2	
121 ... 140 mm (4.76 ... 5.51 inches) Initial: 140 mm (5.51 inches)	0 3	
141 ... 160 mm (5.55 ... 6.30 inches) Initial: 160 mm (6.3 inches)	0 4	
161 ... 180 mm (6.34 ... 7.09 inches) Initial: 180 mm (7.09 inches)	0 5	
181 ... 200 mm (7.13 ... 7.87 inches) Initial: 200 mm (7.87 inches)	0 6	
201 ... 220 mm (7.91 ... 8.66 inches) Initial: 220 mm (8.66 inches)	0 7	
221 ... 240 mm (8.70 ... 9.45 inches) Initial: 225 mm (8.86 inches)	1 1	
241 ... 260 mm (9.49 ... 10.24 inches) Initial: 250 mm (9.84 inches)	1 2	
261 ... 280 mm (10.28 ... 11.02 inches) Initial: 280 mm (11.02 inches)	1 3	
281 ... 300 mm (11.06 ... 11.81 inches) Initial: 285 mm (11.22 inches)	1 4	
301 ... 320 mm (11.85 ... 12.6 inches) Initial: 315 mm (12.4 inches)	1 5	
321 ... 340 mm (12.64 ... 13.39 inches) Initial: 340 mm (13.39 inches)	1 6	
341 ... 360 mm (13.43 ... 14.17 inches) Initial: 360 mm (14.17 inches)	2 0	

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Selection and ordering data (continued)

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 2F, with flange, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
361 ... 380 mm (14.21 ... 14.96 inches) Initial: 380 mm (14.96 inches)	2 1	
381 ... 400 mm (15 ... 15.75 inches) Initial: 400 mm (15.75 inches)	2 2	
401 ... 420 mm (15.79 ... 16.54 inches) Initial: 420 mm (16.54 inches)	2 3	
421 ... 440 mm (16.57 ... 17.32 inches) Initial: 440 mm (17.32 inches)	2 4	
441 ... 460 mm (17.36 ... 18.11 inches) Initial: 460 mm (18.11 inches)	2 5	
461 ... 480 mm (18.15 ... 18.90 inches) Initial: 465 mm (18.30 inches)	2 6	
481 ... 500 mm (18.94 ... 19.69 inches) Initial: 500 mm (19.69 inches)	2 7	
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 510 mm (20.08 inches)	3 1	
551 ... 600 mm (21.69 ... 23.62 inches) Initial: 600 mm (23.62 inches)	3 2	
601 ... 650 mm (23.66 ... 25.59 inches) Initial: 650 mm (25.59 inches)	3 3	
651 ... 700 mm (25.63 ... 27.56 inches) Initial: 700 mm (27.56 inches)	3 4	
701 ... 750 mm (27.6 ... 29.53 inches) Initial: 750 mm (29.53 inches)	3 5	
751 ... 800 mm (29.57 ... 31.50 inches) Initial: 800 mm (31.50 inches)	3 6	
801 ... 850 mm (31.5 ... 33.47 inches) Initial: 850 mm (33.47 inches)	3 7	
851 ... 900 mm (33.5 ... 35.43 inches) Initial: 900 mm (35.43 inches)	4 1	
901 ... 950 mm (35.47 ... 37.4 inches) Initial: 950 mm (37.4 inches)	4 2	
951 ... 1 000 mm (37.44 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)	4 3	
1 001 ... 1 100 mm (39.4 ... (43.30 inches) Initial: 1 100 mm (43.30 inches)	4 4	
1 101 ... 1 200 mm (43.35 ... 47.24 inches) Initial: 1 200 mm (47.24 inches)	4 5	
1 201 ... 1 300 mm (47.28 ... 51.18 inches) Initial: 1 300 mm (51.18 inches)	4 6	
1 301 ... 1 400 mm (51.22 ... 55.11 inches) Initial: 1 400 mm (55.11 inches)	4 7	
1 401 ... 1 500 mm (55.15 ... 59.05 inches) Initial: 1 500 mm (59.05 inches)	5 1	
Extension "X"		
Standard length for type 2F DIN 43772 (X=64 mm (2.52 inches))	1	
Extension length "X" customer-specific • Specify customer-specific length with Y45, see order codes		
75 ... 150 mm (2.95 ... 5.91 inches) Initial: 150 mm (5.91 inches)	9	N 1 D
151 ... 300 mm (5.95 ... 11.81 inches) Initial: 300 mm (11.81 inches)	9	N 2 D
301 ... 450 mm (11.85 ... 17.72 inches) Initial: 450 mm (17.72 inches)	9	N 3 D
Head		
Aluminum head, BA0, flange cap, standard	A	
Aluminum head, BB0, spring flap low, screw closure	B	
Aluminum head, BC0, spring flap high, screw closure	C	
Aluminum head, AG0, screw cover, Ex d suitable[1)]	G	
Aluminum head, AH0, screw cover, Ex d suitable, local display[1)]	H	
Plastic head, BP0, spring flap high, screw closure	P	
Stainless steel head, AU0, screw cover, Ex d suitable[1)]	U	
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1)]	V	
Sensor[2)] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"		
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)	A	
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	B	

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Selection and ordering data (continued)

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 2F, with flange, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)	C	
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)	K	
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)	J	
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)	N	
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"		
Single, basic accuracy (Class 2/Class B)	1	
Single, increased accuracy (Class 1/Class A)	2	
Single, maximum accuracy (Class AA)	3	
Double, basic accuracy (Class 2/Class B)	5	
Double, increased accuracy (Class 1/Class A)	6	
Double, maximum accuracy (Class AA)	7	

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Options Add "-Z" to article number and specify order code.	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	A02
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	A03
Certificates and approvals	
Transmitter test report (5 points)	C11
EN 10204-3.1 Inspection certificate Wetted material	C12
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	C31
EN 10204-3.1 Inspection certificate Helium leak test	C32
EN 10204-3.1 Inspection certificate Surface tear test	C33
EN 10204-3.1 Factory certificate Visual, dimensional and function check	C34
EN 10204-2.1: Declaration of compliance with the order	C35
Wetted parts cleaned and grease-free (for oxygen applications, for example)	C51
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	On request
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	C20
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	D01
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	E00
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	E01
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	E03
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	E04
Without explosion protection requirements (USA, Canada) Basis FM	E10
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	E14
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	E16
Without explosion protection requirements (USA, Canada), Basis CSA	E17
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	E18
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	E21

Options Add "-Z" to article number and specify order code.	Order code
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	E23
Without explosion protection requirements (China)	E54
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	E55
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	E56
Non-sparking "nA"/"NI" according to NEPSI (China)	E57
Without explosion protection requirements (EAC)	E80
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	E81
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	E82
Non-sparking "nA"/"NI" according to EACEx (EAC)	E83
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	G01
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	G12
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	G13
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	G20
SafeGuard 2 × Pt100 4-wire	G30
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	T12
SITRANS TH320, input 1 × universal, 4 ... 20 mA	T24
SITRANS TH320, input 1 × universal, HART	T34
SITRANS TH420, input 2 × universal, HART	T35
SITRANS TH420, input 2 × universal, PROFIBUS PA	T44
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	Y15
Factory calibration per 1 point, specify temperature in plain text	Y33
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	Y01
Specify measuring point description in plain text (max. 16 characters)	Y23
Specify measuring point message in plain text (max. 32 characters)	Y24

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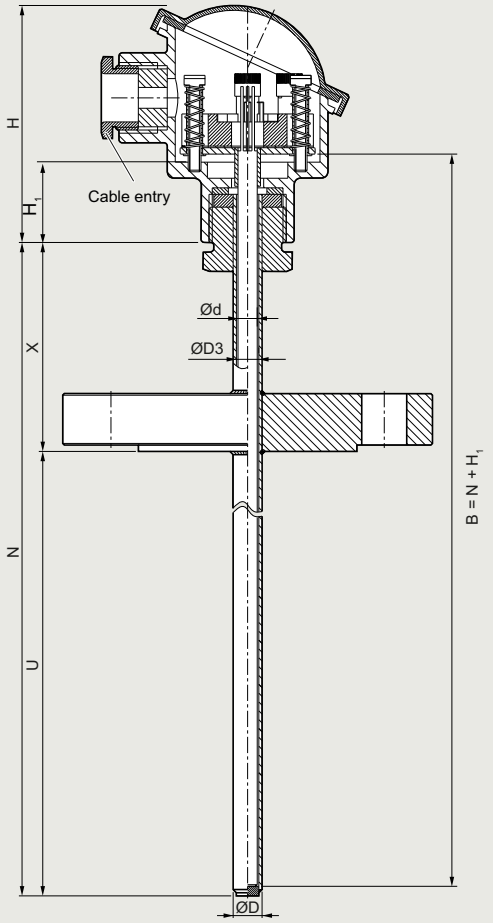
Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code.	Order code
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Extension length X customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y45**
Customer-specific plain text	
Handling number of the special design	**Y99**

1) Select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

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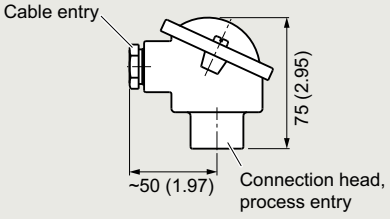
Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Thermowell internal diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length, floor strength 3 mm

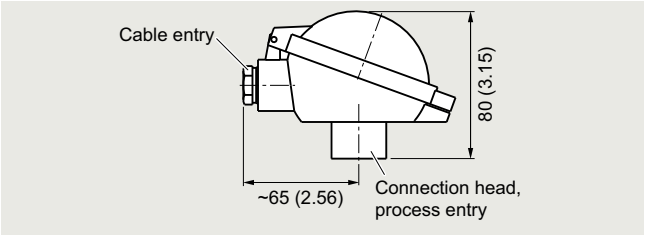
SITRANS TS500, temperature sensors for vessels and pipes, tubular thermowell for low to medium stress, according to DIN 43772, type 2F, with flange, with extension, dimensions in mm (inch)

Connection heads

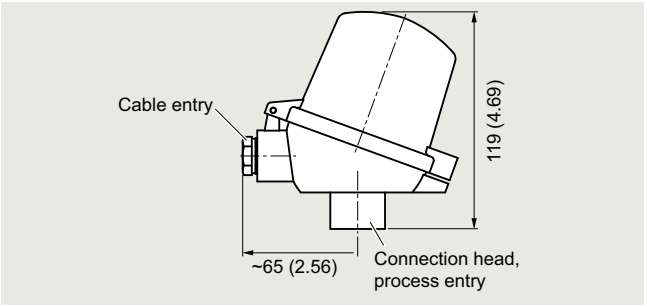


Connection head, aluminum, type BA0, dimensions in mm (inch)

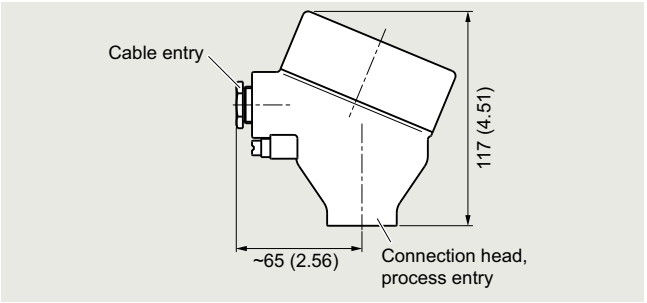
Dimensional drawings (continued)



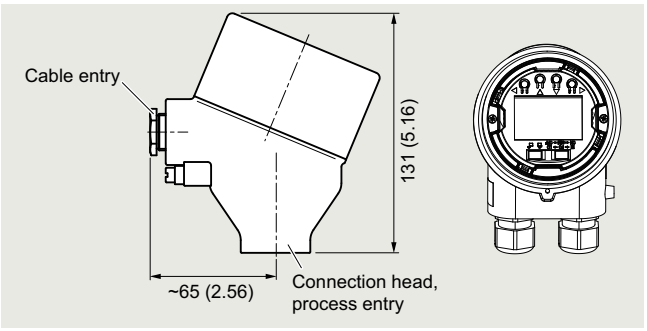
Connection head, aluminum, type BB0, dimensions in mm (inch)



Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 3, without process connection, improved response time, plug-in or for use with sliding compression fittings	Article No. 7MC751	● -	●	●	●	●	-	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.											
Wetted material											
316L (1.4404 or 1.4435)		2									
Process connection											
Without process connection (for compression fittings) U = N			0	N							
Thermowell form											
3. 12/9 mm (0.47/0.35 inches)					K						
Installation length "U" (= N), standard											
160 mm (6.3 inches)						0	4				
220 mm (8.66 inches)						0	7				
280 mm (11.02 inches)						1	3				
Installation length "U" customer-specific Specify customer-specific length with Y44, see order codes											
121 ... 140 mm (4.76 ... 5.51 inches) Initial: 140 mm (5.51 inches)						0	3				
141 ... 160 mm (5.55 ... 6.30 inches) Initial: 160 mm (6.3 inches)						0	4				
161 ... 180 mm (6.34 ... 7.09 inches) Initial: 180 mm (7.09 inches)						0	5				
181 ... 200 mm (7.13 ... 7.87 inches) Initial: 200 mm (7.87 inches)						0	6				
201 ... 220 mm (7.91 ... 8.66 inches) Initial: 220 mm (8.66 inches)						0	7				
221 ...240 mm (8.70 ... 9.45 inches) Initial: 225 mm (8.86 inches)						1	1				
241 ... 260 mm (9.49 ... 10.24 inches) Initial: 250 mm (9.84 inches)						1	2				
261 ... 280 mm (10.28 ... 11.02 inches) Initial: 280 mm (11.02 inches)						1	3				
281 ... 300 mm (11.06 ... 11.81 inches) Initial: 285 mm (11.22 inches)						1	4				
301 ... 320 mm (11.85 ... 12.6 inches) Initial: 315 mm (12.4 inches)						1	5				
321 ... 340 mm (12.64 ... 13.39 inches) Initial: 340 mm (13.39 inches)						1	6				
341 ... 360 mm (13.43 ... 14.17 inches) Initial: 360 mm (14.17 inches)						2	0				
361 ... 380 mm (14.21 ... 14.96 inches) Initial: 380 mm (14.96 inches)						2	1				
381 ... 400 mm (15 ... 15.75 inches) Initial: 400 mm (15.75 inches)						2	2				
401 ... 420 mm (15.79 ... 16.54 inches) Initial: 420 mm (16.54 inches)						2	3				
421 ... 440 mm (16.57 ... 17.32 inches) Initial: 440 mm (17.32 inches)						2	4				
441 ... 460 mm (17.36 ... 18.11 inches) Initial: 460 mm (18.11 inches)						2	5				
461 ... 480 mm (18.15 ... 18.90 inches) Initial: 465 mm (18.30 inches)						2	6				
481 ... 500 mm (18.94 ... 19.69 inches) Initial: 500 mm (19.69 inches)						2	7				
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 510 mm (20.08 inches)						3	1				
551 ... 600 mm (21.69 ... 23.62 inches) Initial: 600 mm (23.62 inches)						3	2				
601 ... 650 mm (23.66 ... 25.59 inches) Initial: 650 mm (25.59 inches)						3	3				
651 ... 700 mm (25.63 ... 27.56 inches) Initial: 700 mm (27.56 inches)						3	4				
701 ... 750 mm (27.6 ... 29.53 inches) Initial: 750 mm (29.53 inches)						3	5				
751 ... 800 mm (29.57 ... 31.50 inches) Initial: 800 mm (31.50 inches)						3	6				
801 ... 850 mm (31.5 ... 33.47 inches) Initial: 850 mm (33.47 inches)						3	7				
851 ... 900 mm (33.5 ... 35.43 inches) Initial: 900 mm (35.43 inches)						4	1				
901 ... 950 mm (35.47 ... 37.4 inches) Initial: 950 mm (37.4 inches)						4	2				
951 ... 1 000 mm (37.44 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)						4	3				

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Selection and ordering data (continued)

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 3, without process connection, improved response time, plug-in or for use with sliding compression fittings	Article No. 7MC751	● -	●	●	●	●	●	-	●	●	●	●
1 001 ... 1 100 mm (39.4 ... (43.30 inches) Initial: 1 100 mm (43.30 inches)							4	4				
Extension												
Standard length for type 2 according to DIN 43772 (without extension N = U)									0			
Head												
Aluminum head, BA0, flange cap, standard										A		
Aluminum head, BB0, spring flap low, screw closure										B		
Aluminum head, BC0, spring flap high, screw closure										C		
Aluminum head, AG0, screw cover, Ex d suitable[1]										G		
Aluminum head, AH0, screw cover, Ex d suitable, local display[1]										H		
Plastic head, BP0, spring flap high, screw closure										P		
Stainless steel head, AU0, screw cover, Ex d suitable[1]										U		
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1]										V		
Sensor[2] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"												
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)											A	
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)											B	
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)											C	
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)											K	
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)											J	
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)											N	
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"												
Single, basic accuracy (Class 2/Class B)												1
Single, increased accuracy (Class 1/Class A)												2
Single, maximum accuracy (Class AA)												3
Double, basic accuracy (Class 2/Class B)												5
Double, increased accuracy (Class 1/Class A)												6
Double, maximum accuracy (Class AA)												7

[1] Ex d in connection with order option E03
[2] Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	**A02**
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	**A03**
Compression fitting enclosed	
G½"	**A31**
NPT½"	**A32**
Certificates and approvals	
Transmitter test report (5 points)	**C11**
EN 10204-3.1 Inspection certificate Wetted material	**C12**
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate Helium leak test	**C32**
EN 10204-3.1 Inspection certificate Surface tear test	**C33**
EN 10204-3.1 Factory certificate Visual, dimensional and function check	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
Wetted parts cleaned and grease-free (for oxygen applications, for example)	**C51**

Options Add "-Z" to article number and specify order code	Order code
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	**On request**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada) Basis FM	**E10**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	**E14**
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	**E16**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**

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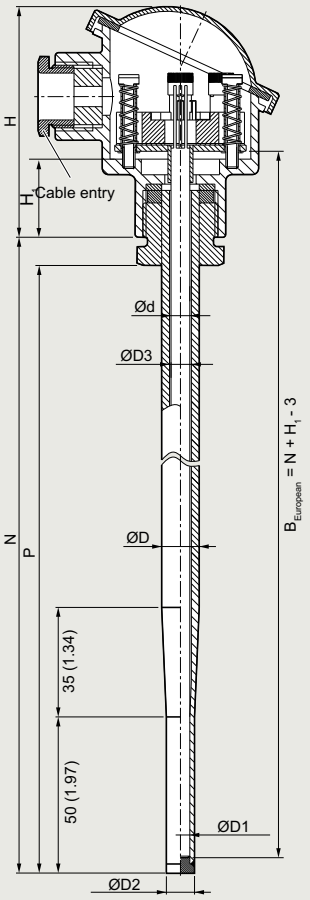
Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code	Order code
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	**G13**
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
SafeGuard 2 × Pt100 4-wire	**G30**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Customer-specific plain text	
Handling number of the special design	**Y99**

[1] Select Ex i version of the optional transmitter.
[2] Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

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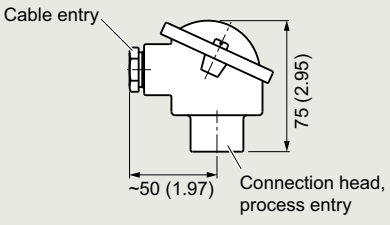
Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD1	Tip internal diameter
ØD2	Tip outer diameter
ØD3	Thermowell internal diameter
H	Head height
H_1	Type Axx> 41 (1.61) Type Bxx> 26 (1.02)
N	Nominal length
P	Space for process connection, floor strength 6 mm

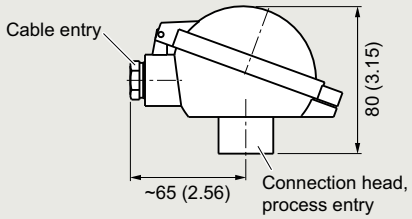
SITRANS TS500, temperature sensors for vessels and pipes, tubular thermowell for low to medium stress, without process connection, without extension, plug-in or for use with sliding compression fittings, dimensions in mm (inch)

Connection heads

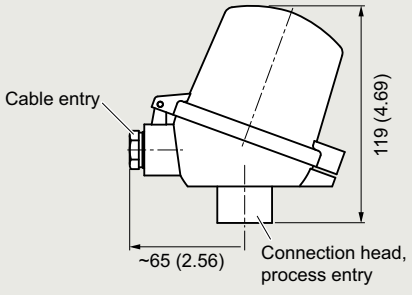


Connection head, aluminum, type BA0, dimensions in mm (inch)

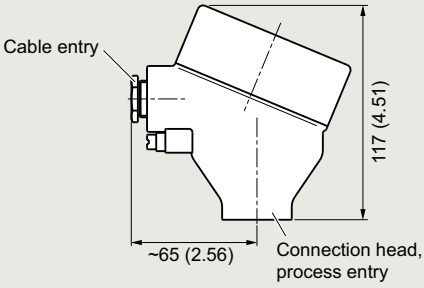
Dimensional drawings (continued)



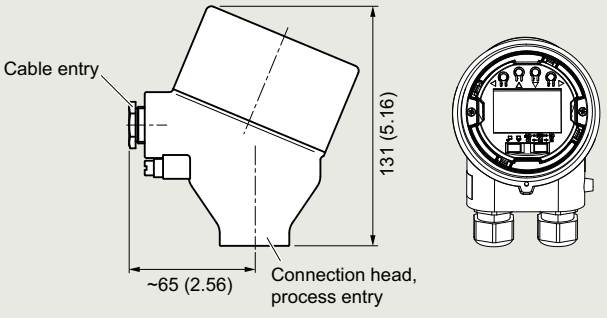
Connection head, aluminum, type BB0, dimensions in mm (inch)



Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 Tubular thermowell made of pipe material for low to medium stress, according to DIN 43772, Type 3G, screwed design, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ● ● ● ●	Order code
Click the article number for online configuration in the PIA Life Cycle Portal.		
Wetted material		
316L (1.4404 or 1.4435)	**2**	
Process connection		
Cylindrical: G½" (½" BSPP)	**1 C**	
Cylindrical: G¾" (¾" BSPP)	**1 D**	
Tapered: NPT½"	**1 J**	
Tapered: NPT¾"	**1 K**	
Tapered: NPT1"	**1 L**	
Cylindrical: M20 × 1.5	**1 V**	
Cylindrical: M27 × 2.0	**1 W**	
Cylindrical: M33 × 2.0	**1 Y**	
Thermowell form		
3G, 12/9 mm (0.47/0.35 inches)	**K**	
Standard installation length "U"		
160 mm (6.30 inches)	**0 4**	
220 mm (8.66 inches)	**0 7**	
280 mm (11.02 inches)	**1 3**	
Installation length "U" customer-specific Specify customer-specific length with Y44, see page 2/83 order codes		
121 ... 140 mm (4.76 ... 5.51 inches) Initial: 140 mm (5.51 inches)	**0 3**	
141 ... 160 mm (5.55 ... 6.30 inches) Initial: 160 mm (6.3 inches)	**0 4**	
161 ... 180 mm (6.34 ... 7.09 inches) Initial: 180 mm (7.09 inches)	**0 5**	
181 ... 200 mm (7.13 ... 7.87 inches) Initial: 200 mm (7.87 inches)	**0 6**	
201 ... 220 mm (7.91 ... 8.66 inches) Initial: 220 mm (8.66 inches)	**0 7**	
221 ...240 mm (8.70 ... 9.45 inches) Initial: 225 mm (8.86 inches)	**1 1**	
241 ... 260 mm (9.49 ... 10.24 inches) Initial: 250 mm (9.84 inches)	**1 2**	
261 ... 280 mm (10.28 ... 11.02 inches) Initial: 280 mm (11.02 inches)	**1 3**	
281 ... 300 mm (11.06 ... 11.81 inches) Initial: 285 mm (11.22 inches)	**1 4**	
301 ... 320 mm (11.85 ... 12.6 inches) Initial: 315 mm (12.4 inches)	**1 5**	
321 ... 340 mm (12.64 ... 13.39 inches) Initial: 340 mm (13.39 inches)	**1 6**	
341 ... 360 mm (13.43 ... 14.17 inches) Initial: 360 mm (14.17 inches)	**2 0**	
361 ... 380 mm (14.21 ... 14.96 inches) Initial: 380 mm (14.96 inches)	**2 1**	
381 ... 400 mm (15 ... 15.75 inches) Initial: 400 mm (15.75 inches)	**2 2**	
401 ... 420 mm (15.79 ... 16.54 inches) Initial: 420 mm (16.54 inches)	**2 3**	
421 ... 440 mm (16.57 ... 17.32 inches) Initial: 440 mm (17.32 inches)	**2 4**	
441 ... 460 mm (17.36 ... 18.11 inches) Initial: 460 mm (18.11 inches)	**2 5**	
461 ... 480 mm (18.15 ... 18.90 inches) Initial: 465 mm (18.30 inches)	**2 6**	
481 ... 500 mm (18.94 ... 19.69 inches) Initial: 500 mm (19.69 inches)	**2 7**	
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 510 mm (20.08 inches)	**3 1**	
551 ... 600 mm (21.69 ... 23.62 inches) Initial: 600 mm (23.62 inches)	**3 2**	
601 ... 650 mm (23.66 ... 25.59 inches) Initial: 650 mm (25.59 inches)	**3 3**	
651 ... 700 mm (25.63 ... 27.56 inches) Initial: 700 mm (27.56 inches)	**3 4**	

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Selection and ordering data (continued)

SITRANS TS500	Article No. 7MC751														Order code			
Tubular thermowell made of pipe material for low to medium stress, according to DIN 43772, Type 3G, screwed design, with extension	●	-	●	●	●	●	●	-	●	●	●	●		●	●	●	
701 ... 750 mm (27.6 ... 29.53 inches) Initial: 750 mm (29.53 inches)					3	5											
751 ... 800 mm (29.57 ... 31.50 inches) Initial: 800 mm (31.50 inches)					3	6											
801 ... 850 mm (31.5 ... 33.47 inches) Initial: 850 mm (33.47 inches)					3	7											
851 ... 900 mm (33.5 ... 35.43 inches) Initial: 900 mm (35.43 inches)					4	1											
901 ... 950 mm (35.47 ... 37.4 inches) Initial: 950 mm (37.4 inches)					4	2											
951 ... 1 000 mm (37.44 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)					4	3											
Extension "X"																	
Standard length for type 3G DIN 43772 (X=131 mm (5.16 inches))									1								
Extension length "X" customer-specific Specify customer-specific length with Y45, see page 2/83 order codes																	
75 ...150 mm (2.95 ... 5.91 inches) Initial: 150 mm (5.91 inches)									9					N	1	D	
151 ... 300 mm (5.95 ... 11.81 inches) Initial: 300 mm (11.81 inches)									9					N	2	D	
Head																	
Aluminum head, BA0, flange cap, standard										A							
Aluminum head, BB0, spring flap low, screw closure										B							
Aluminum head, BC0, spring flap high, screw closure										C							
Aluminum head, AG0, screw cover, Ex d suitable[1]										G							
Aluminum head, AH0, screw cover, Ex d suitable, local display[1]										H							
Plastic head, BP0, spring flap high, screw closure										P							
Stainless steel head, AU0, screw cover, Ex d suitable[1]										U							
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1]										V							
Sensor[2] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"																	
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)											A						
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)											B						
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)											C						
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)											K						
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)											J						
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)											N						
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"																	
Single, basic accuracy (Class 2/Class B)												1					
Single, increased accuracy (Class 1/Class A)												2					
Single, maximum accuracy (Class AA)												3					
Double, basic accuracy (Class 2/Class B)												5					
Double, increased accuracy (Class 1/Class A)												6					
Double, maximum accuracy (Class AA)												7					

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

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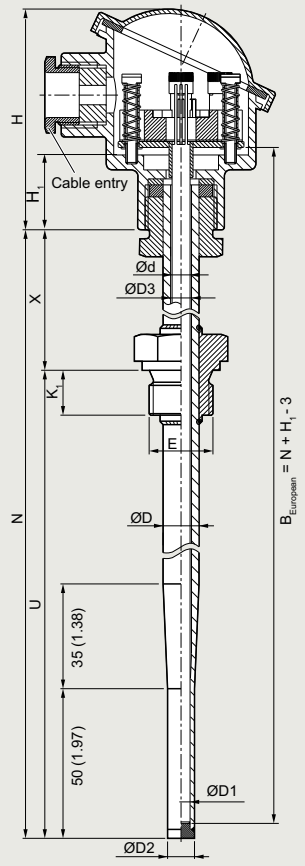
Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	**A02**
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	**A03**
Certificates and approvals	
Transmitter test report (5 points)	**C11**
EN 10204-3.1 Inspection certificate Wetted material	**C12**
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate Helium leak test	**C32**
EN 10204-3.1 Inspection certificate Surface tear test	**C33**
EN 10204-3.1 Factory certificate Visual, dimensional and function check	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
Wetted parts cleaned and grease-free (for oxygen applications, for example)	**C51**
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	**On request**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada) Basis FM	**E10**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	**E14**
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	**E16**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	**G13**
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
SafeGuard 2 × Pt100 4-wire	**G30**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Extension length X customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y45**
Customer-specific plain text	
Handling number of the special design	**Y99**

[1] Select Ex i version of the optional transmitter.
[2] Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

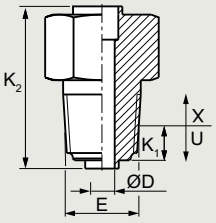
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Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD1	Tip internal diameter
ØD2	Tip outer diameter
ØD3	Thermowell internal diameter
E	Process connection, thread size
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
K_1	Screw depth
N	Nominal length
U	Insertion length
X	Extension length, floor strength 6 mm

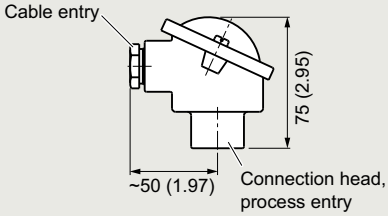
SITRANS TS500, temperature sensors for vessels and pipes, tubular thermowell for low to medium stress, according to DIN 43772, type 3G, screwed design, without process connection, with extension, for screw-in depth dimensions, see "Technical reference", "Thread shapes" page, dimensions in mm (inch).



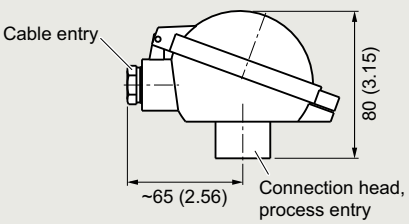
Process connection tapered, dimensions in mm (inch)

Dimensional drawings (continued)

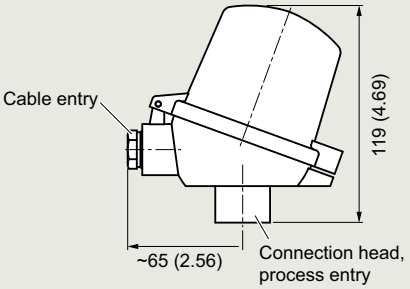
Connection heads



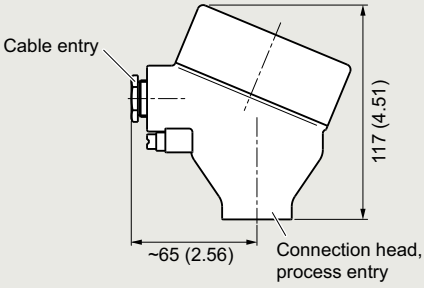
Connection head, aluminum, type BA0, dimensions in mm (inch)



Connection head, aluminum, type BB0, dimensions in mm (inch)



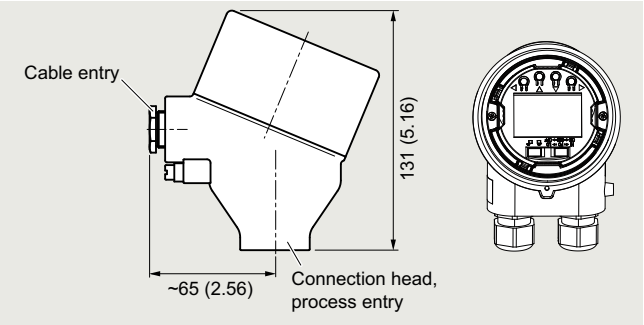
Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)

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Dimensional drawings (continued)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 3F, with flange, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Wetted material		
316L (1.4404 or 1.4435)	2	
Process connection		
Flange EN; DN 25 PN10 ... 40 B1	2 A	
Flange EN; DN 40 PN 40 B1	2 B	
Flange EN; DN 50 PN 40 B1	2 C	
Flange ASME; 1.0" RF 150	2 E	
Flange ASME; 1.0" RF 300	2 F	
Flange ASME; 1.5" RF 150	2 G	
Flange ASME; 1.5" RF 300	2 H	
Flange ASME; 2.0" RF 150	2 J	
Flange ASME; 2.0" RF 300	2 K	
Flange ASME; 1.0" RF 600	2 L	
Flange ASME; 1.5" RF 600	2 N	
Flange ASME; 1.5" RF 900	2 R	
Flange ASME; 2.0" RF 600	2 S	
Flange ASME; 2.0" RF 900	2 T	
Flange EN; DN 32 PN 40 B1	4 A	
Flange EN; DN 40 PN 100 B1	4 B	
Flange EN; DN 50 PN 16 B1	4 C	
Flange EN; DN 80 PN 16 B1	4 D	
Flange EN; DN 100 PN 16 B1	4 E	
Thermowell form		
3F; 12/9 mm (0.47/0.35 inches)	K	
Standard installation length "U"		
225 mm (8.86 inches)	1 1	
285 mm (11.22 inches)	1 4	
345 mm (13.58 inches)	1 7	
Installation length "U" customer-specific Specify customer-specific length with Y44, see order codes		
121 ... 140 mm (4.76 ... 5.51 inches) Initial: 140 mm (5.51 inches)	0 3	
141 ... 160 mm (5.55 ... 6.30 inches) Initial: 160 mm (6.3 inches)	0 4	
161 ... 180 mm (6.34 ... 7.09 inches) Initial: 180 mm (7.09 inches)	0 5	
181 ... 200 mm (7.13 ... 7.87 inches) Initial: 200 mm (7.87 inches)	0 6	
201 ... 220 mm (7.91 ... 8.66 inches) Initial: 220 mm (8.66 inches)	0 7	
221 ...240 mm (8.70 ... 9.45 inches) Initial: 225 mm (8.86 inches)	1 1	
241 ... 260 mm (9.49 ... 10.24 inches) Initial: 250 mm (9.84 inches)	1 2	
261 ... 280 mm (10.28 ... 11.02 inches) Initial: 280 mm (11.02 inches)	1 3	
281 ... 300 mm (11.06 ... 11.81 inches) Initial: 285 mm (11.22 inches)	1 4	
301 ... 320 mm (11.85 ... 12.6 inches) Initial: 315 mm (12.4 inches)	1 5	
321 ... 340 mm (12.64 ... 13.39 inches) Initial: 340 mm (13.39 inches)	1 6	
341 ... 360 mm (13.43 ... 14.17 inches) Initial: 345 mm (13.58 inches)	1 7	
361 ... 380 mm (14.21 ... 14.96 inches) Initial: 380 mm (14.96 inches)	2 1	
381 ... 400 mm (15 ... 15.75 inches) Initial: 400 mm (15.75 inches)	2 2	
401 ... 420 mm (15.79 ... 16.54 inches) Initial: 420 mm (16.54 inches)	2 3	

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Selection and ordering data (continued)

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 3F, with flange, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ● ●
421 ... 440 mm (16.57 ... 17.32 inches) Initial: 440 mm (17.32 inches)	2 4	
441 ... 460 mm (17.36 ... 18.11 inches) Initial: 460 mm (18.11 inches)	2 5	
461 ... 480 mm (18.15 ... 18.90 inches) Initial: 465 mm (18.30 inches)	2 6	
481 ... 500 mm (18.94 ... 19.69 inches) Initial: 500 mm (19.69 inches)	2 7	
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 510 mm (20.08 inches)	3 1	
551 ... 600 mm (21.69 ... 23.62 inches) Initial: 600 mm (23.62 inches)	3 2	
601 ... 650 mm (23.66 ... 25.59 inches) Initial: 650 mm (25.59 inches)	3 3	
651 ... 700 mm (25.63 ... 27.56 inches) Initial: 700 mm (27.56 inches)	3 4	
701 ... 750 mm (27.6 ... 29.53 inches) Initial: 750 mm (29.53 inches)	3 5	
751 ... 800 mm (29.57 ... 31.50 inches) Initial: 800 mm (31.50 inches)	3 6	
801 ... 850 mm (31.5 ... 33.47 inches) Initial: 850 mm (33.47 inches)	3 7	
851 ... 900 mm (33.5 ... 35.43 inches) Initial: 900 mm (35.43 inches)	4 1	
901 ... 950 mm (35.47 ... 37.4 inches) Initial: 950 mm (37.4 inches)	4 2	
951 ... 1 000 mm (37.44 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)	4 3	
1 001 ... 1 100 mm (39.4 ... (43.30 inches) Initial: 1 100 mm (43.30 inches)	4 4	
Extension "X"		
Standard length for type 3F DIN 43772 (X=66 mm (2.60 inches))	1	
Extension length "X" customer-specific Specify customer-specific length with Y45, see page 2/88 order codes		
75 ... 150 mm (2.95 ... 5.91 inches) Initial: 150 mm (5.91 inches)	9	N 1 D
151 ... 300 mm (5.95 ... 11.81 inches) Initial: 300 mm (11.81 inches)	9	N 2 D
Head		
Aluminum head, BA0, flange cap, standard	A	
Aluminum head, BB0, spring flap low, screw closure	B	
Aluminum head, BC0, spring flap high, screw closure	C	
Aluminum head, AG0, screw cover, Ex d suitable[1)]	G	
Aluminum head, AH0, screw cover, Ex d suitable, local display[1)]	H	
Plastic head, BP0, spring flap high, screw closure	P	
Stainless steel head, AU0, screw cover, Ex d suitable[1)]	U	
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1)]	V	
Sensor[2)] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"		
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)	A	
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	B	
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)	C	
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)	K	
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)	J	
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)	N	
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"		
Single, basic accuracy (Class 2/Class B)	1	
Single, increased accuracy (Class 1/Class A)	2	
Single, maximum accuracy (Class AA)	3	
Double, basic accuracy (Class 2/Class B)	5	
Double, increased accuracy (Class 1/Class A)	6	

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Selection and ordering data (continued)

SITRANS TS500 Tubular thermowell for low to medium stress, according to DIN 43772, Type 3F, with flange, with extension	Article No. 7MC751 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Double, maximum accuracy (Class AA)	7	

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

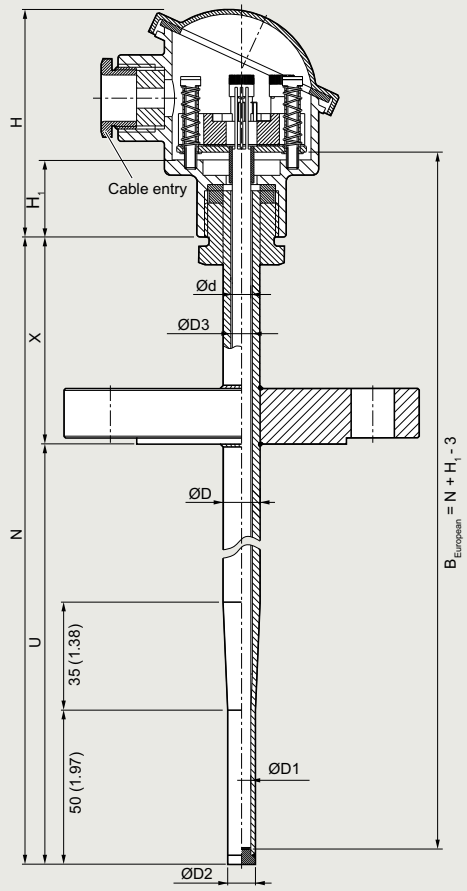
Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	**A02**
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	**A03**
Namur version	
Wetted thermowell parts made instead from 1.4571/316Ti, stained, neutralized and passivated (for U = 225/285/345 mm)	**W03**
Certificates and approvals	
Transmitter test report (5 points)	**C11**
EN 10204-3.1 Inspection certificate Wetted material	**C12**
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate Helium leak test	**C32**
EN 10204-3.1 Inspection certificate Surface tear test	**C33**
EN 10204-3.1 Factory certificate Visual, dimensional and function check	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
Wetted parts cleaned and grease-free (for oxygen applications, for example)	**C51**
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	**On request**
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada) Basis FM	**E10**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	**E14**
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	**E16**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**

Options Add "-Z" to article number and specify order code	Order code
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	**G13**
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
SafeGuard 2 × Pt100 4-wire	**G30**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Extension length X customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y45**
Customer-specific plain text	
Handling number of the special design	**Y99**

1) Select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

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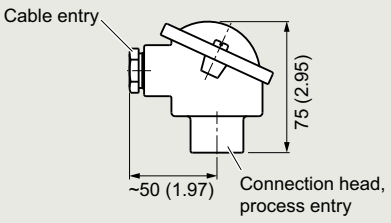
Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD1	Tip internal diameter
ØD2	Tip outer diameter
ØD3	Thermowell internal diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length, floor strength 6 mm

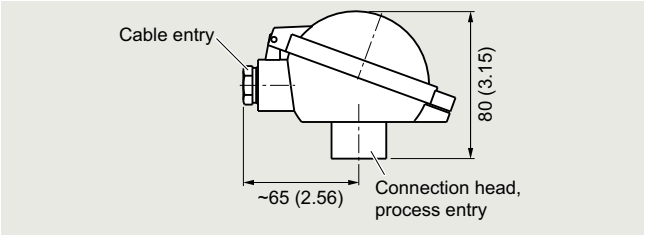
SITRANS TS500, temperature sensors for vessels and pipes, tubular thermowell for low to medium stress, according to DIN 43772, type 3F, with flange, with extension, dimensions in mm (inch)

Connection heads

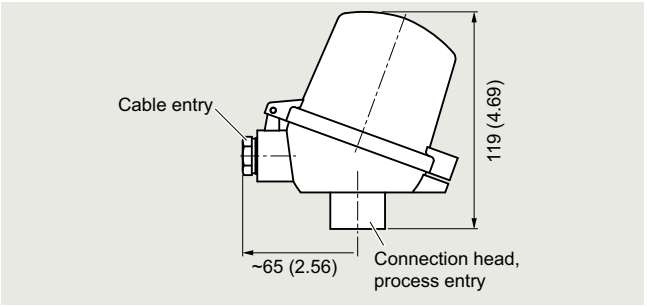


Connection head, aluminum, type BA0, dimensions in mm (inch)

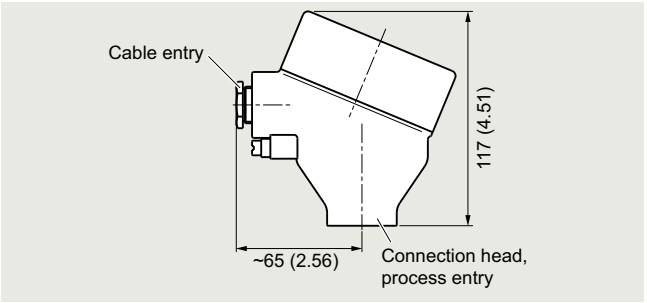
Dimensional drawings (continued)



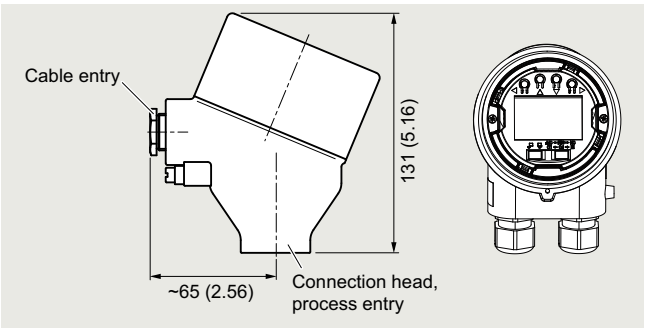
Connection head, aluminum, type BB0, dimensions in mm (inch)



Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 Barstock thermowell for connection head, with local display and medium to high stress, according to DIN 43772. Type 4, for welding, Type 4F with flange, with extension	Article No. 7MC752 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Wetted material		
316Ti (1.4571)	1	
316L (1.4404 or 1.4435)	2	
1.7335 Heat-resistant, only for versions without flange	3	
1.5415 Heat-resistant, only for versions without flange	4	
Process connection		
None (for welding)	0 N	
Flange DN25 PN10 ... 40 B1	2 A	
Flange 1"RF150	2 E	
Flange 1"RF300	2 F	
Flange 1.5"RF150	2 G	
Flange 1.5"RF300	2 H	
Thermowell form Version with flange: Deviating from standard [U = L-70 mm (2.76 inches)] installation length "U"; specify in plain text with Y44. [Min: U = C; Max: U = L-50 mm (1.97 inches)]		
Type 4/4F L = 140 mm (5.51 inches), C = 65 mm (3.74 inches), ØD = 24 mm (0.95 inches), Ød = 6 mm (0.24 inches)	A 0 0	
Type 4/4F L = 200 mm (7.87 inches), C = 65 mm (3.74 inches), ØD = 24 mm (0.95 inches), Ød = 6 mm (0.24 inches)	B 0 0	
Type 4/4F L = 200 mm (7.87 inches), C = 125 mm (4.92 inches), ØD = 24 mm (0.95 inches), Ød = 6 mm (0.24 inches)	D 0 0	
Type 4/4F L = 260 mm (10.24 inches), C = 125 mm (4.92 inches), ØD = 24 mm (0.95 inches), Ød = 6 mm (0.24 inches)	E 0 0	
Extension "X"		
According to DIN 43772, (X=149 mm (5.87 inches))	1	
Extension length "X" customer-specific Specify customer-specific length with Y45, see page 2/93 order codes		
75 ... 150 mm (2.95 ... 5.91 inches) Initial: 150 mm (5.91 inches)	9	N 1 D
151 ... 300 mm (5.95 ... 11.81 inches) Initial: 300 mm (11.81 inches)	9	N 2 D
301 ... 450 mm (11.85 ... 17.72 inches) Initial: 450 mm (17.72 inches)	9	N 3 D
451 ... 600 mm (17.86 ... 23.62 inches) Initial: 600 mm (23.62 inches)	9	N 4 D
601 ... 750 mm (23.66 ... 29.53 inches) Initial: 750 mm (29.53 inches)	9	N 5 D
751 ... 900 mm (29.57 ... 45.43 inches) Initial: 900 mm (45.43 inches)	9	N 6 D
901 ... 1 050 mm (45.47 ... 41.34 inches) Initial: 1 050 mm (41.34 inches)	9	N 7 D
Head		
Aluminum head, BA0, flange cap, standard	A	
Aluminum head, BB0, spring flap low, screw closure	B	
Aluminum head, BC0, spring flap high, screw closure	C	
Aluminum head, AG0, screw cover, Ex d suitable[1)]	G	
Aluminum head, AH0, screw cover, Ex d suitable, local display[1)]	H	
Plastic head, BP0, spring flap high, screw closure	P	
Stainless steel head, AU0, screw cover, Ex d suitable[1)]	U	
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1)]	V	
Sensor[2)] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"		
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)	A	
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	B	
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)	C	
Type K thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)	K	
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)	J	
Type N thermocouple, -270 ... +1 100 °C (-167 ... +2 012 °F)	N	

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Selection and ordering data (continued)

SITRANS TS500 Barstock thermowell for connection head, with local display and medium to high stress, according to DIN 43772. Type 4, for welding, Type 4F with flange, with extension	Article No. 7MC752 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"		
Single, basic accuracy (Class 2/Class B)		1
Single, increased accuracy (Class 1/Class A)		2
Single, maximum accuracy (Class AA)		3
Double, basic accuracy (Class 2/Class B)		5
Double, increased accuracy (Class 1/Class A)		6
Double, maximum accuracy (Class AA)		7

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	A02
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	A03
Certificates and approvals	
Transmitter test report (5 points)	C11
EN 10204-3.1 Inspection certificate Wetted material	C12
EN 10204-3.1 Inspection certificate Hydrostatic pressure test	C31
EN 10204-3.1 Inspection certificate Helium leak test	C32
EN 10204-3.1 Inspection certificate Surface tear test	C33
EN 10204-3.1 Factory certificate Visual, dimensional and function check	C34
EN 10204-2.1: Declaration of compliance with the order	C35
Wetted parts cleaned and grease-free (for oxygen applications, for example)	C51
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	On request
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	C20
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	D01
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	E00
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	E01
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	E03
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	E04
Without explosion protection requirements (USA, Canada) Basis FM	E10
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	E14
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	E16
Without explosion protection requirements (USA, Canada), Basis CSA	E17
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	E18
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	E21
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	E23
Without explosion protection requirements (China)	E54
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	E55

Options Add "-Z" to article number and specify order code	Order code
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	E56
Non-sparking "nA"/"NI" according to NEPSI (China)	E57
Without explosion protection requirements (EAC)	E80
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	E81
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	E82
Non-sparking "nA"/"NI" according to EACEx (EAC)	E83
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	G01
Full penetration process connection for 316L/316TI	G02
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	G12
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	G13
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	G20
SafeGuard 2 × Pt100 4-wire	G30
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	T12
SITRANS TH320, input 1 × universal, 4 ... 20 mA	T24
SITRANS TH320, input 1 × universal, HART	T34
SITRANS TH420, input 2 × universal, HART	T35
SITRANS TH420, input 2 × universal, PROFIBUS PA	T44
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	Y15
Factory calibration per 1 point, specify temperature in plain text	Y33
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	Y01
Specify measuring point description in plain text (max. 16 characters)	Y23
Specify measuring point message in plain text (max. 32 characters)	Y24
Specify bus address in plain text	Y25
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	Y44
Extension length X customer-specific Select range, plain text specification of desired length (no specification = standard length)	Y45

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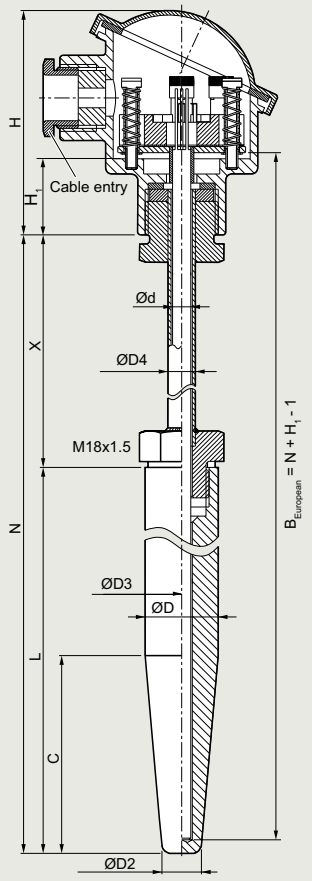
Selection and ordering data (continued)

Options Add "-Z" to article number and specify order code	Order code
Customer-specific plain text	
Handling number of the special design	**Y99**

1) Select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

Dimensional drawings

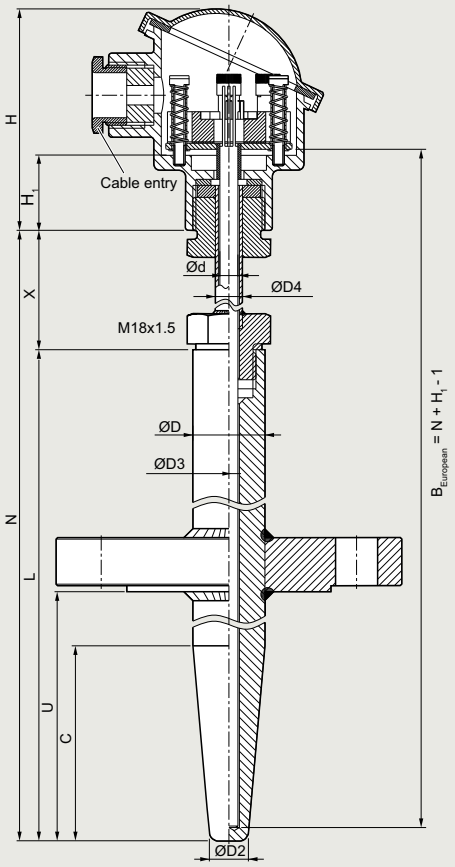
SITRANS TS500, temperature sensors for vessels and pipes, barstock thermowell for medium to extreme stress, according to DIN 43772.



B Measuring insert length
C Cone length = U_{min}
Ød Measuring insert outer diameter (6 (0.24))
ØD Process connection outer diameter
ØD2 Tip outer diameter, 12.5 (0.49)
ØD3 Thermowell internal diameter
ØD4 Extension outer diameter
H Head height
H_1 Type Axx = 41 (1.61)
Type Bxx = 26 (1.02)
L Length of thermowell
N Nominal length
X Extension length, floor strength 4 mm

Thermowell type 4, for welding in, with extension, dimensions in mm (inch)

Dimensional drawings (continued)



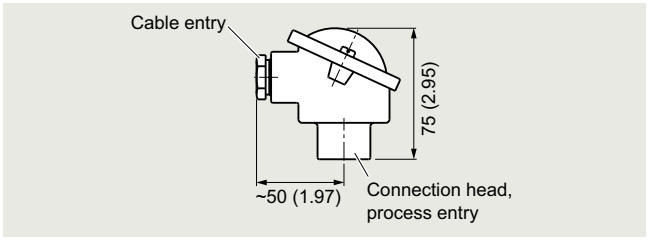
B Measuring insert length
C Cone length = U_{min}
Ød Measuring insert outer diameter (6 (0.24))
ØD Process connection outer diameter
ØD2 Tip outer diameter, 12.5 (0.49)
ØD3 Thermowell internal diameter
ØD4 Extension outer diameter
H Head height
H_1 Type Axx = 41 (1.61)
Type Bxx = 26 (1.02)
L Length of thermowell
N Nominal length
U Insertion length (Standard: U = L - 70 (2.76))
X Extension length, floor strength 4 mm

Thermowell type 4F, with flange, with extension, dimensions in mm (inch)

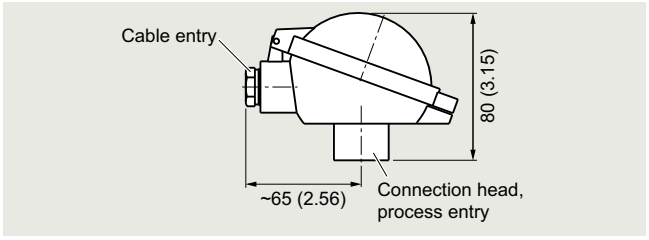
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Dimensional drawings (continued)

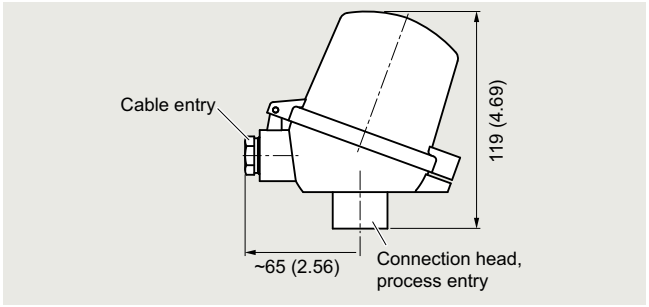
Connection heads



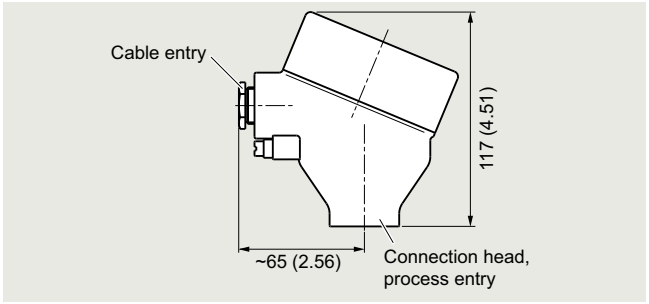
Connection head, aluminum, type BA0, dimensions in mm (inch)



Connection head, aluminum, type BB0, dimensions in mm (inch)

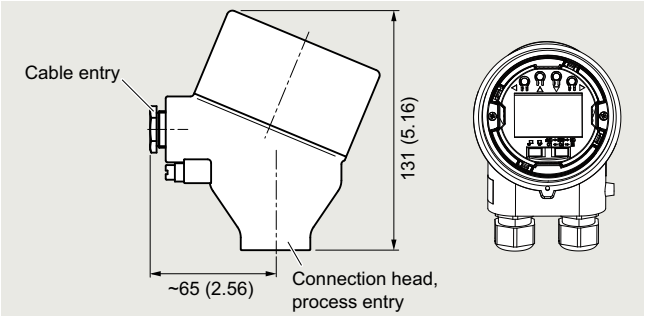


Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)

Dimensional drawings (continued)



Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Selection and ordering data

SITRANS TS500 Temperature sensors for installation in existing thermowells, suitable for thermowells in accordance with DIN 43772 and ASME B40.9-2001, with extension of European or American type	Article No. 7MC7500-										Order code		
	●	●	●	●	●	-	●	●	●	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.													
Design													
Existing thermowells	**1**												
Thread form:													
G½" (½"BSPP) (not for American type)		**C**											
NPT½"		**J**											
M14×1.5 (not for American type)		**T**											
M18×1.5 (not for American type)		**U**											
M20×1.5 (not for American type)		**V**											
Without thread		**N**											
Special design		**Z**									**J**	**1**	**Y**
Installation length "U" unloaded, standard lengths													
110 mm (4.33 inches)			**B**	**1**									
140 mm (5.51 inches)			**B**	**2**									
200 mm (7.87 inches)			**C**	**1**									
260 mm (10.24 inches)			**C**	**2**									
410 mm (16.14 inches)			**E**	**1**									
Installation length "U" unloaded, customer-specific Specify customer-specific length with Y44, see order codes													
30 ... 100 mm (1.18 ... 3.94 inches) Initial: 100 mm (3.94 inches)			**A**	**0**									
101 ... 200 mm (3.98 ... 7.87 inches) Initial: 200 mm (7.87 inches)			**B**	**0**									
201 ... 300 mm (7.91 ... 11.81 inches) Initial: 300 mm (11.81 inches)			**C**	**0**									
301 ... 400 mm (11.85 ... 15.75 inches) Initial: 400 mm (15.75 inches)			**D**	**0**									
401 ... 500 mm (15.79 ... 19.69 inches) Initial: 500 mm (19.69 inches)			**E**	**0**									
501 ... 600 mm (19.72 ... 23.62 inches) Initial: 600 mm (23.62 inches)			**F**	**0**									
601 ... 800 mm (23.66 ... 31.50 inches) Initial: 800 mm (31.50 inches)			**G**	**0**									
801 ... 1 000 mm (31.54 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)			**H**	**0**									
1 001 ... 1 250 mm (39.41 ... 49.21 inches) Initial: 1 250 mm (49.21 inches)			**J**	**0**									
1 251 ... 1 500 mm (49.25 ... 59.05 inches) Initial: 1 500 mm (59.05 inches)			**K**	**0**									
Special length < 30 mm (1.18 inches) or > 1 500 mm (59.00 inches)			**X**	**0**									
Diameter measuring tip "d"													
6 mm (0.24 inches)					**6**								
8 mm (0.31 inches) (with barrel = not exchangeable)					**8**								
10 mm (0.39 inches) (with barrel = not exchangeable)					**0**								
Extension X													
Without extension							**0**						
European type													
• X = 65 (M = 81 mm) (3.15 inches) adjustable							**1**						
• X = 139 mm (5.47 inches) (M = 155 mm (6.10 inches)) adjustable (DIN standard length for L=110)							**2**						
• X = 149 mm (5.87 inches) (M = 165 mm (6.50 inches)) adjustable							**3**						
American type													
• X = 74 mm (2.91 inches), integrated sensor suspension, NIP non-adjustable (NPT½"), Umin = 100 mm							**6**						
• X = 150 mm (5.91 inches) integrated sensor suspension NUN adjustable (NPT½")							**8**						
Extension length "X" customer-specific Specify customer-specific length with Y45, see page 2/98 order codes													
75 ... 150 mm (2.95 ... 5.91 inches) Initial: 150 mm (5.91 inches)							**9**				**N**	**1**	
151 ... 300 mm (5.95 ... 11.81 inches) Initial: 300 mm (11.81 inches)							**9**				**N**	**2**	
301 ... 450 mm (11.85 ... 17.72 inches) Initial: 450 mm (17.72 inches)							**9**				**N**	**3**	

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Selection and ordering data (continued)

SITRANS TS500 Temperature sensors for installation in existing thermowells, suitable for thermowells in accordance with DIN 43772 and ASME B40.9-2001, with extension of European or American type	Article No. 7MC7500- ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Special length < 45 mm (1.77 inches) or > 450 mm (17.7 inches)	9	N 8
Design		
European type (M24 adjustable)		D
Head		
Aluminum head, BA0, flange cap, standard	A	
Aluminum head, BB0, spring flap low, screw closure	B	
Aluminum head, BC0, spring flap high, screw closure	C	
Aluminum head, AG0, screw cover, Ex d suitable[1]	G	
Aluminum head, AH0, screw cover, Ex d suitable, local display[1]	H	
Plastic head, BP0, spring flap high, screw closure	P	
Stainless steel head, AU0, screw cover, Ex d suitable[1]	U	
Stainless steel head, AV0, screw cover, Ex d suitable, local display[1]	V	
Sensor[2] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"		
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)	A	
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	B	
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)	C	
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)	J	
Type K thermocouple, -270 ... +1 100 °C (-167 .... +2 012 °F)	K	
Type N thermocouple, -270 ... +1 100 °C (-167 .... +2 012 °F)	N	
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"		
Single, basic accuracy (Class 2/Class B)	1	
Single, increased accuracy (Class 1/Class A)	2	
Single, maximum accuracy (Class AA)	3	
Double, basic accuracy (Class 2/Class B)	5	
Double, increased accuracy (Class 1/Class A)	6	
Double, maximum accuracy (Class AA)	7	

1) Ex d in connection with order option E03
2) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Options Add "-Z" to article number and specify order code	Order code
Accessories	
With external grounding screw for connection heads AG0, AH0, AU0 and AV0	A02
With external grounding screw for connection heads BC0, AG0, AH0, AU0 and AV0	A03
Certificates and approvals	
Transmitter test report (5 points)	C11
EN 10204-3.1 Factory certificate Visual, dimensional and function check	C34
EN 10204-2.1: Declaration of compliance with the order	C35
EN 10204-3.1 Inspection certificate "Positive Materials Identification" (PMI)	On request
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	C20
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	D01
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	E00

Options Add "-Z" to article number and specify order code	Order code
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	E01
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	E03
Non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	E04
Without explosion protection requirements (USA, Canada) Basis FM	E10
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA); NPT connections at the enclosure are mandatory	E13
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	E14
Non-sparking "nA"/"NI" according to cFMus (USA, Canada)	E16
Without explosion protection requirements (USA, Canada), Basis CSA	E17
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	E18
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cCSAus (USA, Canada); NPT connections **on the enclosure** are mandatory	E20
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to CSAus (USA); other connections (M, G, R)	E21

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Selection and ordering data (continued)

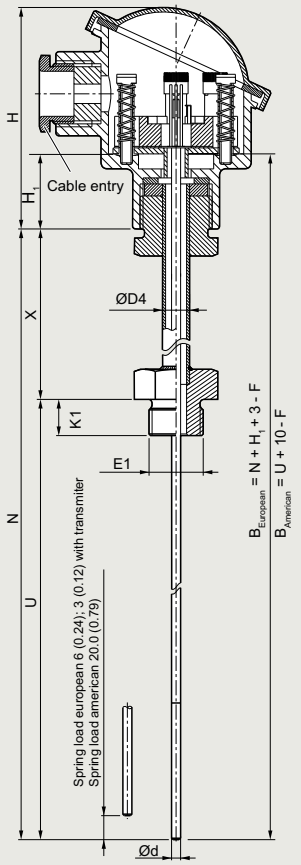
Options Add "-Z" to article number and specify order code	Order code
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through enclosure "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
Flying lead connection type (for direct transmitter mounting, delivery without screws or springs)	**G01**
Full penetration process connection for 316L/316TI	**G02**
Cable input for connection head	
M12 device plug (in combination with transmitter, non-Ex and intrinsically safe, max. IP65/67)	**G12**
Han 7 D device plug (non-Ex and intrinsically safe, without mating connector max. IP65/67)	**G13**
Connection head with ½"-NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
SafeGuard 2 × Pt100 4-wire	**G30**
Input of the connection head	
Input of the connection head: M24×1.5, with sealing screw, Umin = 50 mm	**G50**
Input of the connection head: NPT ½", with sealing screw, Umin = 50 mm	**G51**
Input of the connection head: M24×1.5, open, Umin = 50 mm	**G52**
Input of the connection head: NPT ½", open, Umin = 50 mm	**G53**

Options Add "-Z" to article number and specify order code	Order code
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Installation length U customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Extension length X customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y45**
Customer-specific plain text	
Handling number of the special design	**Y99**

1) Select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

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Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter
ØD4	Extension outer diameter
E1	Process connection, thread size
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
K1	Screw depth
N	Nominal length
U	Insertion length
X	Extension length

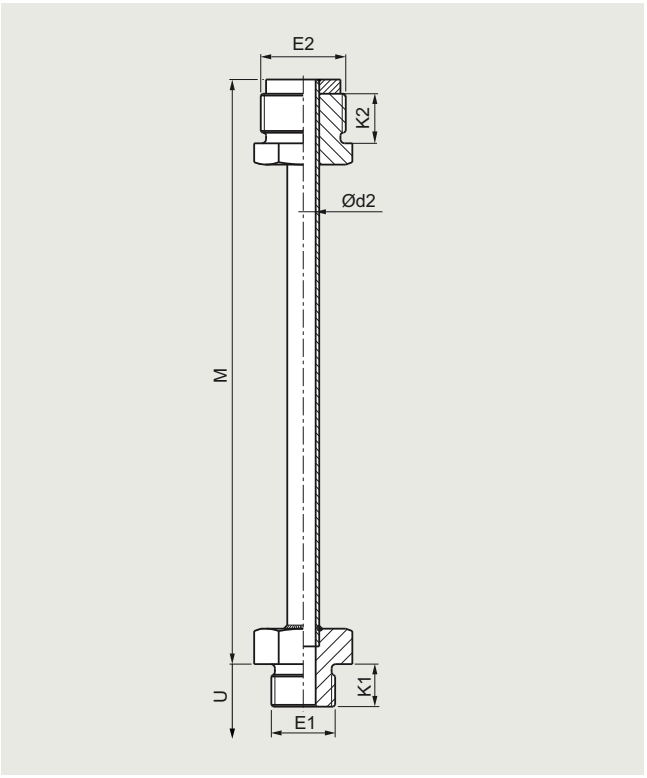
Recommended spring-load:
European versions = inside length of the thermowell + 3 (0.12) U = L-F+3*
American versions = inside length of the thermowell + 6 (0.24) U = L-F+6*

SITRANS TS500, temperature sensors for vessels and pipes. Temperature sensors for installation in existing thermowells, suitable for thermowells in accordance with DIN 43772 and ASME B40.9-2001, with extension of European or American type, dimensions in mm (inch). See the dimensional drawings in "SITRANS TSinsert/Measuring inserts for retrofitting and upgrading - European and American type".

Use our system configurator to configure the sensor and thermowell appropriately for one another.
https://mall.industry.siemens.com/spice/portal/portal?CONFIGID=47&PRODUCTID=SYS_PIA

Dimensional drawings (continued)

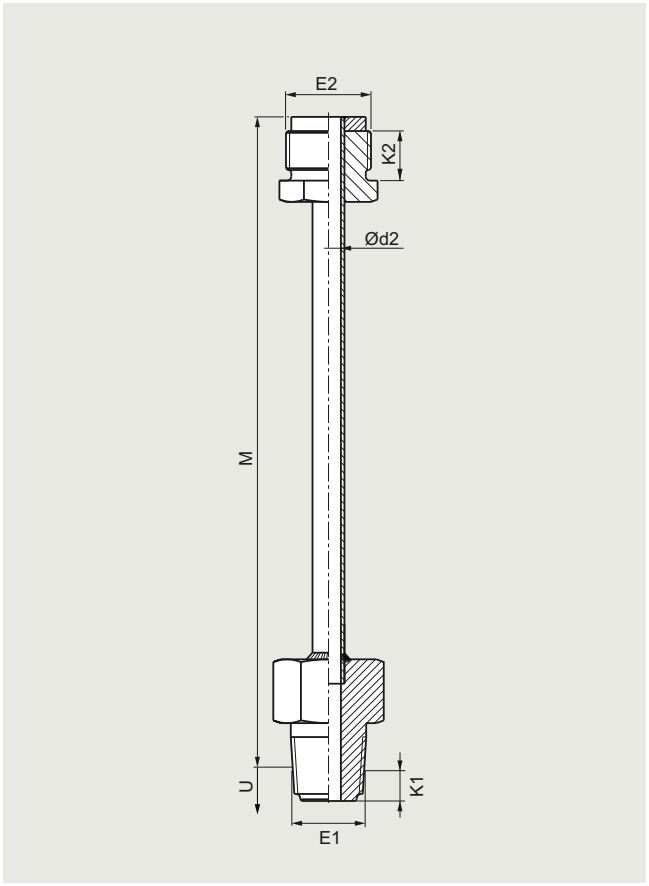
Extensions



Extension (1, 2, 3)[1)], adjustable, European, cylindrical

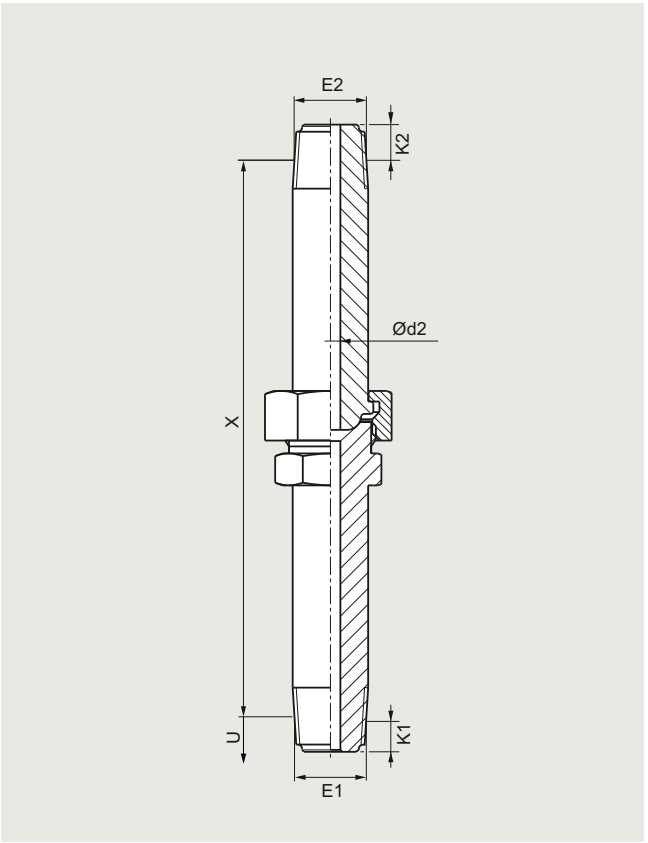
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Dimensional drawings (continued)



Extension (1, 2, 3)[1)], adjustable, European, tapered

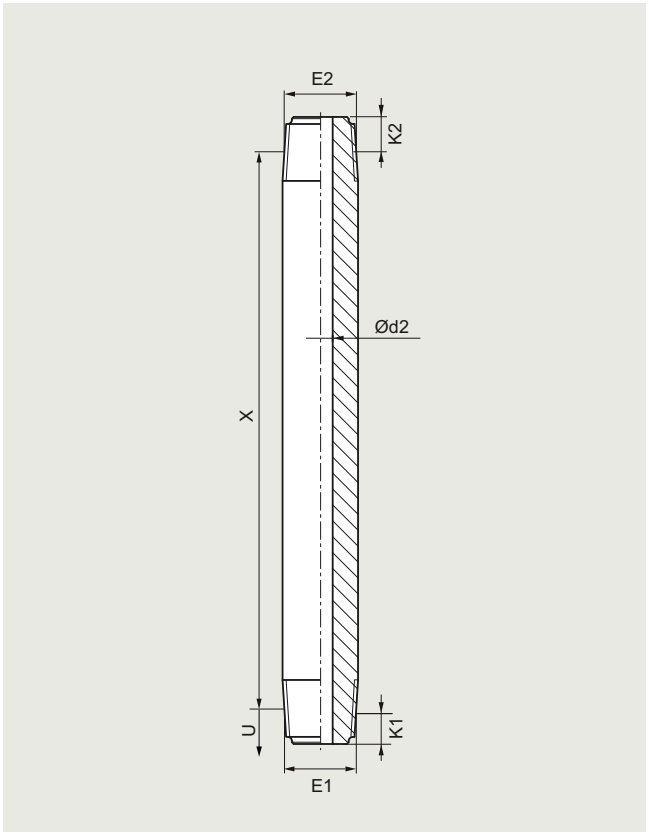
Dimensional drawings (continued)



Extension NUN, adjustable, tapered, American (8)[1)]

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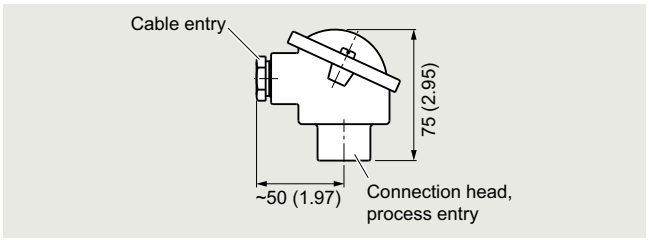
Dimensional drawings (continued)



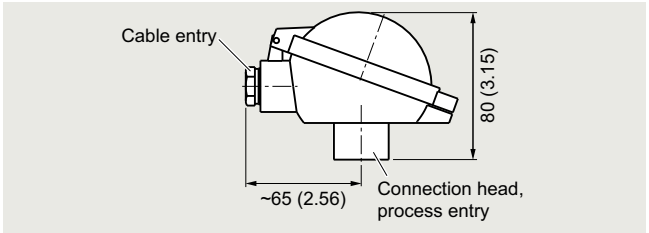
Extension NIP, non-adjustable, tapered, American (6)[1)]

[1)] Numbers 1 ... 8: See Selection and ordering data "Extension" option

Connection heads

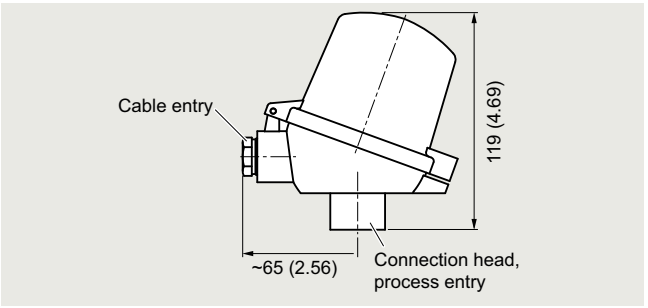


Connection head, aluminum, type BA0, dimensions in mm (inch)

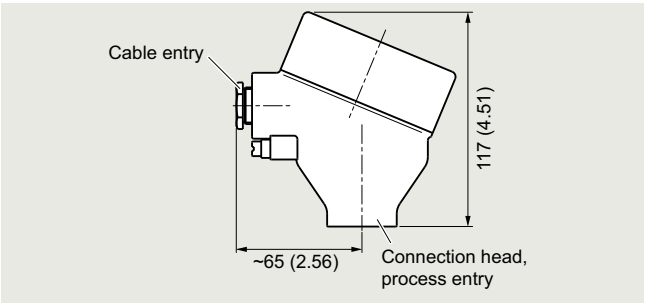


Connection head, aluminum, type BB0, dimensions in mm (inch)

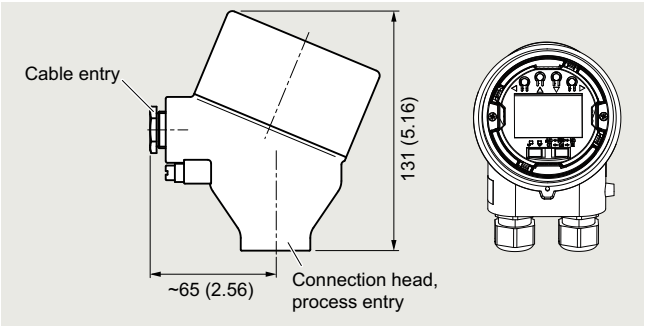
Dimensional drawings (continued)



Connection head, aluminum, type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, aluminum, type AG0, stainless steel, type AU0, dimensions in mm (inch)

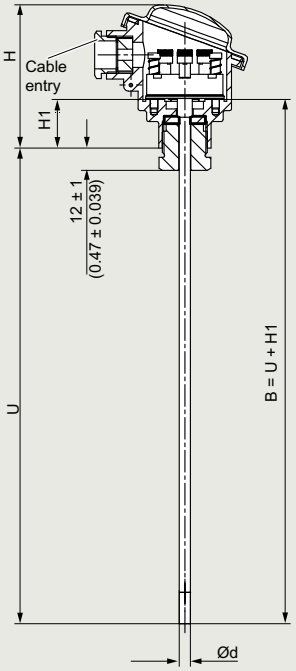


Connection head with local display, aluminum, type AH0, stainless steel, type AV0, dimensions in mm (inch)

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Dimensional drawings (continued)

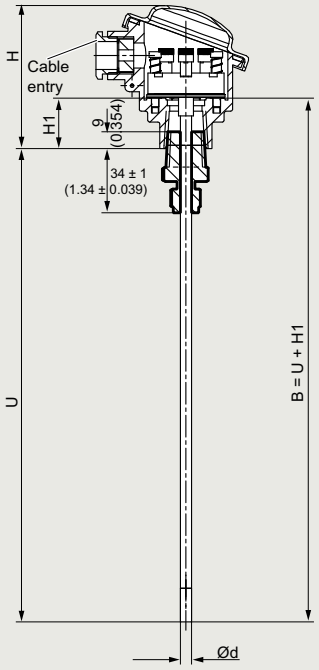
Option G50: M24×1.5, with gasket



B Measuring insert length
Ød Measuring insert outer diameter
H Head height
H1 Type Axx = 41 (1.61)
Type Bxx = 26 (1.02)
U Insertion length

Dimensional drawings (continued)

Option G51: ½" NPT, with seal

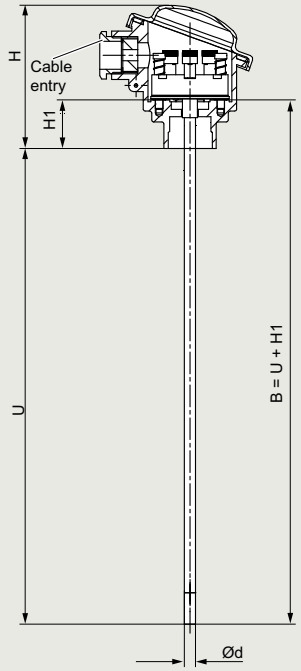


B Measuring insert length
Ød Measuring insert outer diameter
H Head height
H1 Type Axx = 41 (1.61)
Type Bxx = 26 (1.02)
U Insertion length

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Dimensional drawings (continued)

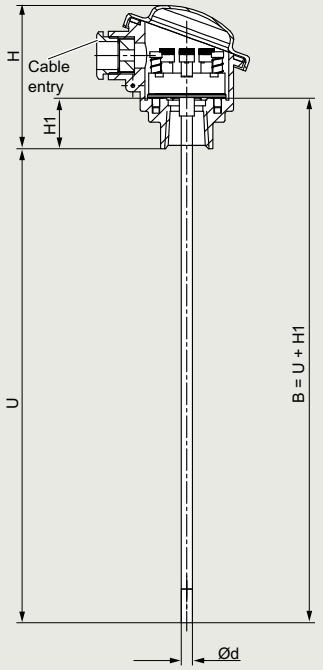
Option G52: M24×1.5, open



B Measuring insert length
Ød Measuring insert outer diameter
H Head height
H1 Type Axx = 41 (1.61)
Type Bxx = 26 (1.02)
U Insertion length

Dimensional drawings (continued)

Option G53: ½" NPT, open



B Measuring insert length
Ød Measuring insert outer diameter
H Head height
H1 Type Axx = 41 (1.61)
Type Bxx = 26 (1.02)
U Insertion length

Input of the connection head: U_{min} = 50 mm (1.97 inches), dimensions in mm (inch)

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Selection and ordering data

SITRANS TSinsert Measuring inserts for temperature sensors, exchangeable, mineral-insulated version, as European or American type	Article No. 7MC701	● -	●	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.							
Diameter measuring tip "d"							
6 mm (0.24 inches)		**6**					
8 mm (0.31 inches); with thermowell		**8**					
10 mm (0.39 inches); with thermowell		**0**					
Type							
European type - DIN ceramic base			**1**				
European type - DIN flying leads, mandatory with mounted transmitter			**2**				
American type - ANSI (nipple spring)			**5**				
Sensor[2)] Note: The accuracy class range can be lower than the measuring range. For more detailed information, see "Configuration"/"Measuring technology: Measuring accuracy"							
Pt100, basic version, -50 ... +400 °C (-58 ... +752 °F)					**A**		
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)					**B**		
Pt100, extended measuring range, -196 ... +600 °C (-320.8 ... +1 112 °F)					**C**		
Type J thermocouple, -0 ... +750 °C (-18 ... +1 382 °F)					**J**		
Type K thermocouple, -270 ... +1 100 °C (-167 .... +2 012 °F)					**K**		
Type N thermocouple, -270 ... +1 100 °C (-167 .... +2 012 °F)					**N**		
Number/precision of sensors Pt100 connection: 1 × 4-wire connection or 2 × 3-wire connection, see "Configuration"/"Measuring technology: Connection types"							
Single, basic accuracy (Class 2/Class B)					**A**		
Single, increased accuracy (Class 1/Class A)					**B**		
Single, maximum accuracy (Class AA)					**C**		
Double, basic accuracy (Class 2/Class B)					**D**		
Double, increased accuracy (Class 1/Class A)					**E**		
Double, maximum accuracy (Class AA)					**F**		
Length of measuring insert "B", standard							
145 mm (6.89 inches)						**1**	**3**
205 mm (8.07 inches)						**1**	**7**
275 mm (10.83 inches)						**2**	**1**
315 mm (12.40 inches)						**2**	**3**
345 mm (13.58 inches)						**2**	**4**
375 mm (14.76 inches)						**2**	**5**
405 mm (15.94 inches)						**2**	**7**
435 mm (17.13 inches)						**2**	**0**
555 mm (21.85 inches)						**3**	**5**
585 mm (23.03 inches)						**3**	**6**
Length of measuring insert "B", customer-specific Specify customer-specific length with Y44, see page 2/103 order codes							
85 ... 100 mm (3.37 ... 3.94 inches) Initial: 100 mm (3.94 inches)						**1**	**1**
101 ... 150 mm (3.98 ... 5.91 inches) Initial: 145 mm (5.71 inches)						**1**	**3**
151 ... 200 mm (5.95 ... 7.87 inches) Initial: 200 mm (7.87 inches)						**1**	**5**
201 ... 250 mm (7.91 ... 9.84 inches) Initial: 205 mm (8.07 inches)						**1**	**7**
251 ... 300 mm (9.88 ... 11.81 inches) Initial: 275 mm (10.83 inches)						**2**	**1**
301 ... 350 mm (11.85 ... 13.78 inches) Initial: 315 mm (12.40 inches)						**2**	**3**
351 ... 400 mm (13.82 ... 15.75 inches) Initial: 375 mm (14.76 inches)						**2**	**5**
401 ... 450 mm (15.79 ... 17.72 inches) Initial: 405 mm (15.94 inches)						**2**	**7**
451 ... 500 mm (17.76 ... 19.69 inches) Initial: 500 mm (19.69 inches)						**3**	**1**
501 ... 550 mm (19.72 ... 21.65 inches) Initial: 525 mm (20.67 inches)						**3**	**3**
551 ... 600 mm (21.69 ... 23.92 inches) Initial: 555 mm (21.85 inches)						**3**	**5**

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Selection and ordering data (continued)

SITRANS TSinsert Measuring inserts for temperature sensors, exchangeable, mineral-insulated version, as European or American type	Article No. 7MC701 ● - ● ● ● ● ●
601 ... 700 mm (23.66 ... 27.56 inches) Initial: 655 mm (25.79 inches)	3 7
701 ... 800 mm (27.60 ... 31.50 inches) Initial: 735 mm (28.94 inches)	4 1
801 ... 900 mm (31.54 ... 35.43 inches) Initial: 825 mm (32.48 inches)	4 3
901 ... 1 000 mm (35.47 ... 39.37 inches) Initial: 950 mm (37.40 inches)	4 5
1 001 ... 1 500 mm (39.41 ... 59.05 inches) Initial: 1 250 mm (49.21 inches)	4 7
1 501 ... 2 000 mm (59.09 ... 78.74 inches) Initial: 1 700 mm (66.93 inches)	4 8

1) Pt1000 versions are also available.
To find these, switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

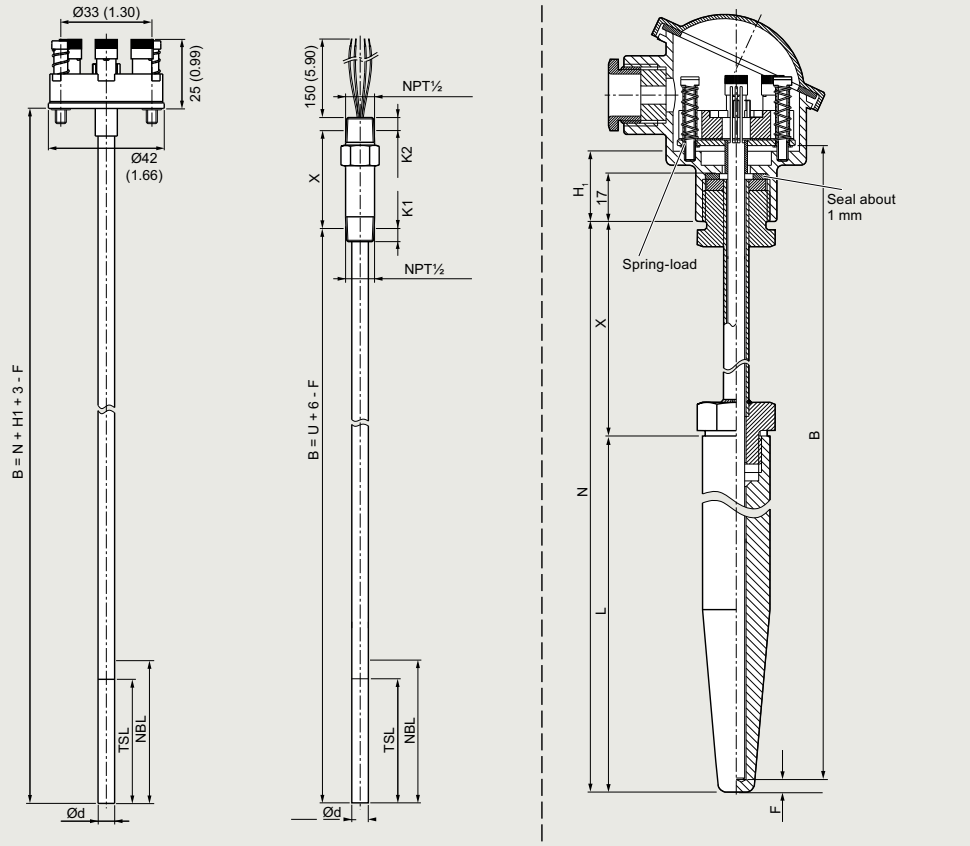
Options Add "-Z" to article number and specify order code	Order code
Certificates for functional safety	
SITRANS TH320/420 transmitter with SIL2/3 certificate	**C20**
Type of protection (Ex)	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
For flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP" [2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
For non-sparking "ec" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada) Basis FM	**E10**
For flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA); NPT connections on the enclosure are mandatory	**E13**
For flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP"[2] according to cFMus (USA, Canada); other connections (M,G,R)	**E14**
For non-sparking "nA"/"NI" according to cFMus (USA, Canada)	**E16**
Without explosion protection requirements (USA, Canada), Basis CSA	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
For flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP" [2] according to cCSAus (USA, Canada); NPT connections on the enclosure are mandatory	**E20**
For flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP" [2] according to CSAus (USA); other connections (M, G, R)	**E21**
For non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
For flameproof enclosure "d"; dust protection through enclosure "t" [2] according to NEPSI (China)	**E56**
For non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
For flameproof enclosure "d"/"XP"; dust protection through enclosure "t"/"DIP" [2] according to EACEx (EAC)	**E82**
For non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Special design	
SafeGuard 2 × Pt100 4-wire	**G30**
Built-in head-mounted transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
SITRANS TH420, input 2 × universal, PROFIBUS PA	**T44**
Device settings (including head-mounted transmitter options)	
Tag plate made of stainless steel, specify label in plain text	**Y15**
Factory calibration per 1 point, specify temperature in plain text	**Y33**
Specify measuring range in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when option "Y15" is selected in addition	**Y01**
Specify measuring point description in plain text (max. 16 characters)	**Y23**
Specify measuring point message in plain text (max. 32 characters)	**Y24**
Specify bus address in plain text	**Y25**
Customer-specific plain text	
Handling number of the special design	**Y99**

1) Select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (select non-Ex version of the optional transmitter).

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Dimensional drawings

Measuring inserts for temperature sensors



B	Measuring insert length	K1	Screw depth
Ød	Measuring insert outer diameter	K2	Screw depth
N	Nominal length	L/U	Thermowell length U for Form 2*/ 3*/ 4F L for Form 4
NBL	Non-bending length	H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
TSL	Temperature-sensitive length		
F	Floor strength Type 2: 3 (0.12) Type 3: 6 (0.24) Type 4: 4 (0.16) ASME types: 6.4 (0.25); round down to 6 (0.24)		
X	Extension length		

Recommended spring-load:
European versions = 3 (0.12)
American versions: 6.4 (0.25); round down to 6 (0.24)

Example calculations

European measuring insert (with ceramic base)
Connection head BC0, Thermowell Form 2F, U = 225 mm, X = 64
B = U + X + H1 + 3 – F
B = 225 + 64 + 26 + 3 – 3 = 315

American measuring insert
Connection head AG0, Thermowell Form 4, L = 200 mm
B = L + 6 - F
B = 200 + 6 – 4 = 202

For the NTP thread, please take tolerances into consideration and select a shorter sensor or use PTFE tape for mounting, for example: -3 (0.12).

SITRANS TSinsert - measuring inserts for temperature sensors, replaceable, mineral-insulated version

European type (DIN ceramic base): max. possible spring approx. 6 mm (0.24 inches)

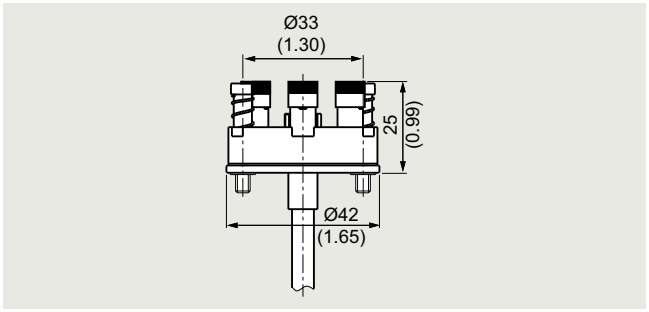
American type: max. possible spring approx. 21 mm (0.83 inches)

Determination of the measuring insert length, dimensions in mm

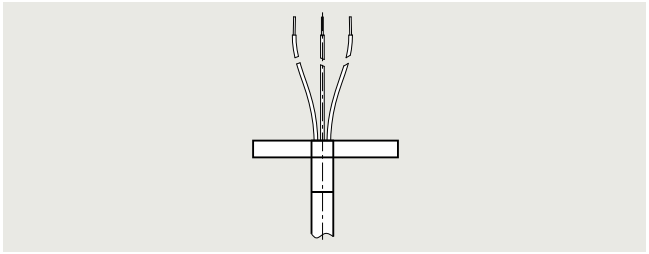
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Dimensional drawings (continued)

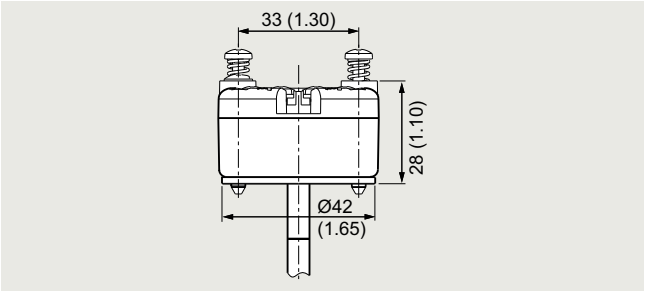
Cold end versions



Cold end versions, ceramic base, dimensions in mm (inch)



Cold end versions, flying lead



European type: Cold end versions, installed transmitter, dimensions in mm (inch)

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Selection and ordering data

Use our system configurator to configure the sensor and protective tube appropriately for each other.
https://mall.industry.siemens.com/spice/portal/portal?CONFIGID=47&PRODUCTID=SYS_PIA

Our thermowell stress calculator allows you to easily design protective tubes in accordance with ASME PTC 19.3 TW-2016.
https://www.siemens.com/mi-sizing

Barstock thermowells according to DIN 43772 - Form 4			Article No. 7MT ● ● ● ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Click the article number for online configuration and buildability check in the PIA Life Cycle Portal.				
Basic model				
Standard	Process connection	Form		
DIN	Weld-in/flange connection	Form 4/4F	1 4	
Outer diameter of root D	Outer diameter of tip D2	Bore hole D3		
24 mm (0.94 inches)	12.5 mm (0.49 inches)	7 mm (0.28 inches)	1	
26 mm (1.02 inches)	12.5 mm (0.49 inches)	7 mm (0.28 inches)	2	
32 mm (1.26 inches)	17 mm (0.67 inches)	11 mm (0.43 inches)	3	
Thermowell length L				
110 mm (4.3 inches)			0 1	
140 mm (5.5 inches)			0 2	
170 mm (6.7 inches)			0 3	
200 mm (7.9 inches)			0 4	
260 mm (10.2 inches)			0 5	
410 mm (16.1 inches)			0 6	
Thermowell material				
316Ti / 1.4571			A	
316L / 1.4404			B	
Hastelloy C276 / 2.4819 (flange with flanged wheel)			E	
1.7335 Heat-resistant			S	
1.5415 Heat-resistant			T	
PFA coating (thermowell made of 316/TI/L)			U	
ECTFE (HALAR) (thermowell made of 316/TI/L)			V	
Stellite coating (thermowell made of 316/TI/L)			W	
Customer-specific thermowell			9 8 8 N	Y 9 9
				+
				Y 4 6
Process connection material				
Without (form 4 for welding)			N	
316Ti/1.4571			A	
316L/1.4404			B	
Hastelloy C276/2.4819			E	
1.7335 Heat-resistant			S	
1.5415 Heat-resistant			T	
PFA coating (thermowell made of 316/TI/L)			U	
ECTFE (HALAR) (thermowell made of 316/TI/L)			V	
Stellite coating (thermowell made of 316/TI/L)			W	
Process connection				
Without (form 4 for welding)			0 0	
Flange according to EN 1092-1 sealing surface Initial B1 for uncoated variants				
• DN 40, PN 10 ... 16			3 2	
• DN 40, PN 25 ... 40			3 3	
• DN 50, PN 10 ... 16			3 4	
• DN 50, PN 25 ... 40			3 5	
Flange according to ASME B16.5 sealing surface Initial RF for uncoated variants				
• 1.50 inches; Class 150			6 0	

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Selection and ordering data (continued)

Barstock thermowells according to DIN 43772 - Form 4	Article No. 7MT ● ● ● ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
• 1.50 inches; Class 300	6 1	
• 1.50 inches; Class 600	6 2	
• 2.00 inches; Class 150	6 6	
• 2.00 inches; Class 300	6 7	
• 2.00 inches; Class 600	6 8	
Customer-specific process connection	Z 8 8	K 1 Y
Installation length U		
For welding (no process connection)	0 N	
130 mm (5.1 inches)	0 A	
190 mm (7.5 inches)	0 B	
340 mm (13.4 inches)	0 C	
Customer-specific installation length	8 Y	Y 4 4
Connection to thermometer E1 (internal thread)		
M18×1.5	Q	
M20×1.5	R	
M27×2.0	T	
½-14 NPT	U	
G½	W	
G¾	X	
Special design	Z	Q 1 Y
Cone length C		
Without (straight)	0	
65 mm (2.6 inches)	2	
73 mm (2.9 inches)	3	
125 mm (4.9 inches)	4	
133 mm (5.2 inches)	5	
275 mm (10.8 inches)	6	

Options Add "-Z" to article number and specify options; separate multiple expansions with "+".	Order code
Inspection certificate according to EN 10204-3.1	
Material certificate, material in contact with media	C12
PMI (positive material ident.), in contact with media	C15
Pressure test	C31
Helium leak test	C32
Dye-penetration test	C33
Compliance with order	C35
X-ray test concentricity of bore hole	C47
Ultrasound test concentricity of bore hole	C48
MR-01-75 NACE conformity	C50
MR-01-03 NACE conformity	C53
Grease-free (cleaned for oxygen applications, for example)	C51
Additional options	
Thread protection stainless steel plug and chain	A55
Forged flange	A76
Sealing surface with concentric lines	A77

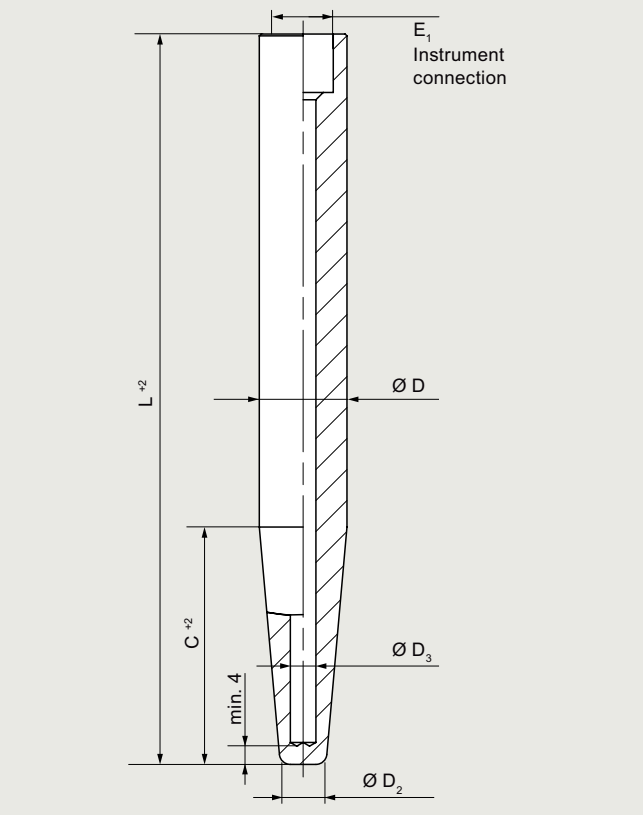
Options Add "-Z" to article number and specify options; separate multiple expansions with "+".	Order code
TAG marking	Y15
Additional flange sealing surfaces	
FF-Flat Face according to ASME B16.5	A70
RTJ ring type joint according to ASME B16.5	A71
Type B2 according to EN1092-1	A72
Type C according to EN1092-1	A73
Type D according to EN1092-1	A74
Additional designs Add "-Z" to article number and specify plain text.	
Additional information	
Additional information in plain text: Process connection (material, type)	K1Y
Additional information in plain text: Connection to thermometer E1	Q1Y
Customer single job production	
Processing and quotation number of special design: Specify in plain text	Y99

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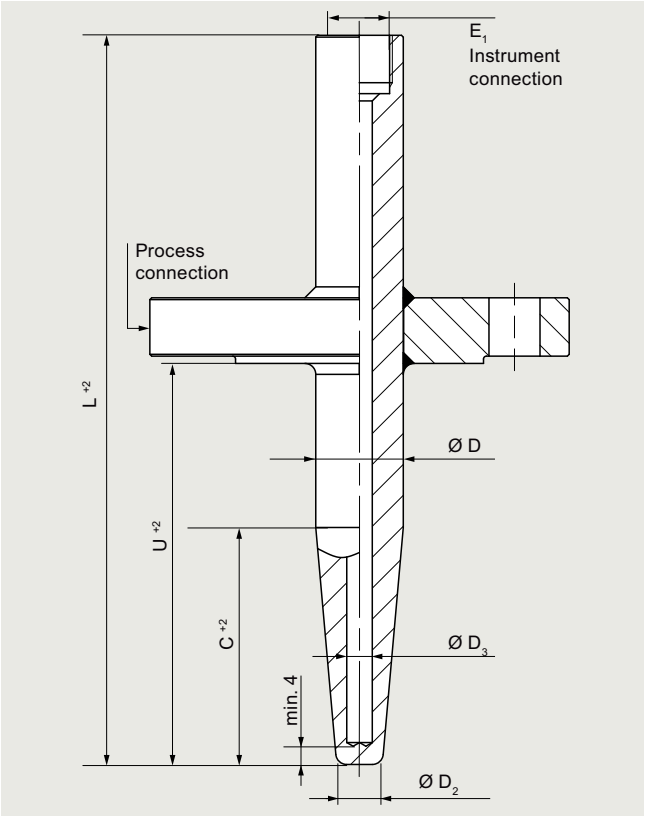
Dimensional drawings

Thermowells according to DIN 43772 - Form 4

7MT14, welded



7MT14, flange connection



The label of the D sleeves is from the previous standard but still used today. The table below shows the order information for the corresponding successor products from DIN 43772.

Design	L [mm]	C [mm]	Ordering data
D1	140	65	**7MC1410-2*N00-0NQ2**
D2	200	125	**7MC1410-4*N00-0NQ4**
D4	200	65	**7MC1410-4*N00-0NQ2**
D5	260	125	**7MC1410-5*N00-0NQ4**
			Material: * = **A**: 1.4571 * = **B**: 1.4404 * = **S**: 1.7335 * = **T**: 1.5415

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Selection and ordering data

Barstock thermowells according to ASME B40.9			Article No. 7MT																	Order code		
Click the article number for online configuration and buildability check in the PIA Life Cycle Portal.							-						-									
Basic model																						
Standard	Process connection	Form																				
ASME	Screwed design	Straight			2	1																
ASME	For welding	Straight			3	1																
ASME	Flange connection	Straight			4	1																
ASME	Van Stone type	Straight			5	1																
ASME	Screwed design	Reduced form			2	2																
ASME	For welding	Reduced form			3	2																
ASME	Flange connection	Reduced form			4	2																
ASME	Van Stone type	Reduced form			5	2																
ASME	Screwed design	Tapered			2	3																
ASME	For welding	Tapered			3	3																
ASME	Flange connection	Tapered			4	3																
ASME	Van Stone type	Tapered			5	3																
Connection to thermometer E1																						
M18×1.5							1															
M20×1.5							2															
½-14 NPT							5															
G½							7															
Special design							9													Y	9	9
Head diameter of the thermowell																						
Screwed design - width across flats	For welding	Flange connection	Van Stone head / process connection																			
	26.7 mm (1.05 inches)							0														
H27	33.4 mm (1.32 inches)	28.6 mm (1.13 inches)	33.4 mm/51 mm (1.32 inches/2.01 inches)					1														
	48.3 mm (1.9 inches)	30 mm (1.18 inches)	48.3 mm/73 mm (1.9 inches/2.87 inches)					2														
H32		32 mm (1.26 inches)	60.3 mm/92 mm (2.37 inches/3.62 inches)					3														
H36		35 mm (1.38 inches)						4														
H42		38 mm (1.5 inches)						5														

Head length X1	Screw-in	Weld-in	Flange	Van Stone																		
25 ... 50 mm (0.99 ... 1.97 inches): Initial 38 mm (1.5 inches) (7MT2), 45 mm (1.77 inches) (7MT3/4)	✓	✓	✓								0											
51 ... 75 mm (2 ... 2.95 inches): Initial 64 mm (2.5 inches)	✓	✓	✓	✓							1											
76 ... 101 mm (3 ... 3.98 inches): Initial 89 mm (3.5 inches)	✓	✓	✓	✓							2											
102 ... 126 mm (4 ... 4.96 inches): Initial 114 mm (4.5 inches)	✓	✓	✓	✓							3											
127 ... 151 mm (5 ... 5.95 inches): Initial 140 mm (5.5 inches)	✓	✓	✓	✓							4											
152 ... 177 mm (... 6.97 inches): Initial 165 mm (6.5 inches)	✓	✓	✓	✓							5											
178 ... 202 mm (7 ... 7.95 inches): Initial 191 mm (7.5 inches)	✓	✓	✓								6											
Installation length U																						
25 ... 126 mm (1 ... 4.99 inches): Initial 25 mm (0.99 inches)												A										
127 ... 253 mm (5 ... 9.99 inches): Initial 127 mm (5 inches)												B										
254 ... 380 mm (10 ... 14.99 inches): Initial 254 mm (10 inches)												C										
381 ... 507 mm (15 ... 19.99 inches): Initial 381 mm (15 inches)												D										
508 ... 634 mm (20 ... 24.99 inches): Initial 508 mm (20 inches)												E										
635 ... 761 mm (25 ... 29.99 inches): Initial 635 mm (25 inches)												F										

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Selection and ordering data (continued)

Barstock thermowells according to ASME B40.9						Article No. 7MT																			Order code		
762 ... 888 mm (30 ... 34.99 inches): Initial 762 mm (30 inches)														G													
Thermowell material			Screw-in	Weld-in	Flange	Van Stone																					
316L / 1.4404			✓	✓	✓	✓										B											
Carbon steel / A105			✓	✓	✓											C											
Hastelloy C276 / 2.4819 (flange with flanged wheel)					✓	✓										E											
Hastelloy C22 / 2.4602 (flange with flanged wheel)					✓	✓										F											
304L / 1.4306			✓	✓	✓	✓										H											
321 / 1.4541			✓	✓	✓	✓										K											
Monel alloy 400 / 2.4360 (flange with flanged wheel)					✓	✓										L											
Tantalum (barrel, thermowell made of 316/TI/L)					✓											Q											
Duplex / 1.4462					✓	✓										P											
Superduplex / 1.4410					✓	✓										R											
PFA coating (thermowell made of 316/TI/L)					✓	✓										U											
ECTFE (HALAR) (thermowell made of 316/TI/L)					✓	✓										V											
Stellite coating (thermowell made of 316/TI/L)					✓	✓										W											
Customer-specific thermowell (head diameter/X1/U/material)			✓		✓	✓								9		8	N	N							G [1]		Y
Outer diameter of root D/tip D2																											
Straight thermowell form	Reduced thermowell form		Tapered thermowell form																								
D	D	D2	D	D2																							
		L6 = 2.5 inches (63.5 mm)																									
0.50 inches (12.7 mm)																	0	0									
0.625 inches (15.9 mm)	0.625 inches (15.9 mm)	0.50 inches (12.7 mm)	0.625 inches (15.9 mm)	0.50 inches (12.7 mm)													0	1									
0.75 inches (19.1 mm)	0.75 inches (19.1 mm)	0.50 inches (12.7 mm)	0.75 inches (19.1 mm)	0.50 inches (12.7 mm)													0	2									
1.00 inch (25.4 mm)	1.00 inch (25.4 mm)	0.50 inches (12.7 mm)															0	3									
1.25 inches (31.8 mm)	1.25 inches (31.8 mm)	0.50 inches (12.7 mm)	1.00 inch (25.4 mm)	0.50 inches (12.7 mm)													0	4									
1.50 inches (38.1 mm)	1.50 inches (38.1 mm)	0.50 inches (12.7 mm)	1.00 inch (25.4 mm)	0.75 inches (19.1 mm)													0	5									
			1.25 inches (31.8 mm)	0.50 inches (12.7 mm)													0	7									
			1.25 inches (31.8 mm)	0.75 inches (19.1 mm)													0	8									
D = 12 mm (0.47 inches)			1.25 inches (31.8 mm)	1.00 inch (25.4 mm)													1	0									
D = 14 mm (0.55 inches)																	1	1									
D = 16 mm (0.63 inches)			1.50 inches (38.1 mm)	0.50 inches (12.7 mm)													1	2									
D = 19 mm (0.75 inches)			1.50 inches (38.1 mm)	0.75 inches (19.1 mm)													1	3									
D = 22 mm (0.87 inches)			1.50 inches (38.1 mm)	1.00 inch (25.4 mm)													1	4									
D = 25 mm (0.98 inches)			1.50 inches (38.1 mm)	1.25 inches (31.8 mm)													1	5									
D = 27 mm (1.06 inches)																	1	6									
			12 mm (0.47 inches)	9 mm (0.35 inches)													3	1									
			14 mm (0.55 inches)	9 mm (0.35 inches)													3	3									
			16 mm (0.63 inches)	9 mm (0.35 inches)													3	6									
			16 mm (0.63 inches)	13 mm (0.51 inches)													3	7									
			16 mm (0.63 inches)	14 mm (0.55 inches)													3	8									
			19 mm (0.75 inches)	9 mm (0.35 inches)													4	1									

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Selection and ordering data (continued)

Barstock thermowells according to ASME B40.9			Article No. 7MT ● ● ● ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
19 mm (0.75 inches)	13 mm (0.51 inches)		4 2	
19 mm (0.75 inches)	14 mm (0.55 inches)		4 3	
22 mm (0.87 inches)	9 mm (0.35 inches)		4 6	
22 mm (0.87 inches)	13 mm (0.51 inches)		4 7	
22 mm (0.87 inches)	14 mm (0.55 inches)		4 8	
22 mm (0.87 inches)	16 mm (0.63 inches)		5 0	
25 mm (0.98 inches)	9 mm (0.35 inches)		5 3	
25 mm (0.98 inches)	13 mm (0.51 inches)		5 4	
25 mm (0.98 inches)	14 mm (0.55 inches)		5 5	
25 mm (0.98 inches)	16 mm (0.63 inches)		5 6	
25 mm (0.98 inches)	19 mm (0.75 inches)		5 7	
27 mm (1.06 inches)	9 mm (0.35 inches)		6 1	
27 mm (1.06 inches)	13 mm (0.51 inches)		6 2	
27 mm (1.06 inches)	14 mm (0.55 inches)		6 3	
27 mm (1.06 inches)	16 mm (0.63 inches)		6 4	
27 mm (1.06 inches)	19 mm (0.75 inches)		6 5	
27 mm (1.06 inches)	22 mm (0.87 inches)		6 6	
32 mm (1.26 inches)	9 mm (0.35 inches)		7 0	
32 mm (1.26 inches)	13 mm (0.51 inches)		7 1	
32 mm (1.26 inches)	14 mm (0.55 inches)		7 2	
32 mm (1.26 inches)	16 mm (0.63 inches)		7 3	
32 mm (1.26 inches)	19 mm (0.75 inches)		7 4	
32 mm (1.26 inches)	22 mm (0.87 inches)		7 5	
32 mm (1.26 inches)	25 mm (0.98 inches)		7 6	
34 mm (1.34 inches)	9 mm (0.35 inches)		8 0	
34 mm (1.34 inches)	13 mm (0.51 inches)		8 1	
34 mm (1.34 inches)	14 mm (0.55 inches)		8 2	
34 mm (1.34 inches)	16 mm (0.63 inches)		8 3	
34 mm (1.34 inches)	19 mm (0.75 inches)		8 4	
34 mm (1.34 inches)	22 mm (0.87 inches)		8 5	
34 mm (1.34 inches)	25 mm (0.98 inches)		8 6	
Customer-specific			9 0	L [1] Y
Process connection				
Thread for 7MT2... (screw-in thermowells)				
• G½"			1 A	
• G¾"			1 B	
• G1"			1 C	
• R½"			1 D	
• R¾"			1 E	

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Selection and ordering data (continued)

Barstock thermowells according to ASME B40.9	Article No. 7MT ● ● ● ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
• R1"	1 F	
• ½" NPT	1 G	
• ¾" NPT	1 H	
• 1" NPT	1 J	
• M20 × 1.5	1 L	
• M27 × 2	1 M	
• M33 × 2	1 N	
Flange according to EN 1092-1 for 7MT4... (Flange thermowell), Sealing surface initial: B1 for uncoated variants, as of Class 900 RTJ		
• DN25, PN10 - 40	2 D	
• DN40, PN10 - 40	2 F	
• DN50, PN10 - 16	2 H	
• DN50, PN25 - 40	2 J	
Flange according to ASME B16.5 for 7MT4... (Flange thermowell), Sealing surface initial: RF for uncoated variants		
• 1.00 inch; Class 150	3 E	
• 1.00 inch; Class 300	3 F	
• 1.00 inch; Class 600	3 G	
• 1.00 inch; Class 900/1500	3 H	
• 1.50 inches; Class 150	3 K	
• 1.50 inches; Class 300	3 L	
• 1.50 inches; Class 600	3 M	
• 1.50 inches; Class 900/1500	3 N	
• 2.00 inches; Class 150	3 R	
• 2.00 inches; Class 300	3 S	
• 2.00 inches; Class 600	3 T	
• 2.00 inches; Class 900/1500	3 U	
• 3.00 inches; Class 150	4 C	
• 3.00 inches; Class 300	4 D	
• 3.00 inches; Class 600	4 E	
• 3.00 inches; Class 900	4 F	
• 3.00 inches; Class 1500	4 L	
• 4.00 inches; Class 150	4 G	
• 4.00 inches; Class 300	4 H	
• 4.00 inches; Class 600	4 J	
• 4.00 inches; Class 900	4 K	
• 4.00 inches; Class 1500	4 M	
For 7MT3... and 7MT5... (weld-in and Van Stone thermowells)		
• None (for optional collar flanges for Van Stone, see "Options")	0 N	

Process connection material (identical to thermowell)	Screw-in	Weld-in	Flange	Van Stone		Order code ●
316L / 1.4404	✓		✓	✓		B
Carbon steel / A105	✓		✓			C
Hastelloy C276 / 2.4819 (flange with flanged wheel)			✓			E
Hastelloy C22 / 2.4602			✓			F
304L / 1.4306	✓		✓			H
321 / 1.4541	✓		✓			K
Monel alloy 400 / 2.4360 (flange with flanged wheel)			✓			L
Tantalum (barrel, thermowell made of 316/TI/L)			✓			Q
Duplex / 1.4462			✓			P
Super duplex			✓			R
PFA coating (thermowell made of 316/TI/L)			✓			U

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Selection and ordering data (continued)

Barstock thermowells according to ASME B40.9					Article No. 7MT ● ● ● ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
ECTFE (HALAR) (thermowell made of 316/TI/L)			✓		V	
Stellite coating (thermowell made of 316/TI/L)			✓		W	
Customer-specific	✓		✓	✓	9 N N	N [1] Y
Bore hole D3						
D3 = 6.6 mm (0.260 inches)					2	
Customer-specific					9	R [1] Y

Options Add "-Z" to article number and specify options; separate multiple expansions with "+".	Order code
Inspection certificate according to EN 10204-3.1	
Material certificate, material in contact with media	C12
PMI (positive material ident.), in contact with media	C15
Pressure test	C31
Helium leak test	C32
Dye-penetration test	C33
Compliance with order	C35
X-ray test for welding seams	C41
Ultrasound test for welding seams	C44
X-ray test concentricity of bore hole	C47
Ultrasound test concentricity of bore hole	C48
MR-01-75 compliance	C50
MR-01-03 compliance	C53
Grease-free (cleaned for oxygen applications, for example)	C51
CRN marking	C60
Additional options	
Thread protection stainless steel plug and chain	A55
Forged flange	A76
Sealing surface with concentric lines	A77
Marking of the installation length (7MT4 flange versions only)	A78
TAG marking	Y15
Full penetration options	
Process connection welded	G02
Surface treatment, options on request	
Parts in contact with media stained, neutralized and passivated	W01
Parts in contact with media electropolished	W02
Additional flange sealing surfaces	
FF-Flat Face according to ASME B16.5	A70
RTJ ring type joint according to ASME B16.5	A71

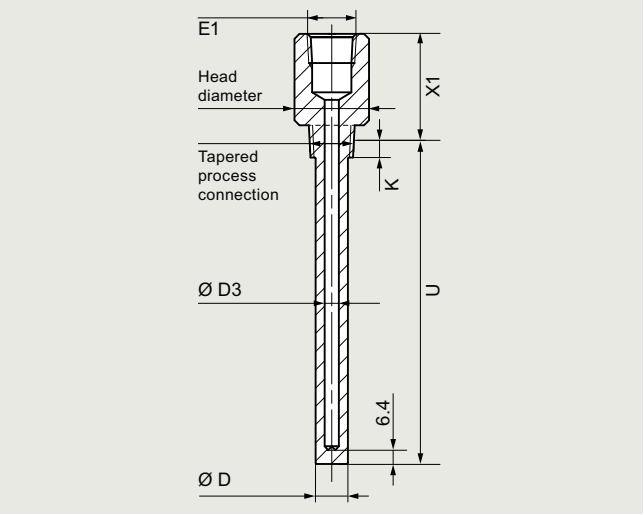
Options Add "-Z" to article number and specify options; separate multiple expansions with "+".	Order code
Type B2 according to EN1092-1	A72
Type C according to EN1092-1	A73
Type D according to EN1092-1	A74
Additional designs Add "-Z" to article number and specify plain text.	
Additional information	
Additional information in plain text: Thermowell (head diameter/X1/U/material)	G1Y
Additional information in plain text: AD root D [tip D2]	L1Y
Additional information in plain text: Process connection (material/type)	N1Y
Additional information in plain text: Bore hole D3:	R1Y
Customer single job production	
Length options U: Specify special installation length (in spec. area)	Y44
Length options X1: Specify special length extension (in spec. area)	Y45
Processing number of special design: Specify in plain text	Y99
Optional collar flanges 316L (Van Stone only)	
1.00 inch; Class 150 sealing surface Initial: RF	B24
1.00 inch; Class 300 sealing surface Initial: RF	B25
1.00 inch; Class 600 sealing surface Initial: RF	B26
1.50 inches; Class 150 sealing surface Initial: RF	B29
1.50 inches; Class 300 sealing surface Initial: RF	B30
1.50 inches; Class 600 sealing surface Initial: RF	B31
2.00 inches; Class 150 sealing surface Initial: RF	B35
2.00 inches; Class 300 sealing surface Initial: RF	B36
2.00 inches; Class 600 sealing surface Initial: RF	B37

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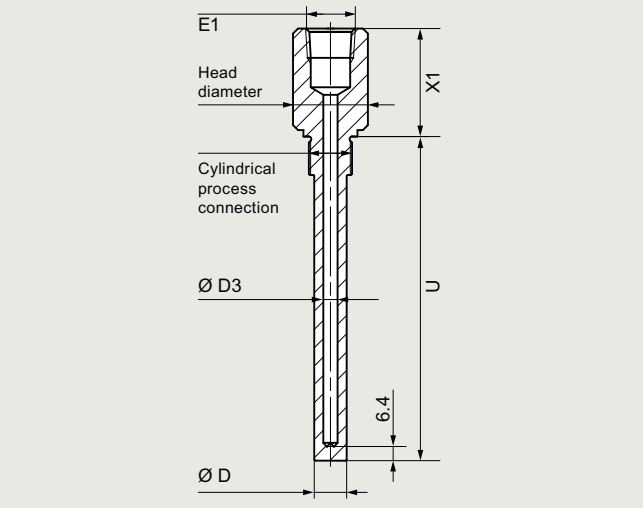
Dimensional drawings

Thermowells according to ASME B40.9

7MT21, screwed design, straight, tapered process connection

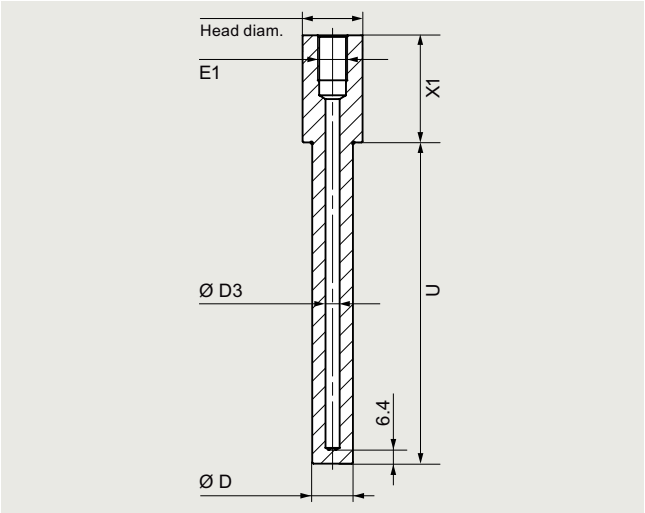


7MT21, screwed design, straight, cylindrical process connection

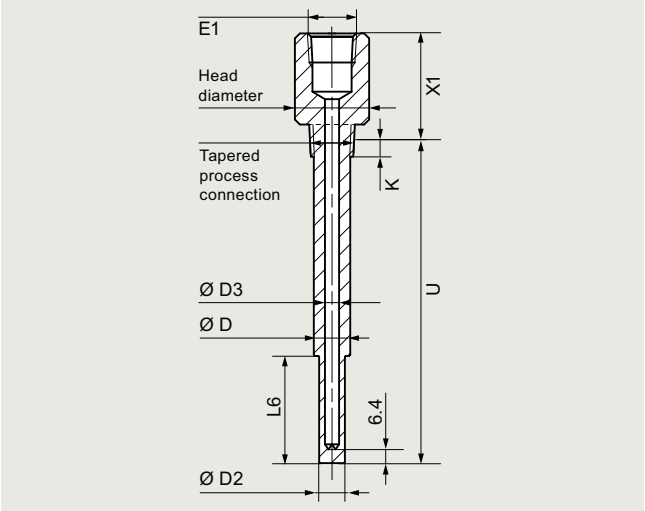


Dimensional drawings (continued)

7MT31, for welding, straight



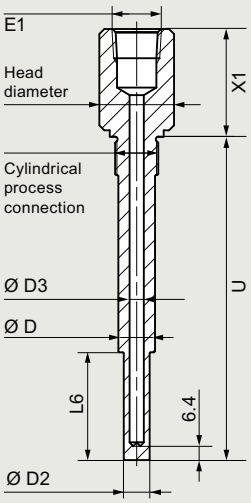
7MT22, screwed design, reduced, tapered process connection



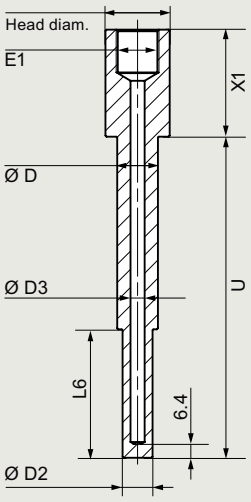
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Dimensional drawings (continued)

7MT22, screwed design, reduced, cylindrical process connection

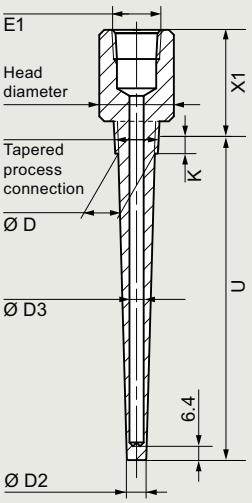


7MT32, for welding, reduced

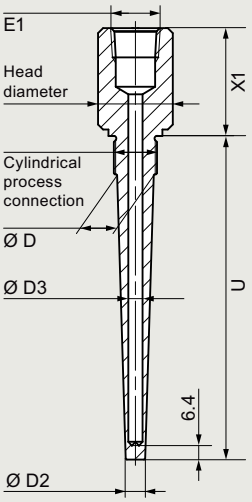


Dimensional drawings (continued)

7MT23, screwed design, tapered, tapered process connection



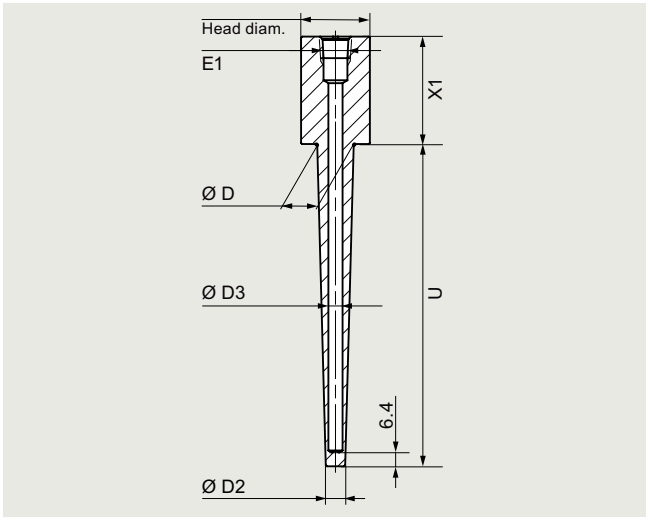
7MT23, screwed design, tapered, cylindrical process connection



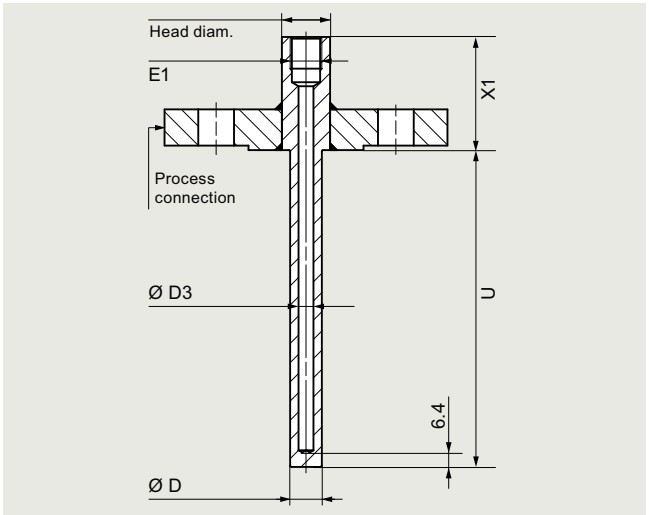
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Dimensional drawings (continued)

7MT33, for welding, tapered

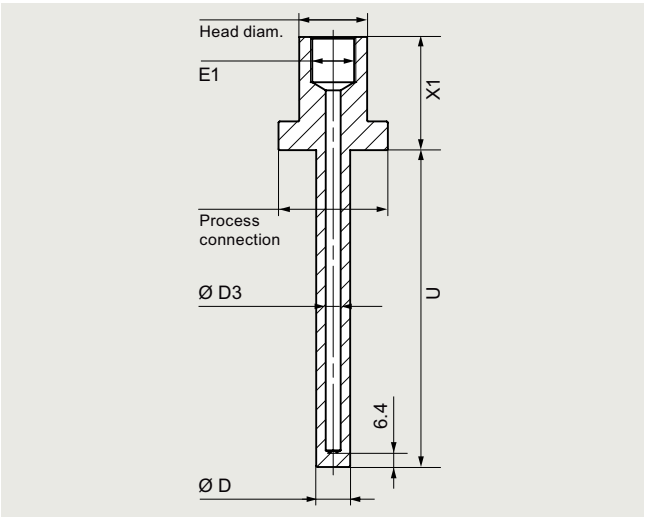


7MT41, flange connection, straight

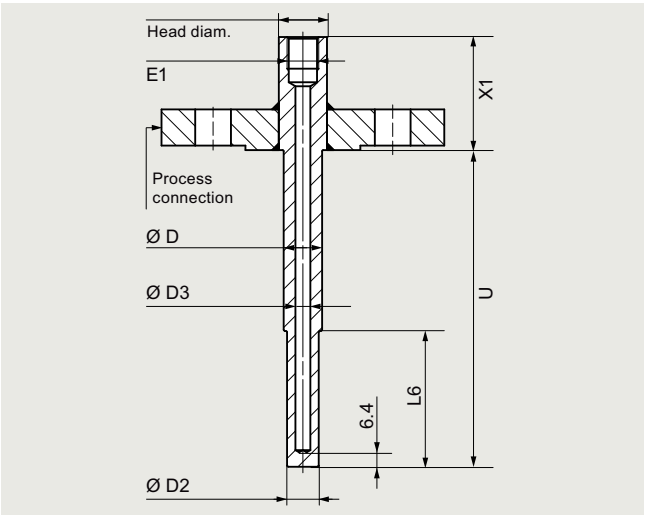


Dimensional drawings (continued)

7MT51, Van Stone type, straight



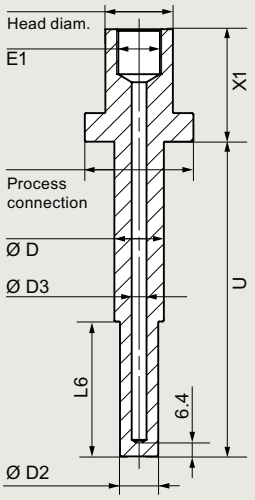
7MT42, flange connection, reduced



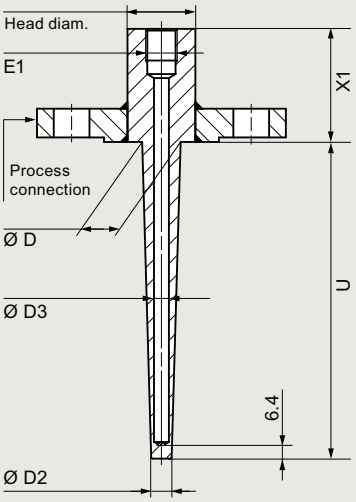
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Dimensional drawings (continued)

7MT52, Van Stone type, reduced

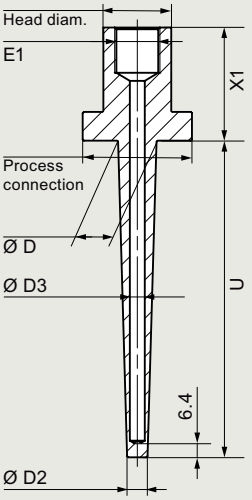


7MT43, flange connection, tapered



Dimensional drawings (continued)

7MT53 Van Stone type, tapered



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Overview



The following temperature transmitters are available for installation in the connection head:

SITRANS TH320

Programmable 2-wire temperature transmitter as a 4 to 20 mA version or with HART communication (4 to 20 mA), galvanic isolation. 1 sensor input for resistance thermometer and thermocouples.

SITRANS TH420

Programmable 2-wire temperature transmitter with HART communication (4 to 20 mA), galvanic isolation. 2 sensor inputs for resistance thermometers and thermocouples; therefore expanded functions such as hot backup (redundancy) and drift detection are possible.

Note:

- SITRANS TH320/TH420 can be installed in place of the connection socket or in the high spring flap. Retrofitting possible only in the high spring flap.
- If using intrinsically-safe temperature sensors any installed temperature transmitters must also be intrinsically-safe.

Selection and ordering data

You can find detailed information on the transmitters for the respective products under "Compact and head transmitters".

Transmitter to be fitted	Order code
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
Customer-specific setting of the built-in transmitter (specify settings in plain text)	**Y11**

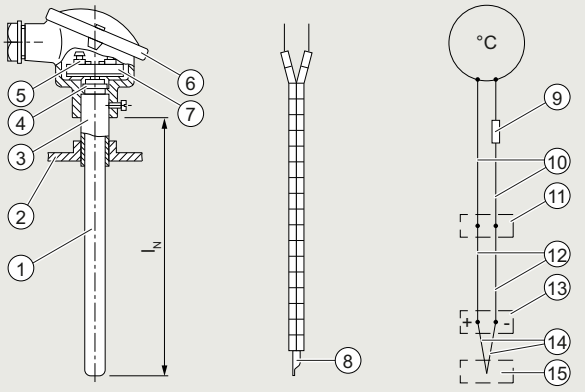
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Design

A thermocouple consists of

- the thermocouple (sensor)
- the mounting and terminal elements required.

The thermocouple consists of two wire elements made of different metals or metal alloys which are joined at one end, the measuring point, by soldering or welding:



Cross section of thermocouple | Thermocouple element with insulating beads | Connection diagram

l_N	Nominal length		
1	Ceramic thermowell	9	Balancing resistor
2	Locating flange	10	Lead
3	Support tube	11	Cold junction
4	Retaining ring	12	Extension lead
5	Terminal	13	Connection point
6	Connection head	14	Thermocouple element with positive and negative legs
7	Terminal block		
8	Temperature sensor	15	Measuring junction

Function

Measuring principle of the thermocouple element

If the measuring junction is exposed to a temperature different from that at the free ends of the thermocouple, a voltage (the thermoelectric voltage, Seebeck effect) is produced at these free ends. The magnitude of the thermoelectric voltage depends on the difference in temperature between the measuring junction and the free ends, and on the combination of materials in the thermocouple. Thermocouples always record a temperature difference. It is therefore essential to hold the free ends of a reference junction at a constant and known temperature in order to be able to determine the temperature at the measuring junction.

Calibration data for thermoelectric voltages and permissible deviations

The basic values of the thermoelectric voltages and the permissible deviations are specified for the commonly used material pairs in DIN IEC 584.

The thermocouples Cu-CuNi and Fe-CuNi to DIN 43710 are used for replacement purposes. Thermocouples of class 2 are supplied as standard. For more accurate measurements, thermocouples of Class 1 are available with half the DIN tolerance or with a test certificate. The tolerances only apply to the condition upon delivery.

During operation at high temperatures, the tolerances of the thermocouples may change due to absorption of foreign matter, oxidation or evaporation of alloy components.

Mode of operation

The thermocouples are extended from their connecting point by means of compensating cables to a point with a temperature which remains constant as far as possible (reference junction).

The compensating cables have the same color code as the associated thermocouple elements; the positive pole is marked in red. Correct polarity must be ensured since otherwise large errors will occur. Up to 200 °C, the same calibration data and tolerances apply to the compensating cables as to the corresponding thermocouples.

Protective fittings/thermowells

The thermocouple can be protected against mechanical stress and chemical attack by a ceramic or metal thermowell, which may be mounted using flanges, screwed glands or by welding into the pipe or vessel. The thermocouple element terminates in the connection head.

Installation examples with specification of the recommended thermocouples and thermowell materials can be found under "Integration" in the "Installation examples" table.

Owing to the different operating conditions, no guarantee can be given for protective fittings. The manufacturer is responsible for damages and measuring errors caused by wrong installation in compliance with the General Terms of Delivery if the instruments have been installed by the manufacturer and if the specifications for the operating conditions furnished by the customer were correct and sufficiently detailed.

Thermocouple elements are very compatible since it is almost always possible to adapt them in shape and size to the particular problem. The temperature-responsive part is almost point-shaped. Thermocouple elements are therefore particularly suitable for measuring rapidly changing temperatures.

Measuring insert and transport

The thermocouple wires are guided in a ceramic insulating pipe. With long lengths, this can also be in several parts in order to avoid or reduce breakage of the insulating pipe during transport. Normal transport conditions can be handled in this way. Small breaks in the measuring insert do not impair the function.

A sheathed thermocouple design or the use of special packaging can be clarified in advance for extreme transport conditions.

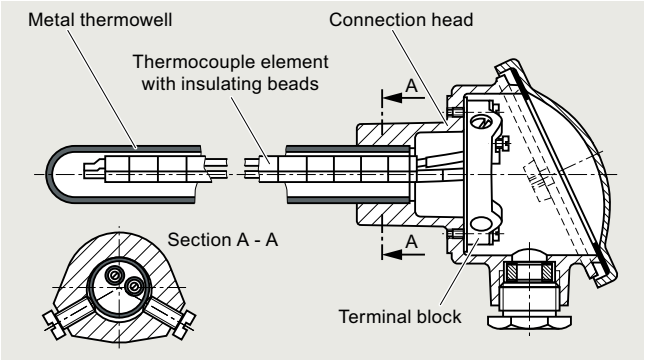
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Overview



The straight thermocouple is suitable for temperatures from 0 to 1250 °C (32 to 2282 °F) with metal thermowell and is available with built-in temperature transmitter.

Design



Straight thermocouple with base-metal thermocouple elements Ni Cr/Ni with metal thermowell

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Selection and ordering data

Notes

- The installation of a transmitter is only possible in the versions with high spring flap (7MC2000-....6).
- To order a temperature transmitter installed in the connection head, see "Temperature transmitters for installation in the connection head".

Straight thermocouple with thermocouples Ni Cr/Ni (type K) with metal thermowell	Article No. 7MC2000-	●	●	●	0	●
Click the article number for online configuration in the PIA Life Cycle Portal.						
Nominal length Specify customer-specific length with Y44, see order codes						
300 ... 500 mm (11.81 ... 19.68 inches) Initial: 500 mm (19.68 inches)		**1**				
501 ... 710 mm (19.72 ... 27.95 inches) Initial: 710 mm (27.95 inches)		**2**				
711 ... 1 000 mm (27.11 ... 39.37 inches) Initial: 1 000 mm (39.37 inches)		**3**				
Thermowell						
≤ 1 000 °C (1 832 °F) X 10 CrAl 24, material no. 1.4749 Diameter: 22 mm × 2 mm (0.87 inches × 0.079 inches) Leg diameter: 2 mm (0.08 inches)			**D**			
≤ 1 100 °C (2 012 °F) X 18 CrN28, material no. 1.4749 Diameter: 26 mm × 4 mm (1.02 × 0.16 inches) Leg diameter: 3 mm (0.12 inches)			**E**			
≤ 1 200 °C (2 192 °F) X 15 CrNi Si 24 19, material no. 1.4841 Diameter: 22 mm × 1.3 mm (0.87 inches × 0.051 inches) Leg diameter: 2 mm (0.08 inches)			**F**			
≤ 1 250 °C (2 282 °F) CrAl 205 (Kanthal AF), material no. 1.4767 Diameter: 22 mm × 1.3 mm (0.87 inches × 0.051 inches) Leg diameter: 3 mm (0.12 inches)			**H**			
Number of thermocouples						
1 × thermocouple				**C**		
2 × thermocouples				**D**		
Connection head, form A						
Made of cast light metal with 1 cable entry and:						
• Screw cover						**1**
• High spring flap						**6**

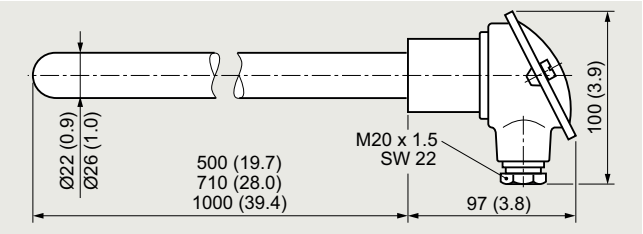
Options	Order code
Add "**-Z**" to article number and specify order code and plain text if needed.	
Tag plate made of stainless steel, specify label/tag no. in plain text	**Y15**
Perform factory calibration at 1 point, specify desired temperature in plain text. Note If there are multiple calibration points, order as many as necessary.	**Y33**
Installation length "U" customer-specific Select range, plain text specification of desired length (no specification = standard length)	**Y44**
Specify special design in plain text	**Y98**
Handling number of the special design	**Y99**

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Technical specifications

Straight thermocouple	
Thermocouples	Ni Cr/Ni Type K
• Quantity	1 or 2
• Leg diameter	2 to 3 mm (0.08 to 0.12 inch)
• Insulation of the legs	Insulating pipe
Thermowell	Metals
Connection head	Form A, from light metal casting, with a cable entry

Dimensional drawings



Straight thermocouple, dimensions in mm (inch)

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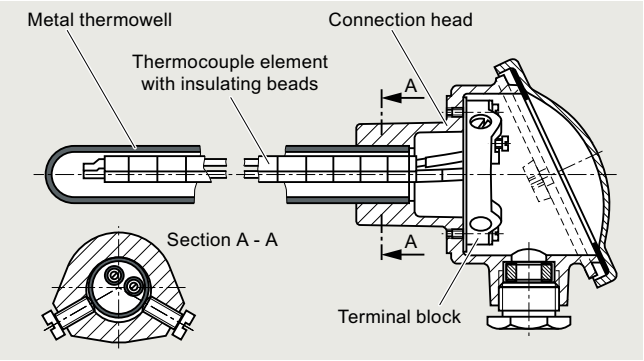
Selection and ordering data

Metal thermowells for straight thermocouples according to EN 50446

	Article No.
X 10 CrAl 24, material no. 1.4749 ⌀ 22 × 2 mm (⌀ 0.87 × 0.08 inch), 0.55 ... 1.10 kg (1.21 ... 2.42 lbs), dished Nominal length/thermowell length in mm (inch):	
• 500 (19.7)/520 (20.5)	**7MC2900-1DA**
• 710 (28.0)/730 (28.7)	**7MC2900-2DA**
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3DA**
X 18 CrN28, material no. 1.4749 ⌀ 26 × 4 mm (⌀ 1.02 × 0.16 inches), 1.25 ... 2.20 kg (2.76 ... 4.85 lbs), dished Nominal length/thermowell length in mm (inch):	
• 500 (19.7)/520 (20.5)	**7MC2900-1EC**
• 710 (28.0)/730 (28.7)	**7MC2900-2EC**
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3EC**
X 15 CrNiSi 25 20, material no. 1.4841 ⌀ 22 × 2 mm (⌀ 0.87 × 0.08 inch), 1.05 kg (2.31 lbs), dished Nominal length/thermowell length in mm (inch):	
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3FA**
CrAl 205 (Kanthal AF), material no. 1.4767 ⌀ 22 × 2 mm (⌀ 0.87 × 0.05 inch), 0.55 ... 1.10 kg (1.21 ... 2.42 lbs) Nominal length/thermowell length in mm (inch):	
• 500 (19.7)/520 (20.5)	**7MC2900-1HA**
• 710 (28.0)/730 (28.7)	**7MC2900-2HA**
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3HA**

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Design



Straight thermocouple with base-metal thermocouple elements Ni Cr/Ni with metal thermowell

Selection and ordering data

Thermocouples for straight thermocouples according to DIN 43733

	Article No.
Base thermocouple with isolating pipe Wire diameter 3 mm (0.12 inch) Ni Cr/Ni, up to 1 000 °C (max. 1 300 °C), (up to 1 832 °F (max. 2 372 °F)) 0.55 ... 2.10 kg (1.21 ... 4.63 lbs) Nominal length *L1*/Thermowell length *L2* in mm (inch):	
• 500 (19.7)/540 (21.3)	**7MC2903-1CA**
• 1 000 (39.4)/1 040 (40.9)	**7MC2903-3CA**

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Overview

Connection head, type A (without terminal base and connection terminals) for thermowell diameter (drill hole = thermowell diameter + 0.5 mm) (0.02 inch)

Selection and ordering data

Connection heads for straight thermocouples

	Article No.
Connection head, type A (without terminal base and terminals), 1 cable entry, degree of protection IP53, 0.35 kg (0.77 lb)	
Light metal, screw-on cover, for thermowell diameter in mm (inch) (hole = thermowell diameter +0.5 mm) (0.02 inch)	
• 22 (0.87)	**7MC2905-1AA**
• 26 (1.02)	**7MC2905-1BA**
Light metal, high spring flap, for thermowell diameter in mm (inch) (hole = thermowell diameter +0.5 mm) (0.02 inch)	
• 22 (0.87)	**7MC2905-4AA**
• 26 (1.02)	**7MC2905-4BA**

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Overview

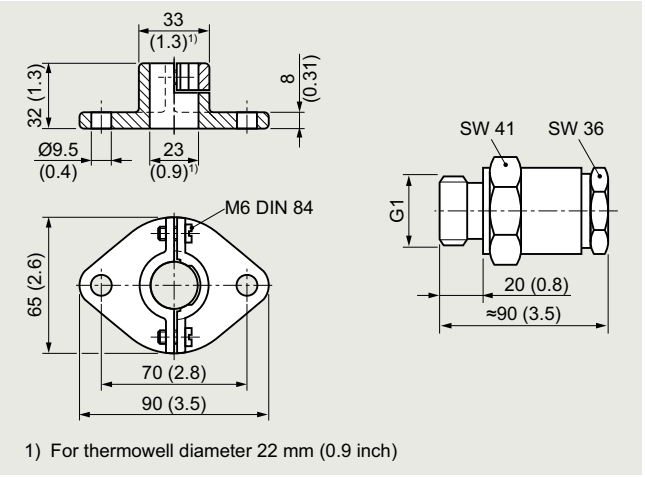
- Mounting base
- Terminal
- Gaskets
- Washers
- Stop flange
- Thread sleeve

Selection and ordering data

Installation accessories for connection heads for straight thermocouples

	Article No.
Terminal base without terminals for base thermocouples; 0.06 kg (0.13 lb)	**7MC2998-1AA**
Terminal for base thermocouples; 0.01 kg (0.02 lb)	**7MC2998-1BA**
Set of sealing rings (100 units) for the lid of the connection head; 0.01 kg (0.02 lb)	**7MC2998-1CA**
Set of washers (100 units) for the terminal base; 0.01 kg (0.02 lb)	**7MC2998-1CB**
Stop flange, adjustable, from GTW	
• For thermowell outer diameter 22 mm (0.87 inch); 0.35 kg (0.77 lb)	**7MC2998-2CB**
• For thermowell outer diameter 26 mm (1.02 inches); 0.32 kg (0.71 lb)	**7MC2998-2CC**
Threaded sleeve, gas-tight up to 1 bar (14.5 psi), adjustable, material no. 1.0718, with seal; 0.40 kg (0.88 lb)	
• For thermowell outer diameter 22 mm (0.87 inch), **G1**	**7MC2998-2DB**
• For thermowell outer diameter 26 mm (1.02 inches), **G1**	**7MC2998-2DC**

Dimensional drawings

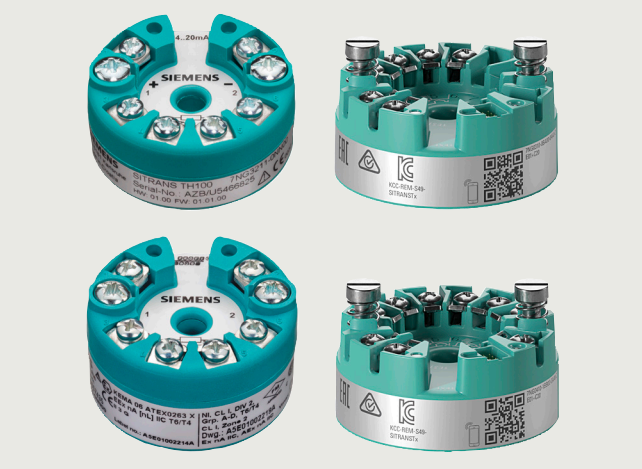


1) For thermowell diameter 22 mm (0.9 inch)

Stop flange according to DIN 43734 (left) and thread sleeve (right) for installing straight thermocouples, dimensions in mm (inch)

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Overview



The following temperature transmitters are available for installation in the connection head:

SITRANS TH100

Programmable 2-wire temperature transmitter (4 to 20 mA), without galvanic isolation, only for Pt100 resistance thermometers.

SITRANS TH320

Programmable 2-wire temperature transmitter as a 4 to 20 mA version or with HART communication (4 to 20 mA), galvanic isolation. 1 sensor input for resistance thermometer and thermocouples.

SITRANS TH420

Programmable 2-wire temperature transmitter with HART communication (4 to 20 mA), galvanic isolation. 2 sensor inputs for resistance thermometers and thermocouples; therefore expanded functions such as hot backup (redundancy) and drift detection are possible.

Note:

- SITRANS TH100/TH320/TH420 can be installed in place of the terminal base or in the high hinged cover. Retrofitting possible only in the high hinged cover.
- If using intrinsically-safe temperature sensors any installed temperature transmitters must also be intrinsically-safe.

Selection and ordering data

You can find detailed information on the transmitters for the respective products under "Compact and head transmitters".

Transmitter to be fitted	Order code
To order the sensor with a built-in temperature transmitter, add "**-Z**" to the article number of the sensor, and supplement with the following order code:	
SITRANS TH100, input 1 × Pt100, 4 ... 20 mA	**T12**
SITRANS TH320, input 1 × universal, 4 ... 20 mA	**T24**
SITRANS TH320, input 1 × universal, HART	**T34**
SITRANS TH420, input 2 × universal, HART	**T35**
Customer-specific setting of the built-in transmitter (specify settings in plain text)	**Y11**

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Overview



The flue gas resistance thermometer with connection head is suitable for the temperature range of -50 to +600 °C (-58 to +1112 °F) and is also available with built-in temperature transmitter.
Please order stop flange or thread sleeve separately.

Selection and ordering data

Notes

- To order a temperature transmitter installed in the connection head, see "Temperature transmitters for installation in the connection head".
- Individual parts: Measuring inserts, see "Accessories".

Flue gas resistance thermometer **Measurement resistance:** **(measurement winding) embedded in ceramic** **1 Pt100 measurement resistance, 3-wire connection**	**Article No.**	
Installation length/mm (inch)		
300 ... 500 mm: (11.8 ... 19.69 inches): Initial 500 mm (19.7 inches)	**7MC1000-1BA2**	●
501 ... 710 mm: (19.72 ... 27.95 inches): Initial 710 mm (27.95 inches)	**7MC1000-2BA2**	●
711 ... 1 000 mm: (28 ... 39.37 inches): Initial 1 000 mm (39.37 inches)	**7MC1000-3BA2**	●
1 001 ... 1 400 mm: (39.41 ... 55.12 inches): Initial 1 400 mm (19.7 inches)	**7MC1000-4BA2**	●
1 401 ... 2 000 mm: (55.16 ... 78.7 inches): Initial 2 000 mm (78.7 inches)	**7MC1000-5BA2**	●
Connection head, form B		
Made of cast light metal with 1 cable entry and		
• Screw cover		**1**
• Standard spring flap		**4**
• High spring flap		**6**

Options	**Order code**
Add "**-Z**" to article number and specify order code and plain text if needed.	
Tag plate made of stainless steel, specify label/tag no. in plain text	**Y15**
Perform factory calibration at 1 point, specify desired temperature in plain text Note If there are multiple calibration points, order as many as necessary.	**Y33**
Specify special design in plain text	**Y98**
Handling number special design	**Y99**

Accessories

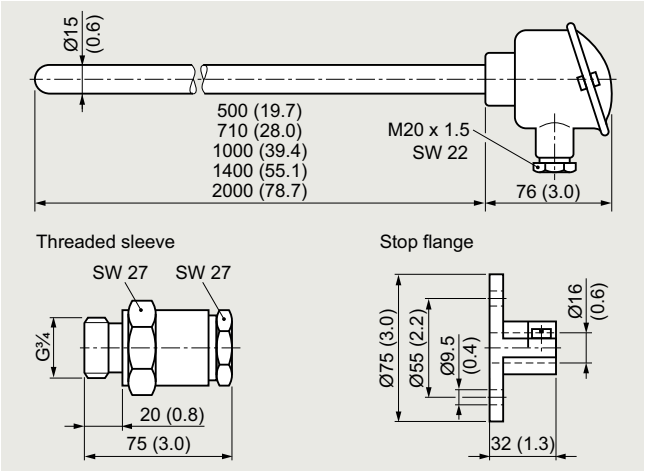
	Article No.
Stop flange	
Adjustable, acc. to DIN 43734; Material: GTW 35, material no. 0.8035, for thermowell diameter: 15 mm (0.59 inches), 0.3 kg (0.66 lb)	**7MC2998-5CA**
Gas-tight threaded sleeve	
Material: 9 SMnPb 28, material no. 1.0718, for thermowell outer diameter 15 mm (0.59 inches), 0.4 kg (0.88 lb)	
Screw-in thread G¾ with seal	**7MC2998-5DA**
Screw-in thread G½ with seal	**7MC2998-5DC**

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Technical specifications

Flue gas resistance thermometer with connection head	
Design	According to DIN 43764: Thermometer without mounting
Thermowell	
• Form	1, DIN 43772; cylindrical, Ø 15 mm (0.59 inches), wall thickness 3 mm (0.12 inches), seamless
• Material	St 35.8, Material No. 1.0305, enameled
• Load rating	1 bar (14.5 psi) overpressure, according to DIN 43772
Measuring insert	Exchangeable, with measuring insert pipe (Ø 8 mm (0.31 inches)) made of stainless steel; terminal base with pressure springs

Dimensional drawings



Flue gas resistance thermometer with connection head, dimensions in mm (inch)

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Overview

The resistance thermometer for damp areas is suitable for the temperature range of -30 to +60 °C (-22 to +140 °F).

Selection and ordering data

Notes

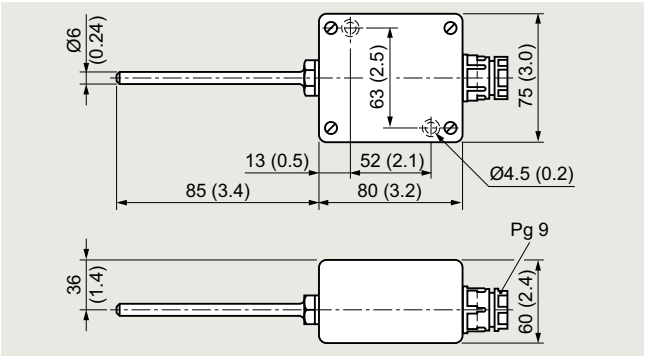
- To order a temperature transmitter installed in the connection head, see "Temperature transmitters for installation in the connection head".
- Subsequent installation of SITRANS TH series head transmitters possible at any time.

Resistance thermometer for damp rooms	Article No.
Thermowell out of stainless steel	
• With 1 Pt100 measurement resistance 0.1 kg (0.22 lb)	**7MC1027-1AA**
• With 2 Pt100 measuring resistor 0.1 kg (0.22 lb)	**7MC1027-1AB**
Options	
Add "**-Z**" to article number and specify order code and plain text if needed.	Order code
Tag plate made of stainless steel, specify label/tag no. in plain text	**Y15**
Perform factory calibration at 1 point, specify desired temperature in plain text Note If there are multiple calibration points, order as many as necessary.	**Y33**
Specify special design in plain text	**Y98**
Handling number special design	**Y99**

Technical specifications

Resistance thermometer for damp rooms	
Thermowell	Made of stainless steel
Connection head	From light metal casting, with cable entry; made of plastic on request
Measuring insert	1 or 2 Pt measurement resistors according to EN 60751, 2 or 3-wire connection, Class B
Degree of protection	IP65 according to EN 60529

Dimensional drawings



Resistance thermometer for damp rooms, dimensions in mm (inch)

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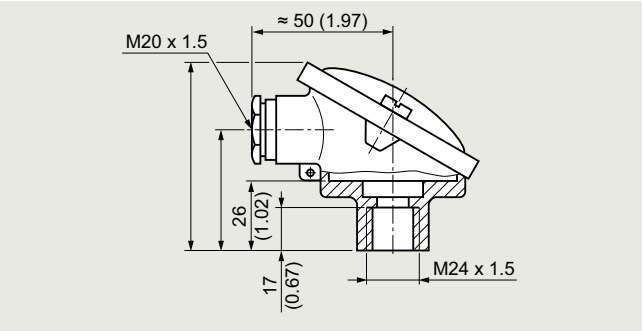
Selection and ordering data

Connection heads type B for SITRANS TS500

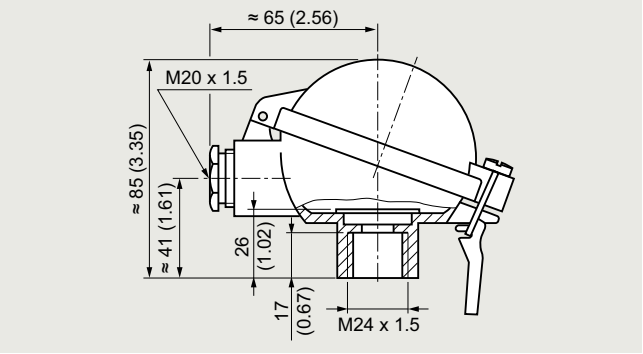
	Article No.
Degree of protection IP54	
Connection head type: similar to BA0; aluminum; flange cover	**7MC1907-1BA**
Degree of protection IP65	
Connection head type: similar to BB0; aluminum; small spring flap	**7MC1907-1BF**
Connection head type: similar to BC0; aluminum; high spring flap	**7MC1907-1BL**
Quick-release lock for connection heads BB0, BC0, degree of protection of connection head reduced to IP20, weight: 0.02 kg (0.04 lb)	**7MC1907-1BS**

Dimensional drawings

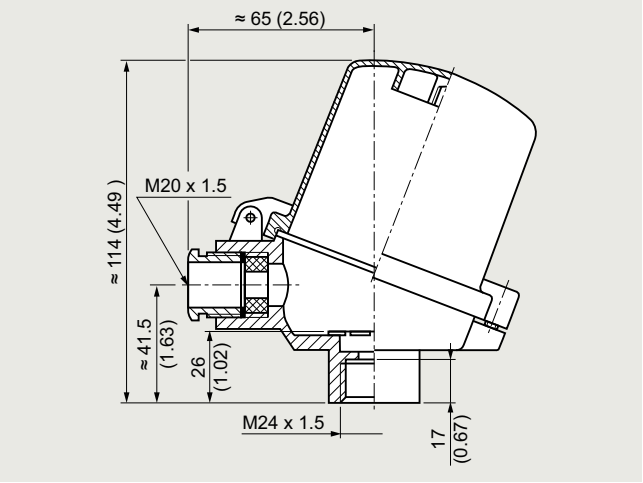
Connection heads type B for SITRANS TS500



Connection head, Type B, degree of protection IP54, made of aluminum, with screw cover, dimensions in mm (inch)



Connection head, Type B, degree of protection IP65, made of aluminum, with standard spring flap, dimensions in mm (inch)



Connection head, Type B, degree of protection IP65, made of aluminum, with high spring flap, dimensions in mm (inch)

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Overview



SITRANS TH100 Slim is particularly suited for the production of compact thermometers with integrated transmitter.

Its cylindrical stainless steel enclosure is simply welded to the main body of the compact thermometer.

Its compact design makes the SITRANS TH100 Slim the ideal solution for manufacturers from a wide variety of industries.

For the parameterization, the SIPROM T software is used in combination with the modem for SITRANS TH100/TH200.

Benefits

- Transmitter in 2-wire system with M12 device plug for mounting on compact thermometer.
- Solution for easy and space-saving temperature measurements in a variety of industries.
- Programmable; as a result, the sensor connection, measuring range and much more are programmable.

Application

The SITRANS TH100 Slim transmitter can be used in combination with Pt100 compact resistance thermometers for temperature measurement in all industries. Thanks to its compact design, it can be mounted to all kinds of designs.

The output signal is a load-independent direct current of 4 to 20 mA which is proportional to the temperature.

Parameterization is implemented over the PC using the parameterization software SIPROM T and the modem for SITRANS TH100/TH200. If you already have a "Modem for SITRANS TK" (article number 7NG3190-6KB), you can continue to use this for parameterization of the SITRANS TH100.

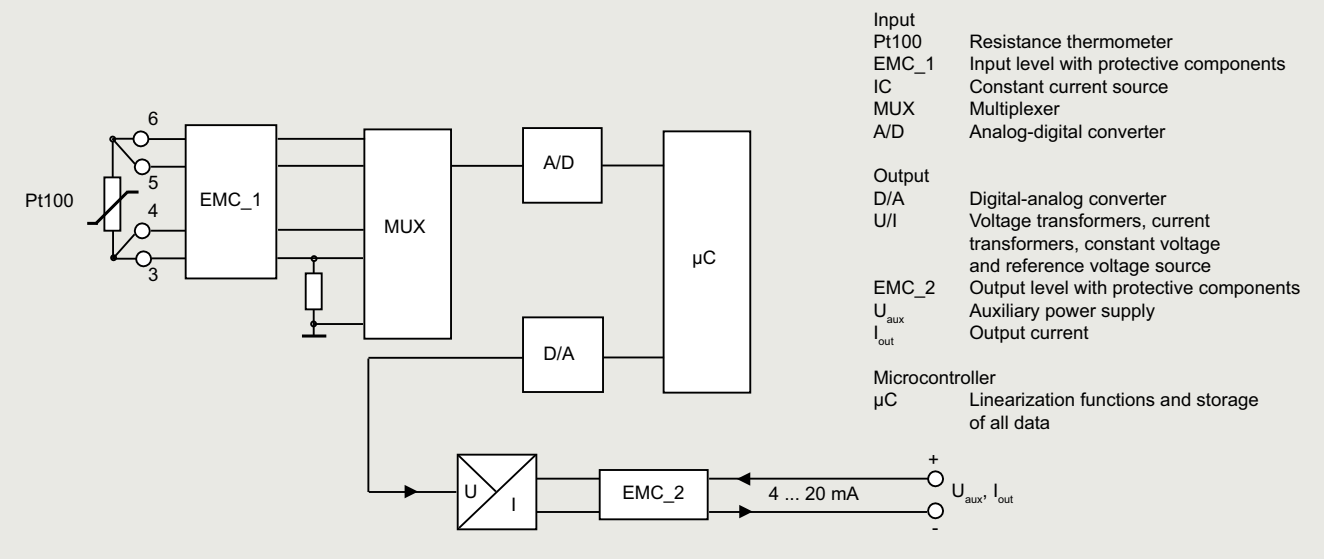
Function

Mode of operation

The measured signal supplied by a Pt100 resistance thermometer (2, 3 or 4-wire connection) is amplified in the input stage. The voltage, which is proportional to the input variable, is then converted into digital signals by a multiplexer in an analog-to-digital converter. They are converted in the microcontroller in accordance with the sensor characteristic and additional parameters (measuring range, damping, ambient temperature, etc.).

The signal prepared in this way is converted in an analog-to-digital converter into a load-independent direct current of 4 to 20 mA.

An EMC filter protects the input and output circuits against electromagnetic interferences.



SITRANS TH100 Slim, function block diagram

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Selection and ordering data

SITRANS TH100 Slim temperature transmitters for Pt100	Article No.
For welding to compact thermometers 2-wire system, 4 ... 20 mA, programmable, without galvanic isolation	
• Without explosion protection	**7NG3150-0NN00**
Accessories	
Modem	
Modem with USB interface and SIPROM T software	**7NG3092-8KN**

Technical specifications

SITRANS TH100 Slim (Pt100)	
Input	
Resistance thermometer	
Measured variable	Temperature
Input type	Pt100 according to IEC 60751
Characteristic curve	Temperature-linear
Connection type	2, 3, 4-wire connection
Resolution	14 bit
Measuring accuracy	< 0.25 °C (0.45 °F)
Repeatability	< 0.1 °C (0.18 °F)
Measuring current	Approx. 0.4 mA
Measuring cycle	< 0.7 s
Measuring range	-60 ... +160 °C (-76 ... +320 °F)
Measuring span	25 ... 220 °C (45 ... 396 °F)
Unit	°C or °F
Offset	Programmable: -100 ... +100 °C (-180 ... +180 °F)
Wire resistance	Max. 20 Ω (total from feeder and return conductor)
Noise suppression	50 and 60 Hz
Output	
Output signal	4 ... 20 mA, 2-wire
Auxiliary power	8.5 ... 36 V DC (30 V for Ex)
Max. load	$(U_{aux} - 8.5\ V)/0.023\ A$
Overrange	3.6 ... 23 mA, continuously adjustable (factory setting: 3.84 ... 20.5 mA)
Error signal (in the event of sensor breakage)	3.6 ... 23 mA, continuously adjustable (factory setting: 3.6 mA or 22.8 mA)
Damping time	0 ... 30 s
Protection	Against reverse polarity
Resolution	12 bit
Accuracy at 23 °C (73.4 °F)	< 0.1% of measuring span
Temperature influence	< 0.13%/10 °C (0.13%/18 °F)
Effect of auxiliary power	< 0.02% of measuring span/V
Effect of load impedance	< 0.055% of max. measuring span/100 Ω
Long-term drift	• < 0.025% of the max. measuring span in the first month • < 0.035% of the max. measuring span after one year • < 0.05% of the max. measuring span after 5 years
Ambient conditions	
Ambient temperature range	-40 ... +85 °C (-40 ... +185 °F)
Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)
Relative humidity	98%, with condensation
Electromagnetic compatibility	According to EN 61326 and NAMUR NE21
Structural design	
Weight	42 g (0.093 lbs)
Dimensions	See dimensional drawing
Material	316L stainless steel
Degree of protection according to IEC 60529	
• Enclosure	IP67

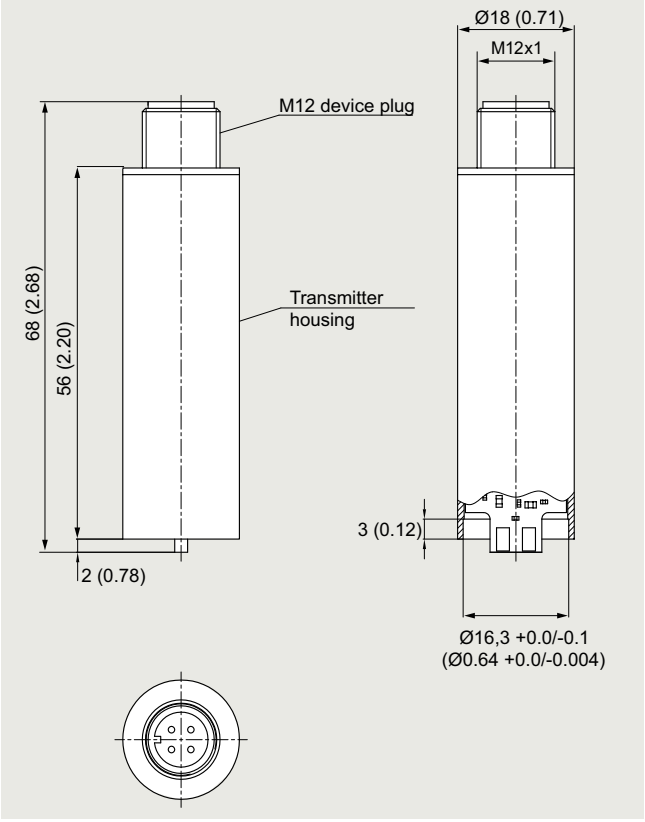
Technical specifications (continued)

SITRANS TH100 Slim (Pt100)	
Software requirements for SIPROM T	
PC operating system	Windows 10, 7, ME, 2000 and XP; also Windows 95, 98 and 98SE, but only in connection with RS 232 modem

Factory setting:

- Pt100 (IEC 751) in the 3-wire connection
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current in the event of sensor breakage: 22.8 mA
- Sensor offset: 0 °C (0 °F)
- Damping 0.0 s

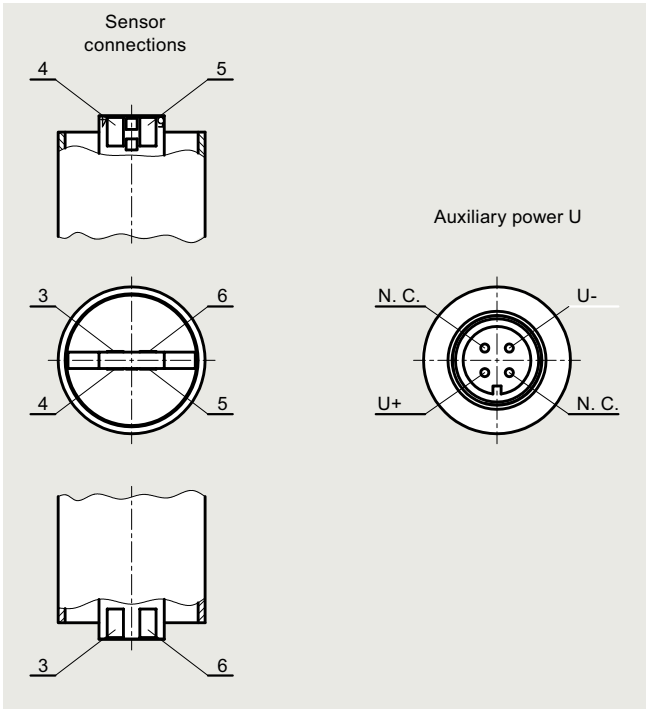
Dimensional drawings



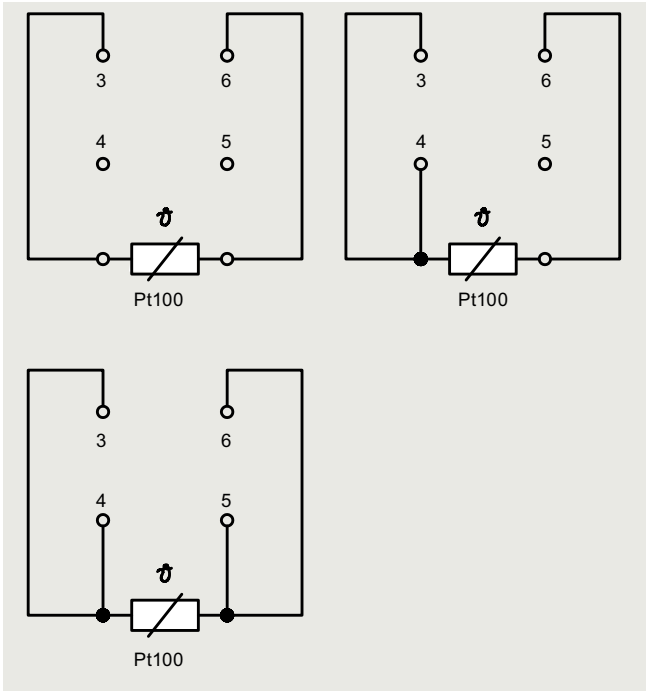
SITRANS TH100 Slim, dimensions in mm (inch)

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Circuit diagrams



SITRANS TH100 Slim, auxiliary power and sensor connection



SITRANS TH100 Slim, sensor connection assignment

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Overview



The SITRANS TH100, which represents an economical alternative by dispensing with galvanic isolation and universal sensor connection, is ideally suited for Pt100 measurements.

For the parameterization, the SIPROM T software is used in combination with the modem for SITRANS TH100/TH200.

Its compact design makes the SITRANS TH100 suitable for retrofitting measuring points or replacing analog transmitters.

The transmitter is available in a non-Ex version and in a version suitable for use in hazardous areas.

Benefits

- Transmitter with 2-wire system
- Mounting in connection head, type B or larger or on DIN rail
- Programmable; as a result, the sensor connection, measuring range and much more are programmable
- Intrinsically safe version for use in hazardous areas

Application

The SITRANS TH100 transmitter can be used for temperature measurement with Pt100 resistance thermometers in all industries. Its compact size means that it can be installed in connection heads of type B or larger.

The output signal is a load-independent direct current of 4 to 20 mA which is proportional to the temperature.

Parameterization is implemented over the PC using the parameterization software SIPROM T and the modem for SITRANS TH100/TH200. If you already have a "Modem for SITRANS TK" (article number 7NG3190-6KB), you can continue to use this for parameterization of the SITRANS TH100.

Transmitters of the "intrinsically safe" type of protection can be installed within potentially explosive atmospheres. The devices meet the directive 2014/34/EU (ATEX) as well as the FM and CSA requirements.

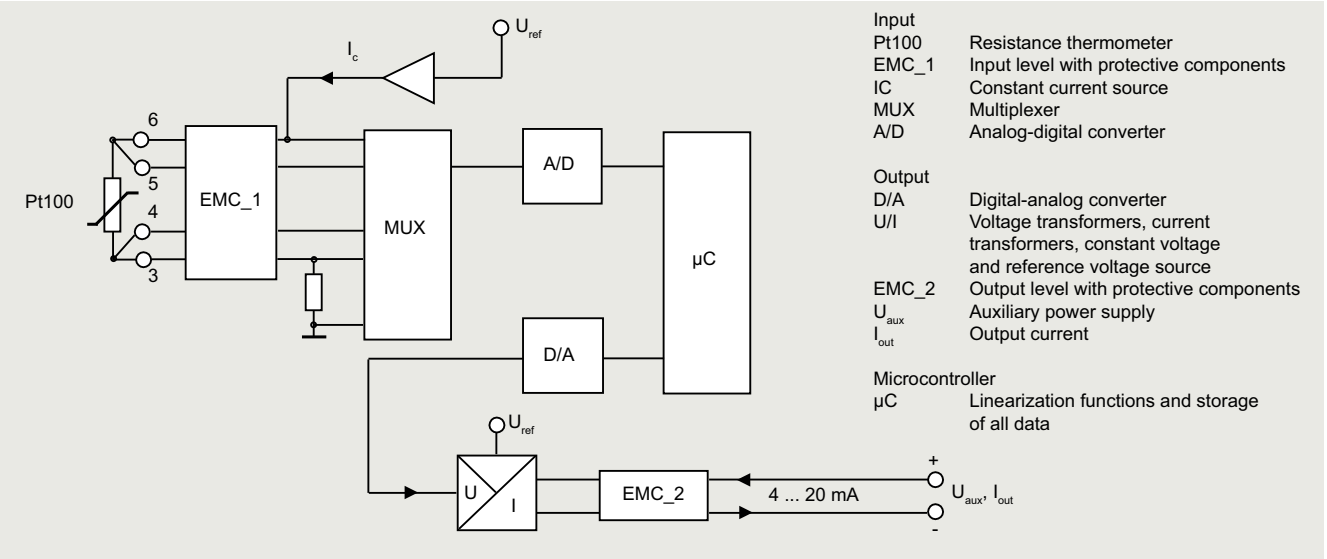
Function

Mode of operation

The measured signal supplied by a Pt100 resistance thermometer (2, 3 or 4-wire connection) is amplified in the input stage. The voltage, which is proportional to the input variable, is then converted into digital signals by a multiplexer in an analog-to-digital converter. They are converted in the microcontroller in accordance with the sensor characteristic and further parameters (measuring range, damping, ambient temperature, etc.).

The signal prepared in this way is converted in an analog-to-digital converter into a load-independent direct current of 4 to 20 mA.

An EMC filter protects the input and output circuits against electromagnetic interferences.



SITRANS TH100, function block diagram

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Selection and ordering data

	Article No.
SITRANS TH100 head transmitter for Pt100 For installation in connection head type B, 2-wire system 4 ... 20 mA, programmable, without galvanic isolation	
Without explosion protection	**7NG3211-0NN00**
With explosion protection "Intrinsic safety" type of protection and for zone 2	
• According to ATEX	**7NG3211-0AN00**
• According to FM ($_cFM_{US}$)	**7NG3211-0BN00**

Options **Add "-Z" to article number, specify order code and, if applicable, plain text**	**Order code**
Test report (5 measuring points)	**C11**
Customer-specific programming	
Specify measuring range to be set in plain text (max. 5 digits): Y01: ... to ... °C, °F	**Y01**[1]
Measuring point number (TAG) max. 8 characters	**Y17**[2]
Measuring point description, max. 16 characters	**Y23**[2]
Pt100 (IEC) 2-wire, R_L = 0 Ω	**U02**[3]
Pt100 (IEC) 3-wire	**U03**[3]
Pt100 (IEC) 4-wire	**U04**[3]
Enter special deviating customer-specific setting in plain text	**Y09**[4]
Fault current 3.6 mA (instead of 22.8 mA)	**U36**[2]

1) For customer-specific programming for RTD and TC, the start value and the end value of the required measuring span must be specified here.
2) For this selection, Y01 or Y09 must also be selected.
3) For this selection, Y01 must also be selected.
4) For customer-specific programming for mV and ohm, the start value and the end value of the required measuring span and the unit must be entered here.

Accessories

	Article No.
Other accessories for assembly, connection and transmitter configuration, see page 2/198.	
Modem	
Modem with USB interface and SIPROM T software	**7NG3092-8KN**
Mounting rail adapter for head transmitter (Quantity delivered: 5 units)	**7NG3092-8KA**
Connecting cable 4-wire, 200 mm (7.87 inches), for sensor connections when using head transmitters in the high spring flap (set with 5 units)	**7NG3092-8KC**

For supply units, see Catalog FI01 section "Supplementary components"

Ordering example:

7NG3211-0NN00-Z Y01+Y23+U03
Y01: -10 ... +100 °C
Y23: TICA1234HEAT

Factory setting:

- Pt100 (IEC 751) in the 3-wire connection
- Measuring range: 0 ... 100 °C (32 ... 212 °C)
- Fault current in the event of sensor breakage: 22.8 mA
- Sensor offset: 0 °C (0 °F)
- Damping 0.0 s

Technical specifications

SITRANS TH100 (4 ... 20 mA, Pt100)	
Input	
Resistance thermometer	
Measured variable	Temperature
Input type	Pt100 according to IEC 60751
Characteristic curve	Temperature-linear
Connection type	2, 3, 4-wire connection
Resolution	14 bit
Measuring accuracy	
• Measuring span <250 °C (450 °F)	< 0.25 °C (0.45 °F)
• Measuring span >250 °C (450 °F)	< 0.1% of measuring span
Repeatability	< 0.1 °C (0.18 °F)
Measuring current	Approx. 0.4 mA
Measuring cycle	< 0.7 s
Measuring range	-200 ... +850 °C (-328 ... +1562 °F)
Measuring span	25 ... 1050 °C (77 ... 1922 °F)
Unit	°C or °F
Offset	Programmable: -100 ... +100 °C (-180 ... +180 °F)
Wire resistance	Max. 20 Ω (total from feeder and return conductor)
Noise suppression	50 and 60 Hz
Output	
Output signal	4 ... 20 mA, 2-wire
Auxiliary power	8.5 ... 36 V DC (30 V with Ex ia and ib; 32 V with Ex nL/ic; 35 V with Ex nA)
Max. load	(U_{aux} – 8.5 V)/0.023 A
Overrange	3.6 ... 23 mA, continuously adjustable (default range: 3.84 ... 20.5 mA)
Error signal (following sensor breakage) (conforming to NE43)	3.6 ... 23 mA, continuously adjustable (default range: 3.6 mA or 22.8 mA)
Damping time	0...30 s (default value: 0 s)
Protection	Against reverse polarity
Resolution	12 bit
Accuracy at 23 °C (73.4 °F)	< 0.1% of measuring span
Temperature influence	< 0.1%/10 °C (0.1%/18 °F)
Effect of auxiliary power	< 0.01% of measuring span/V
Effect of load impedance	< 0.025% of the max. measuring span/100 Ω
Long-term drift	• < 0.025% of the max. measuring span in the first month • < 0.035% of the max. measuring span after one year • < 0.05% of the max. measuring span according to 5 years
Ambient conditions	
Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Relative humidity	< 98%, with condensation
Electromagnetic compatibility	According to EN 61326 and NAMUR NE21
Structural design	
Weight	50 g (0.11 lb)
Dimensions	See dimensional drawing
Material	Molded plastic
Cross-section of cables	Max. 2.5 mm² (AWG 13)
Degree of protection according to IEC 60529	
• Enclosure	IP40
• Terminals	IP00
Certificates and approvals	
ATEX explosion protection	
EC type-examination certificate	DEKRA 21ATEX0033X / DEKRA 21ATEX0034X
• "Intrinsic gas safety" type of protection	• II 1 G Ex ia IIC T6...T4 Ga • II 2 (1) G Ex ib [ia Ga] IIC T6...T4 Gb • II 3 (1) G Ex ic [ia Ga] IIC T6...T4 Gc • II 3 G Ex ic IIC T6...T4 Gc
• "Increased safety" type of protection	• II 3 G Ex ec IIC T6...T4 Gc
• "Intrinsic dust safety" type of protection	II 2 D Ex ia IIIC Db

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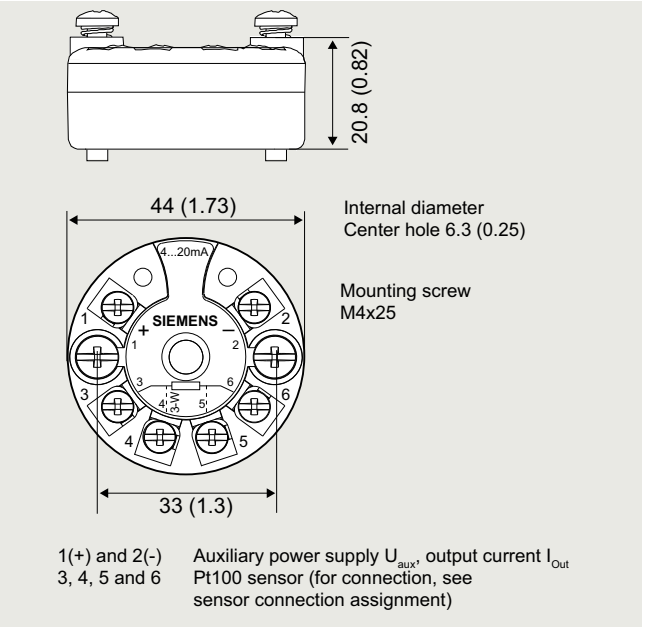
Technical specifications (continued)

SITRANS TH100 (4 ... 20 mA, Pt100)	
Explosion protection: FM for USA	
• FM approval	FM 3024169
• Degrees of protection	• IS / Cl I, II, III / Div 1 / GP ABCDEFG T6, T5, T4 • Cl I / ZN 0 / AEx ia IIC T6, T5, T4 • NI / Cl I / Div 2 / GP ABCDFG T6, T5, T4 • NI / Cl I / ZN 2 / IIC T6, T5, T4
Explosion protection to FM for Canada ($_cFM_{US}$)	
• FM approval	FM 3024169C
• Degrees of protection	• IS / Cl I, II, III / Div 1/ GP ABCDEFG T6, T5, T4 • NI / Cl I / DIV 2 / GP ABCD T6, T5, T4 • NIFW / Cl I, II, III / DIV 2 / GP ABCDFG T6, T5, T4 • DIP / Cl II, III / Div 2 / GP FG T6, T5, T4 • Cl I / ZN 0 / Ex ia IIC T6, T5, T4 • Cl I / ZN 2 / Ex nA nL IIC T6, T5, T4
Other certificates	EAC Ex, NEPSI
Software requirements for SIPROM T	
PC operating system	Windows ME, 2000, XP, Win 7, 8 and 10; in connection with RS 232 modem, also Windows 95, 98 and 98 SE

Factory setting:

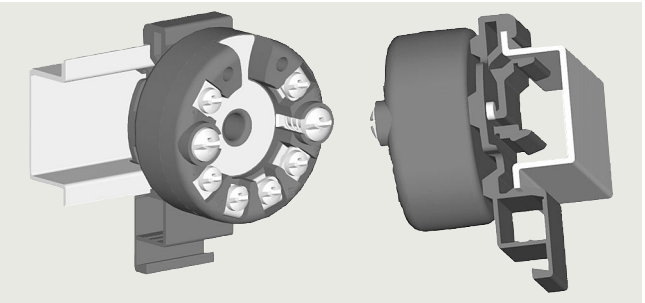
- Pt100 (IEC 751) in the 3-wire connection
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current in the event of sensor breakage: 22.8 mA
- Sensor offset: 0 °C (32 °F)
- Damping 0.0 s

Dimensional drawings

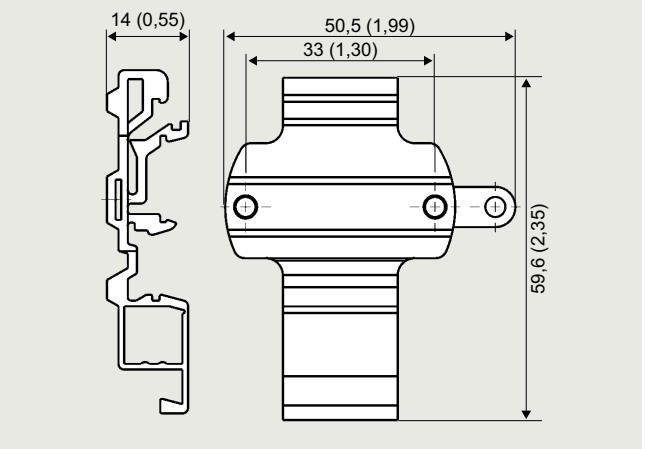


SITRANS TH100, dimensions in mm (inch)

Mounting on DIN rail



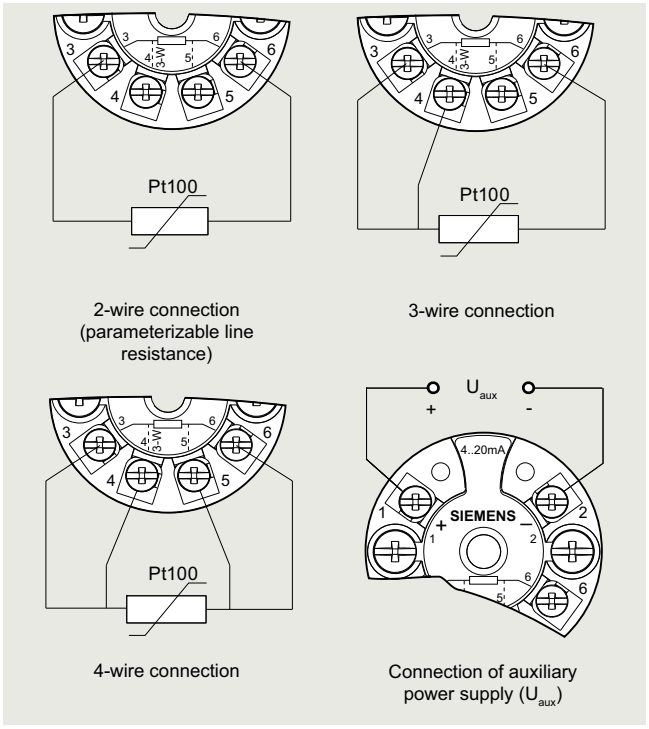
SITRANS TH100, mounting of transmitter on DIN rail



Mounting rail adapter, dimensions in mm (inch)

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Circuit diagrams



SITRANS TH100, sensor connection assignment

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Overview



- 2-wire head transmitter with and without HART communications interface
- Mounting in the connection head of the temperature sensor
- Universal input for virtually any type of temperature sensor
- Can be configured via PC, HART 7 or optional local operation

Benefits

- Compact design
- Flexible mounting and center hole allow you to select your preferred mounting type
- Galvanic isolation
- Test terminals for ammeter
- Diagnostics LED (green/red)
- Input monitoring wire break and short-circuit
- Self-monitoring
- Configuration status stored in EEPROM
- SIL2/3 (with order note C20)
- Expanded diagnostic functions, such as slave pointer, operating hours counter, etc.
- Special characteristic
- Electromagnetic compatibility according to EN 61326 and NE21

Application

SITRANS TH320 transmitters can be used in all sectors. Its compact size means that it can be installed in connection heads of type B or larger. The following sensors/signal sources can be connected over their universal input module:

- Resistance thermometer (2-wire, 3-wire, 4-wire connection)
- Thermocouples
- Linear resistance, potentiometer and DC voltage sources

With HART communications interface:

- The output signal is a load-independent direct current from 4 to 20 mA in accordance with the input characteristic, superimposed by the digital HART signal.

Transmitters of the "intrinsically safe or Zone 2 increased safety" type of protection can be installed in hazardous areas. The device meets the requirements of the EU Directive 2014/34/EU (ATEX), the FM and CSA regulations as well as other national approvals.

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Function

Without HART communications interface

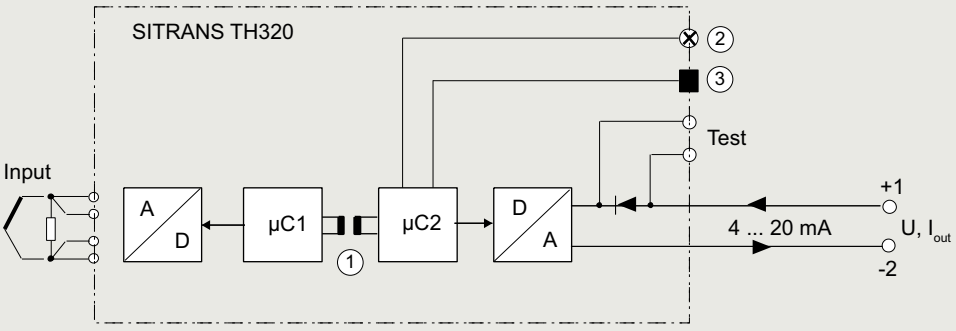
For the SITRANS TH320 without HART functionality, parameters are assigned with the PC. A special modem and the software tool SIPROM T are available for this purpose.

With HART communications interface:

The SITRANS TH320 is configured via HART. The configuration can be carried out using a handheld communicator or, more conveniently, with a HART modem and the SIMATIC PDM parameterization software. The configuration data is then permanently stored in the non-volatile memory (EEPROM).

After correct connection of input and supply voltage, the transmitter outputs a temperature-linear output signal and the diagnostics LED is green. In case of external errors, e.g. sensor short circuit or interruption, the LED flashes red; an internal device error is indicated by a permanent red light.

An ammeter can be connected at any time for checking and plausibility via the test terminals. The output current can be read without any interruption, or even without opening the current loop.



Input		Output	
A/D	Analog-digital converter	µC2	Microcontroller, primary circuit
µC1	Microcontroller, secondary circuit	D/A	Digital-analog converter
		U	Supply Voltage
		I_{out}	Output current
①	Galvanic isolation	②	LED
		③	Extension port

SITRANS TH320 function block diagram

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Selection and ordering data

SITRANS TH320 head-mounted transmitter with 1 input	Article No. 7NG031 ● - ● ● ● ● ● - 0 ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.	
Communication	
With HART	**0**
2-wire, 4 ... 20 mA	**7**
Primary value output	
Input 1	**0**
Input 1, type	
RTD	
• Pt100 (IEC), 3-wire	**B**
• Pt100 (IEC), 4-wire	**C**
• Pt1000 (IEC), 3-wire	**D**
• Pt1000 (IEC), 4-wire	**E**
TC	
• Type B	**F**
• Type E	**G**
• Type J	**H**
• Type K	**J**
• Type L	**K**
• Type N	**L**
• Type R	**N**
• Type S	**P**
• Type T	**Q**
Potentiometer, 4-wire	**R**
Input 1, type customer-specific	
Define customer-specific input configurations in V options	**Y**
Input 2, type	
Without input 2	**A**
CJC configuration for TC	
Without CJC	**0**
Internal CJC	**1**
External CJC Pt100 (IEC), 3-wire	**3**
External CJC Ni100 (DIN), 3-wire	**6**
Define fixed CJC value with option Y60	**8**
Materials not in contact with media	
None	**0**
Type of protection	
General safety (non-Ex); CE, RCM, FM, KCC, EAC, CSA, UK	**A**
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW) / increased safety zone 2 (Ex ec) / non-incendive (NI) (ATEX, IECEx, EACEx, CSA, FM, NEPSI, Inmetro, UKEx)	**N**
Electrical connection/cable entries	
None	**A**
Local HMI	
Without local display	**0**

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	**C11**
Certificates for functional safety	
Functional safety SIL2/3 (IEC 61508)	**C20**
Device options	
PDF file with device settings	**D10**
Without labeling of the measuring range on the TAG plate	**D41**
Input 1: Cable extension 200 mm fixed, for RTD Pt100 (0 ... 100 °C) 4-wire	**D73**
Jumper plug set on device for write protection	**D81**
Jumper plug set on device set for fault current > 21 mA (instead of < 3.6 mA) (only non-SIL)	**D82**
Noise damping	
Noise damping 60 Hz instead of 50 Hz	**P10**
Input 1: TC	
Type C W5	**V01**
Type D W3	**V02**
Type U	**V03**
Type Lr	**V04**
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	**V50**
3-wire (define Callendar Van Dusen parameter in option Y35)	**V51**
4-wire (define Callendar Van Dusen parameter in option Y35)	**V52**
Input 1: RTD	
Pt × (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V60**
Pt × (IEC 60721), 3-wire, define RTD factor × in option Y21	**V61**
Pt × (IEC 60721), 4-wire, define RTD factor × in option Y21	**V62**
Pt × (JIS C1604), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V63**
Pt × (JIS C1604-81), 3-wire, define RTD factor × in option Y21	**V64**
Pt × (JIS C1604-81), 4-wire, define RTD factor × in option Y21	**V65**
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V66**
Pt × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	**V67**
Pt × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	**V68**
Ni × (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V69**
Ni × (DIN 43760-87), 3-wire, define RTD factor × in option Y21	**V70**
Ni × (DIN 43760-87), 4-wire, define RTD factor × in option Y21	**V71**
Ni × (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V72**
Ni × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	**V73**
Ni × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	**V74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V75**
Cu × (ECW-15), 3-wire, define RTD factor × in option Y21	**V76**
Cu × (ECW-15), 4-wire, define RTD factor × in option Y21	**V77**
Cu × (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V78**
Cu × (GOST 6651-94), define 3-wire, define RTD factor × in option Y21	**V79**
Cu × (GOST 6651-94), define 4-wire, define RTD factor × in option Y21	**V80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V81**
Cu × (GOST 6651-2009), define 3-wire, define RTD factor × in option Y21	**V82**
Cu × (GOST 6651-2009), define 4-wire, define RTD factor × in option Y21	**V83**
Device settings	
Measuring range setting temperature input (instead of 0 ... 100 °C): Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	**Y01**
Customer-specific programming in plain text (n-lines)	**Y09**
Tag (device parameters, max. 32 characters), adhesive label	**Y15**
Measuring point description (device parameters, max. 32 characters), adhesive label	**Y16**
Tag (device parameters, max. 8 characters), adhesive label	**Y17**
Descriptor (device parameters, max. 16 characters), adhesive label	**Y18**
Input 1: RTD factor; e.g. factor "200" = Pt200, adhesive label	**Y21**
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	**Y31**
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y35**
Wire resistance value input 1 in ohms (0 ... 100 ohms)	**Y51**
Input 1: CJC sensor, fixed value (see measuring range for unit)	**Y60**
ID number of special design	**Y99**

Accessories

	Article No.
Other accessories for assembly, connection and transmitter configuration, see page 2/198.	
Modems	
HART modem with USB interface	**7MF4997-1DB**
Modem with USB interface and SIPROM T software	**7NG3092-8KN**
SIMATIC PDM parameterization software	See Catalog FI 01 section 8
Mounting rail adapter for head-mounted transmitter (Quantity delivered: 5 units)	**7NG3092-8KA**
Connecting cable 4-wire, 200 mm (7.97 inches), for input connections when using head-mounted transmitters in the high spring flap (set with 5 units)	**7NG3092-8KC**

Ordering example

7NG0310-0BA00-0AA0-Z Y01
Y01: -10 ... +100 °C

Factory setting

- Pt100 (IEC 60751); 3-wire connection
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current
  - Device fault: < 3.6 mA
  - Input circuit wire break: 22.8 mA
  - Input circuit short-circuit: 22.4 mA
  - Input monitoring wire break and short-circuit
- No trimming of input and output (offset)
- Damping 0.0 s

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Technical specifications

SITRANS TH320 (HART, universal)	
General	
Supply voltage[1) 2)]	
• Without explosion protection (non-Ex)	7.5 ... 48 V DC
• With explosion protection (Ex i)	7.5 ... 30 V DC
Additional minimum supply voltage when using test terminals	0.8 V
Maximum power loss	≤ 850 mW
Minimum load resistance at supply voltage > 37 V	(V_{supply} - 37 V)/23 mA
Insulation voltage, test/operation	
• Without explosion protection (non-Ex)	2.5 kV AC/55 V AC
• With explosion protection (Ex i)	2.5 kV AC/42 V AC
Polarity protection	All inputs and outputs
Write protection	Wire jumper or software
Warm-up time	< 5 min
Starting time	< 2.75 s
Programming	HART
Signal-to-noise ratio	> 60 dB
Long-term stability	Better than: • ± 0.05% of measuring span/year • ± 0.18% of measuring span/5 years
Response time	4 ... 20 mA: ≤ 55 ms HART: ≤ 75 ms (typically 70 ms)
Programmable damping	0 ... 60 s
Signal dynamic	
• Input	24 bit
• Output	18 bit
Influence of change in supply voltage	< 0.005% of measuring span/V DC
Input	
Resistance thermometer (RTD)	
Input type	
• Pt10 ... 10000	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen
• Ni10 ... 10000	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003
• Cu5 ... 1000	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• Pt1000, Pt10000 (IEC 60751 and JIS C 1604-8)	Max. 30 nF
• All other input types	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time (RTD)	≤ 75 ms (typically 70 ms)
Error detection time (for 3-wire and 4-wire)	≤ 2 000 ms
Thermocouples (TC)	
Input type	
• B	IEC 60584-1
• E	IEC 60584-1
• J	IEC 60584-1
• K	IEC 60584-1
• L	DIN 43710

SITRANS TH320 (HART, universal)	
• Lr	GOST 3044-84
• N	IEC 60584-1
• R	IEC 60584-1
• S	IEC 60584-1
• T	IEC 60584-1
• U	DIN 43710
• W3	ASTM E988-96
• W5	ASTM E988-96
• LR	GOST 3044-84
Cold Junction Compensation (CJC)	Constant, internal or external over Pt100 or Ni100 RTD
• Temperature range internal CJC	-50 ... +100 °C (-58 ... +212 °F)
• Connection external CJC	2-wire or 3-wire
• External CJC, wire resistance per wire (for 3-wire and 4-wire connections)	50 Ω
• Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
• Input current external CJC	< 0.15 mA
• Temperature range external CJC	-50 ... +135 °C (-58 ... +275 °F)
• Cable, wire-wire capacity	Max. 50 nF
• Total wire resistance	Max. 10 kΩ
• Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.
• Error detection time (TC)	≤ 75 ms (typically 70 ms)
• Error detection time, external CJC (for 3-wire and 4-wire)	≤ 2 000 ms
Linear resistance	
Input range	0 ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, defective
Potentiometers	
Input range	10 ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 4-wire and 5-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time, wiper arm (no short-circuit detection)	≤ 75 ms (typically 70 ms)
Error detection time, element	≤ 2 000 ms
Error detection time (for 4-wire and 5-wire)	≤ 2 000 ms
Voltage input	

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Technical specifications (continued)

SITRANS TH320 (HART, universal)	
Measuring range	
• Unipolar	-100 ... 1700 mV
• Bipolar	-800 ... +800 mV
Minimum measuring span	2.5 mV
Input resistance	10 MΩ
Cable, wire-wire capacity	
• Input range: -100 ... 1700 mV	Max. 30 nF
• Input range: -20 ... 100 mV	Max. 50 nF
Error detection, programmable	None, defective
Error detection time	≤ 75 ms (typically 70 ms)
Output and HART communication	
Normal range, programmable	3.8 ... 20.5 mA/20.5 ... 3.8 mA
Extended range (output limits), programmable	3.5 ... 23 mA/23 ... 3.5 mA
Programmable input/output limits	
• Fault current	Enable/disable
• Fault current setting	3.5 ... 23 mA
Update time	10 ms
Load (with current output)	≤ (V_{Supply} - 7.5)/0.023 Ω
Load stability	< 0.01% of measuring span/100 Ω (measuring span = currently selected range)
Input error detection, programmable (detection of input short-circuits is ignored with TC and voltage inputs)	3.5 ... 23 mA
NAMUR NE43 Upscale	> 21 mA
NAMUR NE43 Downscale	< 3.6 mA
HART protocol versions	HART 7
Measuring accuracy	
Input accuracy	See "Input accuracy" table
Output accuracy	See "Output accuracy" table
Operating conditions	
Ambient temperature	-50 ... +85 °C (-58 ... +185 °F)
Ambient temperature for devices with functional safety	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
Reference temperature for sensor calibration	24 °C ±1.0 °C (75.2 °F ±1.8 °F)
Relative humidity	< 99% (no condensation)
Degree of protection	
• Transmitter enclosure	IP68
• Terminals	IP00
Structural design	
Weight	50 g (0.11 lb)
Maximum core cross-section	1 × 1.5 mm² (stranded wire)
Tightening torque for clamping screws	0.4 Nm
Vibrations	IEC 60068-2-6
• 2 ... 25 Hz	± 1.6 mm (0.07 inches)
• 25 ... 100 Hz	± 4 g
Certificates and approvals	
Explosion protection ATEX/IECEx and others	
Certificates[3)]	• DEKRA 17ATEX0116 X • IECEx DEK 17.0054X • A5E43700604A-2018X
"Intrinsic safety ia/ib" type of protection	For use in Zone 0, 1, 2, 20, 21, 22
• ATEX	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2(1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 D Ex ia IIIC Db • I M1 Ex ia I Ma
• IECEx and others	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ia IIIC Db • Ex ia I Ma
"Intrinsic safety ic" type of protection	For use in Zones 2 and 22
• ATEX	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC Dc

SITRANS TH320 (HART, universal)	
• IECEx and others	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC Dc
"Non-sparking/increased safety nA/ec" type of protection	For use in Zones 2 and 22
• ATEX	• II 3 G Ex nA IIC T6...T4 Gc • II 3 G Ex ec IIC T6...T4 Gc
• IECEx and others	• Ex nA IIC T6 ... T4 Gc • Ex ec IIC T6 ... T4 Gc
Explosion protection CSA/FM for Canada and USA	
Certificates	• CSA 1861385 • FM18CA0024 • FM18US0046
"Intrinsic safety ia" type of protection	• IS, CL I, Div 1, GP ABCD, T6 ... T4 • Ex ia IIC T6 ... T4 Ga, AEx ia IIC T6 ... T4 Ga or Ex ib [ia Ga] IIC T6...T4 Gb, AEx ib [ia Ga] IIC T6...T4 Gb
"Non incendive field wiring NIFW" type of protection	NIFW, CL I, Div 2, GP ABCD T6 ... T4
"Non incendive NI" type of protection	• NI, CL I, Div 2, GP ABCD T6...T4 • Ex nA IIC T6 ... T4 Gc • AEx nA IIC T6 ... T4 Gc

1) Note that the minimum supply voltage must correspond to the value measured at the terminals of the SITRANS TH320. All external voltage drops must be taken into account.
2) Protect the device from overvoltage with the help of a suitable power supply or suitable overvoltage protection equipment.
3) Additional available certificates are listed on the internet at http://www.siemens.com/processinstrumentation/certificates

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Technical specifications (continued)

Measuring ranges/Minimum measuring span

RTD

Input type	Standard	Measuring range in °C (°F)	α_0 in $°C^{-1}$ ($°F^{-1}$)	Minimum measuring span in °C (°F)
Pt10 ... 10000	IEC 60751	-200 ... +850 (-328 ... +1 562)	0.003851 (0.002139)	10 (50)
	JIS C 1604-8	-200 ... +649 (-328 ... +1 200)	0.003916 (0.002176)	10 (50)
	GOST 6651_2009	-200 ... +850 (-328 ... +1 562)	0.003910 (0.002172)	10 (50)
	Callendar Van Dusen	-200 ... +850 (-328 ... +1 562)	-	10 (50)
Ni10 ... 10000	DIN 43760-1987	-60 ... +250 (-76 ... +482)	0.006180 (0.003433)	10 (50)
	GOST 6651-2009/OIML R84:2003	-60 ... +180 (-76 ... +356)	0.006170 (0.003428)	10 (50)
Cu5 ... 1000	Edison Copper Winding No. 15	-200 ... +260 (-328 ... +500)	0.004270 (0.002372)	100 (212)
	GOST 6651-2009/OIML R84:2003	-180 ... +200 (-292 ... +392)	0.004280 (0.002378)	100 (212)
	GOST 6651-94	-50 ... +200 (-58 ... +392)	0.004260 (0.002367)	100 (212)

TC

Input type	Standard	Measuring range in °C (°F)	Minimum measuring span in °C (°F)
B	IEC 60584-1	0 (85) ... 1 820 (32 (185) ... 3 308)	100 (212)
E	IEC 60584-1	-200 ... +1 000 (-392 ... +1 832)	50 (122)
J	IEC 60584-1	-100 ... +1 200 (-212 ... +2 192)	50 (122)
K	IEC 60584-1	-180 ... +1 372 (-356 ... +2 502)	50 (122)
L	DIN 43710	-200 ... +900 (-392 ... +1 652)	50 (122)
Lr	GOST 3044-84	-200 ... +800 (-392 ... +1 472)	50 (122)
N	IEC 60584-1	-180 ... +1 300 (-356 ... +2 372)	50 (122)
R	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
S	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
T	IEC 60584-1	-200 ... +400 (-392 ... +752)	50 (122)
U	DIN 43710	-200 ... +600 (-392 ... +1 112)	50 (122)
W3	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
W5	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
LR	GOST 3044-84	-200 ... +800 (-392 ... +1472)	50 (122)

Input accuracy

Basic values

Input type	Basic accuracy	Temperature coefficient[1)]
RTD		
Pt10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Pt20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Pt50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Pt100	≤ ±0.04 °C (0.072 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt500	$T_{max.}$ < 180 °C (356 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 180 °C (356 °F) = ≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt2000	$T_{max.}$ < 300 °C (572 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 300 °C (572 °F) = ≤ ±0.4 °C (0.72 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt10000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Ni10	≤ ±1.6 °C (2.88 °F)	≤ ±0.020 °C/°C (°F/°F)
Ni20	≤ ±0.8 °C (1.44 °F)	≤ ±0.010 °C/°C (°F/°F)
Ni50	≤ ±0.32 °C (0.576 °F)	≤ ±0.004 °C/°C (°F/°F)
Ni100	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni120	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni200	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni1000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)

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Technical specifications (continued)

Input type	Basic accuracy	Temperature coefficient[1]
Ni2000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni10000	≤ ±0.32 °C (0.576 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Cu5	≤ ±1.6 °C (2.88 °F)	≤ ±0.040 °C/°C (°F/°F)
Cu10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Cu20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Cu50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Cu100	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Linear resistance		
0 ... 400 Ω	≤ ±40 mΩ	≤ ±2 mΩ/°C (1.11 mΩ/°F)
0 ... 100 kΩ	≤ ±4 Ω	≤ ±0.2 Ω/°C (0.11 Ω/°F)
Potentiometers		
0 ... 100%	< 0.05%	< ± 0.005%
Voltage input		
mV: -20 ... 100 mV	≤ ±5 µV	≤ ±0.2 µV/°C (0.11 µV/°F)
mV: -100 ... 1700 mV	≤ ±0.1 mV	≤ ±36 µV/°C (20 µV/°F)
mV: ± 800 mV	≤ ±0.1 mV	≤ ±32 µV/°C (17.8 µV/°F)
TC		
E	≤ ±0.2 °C (0.36 °F)	≤ ±0.025 °C/°C (°F/°F)
J	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
K	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
L	≤ ±0.35 °C (0.63 °F)	≤ ±0.025 °C/°C (°F/°F)
N	≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
T	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
U	< 0 °C (32 °F) ≤ ±0.8 °C (1.44 °F) ≥ 0 °C (32 °F) ≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
Lr	≤ ±0.2 °C (0.36 °F)	≤ ±0.1 °C/°C (°F/°F)
R	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
S	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
W3	≤ ±0.6 °C (1.08 °F)	≤ ±0.1 °C/°C (°F/°F)
W5	≤ ±0.4 °C (0.72 °F)	≤ ±0.1 °C/°C (°F/°F)
B[2]	≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
B[3]	≤ ±3 °C (5.4 °F)	≤ ±0.1 °C/°C (°F/°F)
B[4]	≤ ±8 °C (14.4 °F)	≤ ±0.8 °C/°C (°F/°F)
B[5]	Not specified	Not specified
CJC (internal)	< ±0.5 °C (0.9 °F)	Included in basic accuracy
CJC (external)	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)

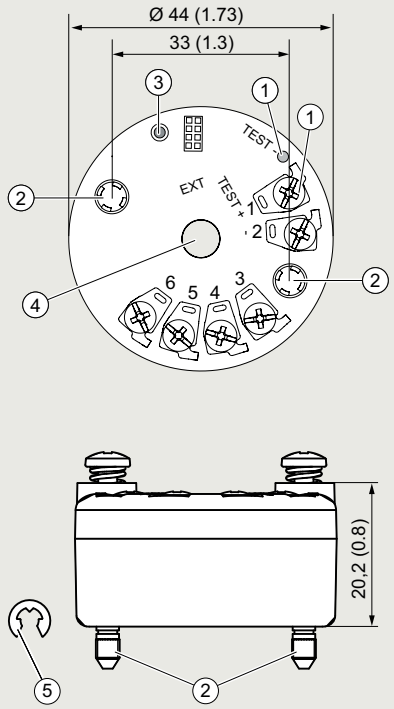
1) Temperature coefficients correspond to the specified values or 0.002% of the input span, depending on which value is greater.
2) Accuracy of the specification range > 400 °C (752 °F)
3) Accuracy of the specification range > 160 °C (320 °F) < 400 °C (752 °F)
4) Accuracy of the specification range > 85 °C (185 °F) < 160 °C (320 °F)
5) Accuracy of the specification range < 85 °C (185 °F)

Output accuracy

Output type	Basic accuracy	Temperature coefficient
Analog output	≤ ±1.6 µA (0.01% of the full output span)	≤ ±0.48 µA/K (≤ ±0.003% of the full output span/K)

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Dimensional drawings



1 Test terminal
2 Mounting screw M4
3 LED
4 Internal diameter of center hole 6.3 (0.25)
5 Lock washer DIN 6799 - 3.2 A2

1 (+) and 2 (-) Output terminals
3, 4, 5 and 6 Input terminals

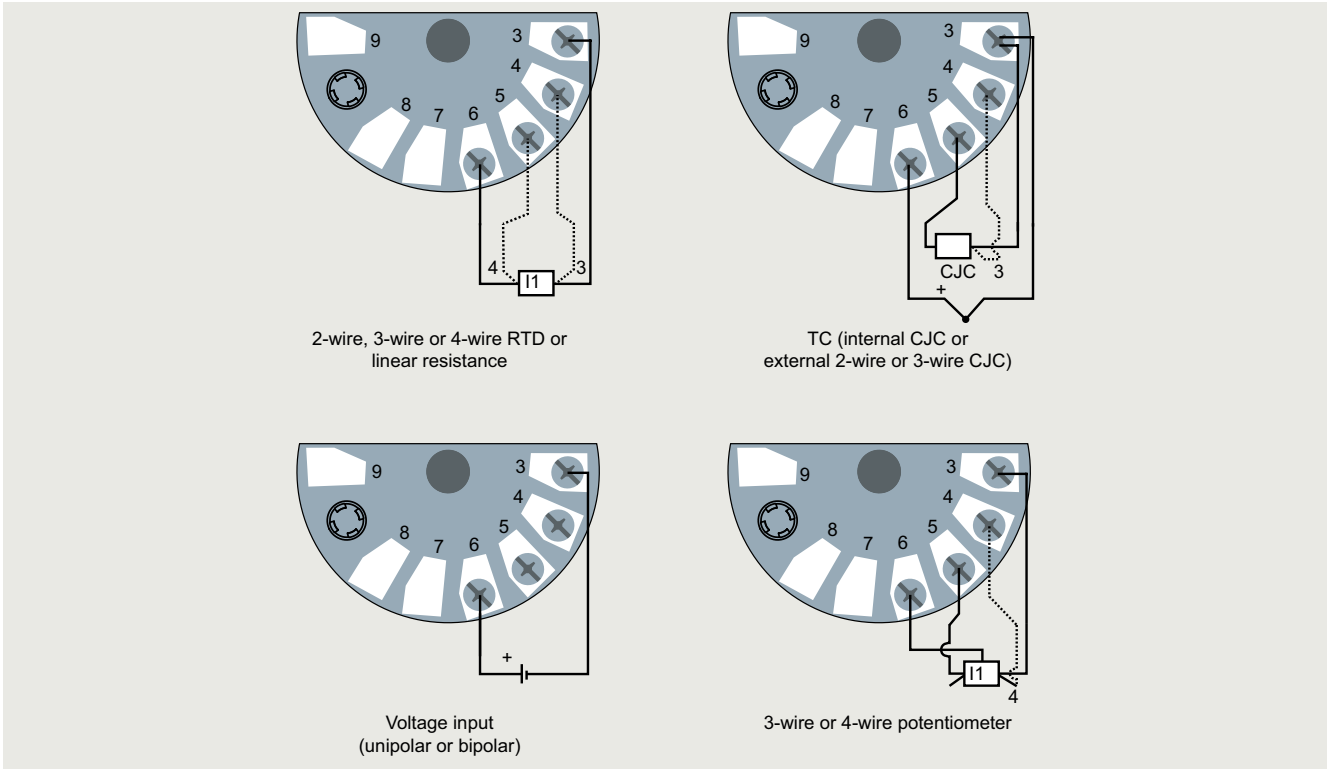
SITRANS TH320, dimensions and pin assignment, dimensions in mm (inch)

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Circuit diagrams

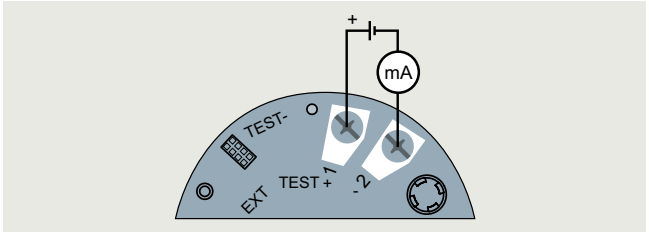
Connections

Input connection



SITRANS TH320, input connection assignment

Output connection



SITRANS TH320, output connection assignment

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Overview



- 2-wire head-mounted transmitter with HART/PA communication interface
- Mounting in the connection head of the temperature sensor
- Universal input for virtually any type of temperature sensor
- Connection of two independent input circuits for redundant operation (high input availability)
- Input drift detection
- Configurable via HART 7 and Profibus PA

Benefits

- Compact design
- Connection of two independent input circuits for redundant operation (high input availability)
- Flexible mounting and center hole allow you to select your preferred mounting type
- Galvanic isolation
- Test terminals for ammeter for HART variant
- Diagnostics LED (green/red)
- Input monitoring wire break, short-circuit and drift
- Self-monitoring
- Configuration status stored in EEPROM
- SIL2/3 (with order note C20) for HART variant
- Expanded diagnostic functions, such as slave pointer, operating hours counter, etc.
- Special characteristic curve
- Up to 32 devices on one Profibus PA segment
- Backwards compatible to Profibus PA profile 3.x
- No GSD file update necessary if replacement for previous unit SITRANS TH400PA
- Transparent product lifecycle thanks to recording of supply voltage (PA variant only) and diagnostic messages
- Electromagnetic compatibility according to EN 61326 and NE21

Application

The SITRANS TH420 transmitter with two inputs can be used in all sectors. Its compact size means that it can be installed in connection heads of type B or larger. Due to its universal input module, the following sensors and signal sources can be connected in redundant operation (high input availability):

- 2 resistance thermometers (2-wire, 3-wire, 4-wire connection)
- 2 thermocouples
- 2 linear resistors, potentiometer and DC voltage sources

The output signal is a load-independent direct current from 4 to 20 mA in accordance with the input characteristic, superimposed by the digital HART signal or digitally using Profibus PA.

The dual input mode also supports drift detection of the inputs, whereby maintenance intervals can be more easily planned.

Transmitters of the "intrinsically safe or Zone 2 increased safety" type of protection can be installed in hazardous areas. The device meets the requirements of the EU Directive 2014/34/EU (ATEX), the FM and CSA regulations as well as other national approvals.

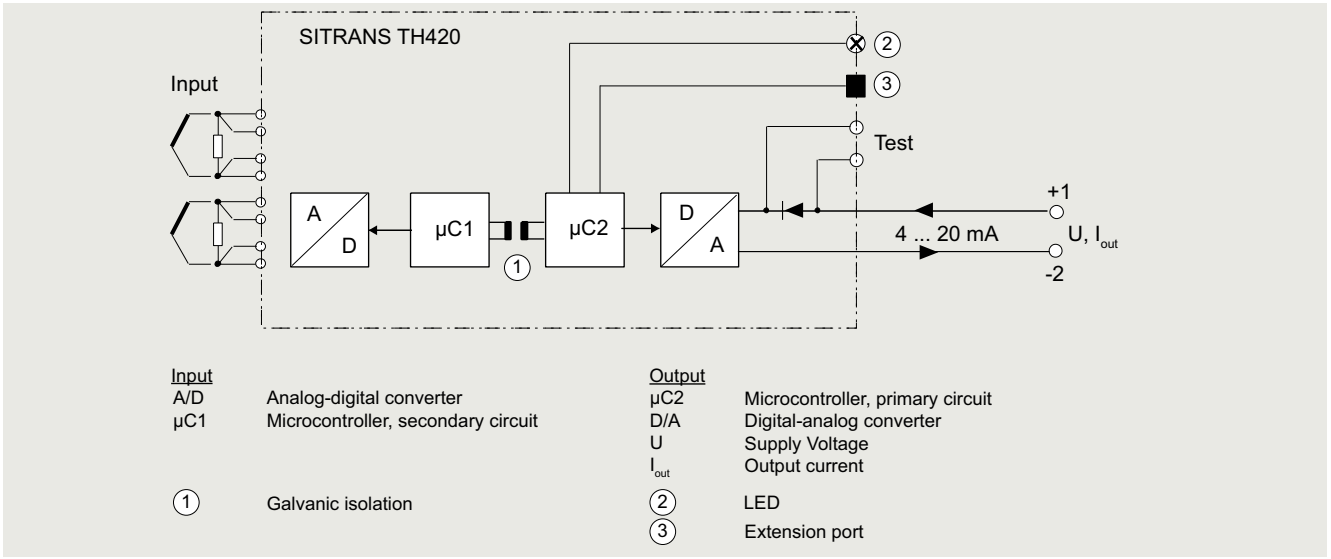
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Function

The SITRANS TH420 is configured via HART or Profibus PA. The configuration of the HART variant can be carried out using a handheld communicator or, more conveniently, with a HART modem using EDD or DTM in Asset management tools (e.g. SIMATIC PDM). The configuration data are then permanently stored in the non-volatile memory (EEPROM).

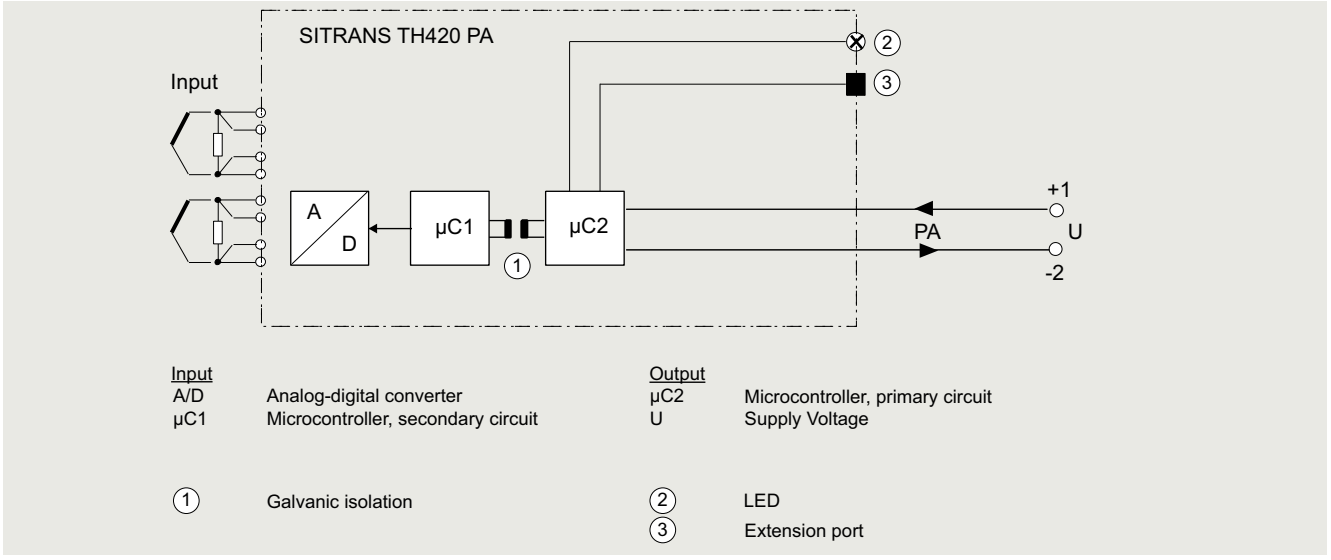
After correct connection of input and supply voltage, the transmitter outputs a temperature-linear output signal and the diagnostics LED is green. In case of external errors, e.g. sensor short circuit or interruption, the LED flashes red; an internal device fault is indicated by a continuous red light.

The test terminals (with HART variant only) can be used to connect an ammeter at any time for monitoring purposes and performing plausibility checks. The output current can be read without any interruption, or even without opening the current loop.



Input		Output	
A/D	Analog-digital converter	µC2	Microcontroller, primary circuit
µC1	Microcontroller, secondary circuit	D/A	Digital-analog converter
		U	Supply Voltage
		I_{out}	Output current
(1)	Galvanic isolation	(2)	LED
		(3)	Extension port

SITRANS TH420 HART, function block diagram



Input		Output	
A/D	Analog-digital converter	µC2	Microcontroller, primary circuit
µC1	Microcontroller, secondary circuit	U	Supply Voltage
(1)	Galvanic isolation	(2)	LED
		(3)	Extension port

SITRANS TH420 PA, function block diagram

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Selection and ordering data

SITRANS TH420 head-mounted transmitter with 2 inputs	Article No. 7NG041 ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Communication		
With HART	**0**	
With Profibus PA	**1**	
Primary value output		
Input 1	**0**	
Input 1, input 2 as redundancy	**1**	
Input 2, input 1 as redundancy	**2**	
Mean value input 1 and input 2, both as redundancy	**3**	
Minimum input 1 and input 2, both as redundancy	**4**	
Maximum input 1 and input 2, both as redundancy	**5**	
Difference input 1 - input 2	**6**	
Difference input 2 - input 1	**7**	
Absolute difference	**8**	
Primary value output, customer-specific		
Minimum input 1 and input 2, without redundancy	**9**	**H 1 A**
Maximum input 1 and input 2, without redundancy	**9**	**H 1 B**
Mean value input 1 and input 2, without redundancy	**9**	**H 1 C**
Input 2	**9**	**H 1 D**
Input 1, type		
RTD		
• Pt100 (IEC), 3-wire	**B**	
• Pt100 (IEC), 4-wire	**C**	
• Pt1000 (IEC), 3-wire	**D**	
• Pt1000 (IEC), 4-wire	**E**	
TC		
• Type B	**F**	
• Type E	**G**	
• Type J	**H**	
• Type K	**J**	
• Type L	**K**	
• Type N	**L**	
• Type R	**N**	
• Type S	**P**	
• Type T	**Q**	
Potentiometer, 4-wire	**R**	
Input 1, type customer-specific		
Define customer-specific input configurations in V options	**Y**	
Input 2, type		
Without input 2	**A**	
RTD		
• Pt100 (IEC), 3-wire	**B**	
• Pt100 (IEC), 4-wire	**C**	
• Pt1000 (IEC), 3-wire	**D**	
• Pt1000 (IEC), 4-wire	**E**	
TC		
• Type B	**F**	
• Type E	**G**	
• Type J	**H**	
• Type K	**J**	
• Type L	**K**	
• Type N	**L**	
• Type R	**N**	

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Selection and ordering data (continued)

SITRANS TH420 head-mounted transmitter with 2 inputs	Article No. 7NG041 ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
• Type S	P	
• Type T	Q	
Potentiometer, 4-wire	R	
Input 2, type customer-specific		
Define customer-specific input configurations in W options	Y	
CJC configuration for TC		
Input 1: no CJC; input 2: No CJC	0	
Input 1: internal CJC; input 2: internal CJC	1	
Input 1: external CJC; input 2: external CJC; define type in option Jxx	2	
Input 1: external CJC; define type in option Jxx; input 2: internal CJC	3	
Input 1: internal CJC; input 2: external CJC; define type in option Jxx	4	
Input 1: Internal CJC; Input 2: No CJC	5	
Input 1: External CJC (define type in option Jxx); input 2: No CJC	6	
Materials not in contact with media		
None	0	
Type of protection		
General safety (non-Ex); CE, RCM, FM, KCC, EAC, CSA, UK	A	
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW) / increased safety zone 2 (Ex ec) / non-incendive (NI) (ATEX, IECEx, EACEx, CSA, FM, NEPSI, Inmetro, UKEx)	N	
Electrical connection/cable entries		
None	A	
Local HMI		
Without local display	0	

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	C11
Certificates for functional safety	
Functional safety SIL2/3 (IEC 61508)	C20
Device options	
PDF file with device settings	D10
Without labeling of the measuring range on the TAG plate	D41
Input 1: Cable extension 200 mm fixed, for RTD Pt100 (0 ... 100 °C) 4-wire	D73
Input 2: Cable extension 200 mm fixed, for RTD Pt100 (0 ... 100 °C) 4-wire	D74
Jumper plug set on device for write protection	D81
Jumper plug set on device set for fault current > 21 mA (instead of < 3.6 mA) (only non-SIL)	D82
External CJC types	
Pt100, IEC 60751, 3-wire	J02
Pt100, IEC 60751, 4-wire	J03
Ni100, DIN 43760-87, 3-wire	J05
Ni100, DIN 43760-87, 4-wire	J06
Noise damping	
Noise damping 60 Hz instead of 50 Hz	P10
Input 1: TC	
Type C W5	V01
Type D W3	V02
Type U	V03
Type Lr	V04

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	V50
3-wire (define Callendar Van Dusen parameter in option Y35)	V51
4-wire (define Callendar Van Dusen parameter in option Y35)	V52
Input 1: RTD	
Pt × (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	V60
Pt × (IEC 60751), 3-wire, define RTD factor × in option Y21	V61
Pt × (IEC 60751), 4-wire, define RTD factor × in option Y21	V62
Pt × (JIS C1604), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	V63
Pt × (JIS C1604-81), 3-wire, define RTD factor × in option Y21	V64
Pt × (JIS C1604-81), 4-wire, define RTD factor × in option Y21	V65
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	V66
Pt × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	V67
Pt × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	V68
Ni × (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	V69
Ni × (DIN 43760-87), 3-wire, define RTD factor × in option Y21	V70
Ni × (DIN 43760-87), 4-wire, define RTD factor × in option Y21	V71
Ni × (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	V72
Ni × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	V73
Ni × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	V74
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	V75
Cu × (ECW-15), 3-wire, define RTD factor × in option Y21	V76

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Cu × (ECW-15), 4-wire, define RTD factor × in option Y21	**V77**
Cu × (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V78**
Cu × (GOST 6651-94), define 3-wire, define RTD factor × in option Y21	**V79**
Cu × (GOST 6651-94), define 4-wire, define RTD factor × in option Y21	**V80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V81**
Cu × (GOST 6651-2009), define 3-wire, define RTD factor × in option Y21	**V82**
Cu × (GOST 6651-2009), define 4-wire, define RTD factor × in option Y21	**V83**
Input 2: TC	
Type C W5	**W01**
Type D W3	**W02**
Type U	**W03**
Type Lr	**W04**
Input 2: Callendar Van Dusen	
2-wire (define wire resistance value in option Y52 and Callendar Van Dusen parameter in option Y36)	**W50**
3-wire (define Callendar Van Dusen parameter in option Y36)	**W51**
4-wire (define Callendar Van Dusen parameter in option Y36)	**W52**
Input 2: RTD	
Pt × (IEC 60751), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W60**
Pt × (IEC 60721), 3-wire, define RTD factor × in option Y22	**W61**
Pt × (IEC 60721), 4-wire, define RTD factor × in option Y22	**W62**
Pt × (JIS C1604), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W63**
Pt × (JIS C1604-81), 3-wire, define RTD factor × in option Y22	**W64**
Pt × (JIS C1604-81), 4-wire, define RTD factor × in option Y22	**W65**
Pt × (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W66**
Pt × (GOST 6651-2009), 3-wire, define RTD factor × in option Y22	**W67**
Pt × (GOST 6651-2009), 4-wire, define RTD factor × in option Y22	**W68**
Ni × (DIN 43760-87), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W69**
Ni × (DIN 43760-87), 3-wire, define RTD factor × in option Y22	**W70**
Ni × (DIN 43760-87), 4-wire, define RTD factor × in option Y22	**W71**
Ni × (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W72**
Ni × (GOST 6651-2009), 3-wire, define RTD factor × in option Y22	**W73**
Ni × (GOST 6651-2009), 4-wire, define RTD factor × in option Y22	**W74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W75**
Cu × (ECW-15), 3-wire, define RTD factor × in option Y22	**W76**
Cu × (ECW-15), 4-wire, define RTD factor × in option Y22	**W77**
Cu × (GOST 6651-94), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W78**
Cu × (GOST 6651-94), 3-wire, define RTD factor × in option Y22	**W79**
Cu × (GOST 6651-94), 4-wire, define RTD factor × in option Y22	**W80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W81**
Cu × (GOST 6651-2009), 3-wire, define RTD factor × in option Y22	**W82**
Cu × (GOST 6651-2009), 4-wire, define RTD factor × in option Y22	**W83**
Device settings	
Measuring range setting temperature input (instead of 0 ... 100 °C): Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	**Y01**
Customer-specific programming in plain text (n-lines)	**Y09**

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Tag (device parameters, max. 32 characters), adhesive label	**Y15**
Measuring point description (device parameters, max. 32 characters), adhesive label	**Y16**
Tag (device parameters, max. 8 characters), adhesive label	**Y17**
Descriptor (device parameters, max. 16 characters), adhesive label	**Y18**
Input 1: RTD factor; e.g. factor "200" = Pt200, adhesive label	**Y21**
Input 2: RTD factor (e.g. factor "200" => RTD Pt200), adhesive label	**Y22**
Preset bus address	**Y25**
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	**Y31**
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y35**
CvD Sensor matching factors input 2 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y36**
Wire resistance value input 1 in ohms (0 ... 100 ohms)	**Y51**
Wire resistance value input 2 in ohms (0 ... 100 ohms)	**Y52**
Input 1: CJC sensor, fixed value (see measuring range for unit)	**Y60**
Input 2: CJC sensor, fixed value (see measuring range for unit)	**Y61**

Accessories

	Article No.
Other accessories for assembly, connection and transmitter configuration, see page 2/198.	
Modems	
HART modem with USB interface	**7MF4997-1DC**
SIMATIC PDM parameterization software	See Catalog FI 01 section 8
Mounting rail adapter for head-mounted transmitter (Quantity delivered: 5 units)	**7NG3092-8KA**
Connecting cable 4-wire, 200 mm (7.87 inches), for input connections when using head-mounted transmitters in the high spring flap (set with 5 units)	**7NG3092-8KC**

Ordering example

7NG0410-0BA00-0AA0-Z Y01
Y01: -10 ... +100 °C

Factory setting of SITRANS TH420 HART

- Input 1: Pt100 (IEC 751); 3-wire connection
- Input 2: not configured (inactive)
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current
  - Device fault: < 3.6 mA
  - Input circuit wire break: 22.8 mA
  - Input circuit short-circuit: 22.4 mA
  - Input circuit drift: 22 mA (active when input 2 is active)
  - Input monitoring wire break and short-circuit
- No trimming of input and output (offset)
- Damping 0.0 s

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Selection and ordering data (continued)

Factory setting of SITRANS TH420 PA

- Input 1: Pt100 (IEC 751); 3-wire connection
- Input 2: not configured (inactive)
- No trimming of input and output (offset)
- Damping 0.0 s
- Bus address: 126

Technical specifications

	SITRANS TH420 HART	SITRANS TH420 PA
General		
Supply voltage[1) 2)]		
• Without explosion protection (non-Ex)	7.5 ... 48 V DC	9 ... 32 V DC
• With explosion protection (Ex i)	7.5 ... 30 V DC	9 ... 30 V DC
Additional minimum supply voltage when using test terminals	0.8 V	
Maximum power loss	≤ 850 mW	≤ 544 mW
Minimum load resistance at supply voltage > 37 V	(V_{supply} - 37 V)/23 mA	
Insulation voltage, test/operation		
• Without explosion protection (non-Ex)	2.5 kV AC/55 V AC	2.5 kV AC/55 V AC
• With explosion protection (Ex i)	2.5 kV AC/42 V AC	2.5 kV AC/42 V AC
Polarity protection	All inputs and outputs	Non-sensitive
Write protection	Wire jumper or software	Wire jumper or software
Warm-up time	< 5 min	< 5 min
Starting time	< 2.75 s	< 15 s
Programming	HART	PA
Signal-to-noise ratio	> 60 dB	
Long-term stability	Better than: • ± 0.05% of measuring span/year • ± 0.18% of measuring span/5 years	Better than • ± 0.05 % of the measured value/year • ± 0.1 % of the measured value/5 years
Response time	≤ 75 ms (typically 70 ms)	≤ 400 ms
Profibus refresh time		< 100 ms
Programmable damping	0 ... 60 s	0 ... 60 s
Signal dynamic		
• Input	24 bit	
• Output	18 bit	
Influence of change in supply voltage	< 0.005% of measuring span/V DC	
Input		
Resistance thermometer (RTD)		
Input type		
• Pt10 ... 10000	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen
• Ni10 ... 10000	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003
• Cu5 ... 1000	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003
Connection type	2-wire, 3-wire or 4-wire	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω	Max. 50 Ω
Input current	< 0.15 mA	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
Cable, wire-wire capacity		
• Pt1000, Pt10000 (IEC 60751 and JIS C 1604-8)	Max. 30 nF	Max. 30 nF
• All other input types	Max. 50 nF	Max. 50 nF

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Technical specifications (continued)

	SITRANS TH420 HART	SITRANS TH420 PA
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω	15 Ω
Error detection time (RTD)	≤ 75 ms (typically 70 ms)	≤ 400 ms
Error detection time (for 3-wire and 4-wire)	≤ 2 000 ms	≤ 2 000 ms
Thermocouples (TC)		
Input type		
• B	IEC 60584-1	IEC 60584-1
• E	IEC 60584-1	IEC 60584-1
• J	IEC 60584-1	IEC 60584-1
• K	IEC 60584-1	IEC 60584-1
• L	DIN 43710	DIN 43710
• Lr	GOST 3044-84	GOST 3044-84
• N	IEC 60584-1	IEC 60584-1
• R	IEC 60584-1	IEC 60584-1
• S	IEC 60584-1	IEC 60584-1
• T	IEC 60584-1	IEC 60584-1
• U	DIN 43710	DIN 43710
• W3	ASTM E988-96	ASTM E988-96
• W5	ASTM E988-96	ASTM E988-96
• LR	GOST 3044-84	GOST 3044-84
Cold Junction Compensation (CJC)	Constant, internal or external over Pt100 or Ni100 RTD	Constant, internal or external over Pt100 or Ni100 RTD
• Temperature range internal CJC	-50 ... +100 °C (-58 ... +212 °F)	-50 ... +100 °C (-58 ... +212 °F)
• Connection external CJC	2-wire, 3-wire or 4-wire	2-wire, 3-wire or 4-wire
• External CJC, wire resistance per wire (for 3-wire and 4-wire connections)	50 Ω	50 Ω
• Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
• Input current external CJC	< 0.15 mA	< 0.15 mA
• Temperature range external CJC	-50 ... +135 °C (-58 ... +275 °F)	-50 ... +135 °C (-58 ... +275 °F)
• Cable, wire-wire capacity	Max. 50 nF	Max. 50 nF
• Total wire resistance	Max. 10 kΩ	Max. 10 kΩ
• Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.
• Error detection time (TC)	≤ 75 ms (typically 70 ms)	≤ 400 ms
• Error detection time, external CJC (for 3-wire and 4-wire)	≤ 2 000 ms	≤ 2 000 ms
Linear resistance		
Input range	0 ... 100 kΩ	0 ... 100 kΩ
Minimum measuring span	25 Ω	25 Ω
Connection type	2-wire, 3-wire or 4-wire	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω	Max. 50 Ω
Input current	< 0.15 mA	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
Cable, wire-wire capacity		
• R > 400 Ω	Max. 30 nF	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF	Max. 50 nF
Error detection, programmable	None, defective	None, defective
Potentiometers		
Input range	10 ... 100 kΩ	10 ... 100 kΩ

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Technical specifications (continued)

	SITRANS TH420 HART	SITRANS TH420 PA
Minimum measuring span	25 Ω	25 Ω
Connection type	3-wire, 4-wire or 5-wire	3-wire, 4-wire or 5-wire
Wire resistance per wire	Max. 50 Ω	Max. 50 Ω
Input current	< 0.15 mA	< 0.15 mA
Effect of the wire resistance (with 4-wire and 5-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
Cable, wire-wire capacity		
• R > 400 Ω	Max. 30 nF	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω	15 Ω
Error detection time, wiper arm (no short-circuit detection)	≤ 75 ms (typically 70 ms)	≤ 400 ms
Error detection time, element	≤ 2 000 ms	≤ 2 000 ms
Error detection time (for 4-wire and 5-wire)	≤ 2 000 ms	≤ 2 000 ms
Voltage input		
Measuring range		
• Unipolar	-100 ... 1700 mV	-100 ... 1700 mV
• Bipolar	-800 ... +800 mV	-800 ... +800 mV
Minimum measuring span	2.5 mV	2.5 mV
Input resistance	10 MΩ	10 MΩ
Cable, wire-wire capacity		
• Input range: -100 ... 1700 mV	Max. 30 nF	Max. 30 nF
• Input range: -20 ... 100 mV	Max. 50 nF	Max. 50 nF
Error detection, programmable	None, defective	None, defective
Error detection time	≤ 75 ms (typically 70 ms)	≤ 400 ms
Output and HART communication		
Normal range, programmable	3.8 ... 20.5 mA/20.5 ... 3.8 mA	
Extended range (output limits), programmable	3.5 ... 23 mA/23 ... 3.5 mA	
Programmable input/output limits		
• Error detection	Enable/disable	Enable/disable
• Fault current setting	3.5 ... 23 mA	
Update time	10 ms	100 ms
Load (with current output)	≤ (V_{Supply} - 7.5)/0.023 Ω	
Load stability	< 0.01% of measuring span/100 Ω (measuring span = currently selected range)	
Input error detection, programmable (detection of input short-circuits is ignored with TC and voltage inputs)	3.5 ... 23 mA	
NAMUR NE43 Upscale	> 21 mA	
NAMUR NE43 Downscale	< 3.6 mA	
HART protocol versions	HART 7	
Measuring accuracy		
Input accuracy	See "Input accuracy" table	See "Input accuracy" table
Output accuracy	See "Output accuracy" table	See "Output accuracy" table
Operating conditions		
Ambient temperature	-50 ... +85 °C (-58 ... +185 °F)	-40 ... +85 °C (-40 ... +185 °F)
Ambient temperature for devices with functional safety	-40 ... +80 °C (-40 ... +176 °F)	
Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	-40 ... +85 °C (-40 ... +185 °F)
Reference temperature for sensor calibration	24 °C ±1.0 °C (75.2 °F ±1.8 °F)	24 °C ±1.0 °C (75.2 °F ±1.8 °F)
Relative humidity	< 99% (no condensation)	< 99% (no condensation)
Degree of protection		
• Transmitter enclosure	IP68	IP68
• Terminals	IP00	IP00

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Technical specifications (continued)

	SITRANS TH420 HART	SITRANS TH420 PA
Structural design		
Weight	50 g (0.11 lb)	50 g (0.11 lb)
Maximum core cross-section	1 × 1.5 mm² (stranded wire)	1 × 1.5 mm² (stranded wire)
Tightening torque for clamping screws	0.4 Nm	0.4 Nm
Vibrations	IEC 60068-2-6	IEC 60068-2-6
• 2 ... 25 Hz	± 1.6 mm (0.07 inches)	± 1.6 mm (0.07 inches)
• 25 ... 100 Hz	± 4 g	± 4 g
Certificates and approvals		
Explosion protection ATEX/IECEx and others		
Certificates[3]	• DEKRA 17ATEX0116 X • IECEx DEK 17.0054X • A5E43700604A-2018X	• in progress • in progress • in progress
"Intrinsic safety ia/ib" type of protection	For use in Zone 0, 1, 2, 20, 21, 22	For use in Zone 0, 1, 2, 20, 21, 22
• ATEX	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2(1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 D Ex ia IIIC Db • I M1 Ex ia I Ma	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2(1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 D Ex ia IIIC Db • I M1 Ex ia I Ma
• IECEx and others	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ia IIIC Db • Ex ia I Ma	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ia IIIC Db • Ex ia I Ma
"Intrinsic safety ic" type of protection	For use in Zones 2 and 22	For use in Zones 2 and 22
• ATEX	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC Dc	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC Dc
• IECEx and others	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC Dc	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC Dc
"Non-sparking/increased safety nA/ec" type of protection	For use in Zones 2 and 22	For use in Zones 2 and 22
• ATEX	• II 3 G Ex nA IIC T6...T4 Gc • II 3 G Ex ec IIC T6...T4 Gc	• II 3 G Ex ec IIC T6...T4 Gc
• IECEx and others	• Ex nA IIC T6 ... T4 Gc • Ex ec IIC T6 ... T4 Gc	• Ex ec IIC T6 ... T4 Gc
Explosion protection CSA/FM for Canada and USA		
Certificates	• CSA 1861385 • FM18CA0024 • FM18US0046	• in progress • in progress • in progress
"Intrinsic safety ia" type of protection	• IS, CL I, Div 1, GP ABCD, T6 ... T4 • Ex ia IIC T6 ... T4 Ga, AEx ia IIC T6 ... T4 Ga or Ex ib [ia Ga] IIC T6...T4 Gb, AEx ib [ia Ga] IIC T6...T4 Gb	• IS, CL I, Div 1, GP ABCD, T6 ... T4 • Ex ia IIC T6 ... T4 Ga, AEx ia IIC T6 ... T4 Ga or Ex ib [ia Ga] IIC T6...T4 Gb, AEx ib [ia Ga] IIC T6...T4 Gb
"Non incendive field wiring NIFW" type of protection	NIFW, CL I, Div 2, GP ABCD T6 ... T4	NIFW, CL I, Div 2, GP ABCD T6 ... T4
"Non incendive NI" type of protection	• NI, CL I, Div 2, GP ABCD T6...T4 • Ex nA IIC T6 ... T4 Gc • AEx nA IIC T6 ... T4 Gc	• NI, CL I, Div 2, GP ABCD T6...T4 • Ex nA IIC T6 ... T4 Gc • AEx nA IIC T6 ... T4 Gc

1) Note that the minimum supply voltage must correspond to the value measured at the terminals of the SITRANS TH420. All external voltage drops must be taken into account.
2) Protect the device from overvoltage with the help of a suitable power supply or suitable overvoltage protection equipment.
3) Additional available certificates are listed on the internet at http://www.siemens.com/processinstrumentation/certificates

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Technical specifications (continued)

Measuring ranges/minimum measuring ranges of sensors

RTD

Input type	Standard	Sensor measuring range in °C (°F)	α_0 in $°C^{-1}$ ($°F^{-1}$)	Minimum measuring span in °C (°F)
Pt10 ... 10000	IEC 60751	-200 ... +850 (-328 ... +1 562)	0.003851 (0.002139)	10 (50)
	JIS C 1604-8	-200 ... +649 (-328 ... +1 200)	0.003916 (0.002176)	10 (50)
	GOST 6651_2009	-200 ... +850 (-328 ... +1 562)	0.003910 (0.002172)	10 (50)
	Callendar Van Dusen	-200 ... +850 (-328 ... +1 562)	-	10 (50)
Ni10 ... 10000	DIN 43760-1987	-60 ... +250 (-76 ... +482)	0.006180 (0.003433)	10 (50)
	GOST 6651-2009/OIML R84:2003	-60 ... +180 (-76 ... +356)	0.006170 (0.003428)	10 (50)
Cu5 ... 1000	Edison Copper Winding No. 15	-200 ... +260 (-328 ... +500)	0.004270 (0.002372)	100 (212)
	GOST 6651-2009/OIML R84:2003	-180 ... +200 (-292 ... +392)	0.004280 (0.002378)	100 (212)
	GOST 6651-94	-50 ... +200 (-58 ... +392)	0.004260 (0.002367)	100 (212)

TC

Input type	Standard	Sensor measuring range in °C (°F)	Minimum measuring span in °C (°F)
B	IEC 60584-1	0 (85) ... 1 820 (32 (185) ... 3 308)	100 (212)
E	IEC 60584-1	-200 ... +1 000 (-392 ... +1 832)	50 (122)
J	IEC 60584-1	-100 ... +1 200 (-212 ... +2 192)	50 (122)
K	IEC 60584-1	-180 ... +1 372 (-356 ... +2 502)	50 (122)
L	DIN 43710	-200 ... +900 (-392 ... +1 652)	50 (122)
Lr	GOST 3044-84	-200 ... +800 (-392 ... +1 472)	50 (122)
N	IEC 60584-1	-180 ... +1 300 (-356 ... +2 372)	50 (122)
R	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
S	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
T	IEC 60584-1	-200 ... +400 (-392 ... +752)	50 (122)
U	DIN 43710	-200 ... +600 (-392 ... +1 112)	50 (122)
W3	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
W5	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
LR	GOST 3044-84	-200 ... +800 (-392 ... +1472)	50 (122)

Input accuracy

Basic values

Input type	Basic accuracy	Temperature coefficient[1)]
RTD		
Pt10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Pt20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Pt50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Pt100	≤ ±0.04 °C (0.072 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt500	$T_{max.}$ < 180 °C (356 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 180 °C (356 °F) = ≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt2000	$T_{max.}$ < 300 °C (572 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 300 °C (572 °F) = ≤ ±0.4 °C (0.72 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt10000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Ni10	≤ ±1.6 °C (2.88 °F)	≤ ±0.020 °C/°C (°F/°F)
Ni20	≤ ±0.8 °C (1.44 °F)	≤ ±0.010 °C/°C (°F/°F)
Ni50	≤ ±0.32 °C (0.576 °F)	≤ ±0.004 °C/°C (°F/°F)
Ni100	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni120	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni200	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)

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Technical specifications (continued)

Input type	Basic accuracy	Temperature coefficient[1]
Ni1000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni2000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni10000	≤ ±0.32 °C (0.576 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Cu5	≤ ±1.6 °C (2.88 °F)	≤ ±0.040 °C/°C (°F/°F)
Cu10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Cu20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Cu50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Cu100	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Linear resistance		
0 ... 400 Ω	≤ ±40 mΩ	≤ ±2 mΩ/°C (1.11 mΩ/°F)
0 ... 100 kΩ	≤ ±4 Ω	≤ ±0.2 Ω/°C (0.11 Ω/°F)
Potentiometers		
0 ... 100%	< 0.05%	< ± 0.005%
Voltage input		
mV: -20 ... 100 mV	≤ ±5 µV	≤ ±0.2 µV/°C (0.11 µV/°F)
mV: -100 ... 1700 mV	≤ ±0.1 mV	≤ ±36 µV/°C (20 µV/°F)
mV: ± 800 mV	≤ ±0.1 mV	≤ ±32 µV/°C (17.8 µV/°F)
TC		
E	≤ ±0.2 °C (0.36 °F)	≤ ±0.025 °C/°C (°F/°F)
J	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
K	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
L	≤ ±0.35 °C (0.63 °F)	≤ ±0.025 °C/°C (°F/°F)
N	≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
T	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
U	< 0 °C (32 °F) ≤ ±0.8 °C (1.44 °F) ≥ 0 °C (32 °F) ≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
Lr	≤ ±0.2 °C (0.36 °F)	≤ ±0.1 °C/°C (°F/°F)
R	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
S	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
W3	≤ ±0.6 °C (1.08 °F)	≤ ±0.1 °C/°C (°F/°F)
W5	≤ ±0.4 °C (0.72 °F)	≤ ±0.1 °C/°C (°F/°F)
B[2]	≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
B[3]	≤ ±3 °C (5.4 °F)	≤ ±0.1 °C/°C (°F/°F)
B[4]	≤ ±8 °C (14.4 °F)	≤ ±0.8 °C/°C (°F/°F)
B[5]	Not specified	Not specified
CJC (internal)	< ±0.5 °C (0.9 °F)	Included in basic accuracy
CJC (external)	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)

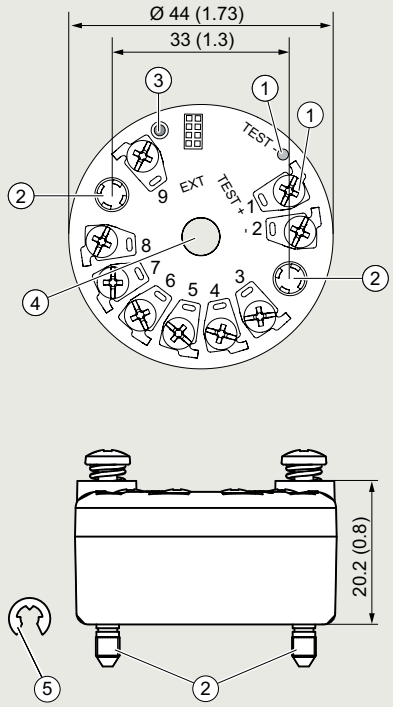
1) Temperature coefficients correspond to the specified values or 0.002% of the input span, depending on which value is greater.
2) Accuracy of the specification range > 400 °C (752 °F)
3) Accuracy of the specification range > 160 °C (320 °F) < 400 °C (752 °F)
4) Accuracy of the specification range > 85 °C (185 °F) < 160 °C (320 °F)
5) Accuracy of the specification range < 85 °C (185 °F)

Output accuracy

Output type	Basic accuracy	Temperature coefficient
Average value measurement	Average of accuracy of input 1 and input 2	Average of temperature coefficient of input 1 and input 2
Differential measurement	Sum of accuracy of input 1 and input 2	Sum of temperature coefficient of input 1 and input 2
Analog output (HART)	≤ ±1.6 µA (0.01% of the full output span)	≤ ±0.48 µA/K (≤ ±0.003% of the full output span/K)

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Dimensional drawings



1 Test terminal
2 Mounting screw M4
3 LED
4 Internal diameter of center hole 6.3 (0.25)
5 Lock washer DIN 6799 - 3.2 A2

1 (+) and 2 (-)	Output terminals
3, 4, 5, 6, 7, 8 and 9	Input terminals

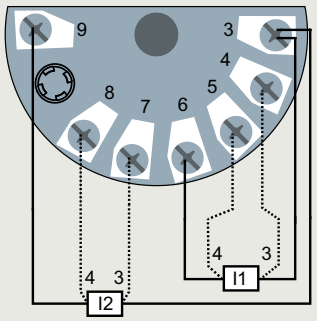
SITRANS TH420, dimensions and pin assignment, dimensions in mm (inch)

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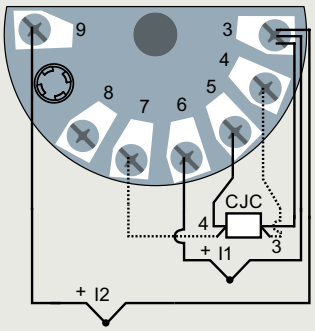
Circuit diagrams

Connections

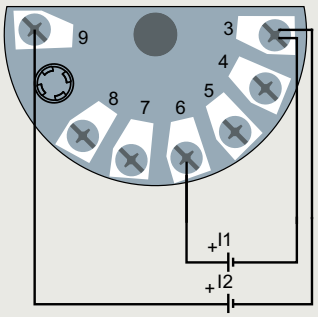
Input connection



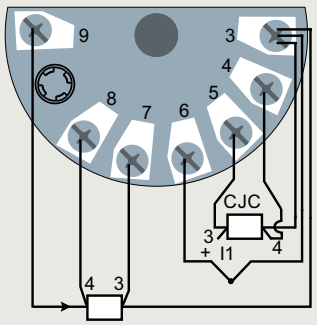
Input 1 and/or input 2:
2-wire, 3-wire or 4-wire RTD or
linear resistance



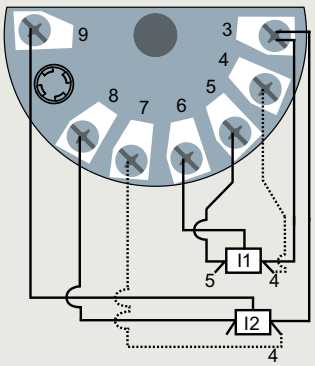
Input 1 and/or input 2:
TC (internal CJC or
external 2-wire, 3-wire or
4-wire CJC)



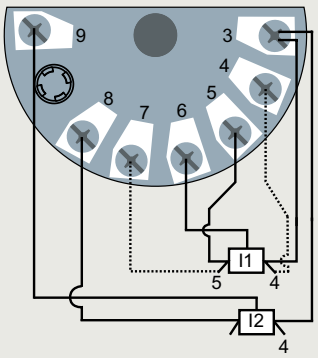
Input 1 and/or input 2:
Voltage input
(unipolar or bipolar)



Input 1: TC (internal CJC or
external 2-wire or 3-wire CJC)
Input 2: 2-wire, 3-wire or 4-wire RTD



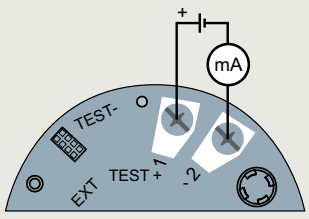
Input 1 and/or Input 2:
3-wire or 4-wire potentiometer



Input 1: 5-wire potentiometer
Input 2: 3-wire potentiometer

SITRANS TH420, input connection assignment

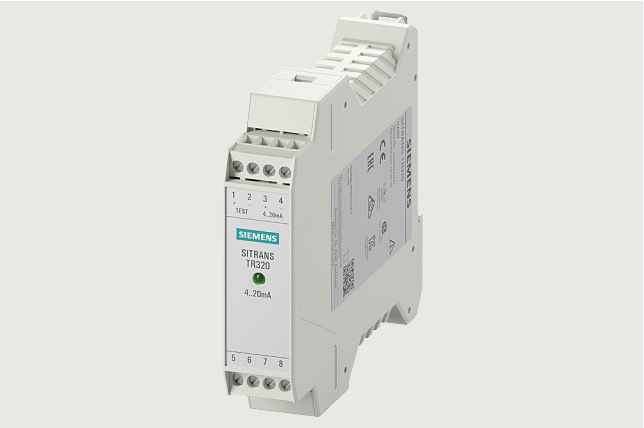
Output connection



SITRANS TH420, output connection assignment

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Overview



- 2-wire rail transmitter with and without HART communications interface
- Enclosure for DIN rail mounting
- Universal input for virtually any type of temperature sensor
- Can be configured via PC, HART 7

Benefits

- Compact design
- Galvanic isolation
- Test terminals for ammeter
- Diagnostics LED (green/red)
- Input monitoring wire break and short-circuit
- Self-monitoring
- Configuration status stored in EEPROM
- Expanded diagnostic functions, such as slave pointer, operating hours counter, etc.
- Special characteristic
- Electromagnetic compatibility according to EN 61326 and NE21
- SIL2/3 (with order note C20)

Application

SITRANS TR320 transmitters can be used in all sectors. Their compact design enables simple mounting on standard DIN rails on-site in protective boxes or in control cabinets. The following sensors/signal sources can be connected over their universal input module:

- Resistance thermometer (2-wire, 3-wire, 4-wire connection)
- Thermocouples
- Linear resistance, potentiometer and DC voltage sources

With HART communication interface:

- The output signal is a load-independent direct current from 4 to 20 mA in accordance with the input characteristic, superimposed by the digital HART signal.

Transmitters of the "intrinsically safe or Zone 2 increased safety" type of protection can be installed in hazardous areas. The device meets the requirements of the EU Directive 2014/34/EU (ATEX), the FM and CSA regulations as well as other national approvals.

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Function

Without HART communications interface

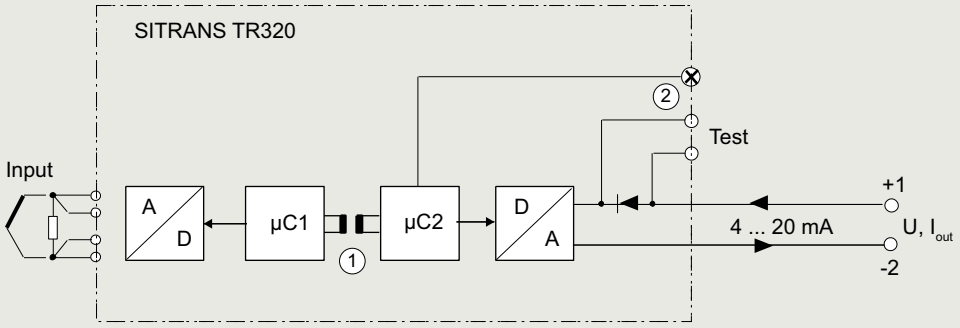
For the SITRANS TR320 without HART functionality, parameters are assigned with the PC. Available for this purpose are a special modem and the software tool SIPROM T.

With HART communications interface:

- The SITRANS TR320 is configured via HART. The configuration can be carried out using a handheld communicator or, more conveniently, with a HART modem and the SIMATIC PDM configuration software. The configuration data are then permanently stored in the non-volatile memory (EEPROM).

After correct connection of input and supply voltage, the transmitter outputs a temperature-linear output signal and the diagnostics LED is green. In case of external errors, e.g. sensor short circuit or interruption, the LED flashes red; an internal error is indicated by a permanent red light.

An ammeter can be connected at any time for checking and plausibility via the test terminals. The output current can be read without any interruption, or even without opening the current loop.



Input		Output	
A/D	Analog-digital converter	µC2	Microcontroller, primary circuit
µC1	Microcontroller, secondary circuit	D/A	Digital-analog converter
		U	Supply Voltage
		I_{out}	Output current
①	Galvanic isolation	②	LED

SITRANS TR320 function block diagram

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Selection and ordering data

SITRANS TR320 rail transmitter with 1 input	Article No. 7NG032 ● - ● ● ● ● ● - 0 ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.	
Communication	
With HART	**0**
2-wire, 4 ... 20 mA	**7**
Primary value output	
Input 1	**0**
Input 1, type	
RTD	
• Pt100 (IEC), 3-wire	**B**
• Pt100 (IEC), 4-wire	**C**
• Pt1000 (IEC), 3-wire	**D**
• Pt1000 (IEC), 4-wire	**E**
TC	
• Type B	**F**
• Type E	**G**
• Type J	**H**
• Type K	**J**
• Type L	**K**
• Type N	**L**
• Type R	**N**
• Type S	**P**
• Type T	**Q**
Potentiometer, 4-wire	**R**
Input 1, type customer-specific	
Define customer-specific input configurations with V options	**Y**
Input 2, type	
Without input 2	**A**
CJC configuration for TC	
Without CJC	**0**
Internal CJC	**1**
External CJC Pt100 (IEC), 3-wire	**3**
External CJC Ni100 (DIN), 3-wire	**6**
Define fixed CJC value with option Y60	**8**
Materials not in contact with media	
None	**0**
Type of protection	
General safety (non-Ex); CE, RCM, FM, KCC, EAC, CSA, UK	**A**
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW) / increased safety zone 2 (Ex ec) / non-incendive (NI) (ATEX, IECEx, EACEx, CSA, FM, NEPSI, Inmetro, UKEx)	**N**
Electrical connection/cable entries	
None	**A**
Local HMI	
Without local display	**0**

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	**C11**
Certificates for functional safety	
Functional safety SIL2/3 (IEC 61508)	**C20**
Device options	
PDF file with device settings	**D10**
Without labeling of the measuring range on the TAG plate	**D41**
Jumper plug set on device for write protection	**D81**
Jumper plug set on device set for fault current > 21 mA (instead of < 3.6 mA) (only non-SIL)	**D82**
Noise damping	
Noise damping 60 Hz instead of 50 Hz	**P10**
Input 1: TC	
Type C W5	**V01**
Type D W3	**V02**
Type U	**V03**
Type Lr	**V04**
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	**V50**
3-wire (define Callendar Van Dusen parameter in option Y35)	**V51**
4-wire (define Callendar Van Dusen parameter in option Y35)	**V52**
Input 1: RTD	
Pt x (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V60**
Pt x (IEC 60751), 3-wire, define RTD factor x in option Y21	**V61**
Pt x (IEC), 4-wire, define RTD factor x in option Y21	**V62**
Pt x (JIS C1604), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V63**
Pt x (JIS C1604-81), 3-wire, define RTD factor x in option Y21	**V64**
Pt x (JIS C1604-81), 4-wire, define RTD factor x in option Y21	**V65**
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V66**
Pt x (GOST 6651-2009), 3-wire, define RTD factor x in option Y21	**V67**
Pt x (GOST 6651-2009), 4-wire, define RTD factor x in option Y21	**V68**
Ni x (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V69**
Ni x (DIN 43760-87), 3-wire, define RTD factor x in option Y21	**V70**
Ni x (DIN 43760-87), 4-wire, define RTD factor x in option Y21	**V71**
Ni x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V72**
Ni x (GOST 6651-2009), 3-wire, define RTD factor x in option Y21	**V73**
Ni x (GOST 6651-2009), 4-wire, define RTD factor x in option Y21	**V74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V75**
Cu x (ECW-15), 3-wire, define RTD factor x in option Y21	**V76**
Cu x (ECW-15), 4-wire, define RTD factor x in option Y21	**V77**
Cu x (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V78**
Cu x (GOST 6651-94), define 3-wire, define RTD factor x in option Y21	**V79**
Cu x (GOST 6651-94), define 4-wire, define RTD factor x in option Y21	**V80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V81**
Cu x (GOST 6651-2009), define 3-wire, define RTD factor x in option Y21	**V82**
Cu x (GOST 6651-2009), define 4-wire, define RTD factor x in option Y21	**V83**

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Device settings	
Measuring range setting temperature input (instead of 0 ... 100 °C): Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	**Y01**
Customer-specific programming in plain text (n-lines)	**Y09**
Tag (device parameters, max. 32 characters), adhesive label	**Y15**
Measuring point description (device parameters, max. 32 characters), adhesive label	**Y16**
Descriptor (device parameters, max. 16 characters), adhesive label	**Y18**
Tag (device parameters, max. 16 characters), adhesive label on front	**Y19**
Input 1: RTD factor; e.g. factor "200" = Pt200, adhesive label	**Y21**
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	**Y31**
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y35**
Wire resistance value input 1 in ohms (0 ... 100 ohms)	**Y51**
Input 1: CJC sensor, fixed value (see measuring range for unit)	**Y60**
ID number of special design	**Y99**

Accessories

	Article No.
Other accessories for assembly, connection and transmitter configuration, see page 2/198.	
Modems	
HART modem with USB interface	**7MF4997-1DB**
Modem with USB interface and SIPROM T software	**7NG3092-8KN**
SIMATIC PDM parameterization software	See Catalog FI 01 section 8

Ordering example

7NG0320-0BA00-0AA0-Z Y01
Y01: -10 ... +100 °C

Factory setting

- Pt100 (IEC 751); 3-wire connection
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current
  - Device fault: < 3.6 mA
  - Input circuit wire break: 22.8 mA
  - Input circuit short-circuit: 22.4 mA
  - Input monitoring wire break and short-circuit
- No trimming of input and output (offset)
- Damping 0.0 s

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Technical specifications

SITRANS TR320 (HART, universal)	
General	
Supply voltage[1) 2)]	
• Without explosion protection (non-Ex)	7.5 ... 48 V DC
• With explosion protection (Ex i)	7.5 ... 30 V DC
Additional minimum supply voltage when using test terminals	0.8 V
Maximum power loss	≤ 850 mW
Minimum load resistance at supply voltage > 37 V	(V_{supply} - 37 V)/23 mA
Insulation voltage, test/operation	
• Without explosion protection (non-Ex)	2.5 kV AC/55 V AC
• With explosion protection (Ex i)	2.5 kV AC/42 V AC
Polarity protection	All inputs and outputs
Write protection	Wire jumper or software
Warm-up time	< 5 min
Starting time	< 2.75 s
Programming	HART
Signal-to-noise ratio	> 60 dB
Long-term stability	Better than: • ± 0.05% of measuring span/year • ± 0.18% of measuring span/5 years
Response time	4 ... 20 mA: ≤ 55 ms HART: ≤ 75 ms (typically 70 ms)
Programmable damping	0 ... 60 s
Signal dynamic	
• Input	24 bit
• Output	18 bit
Influence of change in supply voltage	< 0.005% of measuring span/V DC
Input	
Resistance thermometer (RTD)	
Input type	
• Pt10 ... 10000	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen
• Ni10 ... 10000	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003
• Cu5 ... 1000	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• Pt1000, Pt10000 (IEC 60751 and JIS C 1604-8)	Max. 30 nF
• All other input types	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time (RTD)	≤ 75 ms (typically 70 ms)
Error detection time (for 3-wire and 4-wire)	≤ 2 000 ms
Thermocouples (TC)	
Input type	
• B	IEC 60584-1
• E	IEC 60584-1
• J	IEC 60584-1
• K	IEC 60584-1
• L	DIN 43710

SITRANS TR320 (HART, universal)	
• Lr	GOST 3044-84
• N	IEC 60584-1
• R	IEC 60584-1
• S	IEC 60584-1
• T	IEC 60584-1
• U	DIN 43710
• W3	ASTM E988-96
• W5	ASTM E988-96
• LR	GOST 3044-84
Cold Junction Compensation (CJC)	Constant, internal or external over Pt100 or Ni100 RTD
• Temperature range internal CJC	-50 ... +100 °C (-58 ... +212 °F)
• Connection external CJC	2-wire or 3-wire
• External CJC, wire resistance per wire (for 3-wire and 4-wire connections)	50 Ω
• Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
• Input current external CJC	< 0.15 mA
• Temperature range external CJC	-50 ... +135 °C (-58 ... +275 °F)
• Cable, wire-wire capacity	Max. 50 nF
• Total wire resistance	Max. 10 kΩ
• Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.
• Error detection time (TC)	≤ 75 ms (typically 70 ms)
• Error detection time, external CJC (for 3-wire and 4-wire)	≤ 2 000 ms
Linear resistance	
Input range	0 ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, defective
Potentiometers	
Input range	10 ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 4-wire and 5-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time, wiper arm (no short-circuit detection)	≤ 75 ms (typically 70 ms)
Error detection time, element	≤ 2 000 ms
Error detection time (for 4-wire and 5-wire)	≤ 2 000 ms
Voltage input	

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Technical specifications (continued)

SITRANS TR320 (HART, universal)	
Measuring range	
• Unipolar	-100 ... 1700 mV
• Bipolar	-800 ... +800 mV
Minimum measuring span	2.5 mV
Input resistance	10 MΩ
Cable, wire-wire capacity	
• Input range: -100 ... 1700 mV	Max. 30 nF
• Input range: -20 ... 100 mV	Max. 50 nF
Error detection, programmable	None, defective
Error detection time	≤ 75 ms (typically 70 ms)
Output and HART communication	
Normal range, programmable	3.8 ... 20.5 mA/20.5 ... 3.8 mA
Extended range (output limits), programmable	3.5 ... 23 mA/23 ... 3.5 mA
Programmable input/output limits	
• Fault current	Enable/disable
• Fault current setting	3.5 ... 23 mA
Update time	10 ms
Load (with current output)	≤ (V_{Supply} - 7.5)/0.023 Ω
Load stability	< 0.01% of measuring span/100 Ω (measuring span = currently selected range)
Input error detection, programmable (detection of input short-circuits is ignored with TC and voltage inputs)	3.5 ... 23 mA
NAMUR NE43 Upscale	> 21 mA
NAMUR NE43 Downscale	< 3.6 mA
HART protocol versions	HART 7
Measuring accuracy	
Input accuracy	See "Input accuracy" table
Output accuracy	See "Output accuracy" table
Operating conditions	
Ambient temperature	-50 ... +85 °C (-58 ... +185 °F)
Ambient temperature for devices with functional safety	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
Reference temperature for sensor calibration	24 °C ±1.0 °C (75.2 °F ±1.8 °F)
Relative humidity	< 99% (no condensation)
Degree of protection	
• Transmitter enclosure	IP20
• Terminals	IP20
Structural design	
Weight	122 g (0.27 lb)
Maximum core cross-section	2.5 mm² (AWG 13)
Tightening torque for clamping screws	0.5 ... 0.6 Nm
Vibrations	IEC 60068-2-6
• 2 ... 25 Hz	± 1.6 mm (0.07 inches)
• 25 ... 100 Hz	± 4 g
Certificates and approvals	
Explosion protection ATEX/IECEx and others	
Certificates[3)]	• DEKRA 17ATEX0116 X • IECEx DEK 17.0054X • A5E43700604A-2018X
"Intrinsic safety ia/ib" type of protection	For use in Zone 0, 1, 2, 20, 21, 22
• ATEX	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2(1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 D Ex ia IIIC Db • I M1 Ex ia I Ma
• IECEx and others	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ia IIIC Db • Ex ia I Ma
"Intrinsic safety ic" type of protection	For use in Zones 2 and 22
• ATEX	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC Dc

SITRANS TR320 (HART, universal)	
• IECEx and others	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC Dc
"Non-sparking/increased safety nA/ec" type of protection	For use in Zones 2 and 22
• ATEX	• II 3 G Ex nA IIC T6...T4 Gc • II 3 G Ex ec IIC T6...T4 Gc
• IECEx and others	• Ex nA IIC T6 ... T4 Gc • Ex ec IIC T6 ... T4 Gc
Explosion protection CSA/FM for Canada and USA	
Certificates	• CSA 1861385 • FM18CA0024 • FM18US0046
"Intrinsic safety ia" type of protection	• IS, CL I, Div 1, GP ABCD, T6 ... T4 • Ex ia IIC T6 ... T4 Ga, AEx ia IIC T6 ... T4 Ga or Ex ib [ia Ga] IIC T6...T4 Gb, AEx ib [ia Ga] IIC T6...T4 Gb
"Non incendive field wiring NIFW" type of protection	NIFW, CL I, Div 2, GP ABCD T6 ... T4
"Non incendive NI" type of protection	• NI, CL I, Div 2, GP ABCD T6...T4 • Ex nA IIC T6 ... T4 Gc • AEx nA IIC T6 ... T4 Gc

1) Note that the minimum supply voltage must correspond to the value measured at the terminals of the SITRANS TR320. All external voltage drops must be taken into account.
2) Protect the device from overvoltage with the help of a suitable power supply or suitable overvoltage protection equipment.
3) Additional available certificates are listed on the internet at http://www.siemens.com/processinstrumentation/certificates

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Technical specifications (continued)

Measuring ranges/Minimum measuring span

RTD

Input type	Standard	Measuring range in °C (°F)	α_0 in $°C^{-1}$ ($°F^{-1}$)	Minimum measuring span in °C (°F)
Pt10 ... 10000	IEC 60751	-200 ... +850 (-328 ... +1 562)	0.003851 (0.002139)	10 (50)
	JIS C 1604-8	-200 ... +649 (-328 ... +1 200)	0.003916 (0.002176)	10 (50)
	GOST 6651_2009	-200 ... +850 (-328 ... +1 562)	0.003910 (0.002172)	10 (50)
	Callendar Van Dusen	-200 ... +850 (-328 ... +1 562)	-	10 (50)
Ni10 ... 10000	DIN 43760-1987	-60 ... +250 (-76 ... +482)	0.006180 (0.003433)	10 (50)
	GOST 6651-2009/OIML R84:2003	-60 ... +180 (-76 ... +356)	0.006170 (0.003428)	10 (50)
Cu5 ... 1000	Edison Copper Winding No. 15	-200 ... +260 (-328 ... +500)	0.004270 (0.002372)	100 (212)
	GOST 6651-2009/OIML R84:2003	-180 ... +200 (-292 ... +392)	0.004280 (0.002378)	100 (212)
	GOST 6651-94	-50 ... +200 (-58 ... +392)	0.004260 (0.002367)	100 (212)

TC

Input type	Standard	Measuring range in °C (°F)	Minimum measuring span in °C (°F)
B	IEC 60584-1	0 (85) ... 1 820 (32 (185) ... 3 308)	100 (212)
E	IEC 60584-1	-200 ... +1 000 (-392 ... +1 832)	50 (122)
J	IEC 60584-1	-100 ... +1 200 (-212 ... +2 192)	50 (122)
K	IEC 60584-1	-180 ... +1 372 (-356 ... +2 502)	50 (122)
L	DIN 43710	-200 ... +900 (-392 ... +1 652)	50 (122)
Lr	GOST 3044-84	-200 ... +800 (-392 ... +1 472)	50 (122)
N	IEC 60584-1	-180 ... +1 300 (-356 ... +2 372)	50 (122)
R	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
S	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
T	IEC 60584-1	-200 ... +400 (-392 ... +752)	50 (122)
U	DIN 43710	-200 ... +600 (-392 ... +1 112)	50 (122)
W3	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
W5	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
LR	GOST 3044-84	-200 ... +800 (-392 ... +1472)	50 (122)

Input accuracy

Basic values

Input type	Basic accuracy	Temperature coefficient[1)]
RTD		
Pt10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Pt20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Pt50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Pt100	≤ ±0.04 °C (0.072 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt500	$T_{max.}$ < 180 °C (356 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 180 °C (356 °F) = ≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt2000	$T_{max.}$ < 300 °C (572 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 300 °C (572 °F) = ≤ ±0.4 °C (0.72 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt10000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Ni10	≤ ±1.6 °C (2.88 °F)	≤ ±0.020 °C/°C (°F/°F)
Ni20	≤ ±0.8 °C (1.44 °F)	≤ ±0.010 °C/°C (°F/°F)
Ni50	≤ ±0.32 °C (0.576 °F)	≤ ±0.004 °C/°C (°F/°F)
Ni100	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni120	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni200	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni1000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)

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Technical specifications (continued)

Input type	Basic accuracy	Temperature coefficient[1]
Ni2000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni10000	≤ ±0.32 °C (0.576 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Cu5	≤ ±1.6 °C (2.88 °F)	≤ ±0.040 °C/°C (°F/°F)
Cu10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Cu20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Cu50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Cu100	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Linear resistance		
0 ... 400 Ω	≤ ±40 mΩ	≤ ±2 mΩ/°C (1.11 mΩ/°F)
0 ... 100 kΩ	≤ ±4 Ω	≤ ±0.2 Ω/°C (0.11 Ω/°F)
Potentiometers		
0 ... 100%	< 0.05%	< ± 0.005%
Voltage input		
mV: -20 ... 100 mV	≤ ±5 µV	≤ ±0.2 µV/°C (0.11 µV/°F)
mV: -100 ... 1700 mV	≤ ±0.1 mV	≤ ±36 µV/°C (20 µV/°F)
mV: ± 800 mV	≤ ±0.1 mV	≤ ±32 µV/°C (17.8 µV/°F)
TC		
E	≤ ±0.2 °C (0.36 °F)	≤ ±0.025 °C/°C (°F/°F)
J	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
K	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
L	≤ ±0.35 °C (0.63 °F)	≤ ±0.025 °C/°C (°F/°F)
N	≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
T	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
U	< 0 °C (32 °F) ≤ ±0.8 °C (1.44 °F) ≥ 0 °C (32 °F) ≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
Lr	≤ ±0.2 °C (0.36 °F)	≤ ±0.1 °C/°C (°F/°F)
R	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
S	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
W3	≤ ±0.6 °C (1.08 °F)	≤ ±0.1 °C/°C (°F/°F)
W5	≤ ±0.4 °C (0.72 °F)	≤ ±0.1 °C/°C (°F/°F)
B[2]	≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
B[3]	≤ ±3 °C (5.4 °F)	≤ ±0.1 °C/°C (°F/°F)
B[4]	≤ ±8 °C (14.4 °F)	≤ ±0.8 °C/°C (°F/°F)
B[5]	Not specified	Not specified
CJC (internal)	< ±0.5 °C (0.9 °F)	Included in basic accuracy
CJC (external)	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)

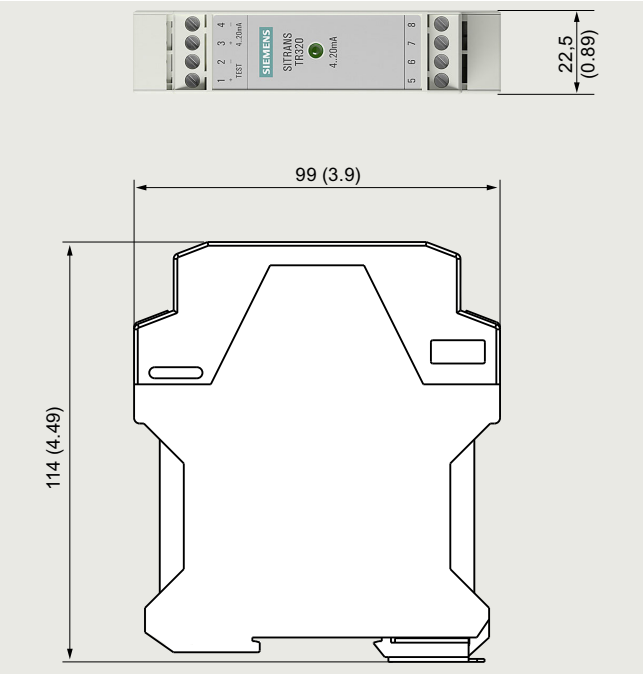
1) Temperature coefficients correspond to the specified values or 0.002% of the input span, depending on which value is greater.
2) Accuracy of the specification range > 400 °C (752 °F)
3) Accuracy of the specification range > 160 °C (320 °F) < 400 °C (752 °F)
4) Accuracy of the specification range > 85 °C (185 °F) < 160 °C (320 °F)
5) Accuracy of the specification range < 85 °C (185 °F)

Output accuracy

Output type	Basic accuracy	Temperature coefficient
Analog output	≤ ±1.6 µA (0.01% of the full output span)	≤ ±0.48 µA/K (≤ ±0.003% of the full output span/K)

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Dimensional drawings



SITRANS TR320, dimensions in mm (inch)

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Circuit diagrams

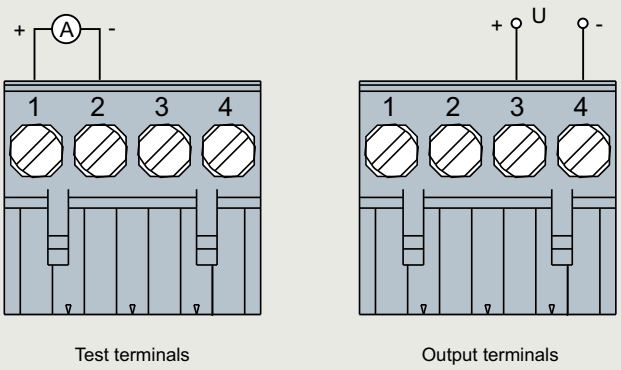
Connections



1 (+) and 2 (-)	Test terminals for measurement of the output current with an amperemeter
3 (+) and 4 (-)	Output terminals
5, 6, 7 and 8	Input terminals

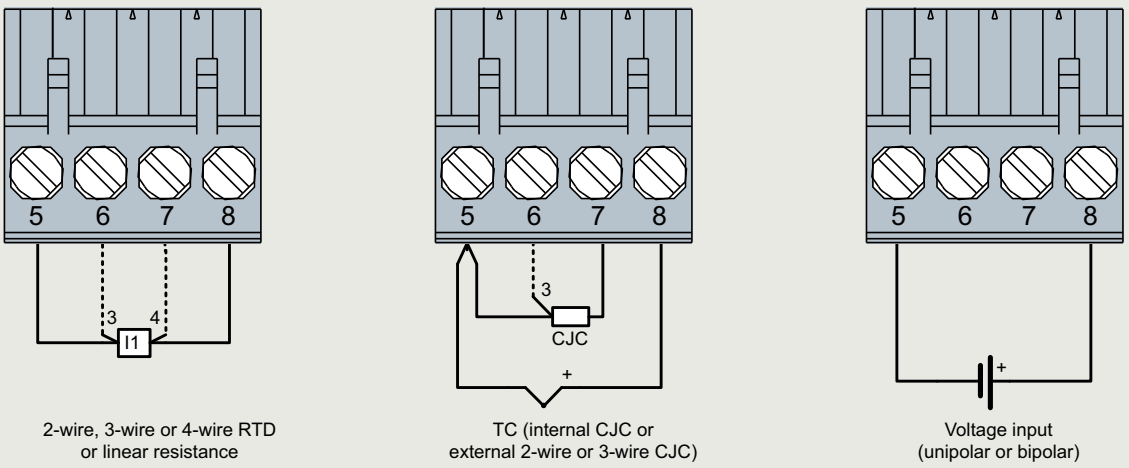
SITRANS TR320, connector assignment

Output and test connection



SITRANS TR320, output connection assignment

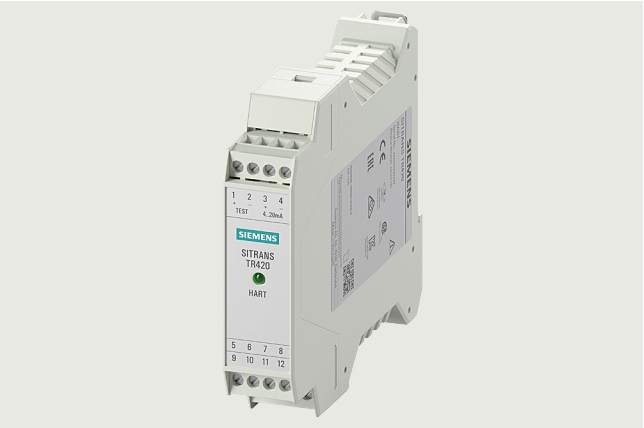
Input connection



SITRANS TR320, input connection assignment

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Overview



- 2-wire rail transmitter with HART communications interface
- Device for rail mounting
- Universal input for virtually any type of temperature sensor
- Connection of two independent input circuits for redundant operation (high input availability)
- Input drift detection
- Configurable via HART 7

Benefits

- Compact design
- Connection of two independent input circuits for redundant operation (high input availability)
- Galvanic isolation
- Test terminals for ammeter
- Diagnostics LED (green/red)
- Input monitoring wire break and short-circuit
- Self-monitoring
- Configuration status stored in EEPROM
- Expanded diagnostic functions, such as slave pointer, operating hours counter, etc.
- Special characteristic
- Electromagnetic compatibility according to EN 61326 and NE21
- SIL2/3 (with order note C20)

Application

SITRANS TR420 transmitters with two inputs can be used in all sectors. Their compact design enables simple mounting on standard DIN rails on-site in protective boxes or in control cabinets. The following sensors/signal sources can be connected over their universal input module:

- 2 resistance thermometers (2-wire, 3-wire, 4-wire connection)
- 2 thermocouples
- 2 linear resistors, potentiometer and DC voltage sources

The output signal is a load-independent direct current from 4 to 20 mA in accordance with the input characteristic, superimposed by the digital HART signal.

The dual input mode also supports drift detection of the inputs, whereby maintenance intervals can be more easily planned.

Transmitters of the "intrinsically safe or Zone 2 increased safety" type of protection can be installed in hazardous areas. The device meets the requirements of the EU Directive 2014/34/EU (ATEX), the FM and CSA regulations as well as other national approvals.

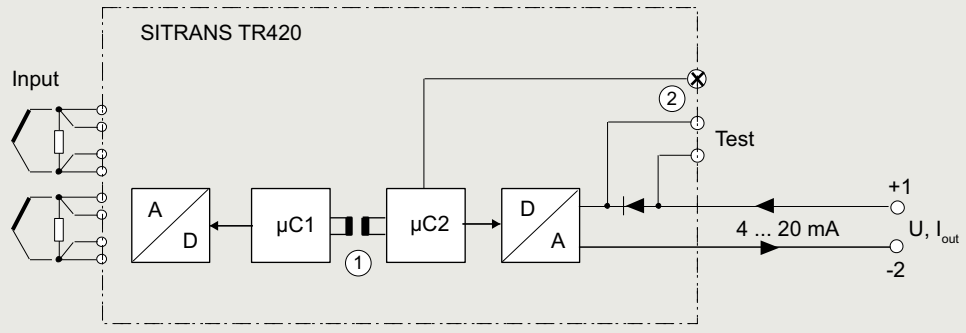
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Function

The SITRANS TR420 is configured via HART. The configuration can be carried out using a handheld communicator or, more conveniently, with a HART modem and the SIMATIC PDM configuration software. The configuration data are then permanently stored in the non-volatile memory (EEPROM).

After correct connection of input and supply voltage, the transmitter outputs a temperature-linear output signal and the diagnostics LED is green. In case of external errors, e.g. sensor short circuit or interruption, the LED flashes red; an internal error is indicated by a permanent red light.

An ammeter can be connected at any time for checking and plausibility via the test terminals. The output current can be read without any interruption, or even without opening the current loop.



Input		Output	
A/D	Analog-digital converter	µC2	Microcontroller, primary circuit
µC1	Microcontroller, secondary circuit	D/A	Digital-analog converter
		U	Supply Voltage
		I_{out}	Output current
①	Galvanic isolation	②	LED

SITRANS TR420, function block diagram

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Selection and ordering data

SITRANS TR420 rail transmitter with 2 inputs	Article No. 7NG042 ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Communication		
With HART	0	
Primary value output		
Input 1	0	
Input 1, input 2 as redundancy	1	
Input 2, input 1 as redundancy	2	
Mean value input 1 and input 2, both as redundancy	3	
Minimum input 1 and input 2, both as redundancy	4	
Maximum input 1 and input 2, both as redundancy	5	
Difference input 1 - input 2	6	
Difference input 2 - input 1	7	
Absolute difference	8	
Primary value output, customer-specific		
Minimum input 1 and input 2, without redundancy	9	H 1 A
Maximum input 1 and input 2, without redundancy	9	H 1 B
Mean value input 1 and input 2, without redundancy	9	H 1 C
Input 2	9	H 1 D
Input 1, type		
RTD		
• Pt100 (IEC), 3-wire	B	
• Pt100 (IEC), 4-wire	C	
• Pt1000 (IEC), 3-wire	D	
• Pt1000 (IEC), 4-wire	E	
TC		
• Type B	F	
• Type E	G	
• Type J	H	
• Type K	J	
• Type L	K	
• Type N	L	
• Type R	N	
• Type S	P	
• Type T	Q	
Potentiometer, 4-wire	R	
Input 1, type customer-specific		
Define customer-specific input configurations in V options	Y	
Input 2, type		
Without input 2	A	
RTD		
• Pt100 (IEC), 3-wire	B	
• Pt100 (IEC), 4-wire	C	
• Pt1000 (IEC), 3-wire	D	
• Pt1000 (IEC), 4-wire	E	
TC		
• Type B	F	
• Type E	G	
• Type J	H	
• Type K	J	
• Type L	K	
• Type N	L	
• Type R	N	
• Type S	P	

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Selection and ordering data (continued)

SITRANS TR420 rail transmitter with 2 inputs	Article No. 7NG042 ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
• Type T	Q	
Potentiometer, 4-wire	R	
Input 2, type customer-specific		
Define customer-specific input configurations in W options	Y	
CJC configuration for TC		
Input 1: no CJC; input 2: No CJC	0	
Input 1: internal CJC; input 2: internal CJC	1	
Input 1: external CJC; input 2: external CJC; define type in option Jxx	2	
Input 1: external CJC; define type in option Jxx; input 2: internal CJC	3	
Input 1: internal CJC; input 2: external CJC; define type in option Jxx	4	
Input 1: Internal CJC; Input 2: No CJC	5	
Input 1: External CJC (define type in option Jxx); input 2: No CJC	6	
CJC configuration for TC, customer-specific		
Input 1: Fixed CJC value (define value in option Y60); Input 2: Fixed CJC value (define value in option Y61)	9	L 1 A
Input 1: External CJC (define type in option Jxx); Input 2: Define fixed CJC value with option Y61	9	L 1 B
Input 1: Define fixed CJC value with option Y60; Input 2: External CJC (define type in option Jxx)	9	L 1 C
Input 1: Define fixed CJC value with option Y60; Input 2: Internal CJC	9	L 1 D
Input 1: Internal CJC; Input 2: Define fixed CJC value with option Y61	9	L 1 E
Materials not in contact with media		
None	0	
Type of protection		
General safety (non-Ex); CE, RCM, FM, KCC, EAC, CSA, UK	A	
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW) / increased safety zone 2 (Ex ec) / non-incendive (NI) (ATEX, IECEx, EACEx, CSA, FM, NEPSI, Inmetro, UKEx)	N	
Electrical connection/cable entries		
None	A	
Local HMI		
Without local display	0	

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	C11
Certificates for functional safety	
Functional safety SIL2/3 (IEC 61508)	C20
Device options	
PDF file with device settings	D10
Without labeling of the measuring range on the TAG plate	D41
Jumper plug set on device for write protection	D81
Jumper plug set on device set for fault current > 21 mA (instead of < 3.6 mA) (only non-SIL)	D82
External CJC types	
Pt100, IEC 60751, 3-wire	J02
Pt100, IEC 60751, 4-wire	J03
Ni100, DIN 43760-87, 3-wire	J05
Ni100, DIN 43760-87, 4-wire	J06
Noise damping	
Noise damping 60 Hz instead of 50 Hz	P10
Input 1: TC	
Type C W5	V01
Type D W3	V02
Type U	V03

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Type Lr	V04
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	V50
3-wire (define Callendar Van Dusen parameter in option Y35)	V51
4-wire (define Callendar Van Dusen parameter in option Y35)	V52
Input 1: RTD	
Pt x (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	V60
Pt x (IEC 60751), 3-wire, define RTD factor x in option Y21	V61
Pt x (IEC 60751), 4-wire, define RTD factor x in option Y21	V62
Pt x (JIS C1604), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	V63
Pt x (JIS C1604-81), 3-wire, define RTD factor x in option Y21	V64
Pt x (JIS C1604-81), 4-wire, define RTD factor x in option Y21	V65
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	V66
Pt x (GOST 6651-2009), 3-wire, define RTD factor x in option Y21	V67
Pt x (GOST 6651-2009), 4-wire, define RTD factor x in option Y21	V68
Ni x (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	V69
Ni x (DIN 43760-87), 3-wire, define RTD factor x in option Y21	V70
Ni x (DIN 43760-87), 4-wire, define RTD factor x in option Y21	V71

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Ni × (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V72**
Ni × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	**V73**
Ni × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	**V74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V75**
Cu × (ECW-15), 3-wire, define RTD factor × in option Y21	**V76**
Cu × (ECW-15), 4-wire, define RTD factor × in option Y21	**V77**
Cu × (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V78**
Cu × (GOST 6651-94), define 3-wire, define RTD factor × in option Y21	**V79**
Cu × (GOST 6651-94), define 4-wire, define RTD factor × in option Y21	**V80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V81**
Cu × (GOST 6651-2009), define 3-wire, define RTD factor × in option Y21	**V82**
Cu × (GOST 6651-2009), define 4-wire, define RTD factor × in option Y21	**V83**
Input 2: TC	
Type C W5	**W01**
Type D W3	**W02**
Type U	**W03**
Type Lr	**W04**
Input 2: Callendar Van Dusen	
2-wire (define wire resistance value in option Y52 and Callendar Van Dusen parameter in option Y36)	**W50**
3-wire (define Callendar Van Dusen parameter in option Y36)	**W51**
4-wire (define Callendar Van Dusen parameter in option Y36)	**W52**
Input 2: RTD	
Pt × (IEC 60751), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W60**
Pt × (IEC 60721), 3-wire, define RTD factor × in option Y22	**W61**
Pt × (IEC 60721), 4-wire, define RTD factor × in option Y22	**W62**
Pt × (JIS C1604), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W63**
Pt × (JIS C1604-81), 3-wire, define RTD factor × in option Y22	**W64**
Pt × (JIS C1604-81), 4-wire, define RTD factor × in option Y22	**W65**
Pt × (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W66**
Pt × (GOST 6651-2009), 3-wire, define RTD factor × in option Y22	**W67**
Pt × (GOST 6651-2009), 4-wire, define RTD factor × in option Y22	**W68**
Ni × (DIN 43760-87), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W69**
Ni × (DIN 43760-87), 3-wire, define RTD factor × in option Y22	**W70**
Ni × (DIN 43760-87), 4-wire, define RTD factor × in option Y22	**W71**
Ni × (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W72**
Ni × (GOST 6651-2009), 3-wire, define RTD factor × in option Y22	**W73**
Ni × (GOST 6651-2009), 4-wire, define RTD factor × in option Y22	**W74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W75**
Cu × (ECW-15), 3-wire, define RTD factor × in option Y22	**W76**
Cu × (ECW-15), 4-wire, define RTD factor × in option Y22	**W77**
Cu × (GOST 6651-94), 2-wire (define wire resistance value in option Y52 and RTD factor × in option Y22)	**W78**
Cu × (GOST 6651-94), 3-wire, define RTD factor × in option Y22	**W79**
Cu × (GOST 6651-94), 4-wire, define RTD factor × in option Y22	**W80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W81**

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Cu × (GOST 6651-2009), 3-wire, define RTD factor × in option Y22	**W82**
Cu × (GOST 6651-2009), 4-wire, define RTD factor × in option Y22	**W83**
Device settings	
Measuring range setting temperature input (instead of 0 ... 100 °C): Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	**Y01**
Customer-specific programming in plain text (n-lines)	**Y09**
Tag (device parameters, max. 32 characters), adhesive label	**Y15**
Measuring point description (device parameters, max. 32 characters), adhesive label	**Y16**
Descriptor (device parameters, max. 16 characters), adhesive label	**Y18**
Input 1: RTD factor (e.g. factor "200" - Pt200), adhesive label	**Y21**
Input 2: RTD factor (e.g. factor "200" - RTD Pt200), adhesive label	**Y22**
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	**Y31**
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y35**
CvD Sensor matching factors input 2 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y36**
Wire resistance value input 1 in ohms (0 ... 100 ohms)	**Y51**
Wire resistance value input 2 in ohms (0 ... 100 ohms)	**Y52**
Input 1: CJC sensor, fixed value (see measuring range for unit)	**Y60**
Input 2: CJC sensor, fixed value (see measuring range for unit)	**Y61**
ID number of special design	**Y99**

Accessories

	Article No.
Other accessories for assembly, connection and transmitter configuration, see page 2/198.	
Modem	
HART modem with USB interface	**7MF4997-1DB**
SIMATIC PDM parameterization software	See Catalog FI 01 section 8

Ordering example

7NG0420-0BA00-0AA0-Z Y01
Y01: -10 ... +100 °C

Factory setting

- Input 1: Pt100 (IEC 751; 3-wire connection)
- Input 2: not configured (inactive)
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current
  - Device fault: < 3.6 mA
  - Input circuit wire break: 22.8 mA
  - Input circuit short-circuit: 22.4 mA
  - Input circuit drift: 22 mA (active when input 2 is active)
  - Input monitoring wire break and short-circuit
- No trimming of input and output (offset)
- Damping 0.0 s

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Technical specifications

SITRANS TR420 (HART, universal)	
General	
Supply voltage[1) 2)]	
• Without explosion protection (non-Ex)	7.5 ... 48 V DC
• With explosion protection (Ex i)	7.5 ... 30 V DC
Additional minimum supply voltage when using test terminals	0.8 V
Maximum power loss	≤ 850 mW
Minimum load resistance at supply voltage > 37 V	(V_{supply} - 37 V)/23 mA
Insulation voltage, test/operation	
• Without explosion protection (non-Ex)	2.5 kV AC/55 V AC
• With explosion protection (Ex i)	2.5 kV AC/42 V AC
Polarity protection	All inputs and outputs
Write protection	Wire jumper or software
Warm-up time	< 5 min
Starting time	< 2.75 s
Programming	SIPROM T and HART
Signal-to-noise ratio	> 60 dB
Long-term stability	Better than: • ± 0.05% of measuring span/year • ± 0.18% of measuring span/5 years
Response time	≤ 75 ms (typically 70 ms)
Programmable damping	0 ... 60 s
Signal dynamic	
• Input	24 bit
• Output	18 bit
Influence of change in supply voltage	< 0.005% of measuring span/V DC
Input	
Resistance thermometer (RTD)	
Input type	
• Pt10 ... 10000	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen
• Ni10 ... 10000	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003
• Cu5 ... 1000	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• Pt1000, Pt10000 (IEC 60751 and JIS C 1604-8)	Max. 30 nF
• All other input types	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time (RTD)	≤ 75 ms (typically 70 ms)
Error detection time (for 3-wire and 4-wire)	≤ 2 000 ms
Thermocouples (TC)	
Input type	
• B	IEC 60584-1
• E	IEC 60584-1
• J	IEC 60584-1
• K	IEC 60584-1
• L	DIN 43710
• Lr	GOST 3044-84

SITRANS TR420 (HART, universal)	
• N	IEC 60584-1
• R	IEC 60584-1
• S	IEC 60584-1
• T	IEC 60584-1
• U	DIN 43710
• W3	ASTM E988-96
• W5	ASTM E988-96
• LR	GOST 3044-84
Cold Junction Compensation (CJC)	Constant, internal or external over Pt100 or Ni100 RTD
• Temperature range internal CJC	-50 ... +100 °C (-58 ... +212 °F)
• Connection external CJC	2-wire, 3-wire or 4-wire
• External CJC, wire resistance per wire (for 3-wire and 4-wire connections)	50 Ω
• Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
• Input current external CJC	< 0.15 mA
• Temperature range external CJC	-50 ... +135 °C (-58 ... +275 °F)
• Cable, wire-wire capacity	Max. 50 nF
• Total wire resistance	Max. 10 kΩ
• Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.
• Error detection time (TC)	≤ 75 ms (typically 70 ms)
• Error detection time, external CJC (for 3-wire and 4-wire)	≤ 2 000 ms
Linear resistance	
Input range	0 ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, defective
Potentiometers	
Input range	10 ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	3-wire, 4-wire or 5-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 4-wire and 5-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time, wiper arm (no short-circuit detection)	≤ 75 ms (typically 70 ms)
Error detection time, element	≤ 2 000 ms
Error detection time (for 4-wire and 5-wire)	≤ 2 000 ms
Voltage input	
Measuring range	

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Technical specifications (continued)

SITRANS TR420 (HART, universal)	
• Unipolar	-100 ... 1700 mV
• Bipolar	-800 ... +800 mV
Minimum measuring span	2.5 mV
Input resistance	10 MΩ
Cable, wire-wire capacity	
• Input range: -100 ... 1700 mV	Max. 30 nF
• Input range: -20 ... 100 mV	Max. 50 nF
Error detection, programmable	None, defective
Error detection time	≤ 75 ms (typically 70 ms)
Output and HART communication	
Normal range, programmable	3.8 ... 20.5 mA/20.5 ... 3.8 mA
Extended range (output limits), programmable	3.5 ... 23 mA/23 ... 3.5 mA
Programmable input/output limits	
• Fault current	Enable/disable
• Fault current setting	3.5 ... 23 mA
Update time	10 ms
Load (with current output)	≤ (V_{Supply} - 7.5)/0.023 Ω
Load stability	< 0.01% of measuring span/100 Ω (measuring span = currently selected range)
Input error detection, programmable (detection of input short-circuits is ignored with TC and voltage inputs)	3.5 ... 23 mA
NAMUR NE43 Upscale	> 21 mA
NAMUR NE43 Downscale	< 3.6 mA
HART protocol versions	HART 7
Measuring accuracy	
Input accuracy	See "Input accuracy" table
Output accuracy	See "Output accuracy" table
Operating conditions	
Ambient temperature	-50 ... +85 °C (-58 ... +185 °F)
Ambient temperature for devices with functional safety	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
Reference temperature for sensor calibration	24 °C ±1.0 °C (75.2 °F ±1.8 °F)
Relative humidity	< 99% (no condensation)
Degree of protection	
• Transmitter enclosure	IP20
• Terminals	IP20
Structural design	
Weight	122 g (0.27 lb)
Maximum core cross-section	2.5 mm² (AWG 13)
Tightening torque for clamping screws	0.5 ... 0.6 Nm
Vibrations	IEC 60068-2-6
• 2 ... 25 Hz	± 1.6 mm (0.07 inches)
• 25 ... 100 Hz	± 4 g
Certificates and approvals	
Explosion protection ATEX/IECEx and others	
Certificates[3]	• DEKRA 17ATEX0116 X • IECEx DEK 17.0054X • A5E43700604A-2018X
"Intrinsic safety ia/ib" type of protection	For use in Zone 0, 1, 2, 20, 21, 22
• ATEX	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2(1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 D Ex ia IIIC Db • I M1 Ex ia I Ma
• IECEx and others	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ia IIIC Db • Ex ia I Ma
"Intrinsic safety ic" type of protection	For use in Zones 2 and 22
• ATEX	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC Dc

SITRANS TR420 (HART, universal)	
• IECEx and others	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC Dc
"Non-sparking/increased safety nA/ec" type of protection	For use in Zones 2 and 22
• ATEX	• II 3 G Ex nA IIC T6...T4 Gc • II 3 G Ex ec IIC T6...T4 Gc
• IECEx and others	• Ex nA IIC T6 ... T4 Gc • Ex ec IIC T6 ... T4 Gc
Explosion protection CSA/FM for Canada and USA	
Certificates	• CSA 1861385 • FM18CA0024 • FM18US0046
"Intrinsic safety ia" type of protection	• IS, CL I, Div 1, GP ABCD, T6 ... T4 • Ex ia IIC T6 ... T4 Ga, AEx ia IIC T6 ... T4 Ga or Ex ib [ia Ga] IIC T6...T4 Gb, AEx ib [ia Ga] IIC T6...T4 Gb
"Non incendive field wiring NIFW" type of protection	NIFW, CL I, Div 2, GP ABCD T6 ... T4
"Non incendive NI" type of protection	• NI, CL I, Div 2, GP ABCD T6...T4 • Ex nA IIC T6 ... T4 Gc • AEx nA IIC T6 ... T4 Gc

1) Note that the minimum supply voltage must correspond to the value measured at the terminals of the SITRANS TR420. All external voltage drops must be taken into account.
2) Protect the device from overvoltage with the help of a suitable power supply or suitable overvoltage protection equipment.
3) Additional available certificates are listed on the internet at http://www.siemens.com/processinstrumentation/certificates

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Technical specifications (continued)

Measuring ranges/Minimum measuring span

RTD

Input type	Standard	Measuring range in °C (°F)	α_0 in $°C^{-1}$ ($°F^{-1}$)	Minimum measuring span in °C (°F)
Pt10 ... 10000	IEC 60751	-200 ... +850 (-328 ... +1 562)	0.003851 (0.002139)	10 (50)
	JIS C 1604-8	-200 ... +649 (-328 ... +1 200)	0.003916 (0.002176)	10 (50)
	GOST 6651_2009	-200 ... +850 (-328 ... +1 562)	0.003910 (0.002172)	10 (50)
	Callendar Van Dusen	-200 ... +850 (-328 ... +1 562)	-	10 (50)
Ni10 ... 10000	DIN 43760-1987	-60 ... +250 (-76 ... +482)	0.006180 (0.003433)	10 (50)
	GOST 6651-2009/OIML R84:2003	-60 ... +180 (-76 ... +356)	0.006170 (0.003428)	10 (50)
Cu5 ... 1000	Edison Copper Winding No. 15	-200 ... +260 (-328 ... +500)	0.004270 (0.002372)	100 (212)
	GOST 6651-2009/OIML R84:2003	-180 ... +200 (-292 ... +392)	0.004280 (0.002378)	100 (212)
	GOST 6651-94	-50 ... +200 (-58 ... +392)	0.004260 (0.002367)	100 (212)

TC

Input type	Standard	Measuring range in °C (°F)	Minimum measuring span in °C (°F)
B	IEC 60584-1	0 (85) ... 1 820 (32 (185) ... 3 308)	100 (212)
E	IEC 60584-1	-200 ... +1 000 (-392 ... +1 832)	50 (122)
J	IEC 60584-1	-100 ... +1 200 (-212 ... +2 192)	50 (122)
K	IEC 60584-1	-180 ... +1 372 (-356 ... +2 502)	50 (122)
L	DIN 43710	-200 ... +900 (-392 ... +1 652)	50 (122)
Lr	GOST 3044-84	-200 ... +800 (-392 ... +1 472)	50 (122)
N	IEC 60584-1	-180 ... +1 300 (-356 ... +2 372)	50 (122)
R	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
S	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
T	IEC 60584-1	-200 ... +400 (-392 ... +752)	50 (122)
U	DIN 43710	-200 ... +600 (-392 ... +1 112)	50 (122)
W3	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
W5	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
LR	GOST 3044-84	-200 ... +800 (-392 ... +1472)	50 (122)

Input accuracy

Basic values

Input type	Basic accuracy	Temperature coefficient[1)]
RTD		
Pt10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Pt20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Pt50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Pt100	≤ ±0.04 °C (0.072 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt500	$T_{max.}$ < 180 °C (356 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 180 °C (356 °F) = ≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt2000	$T_{max.}$ < 300 °C (572 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 300 °C (572 °F) = ≤ ±0.4 °C (0.72 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt10000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Ni10	≤ ±1.6 °C (2.88 °F)	≤ ±0.020 °C/°C (°F/°F)
Ni20	≤ ±0.8 °C (1.44 °F)	≤ ±0.010 °C/°C (°F/°F)
Ni50	≤ ±0.32 °C (0.576 °F)	≤ ±0.004 °C/°C (°F/°F)
Ni100	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni120	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni200	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)

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Technical specifications (continued)

Input type	Basic accuracy	Temperature coefficient[1]
Ni1000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni2000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni10000	≤ ±0.32 °C (0.576 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Cu5	≤ ±1.6 °C (2.88 °F)	≤ ±0.040 °C/°C (°F/°F)
Cu10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Cu20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Cu50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Cu100	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Linear resistance		
0 ... 400 Ω	≤ ±40 mΩ	≤ ±2 mΩ/°C (1.11 mΩ/°F)
0 ... 100 kΩ	≤ ±4 Ω	≤ ±0.2 Ω/°C (0.11 Ω/°F)
Potentiometers		
0 ... 100%	< 0.05%	< ± 0.005%
Voltage input		
mV: -20 ... 100 mV	≤ ±5 µV	≤ ±0.2 µV/°C (0.11 µV/°F)
mV: -100 ... 1700 mV	≤ ±0.1 mV	≤ ±36 µV/°C (20 µV/°F)
mV: ± 800 mV	≤ ±0.1 mV	≤ ±32 µV/°C (17.8 µV/°F)
TC		
E	≤ ±0.2 °C (0.36 °F)	≤ ±0.025 °C/°C (°F/°F)
J	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
K	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
L	≤ ±0.35 °C (0.63 °F)	≤ ±0.025 °C/°C (°F/°F)
N	≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
T	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
U	< 0 °C (32 °F) ≤ ±0.8 °C (1.44 °F) ≥ 0 °C (32 °F) ≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
Lr	≤ ±0.2 °C (0.36 °F)	≤ ±0.1 °C/°C (°F/°F)
R	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
S	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
W3	≤ ±0.6 °C (1.08 °F)	≤ ±0.1 °C/°C (°F/°F)
W5	≤ ±0.4 °C (0.72 °F)	≤ ±0.1 °C/°C (°F/°F)
B[2]	≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
B[3]	≤ ±3 °C (5.4 °F)	≤ ±0.1 °C/°C (°F/°F)
B[4]	≤ ±8 °C (14.4 °F)	≤ ±0.8 °C/°C (°F/°F)
B[5]	Not specified	Not specified
CJC (internal)	< ±0.5 °C (0.9 °F)	Included in basic accuracy
CJC (external)	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)

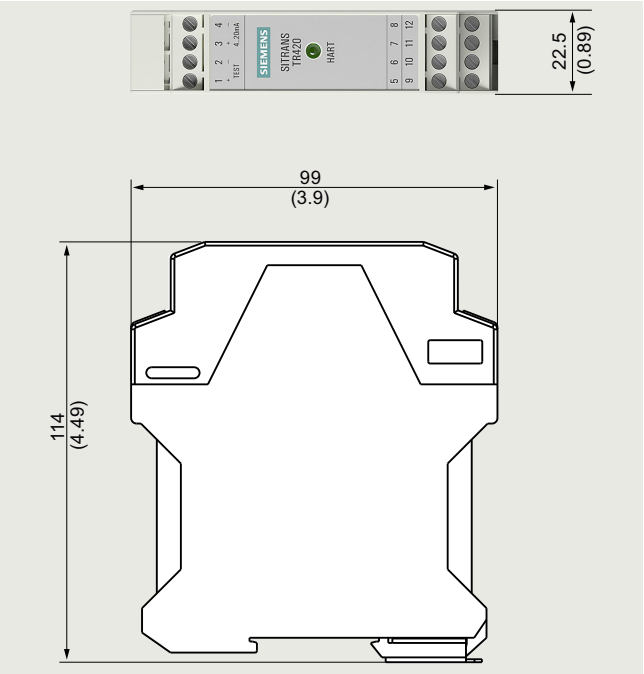
1) Temperature coefficients correspond to the specified values or 0.002% of the input span, depending on which value is greater.
2) Accuracy of the specification range > 400 °C (752 °F)
3) Accuracy of the specification range > 160 °C (320 °F) < 400 °C (752 °F)
4) Accuracy of the specification range > 85 °C (185 °F) < 160 °C (320 °F)
5) Accuracy of the specification range < 85 °C (185 °F)

Output accuracy

Output type	Basic accuracy	Temperature coefficient
Average value measurement	Average of accuracy of input 1 and input 2	Average of temperature coefficient of input 1 and input 2
Differential measurement	Sum of accuracy of input 1 and input 2	Sum of temperature coefficient of input 1 and input 2
Analog output	≤ ±1.6 µA (0.01% of the full output span)	≤ ±0.48 µA/K (≤ ±0.003% of the full output span/K)

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Dimensional drawings



SITRANS TR420, dimensions in mm (inch)

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Circuit diagrams

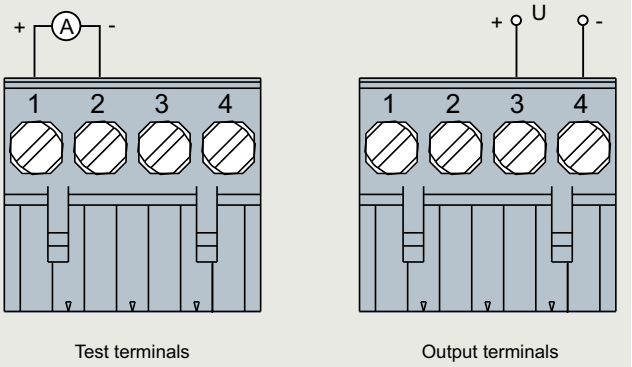
Connections



1 (+) and 2 (-)	Test terminals for measurement of the output current with an amperemeter
3 (+) and 4 (-)	Output terminals
5, 6, 7 and 8	Input 1 terminals
9, 10, 11 and 12	Input 2 terminals

SITRANS TR420, connector assignment

Output and test connection

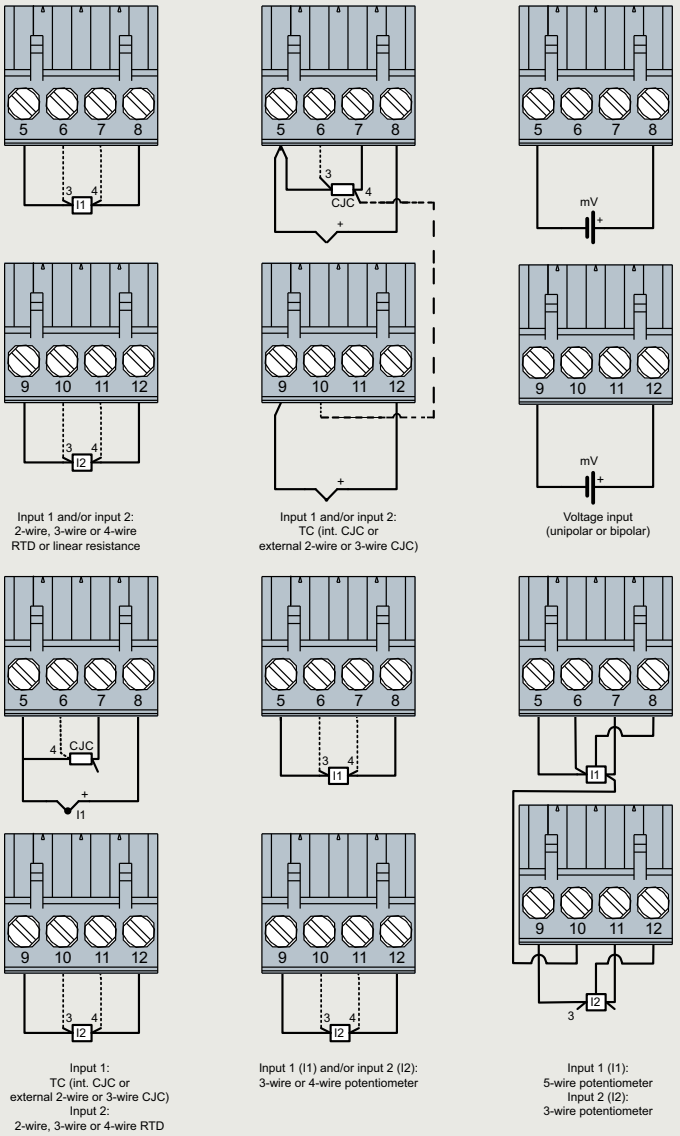


SITRANS TR420, output connection assignment

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Circuit diagrams (continued)

Input connection



SITRANS TR420, input connection assignment

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Overview



SITRANS TF320 in dual chamber enclosure

Overview (continued)



SITRANS TF320 in single chamber enclosure

- 2-wire temperature transmitter with and without HART communication interface
- Universal input for virtually any type of temperature sensor
- Can be configured via PC, HART 7 or optional local operation

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Benefits

- Universally applicable as a temperature transmitter with galvanic isolation for:
  - Resistance thermometer (2-wire, 3-wire, 4-wire connection)
  - Thermocouples
  - Linear resistances, potentiometer and DC voltage sources
- Test terminals for ammeter for HART variant
- Input monitoring wire break, short-circuit and drift
- Self-monitoring
- Configuration status stored in EEPROM
- Expanded diagnostic functions, such as slave pointer, operating hours counter, etc.
- Special characteristic curve
- Up to 32 devices on a Profibus PA segment
- Backwards compatible to Profibus PA profile 3.x
- No GSD file update necessary if replacement for previous unit SITRANS TH400PA
- Transparent product lifecycle thanks to recording of supply voltage (PA variant only) and diagnostic messages
- Local operation of the temperature transmitter via display (single chamber enclosure) or control keys accessible from outside (dual chamber enclosure)
- Rugged single or dual chamber enclosure made of die-cast aluminum or stainless steel 316/316L
- Electronic compartment isolated (watertight) from terminal compartment in dual chamber enclosure
- Degree of protection IP66/68 (1.5 m/2 h)
- Electromagnetic compatibility according to EN 61326 and NE21
- Test terminals for direct read-out of the output signal without breaking the current loop
- Remote installation option:
  - Measuring point is difficult to access
  - Measuring point is subjected to high temperatures
  - Measuring point is subjected to vibration through plant
  - Long neck pipes and thermowells must be avoided
- Compact mounting directly on the sensor, via the optional process input with M24 or ½" NPT thread on the underside of the single chamber enclosure (see selection options "Thread cable entry / thread process input on underside")
- Temperature transmitters of the "intrinsically safe protection type, increased safety for zone 2, flameproof and dust-protected" type of protection can be installed in hazardous areas. The transmitter meets the requirements of the EU Directive 2014/34/EU (ATEX), the FM and CSA regulations as well as other national approvals, e.g. EACEx, NEPSI, KCs, Inmetro.
- SIL2/3 (with order note C20) according to IEC 61508 and Electrical Equipment For Furnaces And Ancillary Equipment (EN 50156-2)

Application

SITRANS TF320 can be used everywhere where temperatures need to be measured under particularly adverse conditions and where a user-friendly local display is ideal. Which is why users from all industries have opted for this field device. The rugged enclosure protects the electronics. The stainless steel model is almost completely resistant to sea water and other aggressive substances. The inner workings offer high measuring accuracy, universal input and a wide range of diagnostic options.

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Function

Configuration

The communication capability over the HART protocol V 7 permits parameterization using a PC or HART communicator (hand-held communicator). The SIMATIC PDM makes it easy.

For the SITRANS TF320 without HART functionality, parameters are assigned with the PC. A special modem and the software tool SIPROM T are available for this purpose.

The optional local operation on the device gives you the possibility to configure the device's most important functions very quickly.

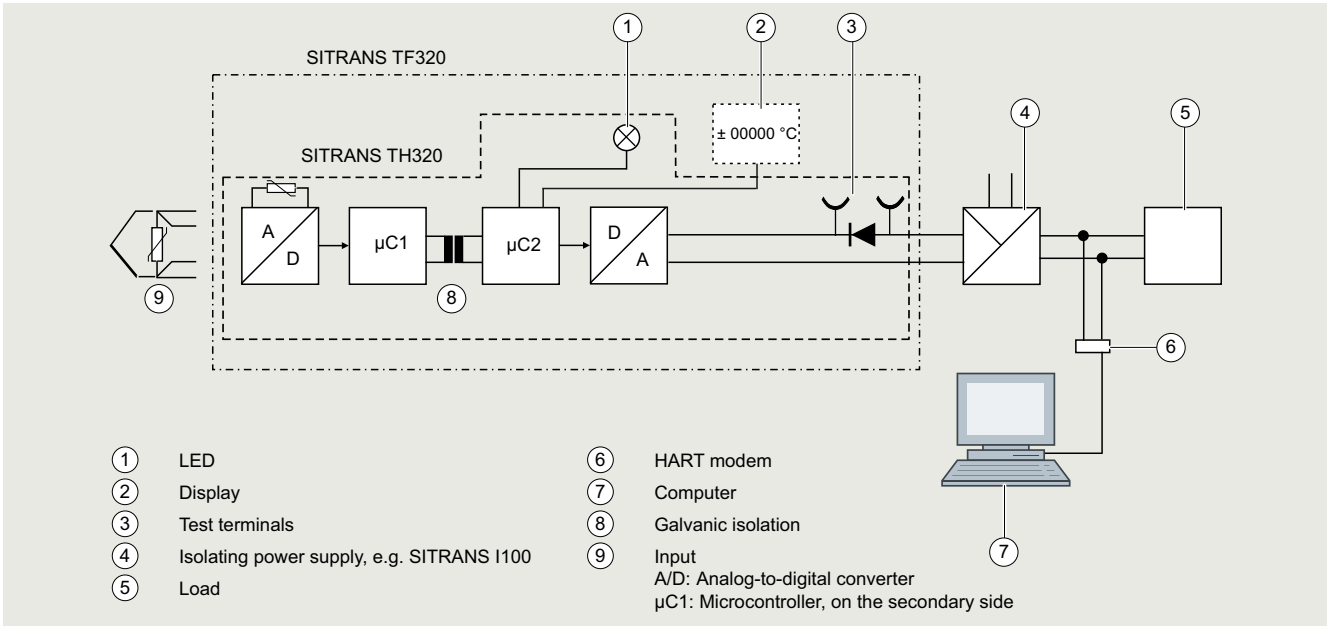
Principle of operation

SITRANS TF320 as temperature transmitter

The input signal, whether resistance thermometer (RTD), thermocouple (TC), Ω or mV signal, is amplified and linearized. Input and output side are galvanically isolated. An internal cold junction is integrated for measurements with thermocouples.

The device outputs a temperature-linear direct current from 4 to 20 mA. As well as the analog transmission of measured values from 4 to 20 mA, the HART version also supports digital communication for online diagnostics, measured value transmission, and configuration.

SITRANS TF320 automatically detects when a sensor should be interrupted or is indicating a short-circuit. The practical test terminals allow direct measurement of 4 to 20 mA signals over an ammeter without interrupting the output current loop.



Function block diagram SITRANS TF320 with integrated SITRANS TH320

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Selection and ordering data

Single chamber enclosure

SITRANS TF320 temperature transmitter with single chamber enclosure for wall or pipe mounting, one configurable input and an electrically isolated 2-wire output.	Article No. 7NG034 ● - ● ● ● ● ● - 0 ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.	
Communication	
With HART (4 ... 20 mA)	0
Without HART (4 ... 20 mA)	7
Primary value output	
Input 1	0
Input 1, type	
RTD	
• Pt100 (IEC 60751), 3-wire	B
• Pt100 (IEC 60751), 4-wire	C
• Pt1000 (IEC 60751), 3-wire	D
• Pt1000 (IEC 60751), 4-wire	E
TC	
• Type B	F
• Type E	G
• Type J	H
• Type K	J
• Type L	K
• Type N	L
• Type R	N
• Type S	P
• Type T	Q
Potentiometer, 4-wire	R
More types in option Vxx	Y
Input 2, type	
Without input 2	A
CJC configuration for TC	
None CJC	0
Internal CJC	1
External CJC RTD Pt100 (IEC 60751), 3-wire	3
External CJC RTD Ni100 (DIN 43760-87), 3-wire	6
Define fixed CJC value with option Y60	8
Material of non-wetted parts	
Die-cast aluminum enclosure	1
Enclosure made of stainless steel investment casting 1.4401 (similar to 316)	3
Type of protection (Ex)	
General safety	A
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW)	B
Flameproof enclosure (Ex d) / Explosion proof (XP)	C
Dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	L
Flameproof enclosure (Ex d) / intrinsic safety (Ex i) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec)	S
Flameproof enclosure (Ex d) / explosion proof (XP) / intrinsic safety (Ex i) / non-incendive / non-incendive field wiring (NIFW) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	T
Electrical connection/cable entries	
2 × M20 × 1.5	F
1 × M20 × 1.5 / M24 × 1.5	G
1 × M20 × 1.5 / ½ "× 14 NPT	H
2 × ½" NPT / closed	M
Local operation	
Without local operation	0
Local operation (closed lid)	1

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Selection and ordering data (continued)

SITRANS TF320 temperature transmitter with single chamber enclosure for wall or pipe mounting, one configurable input and an electrically isolated 2-wire output.	Article No. 7NG034 ● - ● ● ● ● ● - 0 ● ● ●
Local operation (lid with glass window)	2

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Cable gland included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn Cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches) Cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	**A11**
CAPRI ADE 4F, stainless steel Cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches) Cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	**A12**
Han plug	
Device plug Han 7D, mounted on left, metal, straight	**A32**
Cable socket included, metal, for device plug Han 7D/8D	**A41**
M12 plug	
Device plug M12, mounted on left, stainless steel, without cable socket	**A62**
Device plug M12, mounted on left, stainless steel, with cable socket	**A63**
Mounting cable glands/plugs	
Cable gland mounted	**A97**
Device plug for output, mounted right	**A98**
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	**C11**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
PDF file with device settings	**D10**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Nameplate and approval plate, stainless steel 1.4404/316L	**D42**
Overvoltage protection up to 6 kV/3 kA (external)	**D71**
Jumper plug set on device for write protection	**D81**
Jumper plug set on device set for fault current >21 mA (instead of <3.6 mA) (only non-SIL)	**D82**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, KCC	**E00**
Global	**E01**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection certificates	
ATEX (Europe)	**E20**
FM (USA & Canada)	**E22**
IECEx (Worldwide)	**E23**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKEX (United Kingdom)	**E33**

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
ATEX (Europe) and IECEx (Worldwide)	**E47**
ATEX, IECEx and FM	**E49**
Factory	
Made in France	**F00**
Mounting clamps	
Pipe mounting kit for single chamber enclosure, stainless steel 316L	**H06**
Wall mounting kit for single chamber enclosure, stainless steel 316L	**H07**
Noise damping	
Noise damping 60 Hz instead of 50 Hz	**P10**
Input 1: TC	
Type C W5	**V01**
Type D W3	**V02**
Type U	**V03**
Type Lr	**V04**
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	**V50**
3-wire (define Callendar Van Dusen parameter in option Y35)	**V51**
4-wire (define Callendar Van Dusen parameter in option Y35)	**V52**
Input 1: RTD	
Pt × (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V60**
Pt × (IEC 60751), 3-wire, define RTD factor × in option Y21	**V61**
Pt × (IEC 60751), 4-wire, define RTD factor × in option Y21	**V62**
Pt × (JIS C1604), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V63**
Pt × (JIS C1604-81), 3-wire, define RTD factor × in option Y21	**V64**
Pt × (JIS C1604-81), 4-wire, define RTD factor × in option Y21	**V65**
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V66**
Pt × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	**V67**
Pt × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	**V68**
Ni × (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V69**
Ni × (DIN 43760-87), 3-wire, define RTD factor × in option Y21	**V70**
Ni × (DIN 43760-87), 4-wire, define RTD factor × in option Y21	**V71**
Ni × (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V72**
Ni × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	**V73**
Ni × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	**V74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V75**
Cu × (ECW-15), 3-wire, define RTD factor × in option Y21	**V76**
Cu × (ECW-15), 4-wire, define RTD factor × in option Y21	**V77**
Cu × (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V78**
Cu × (GOST 6651-94), define 3-wire, define RTD factor × in option Y21	**V79**
Cu × (GOST 6651-94), define 4-wire, define RTD factor × in option Y21	**V80**
Cu × (GOST 6651-2009), define 3-wire, define RTD factor × in option Y21	**V82**

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Cu × (GOST 6651-2009), define 4-wire, define RTD factor × in option Y21	**V83**
Device settings	
Measuring range setting temperature input (instead of 0 ... 100 °C): Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	**Y01**
Customer-specific programming in plain text (n-lines)	**Y09**
Tag (device parameters, max. 32 characters), adhesive label	**Y15**
Measuring point description (device parameters, max. 32 characters), adhesive label	**Y16**
Tag (device parameters, max. 8 characters), adhesive label	**Y17**
Descriptor (device parameters, max. 16 characters), adhesive label	**Y18**
Input 1: RTD factor; e.g. factor "200" = Pt200, adhesive label	**Y21**

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	**Y31**
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y35**
Wire resistance value input 1 in ohms (0 ... 100 ohms)	**Y51**
Input 1: CJC sensor, fixed value (see measuring range for unit)	**Y60**
ID number of special design	**Y99**

Dual chamber enclosure

SITRANS TF320 temperature transmitter with dual chamber enclosure for wall or pipe mounting, one configurable input and an electrically isolated 2-wire output.	Article No. 7NG035 ● - ● ● ● ● ● - 0 ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.	
Communication	
With HART (4 ... 20 mA)	**0**
Without HART (4 ... 20 mA)	**7**
Primary value output	
Input 1	**0**
Input 1, type	
RTD	
• Pt100 (IEC 60751), 3-wire	**B**
• Pt100 (IEC 60751), 4-wire	**C**
• Pt1000 (IEC 60751), 3-wire	**D**
• Pt1000 (IEC 60751), 4-wire	**E**
TC	
• Type B	**F**
• Type E	**G**
• Type J	**H**
• Type K	**J**
• Type L	**K**
• Type N	**L**
• Type R	**N**
• Type S	**P**
• Type T	**Q**
Potentiometer, 4-wire	**R**
More types in option Vxx	**Y**
Input 2, type	
Without input 2	**A**
CJC configuration for TC	
Without CJC	**0**
Internal CJC	**1**
External CJC RTD Pt100 (IEC 60751), 3-wire	**3**
External CJC RTD Ni100 (DIN 43760-87), 3-wire	**6**
Define fixed CJC value with option Y60	**8**
Material of non-wetted parts	
Die-cast aluminum enclosure	**1**
Enclosure made of stainless steel investment casting CF3M/1.4409 (similar to 316L)	**2**

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Selection and ordering data (continued)

SITRANS TF320 temperature transmitter with dual chamber enclosure for wall or pipe mounting, one configurable input and an electrically isolated 2-wire output.	Article No. 7NG035 ● - ● ● ● ● ● - 0 ● ● ●
Type of protection (Ex)	
General safety	A
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW)	B
Flameproof enclosure (Ex d) / Explosion proof (XP)	C
Dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	L
Flameproof enclosure (Ex d) / intrinsic safety (Ex i) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec)	S
Flameproof enclosure (Ex d) / explosion proof (XP) / intrinsic safety (Ex i) / non-incendive / non-incendive field wiring (NIFW) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	T
Electrical connection/cable entries	
2 × M20 × 1.5	F
2 × ½" NPT	M
Local operation	
Without local operation	0
Local operation (closed lid)	1
Local operation (lid with glass window)	2

Options	Order code
Add "**-Z**" to article number, specify order code and, if applicable, free text.	
Cable gland included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn Cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches) Cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	**A11**
CAPRI ADE 4F, stainless steel Cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches) Cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	**A12**
Device plug Han, mounted on left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12, mounted on left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Mounting cable glands/plugs	
Cable gland mounted	**A97**
Device plug for output, mounted right	**A98**
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	**C11**

Options	Order code
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV/3 kA (internal)	**D70**
Overvoltage protection up to 6 kV/3 kA (external)	**D71**
Jumper plug set on device for write protection	**D81**
Jumper plug set on device set for fault current >21 mA (instead of <3.6 mA) (only non-SIL)	**D82**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, KCC	**E00**
Global	**E01**
EAC	**E07**
FM	**E08**
Explosion protection certificates	
ATEX (Europe)	**E20**
FM (USA & Canada)	**E22**
IECEx (Worldwide)	**E23**
NEPSI (China)	**E27**
PESO (India)	**E28**
ATEX (Europe) and IECEx (Worldwide)	**E47**
ATEX and IECEx and FM	**E49**
Factory	
Made in France	**F00**
Mounting brackets (only dual chamber enclosure)	
Wall/pipe mounting bracket for dual chamber enclosure, steel	**H01**
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 304	**H02**

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Selection and ordering data (continued)

Options	Order code
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 316L	**H03**
Noise damping	
Noise damping 60 Hz instead of 50 Hz	**P10**
Input 1: TC	
Type C W5	**V01**
Type D W3	**V02**
Type U	**V03**
Type Lr	**V04**
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	**V50**
3-wire (define Callendar Van Dusen parameter in option Y35)	**V51**
4-wire (define Callendar Van Dusen parameter in option Y35)	**V52**
Input 1: RTD	
Pt x (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V60**
Pt x (IEC 60751), 3-wire, define RTD factor x in option Y21	**V61**
Pt x (IEC 60751), 4-wire, define RTD factor x in option Y21	**V62**
Pt x (JIS C1604-81), 3-wire, define RTD factor x in option Y21	**V64**
Pt x (JIS C1604-81), 4-wire, define RTD factor x in option Y21	**V65**
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V66**
Pt x (GOST 6651-2009), 3-wire, define RTD factor x in option Y21	**V67**
Pt x (GOST 6651-2009), 4-wire, define RTD factor x in option Y21	**V68**
Ni x (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V69**
Ni x (DIN 43760-87), 3-wire, define RTD factor x in option Y21	**V70**
Ni x (DIN 43760-87), 4-wire, define RTD factor x in option Y21	**V71**
Ni x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V72**
Ni x (GOST 6651-2009), 3-wire, define RTD factor x in option Y21	**V73**
Ni x (GOST 6651-2009), 4-wire, define RTD factor x in option Y21	**V74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V75**
Cu x (ECW-15), 3-wire, define RTD factor x in option Y21	**V76**
Cu x (ECW-15), 4-wire, define RTD factor x in option Y21	**V77**
Cu x (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V78**
Cu x (GOST 6651-94), define 3-wire, define RTD factor x in option Y21	**V79**
Cu x (GOST 6651-94), define 4-wire, define RTD factor x in option Y21	**V80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V81**
Cu x (GOST 6651-2009), define 3-wire, define RTD factor x in option Y21	**V82**
Cu x (GOST 6651-2009), define 4-wire, define RTD factor x in option Y21	**V83**
Device settings	
Measuring range setting temperature input: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	**Y01**
Customer-specific programming in plain text (n-lines)	**Y09**
Tag (device parameters, max. 32 characters), plate, stainless steel 316L/1.4404	**Y15**
Measuring point description (device parameters, max. 32 characters), stainless steel 316L/1.4404	**Y16**
Tag (device parameters, max. 8 characters), stainless steel 316L/1.4404	**Y17**
Descriptor (device parameters, max. 16 characters), stainless steel 316L/1.4404	**Y18**
Input 1: RTD factor; e.g. factor "200" = Pt200, adhesive label	**Y21**
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	**Y31**
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y35**
Wire resistance value input 1 in ohms (0 ... 100 ohms)	**Y51**
Input 1: CJC sensor, fixed value (see measuring range for unit)	**Y60**
ID number of special design	**Y99**

Accessories

	Article No.
See section "Other accessories for assembly, connection and transmitter configuration"	
Modems	
Modem with USB interface and SIPROM T software	**7NG3092-8KN**
HART modem with USB interface	**7MF4997-1DB**
Thread adapter	
Thread adapter M20×1.5 (external thread) to ½-14 NPT (internal thread)	**7MP1990-0BA00**
Thread adapter M20x1.5 (external thread) to G½ (internal thread)	**7MP1990-0BB00**
Local operation	
Local operation for temperature transmitter in dual chamber enclosure	**7MF7902-1AD**
Mounting system for local operation 7MF7902-1AD in single chamber enclosure	**7MF7902-1AS**
Mounting brackets (only dual chamber enclosure)	
Wall/pipe mounting bracket for dual chamber enclosure, steel, 5/16-24UNF	**7MF7900-1AB**
Wall/pipe mounting bracket for dual chamber enclosure, steel, M8	**7MF7900-1AC**
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 316L, 5/16-24UNF	**7MF7900-1AH**
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 316L, M8	**7MF7900-1AJ**
Mounting system (only single chamber enclosures)	
Pipe mounting kit for single chamber enclosure, stainless steel 316L	**7MF7900-1AK**
Wall mounting kit for single chamber enclosure, stainless steel 316L	**7MF7900-1AL**
Cable gland	
Cable gland, gray, non-Ex, M20	**7MF7906-1AB**
Cable gland, gray, non-Ex, NPT	**7MF7906-1BB**
Cable gland, metal, non-Ex, NPT	**7MF7906-1BD**
Cable gland, metal, non-Ex, M20	**7MF7906-1AD**
Cable gland, metal, Ex-d, NPT	**7MF7906-1BE**
Cable gland, metal, Ex-d, M20	**7MF7906-1AE**
Cable gland, 316L, non-Ex, NPT	**7MF7906-1BH**
Cable gland, 316L, non-Ex, M20	**7MF7906-1AH**
Cable gland, 316L, Ex-d, NPT	**7MF7906-1BJ**
Cable gland, 316L, Ex-d, M20	**7MF7906-1AJ**
Cable gland, E1FX Tri-Star ½-14 NPT, CMP	**7MF7906-1NE**
Cable gland, ½ NPT Capri ADE 4F cpl., CuZn	**7MF7906-1PE**
Cable gland, ½ NPT Capri ADE 4F cpl., stainless steel	**7MF7906-1PJ**
Plug and cable socket	
Plug Han 7D, plastic, straight	**7MF7906-2AB**
Plug Han 7D, plastic, angled	**7MF7906-2AC**
Plug Han 7D, metal, straight, blue	**7MF7906-2AQ**

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Selection and ordering data (continued)

	Article No.
Plug Han 7D, metal, straight, gray	**7MF7906-2AN**
Plug Han 7D, metal, angled, blue	**7MF7906-2AR**
Plug Han 7D, metal, angled, gray	**7MF7906-2AP**
Plug Han 8D, plastic, straight	**7MF7906-2EB**
Plug Han 8D, plastic, angled	**7MF7906-2EC**
Plug Han 8D, metal, straight, blue	**7MF7906-2EQ**
Plug Han 8D, metal, straight, gray	**7MF7906-2EN**
Plug Han 8D, metal, angled, blue	**7MF7906-2ER**
Plug Han 8D, metal, angled, gray	**7MF7906-2EP**
Cable socket, plastic, for plug Han 7D	**7MF7906-2BB**
Cable socket, plastic, for plug Han 8D	**7MF7906-2FB**
Cable socket, metal, for Han 7D blue	**7MF7906-2BQ**
Cable socket, metal, for Han 8D blue	**7MF7906-2FQ**
Cable socket, metal, for Han 7D gray	**7MF7906-2BN**
Cable socket, metal, for Han 8D gray	**7MF7906-2FN**
Plug M12 with cable socket, stainless steel	**7MF7906-3AB**
Overvoltage protection	
Overvoltage protection up to 20 kV, M20	**7MF7906-3AC**
Overvoltage protection up to 20 kV, NPT	**7MF7906-3AD**
Lid	
Closed lid aluminum, painted 2×, without glass window, with seal NBR	**7MF7901-1BB**
Closed lid aluminum, painted 2×, without glass window, with seal FVMQ	**7MF7901-1BC**
Lid aluminum 2x coated, with glass window, with seal NBR	**7MF7901-1BG**
Lid aluminum 2x coated, with glass window, with seal FVMQ	**7MF7901-1BH**

	Article No.
Closed lid stainless steel investment casting, without glass window, with seal NBR	**7MF7901-2AB**
Closed lid stainless steel investment casting, without glass window, with seal FVMQ	**7MF7901-2AC**
Lid stainless steel investment casting, with glass window, with seal NBR	**7MF7901-2AG**
Lid stainless steel investment casting, with glass window, with seal FVMQ	**7MF7901-2AH**

Ordering example

SITRANS TF320 (single chamber enclosure)
7NG0340-0BA01-0AF2-Z Y01+Y17+P10
Y01: -10 ... +100 °C
Y17: TICA123
Factory setting

- Pt100 (IEC 60751) in 3-wire connection
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current
  - Input circuit wire break: 22.8 mA
  - Input circuit short-circuit: 22.4 mA
  - Input monitoring wire break and short-circuit
- No trimming of input and output (offset)
- Damping 0.0 s

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Technical specifications

SITRANS TF320 (HART, universal)	
General	
Supply voltage[1) 2)]	
• Without explosion protection (non-Ex)	10.5 ... 48 V DC
• With explosion protection (Ex i)	10.5 ... 30 V DC
Additional minimum supply voltage when using test terminals	0.8 V
Maximum power loss	≤ 850 mW
Minimum load resistance at supply voltage > 37 V	(V_{supply} - 37 V)/23 mA
Insulation voltage, test/operation	
• Without explosion protection (non-Ex)	2.5 kV AC/55 V AC
• With explosion protection (Ex i)	2.5 kV AC/42 V AC
Polarity protection	All inputs and outputs
Write protection	Wire jumper (transmitter), switch (on display) or software
Warm-up time	< 5 min
Starting time	< 2.75 s
Programming	SIPROM T and HART
Signal-to-noise ratio	> 60 dB
Long-term stability	Better than: • ± 0.05% of measuring span/year • ± 0.18% of measuring span/5 years
Response time	4 ... 20 mA: ≤ 55 ms HART: ≤ 75 ms (typically 70 ms)
Programmable damping	0 ... 60 s
Signal dynamic	
• Input	24 bit
• Output	18 bit
Influence of change in supply voltage	< 0.005% of measuring span/V DC
Input	
Resistance thermometer (RTD)	
Input type	
• Pt10 ... 10000	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen
• Ni10 ... 10000	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003
• Cu5 ... 1000	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• Pt1000, Pt10000 (IEC 60751 and JIS C 1604-8)	Max. 30 nF
• All other input types	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time (RTD)	≤ 75 ms (typically 70 ms)
Error detection time (for 3-wire and 4-wire)	≤ 2 000 ms
Thermocouples (TC)	
Input type	
• B	IEC 60584-1
• E	IEC 60584-1
• J	IEC 60584-1
• K	IEC 60584-1
• L	DIN 43710

SITRANS TF320 (HART, universal)	
• Lr	GOST 3044-84
• N	IEC 60584-1
• R	IEC 60584-1
• S	IEC 60584-1
• T	IEC 60584-1
• U	DIN 43710
• W3	ASTM E988-96
• W5	ASTM E988-96
• LR	GOST 3044-84
Cold Junction Compensation (CJC)	Constant, internal or external over Pt100 or Ni100 RTD
• Temperature range internal CJC	-50 ... +100 °C (-58 ... +212 °F)
• Connection external CJC	2-wire or 3-wire
• External CJC, wire resistance per wire (for 3-wire and 4-wire connections)	50 Ω
• Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
• Input current external CJC	< 0.15 mA
• Temperature range external CJC	50 ... +135 °C (-58 ... +275 °F)
• Cable, wire-wire capacity	Max. 50 nF
• Total wire resistance	Max. 10 kΩ
• Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.
• Error detection time (TC)	≤ 75 ms (typically 70 ms)
• Error detection time, external CJC (for 3-wire and 4-wire)	≤ 2 000 ms
Linear resistance	
Input range	0 ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, defective
Potentiometers	
Input range	10 Ω ... 100 kΩ
Minimum measuring span	25 Ω
Connection type	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω
Input current	< 0.15 mA
Effect of the wire resistance (with 4-wire and 5-wire connections)	< 0.002 Ω/Ω
Cable, wire-wire capacity	
• R > 400 Ω	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω
Error detection time, wiper arm (no short-circuit detection)	≤ 75 ms (typically 70 ms)
Error detection time, element	≤ 2 000 ms
Error detection time (for 4-wire and 5-wire)	≤ 2 000 ms
Supply voltage	

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Technical specifications (continued)

SITRANS TF320 (HART, universal)	
Measuring range	
• Unipolar	-100 ... 1700 mV
• Bipolar	-800 ... +800 mV
Minimum measuring span	2.5 mV
Input resistance	10 MΩ
Cable, wire-wire capacity	
• Input range: -100 ... 1700 mV	Max. 30 nF
• Input range: -20 ... 100 mV	Max. 50 nF
Error detection, programmable	None, defective
Error detection time	≤ 75 ms (typically 70 ms)
Output and HART communication	
Normal range, programmable	3.8 ... 20.5 mA/20.5 ... 3.8 mA
Extended range (output limits), programmable	3.5 ... 23 mA/23 ... 3.5 mA
Programmable input/output limits	
• Fault current	Enable/disable
• Fault current setting	3.5 ... 23 mA
Update time	10 ms
Load (with current output)	≤ (V_{Supply} - 10.5)/0.023 Ω
Load stability	< 0.01% of measuring span/100 Ω (measuring span = currently selected range)
Input error detection, programmable (detection of input short-circuits is ignored with TC and voltage inputs)	3.5 ... 23 mA
NAMUR NE43 Upscale	> 21 mA
NAMUR NE43 Downscale	< 3.6 mA
HART protocol versions	HART 7
Measuring accuracy	
Input accuracy	See "Input accuracy" table
Output accuracy	See "Output accuracy" table
Operating conditions	
Ambient temperature	
• Without local operation in single chamber enclosure	50 ... +85 °C (-58 ... +185 °F)
• With local operation	40 ... +85 °C (-40 ... +185 °F)
• For transmitters with functional safety	40 ... +80 °C (-40 ... +176 °F)
Storage temperature	50 ... +85 °C (-58 ... +185 °F)
Reference temperature for sensor calibration	24 °C ±1.0 °C (75.2 °F ±1.8 °F)
Relative humidity	< 99% (no condensation)
Degree of protection	
• Temperature transmitter enclosure	IP66/IP68
• Terminals	IP00
Structural design	
Weight	
• Single chamber enclosure	• Aluminum: 0.85 kg (1.87 lbs) • Stainless steel: 1.69 kg (3.73 lbs)
• Dual chamber enclosure	• Aluminum: 1.3 kg (2.87 lbs) • Stainless steel: 3.3 kg (7.28 lbs)
Maximum core cross-section	
• Single chamber enclosure	1.5 mm² (AWG 16)
• Dual chamber enclosure	2.5 mm² (AWG 14)
Tightening torque for clamping screws	• 0.4 Nm (single chamber enclosure) • 0.5 ... 0.6 Nm (dual chamber enclosure)
Vibrations	IEC 60068-2-6
• 2 ... 25 Hz	± 1.6 mm (0.07 inches)
• 25 ... 100 Hz	± 4 g
Certificates and approvals	
Explosion protection ATEX/IECEx and others	
Certificates[3)]	• IECEx DEK 19.0069X • IECEx DEK 19.0070X • DEKRA 19ATEX0106 X (Category 1) • DEKRA 19ATEX0108X (Category 2) • DEKRA 19ATEX0107X (Category 3) • A5E50642461A-2021X (Category 3)

SITRANS TF320 (HART, universal)	
"Intrinsic safety ia/ib" type of protection	For use in Zone 0, 1, 2, 21
• ATEX	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2 (1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 (1) D Ex ib [ia Da] IIIC T100 °C Db
• IECEx and others	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ib [ia Da] IIIC T 100 °C Db
"Intrinsic safety ic" type of protection	For use in Zone 2, 22
• ATEX	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC T100 °C Dc
• IECEx and others	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC T100 °C Dc
"Increased safety ec" type of protection	For use in Zone 2
• ATEX	II 3 G Ex ec IIC T6...T4 Gc
• IECEx and others	Ex ec IIC T6 ... T4 Gc
• "Flameproof enclosure db" type of protection	For use in Zone 1
• ATEX	II 2 G Ex db IIC T6...T4 Gb
• IECEx and others	Ex db IIC T6 ... T4 Gb
• "Protection by enclosure tb/tc" type of protection	For use in Zone 21, 22
• ATEX	• II 2 D Ex tb IIC T100 °C Db • II 3 D Ex tc IIIC T100 °C Dc
• IECEx and others	• Ex tb IIC T100 °C Db • Ex tc IIIC T100 °C Dc

1) Note that the minimum supply voltage must correspond to the value measured at the terminals of the SITRANS TF320. All external voltage drops must be taken into account.
2) Protect the device from overvoltage with the help of a suitable power supply or suitable overvoltage protection equipment.
3) Additional available certificates are listed on the internet at http://www.siemens.com/processinstrumentation/certificates

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Technical specifications (continued)

Measuring ranges/Minimum measuring span

RTD

Input type	Standard	Measuring range in °C (°F)	α_0 in $°C^{-1}$ ($°F^{-1}$)	Minimum measuring span in °C (°F)
Pt10 ... 10000	IEC 60751	-200 ... +850 (-328 ... +1 562)	0.003851 (0.002139)	10 (50)
	JIS C 1604-8	-200 ... +649 (-328 ... +1 200)	0.003916 (0.002176)	10 (50)
	GOST 6651_2009	-200 ... +850 (-328 ... +1 562)	0.003910 (0.002172)	10 (50)
	Callendar Van Dusen	-200 ... +850 (-328 ... +1 562)	-	10 (50)
Ni10 ... 10000	DIN 43760-1987	-60 ... +250 (-76 ... +482)	0.006180 (0.003433)	10 (50)
	GOST 6651-2009/OIML R84:2003	-60 ... +180 (-76 ... +356)	0.006170 (0.003428)	10 (50)
Cu5 ... 1000	Edison Copper Winding No. 15	-200 ... +260 (-328 ... +500)	0.004270 (0.002372)	100 (212)
	GOST 6651-2009/OIML R84:2003	-180 ... +200 (-292 ... +392)	0.004280 (0.002378)	100 (212)
	GOST 6651-94	-50 ... +200 (-58 ... +392)	0.004260 (0.002367)	100 (212)

TC

Input type	Standard	Measuring range in °C (°F)	Minimum measuring span in °C (°F)
B	IEC 60584-1	0 (85) ... 1 820 (32 (185) ... 3 308)	100 (212)
E	IEC 60584-1	-200 ... +1 000 (-392 ... +1 832)	50 (122)
J	IEC 60584-1	-100 ... +1 200 (-212 ... +2 192)	50 (122)
K	IEC 60584-1	-180 ... +1 372 (-356 ... +2 502)	50 (122)
L	DIN 43710	-200 ... +900 (-392 ... +1 652)	50 (122)
Lr	GOST 3044-84	-200 ... +800 (-392 ... +1 472)	50 (122)
N	IEC 60584-1	-180 ... +1 300 (-356 ... +2 372)	50 (122)
R	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
S	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
T	IEC 60584-1	-200 ... +400 (-392 ... +752)	50 (122)
U	DIN 43710	-200 ... +600 (-392 ... +1 112)	50 (122)
W3	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
W5	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
LR	GOST 3044-84	-200 ... +800 (-392 ... +1472)	50 (122)

Input accuracy

Basic values

Input type	Basic accuracy	Temperature coefficient[1)]
RTD		
Pt10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Pt20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Pt50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Pt100	≤ ±0.04 °C (0.072 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt500	$T_{max.}$ < 180 °C (356 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 180 °C (356 °F) = ≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt2000	$T_{max.}$ < 300 °C (572 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 300 °C (572 °F) = ≤ ±0.4 °C (0.72 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt10000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Ni10	≤ ±1.6 °C (2.88 °F)	≤ ±0.020 °C/°C (°F/°F)
Ni20	≤ ±0.8 °C (1.44 °F)	≤ ±0.010 °C/°C (°F/°F)
Ni50	≤ ±0.32 °C (0.576 °F)	≤ ±0.004 °C/°C (°F/°F)
Ni100	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni120	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni200	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni1000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)

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Technical specifications (continued)

Input type	Basic accuracy	Temperature coefficient[1]
Ni2000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni10000	≤ ±0.32 °C (0.576 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Cu5	≤ ±1.6 °C (2.88 °F)	≤ ±0.040 °C/°C (°F/°F)
Cu10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Cu20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Cu50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Cu100	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Linear resistance		
0 ... 400 Ω	≤ ±40 mΩ	≤ ±2 mΩ/°C (1.11 mΩ/°F)
0 ... 100 kΩ	≤ ±4 Ω	≤ ±0.2 Ω/°C (0.11 Ω/°F)
Potentiometers		
0 ... 100%	< 0.05%	< ± 0.005%
Supply voltage		
mV: -20 ... 100 mV	≤ ±5 µV	≤ ±0.2 µV/°C (0.11 µV/°F)
mV: -100 ... 1700 mV	≤ ±0.1 mV	≤ ±36 µV/°C (20 µV/°F)
mV: ± 800 mV	≤ ±0.1 mV	≤ ±32 µV/°C (17.8 µV/°F)
TC		
E	≤ ±0.2 °C (0.36 °F)	≤ ±0.025 °C/°C (°F/°F)
J	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
K	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
L	≤ ±0.35 °C (0.63 °F)	≤ ±0.025 °C/°C (°F/°F)
N	≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
T	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
U	< 0 °C (32 °F) ≤ ±0.8 °C (1.44 °F) ≥ 0 °C (32 °F) ≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
Lr	≤ ±0.2 °C (0.36 °F)	≤ ±0.1 °C/°C (°F/°F)
R	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
S	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
W3	≤ ±0.6 °C (1.08 °F)	≤ ±0.1 °C/°C (°F/°F)
W5	≤ ±0.4 °C (0.72 °F)	≤ ±0.1 °C/°C (°F/°F)
B[2]	≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
B[3]	≤ ±3 °C (5.4 °F)	≤ ±0.1 °C/°C (°F/°F)
B[4]	≤ ±8 °C (14.4 °F)	≤ ±0.8 °C/°C (°F/°F)
B[5]	Not specified	Not specified
CJC (internal)	< ±0.5 °C (0.9 °F)	Included in basic accuracy
CJC (external)	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)

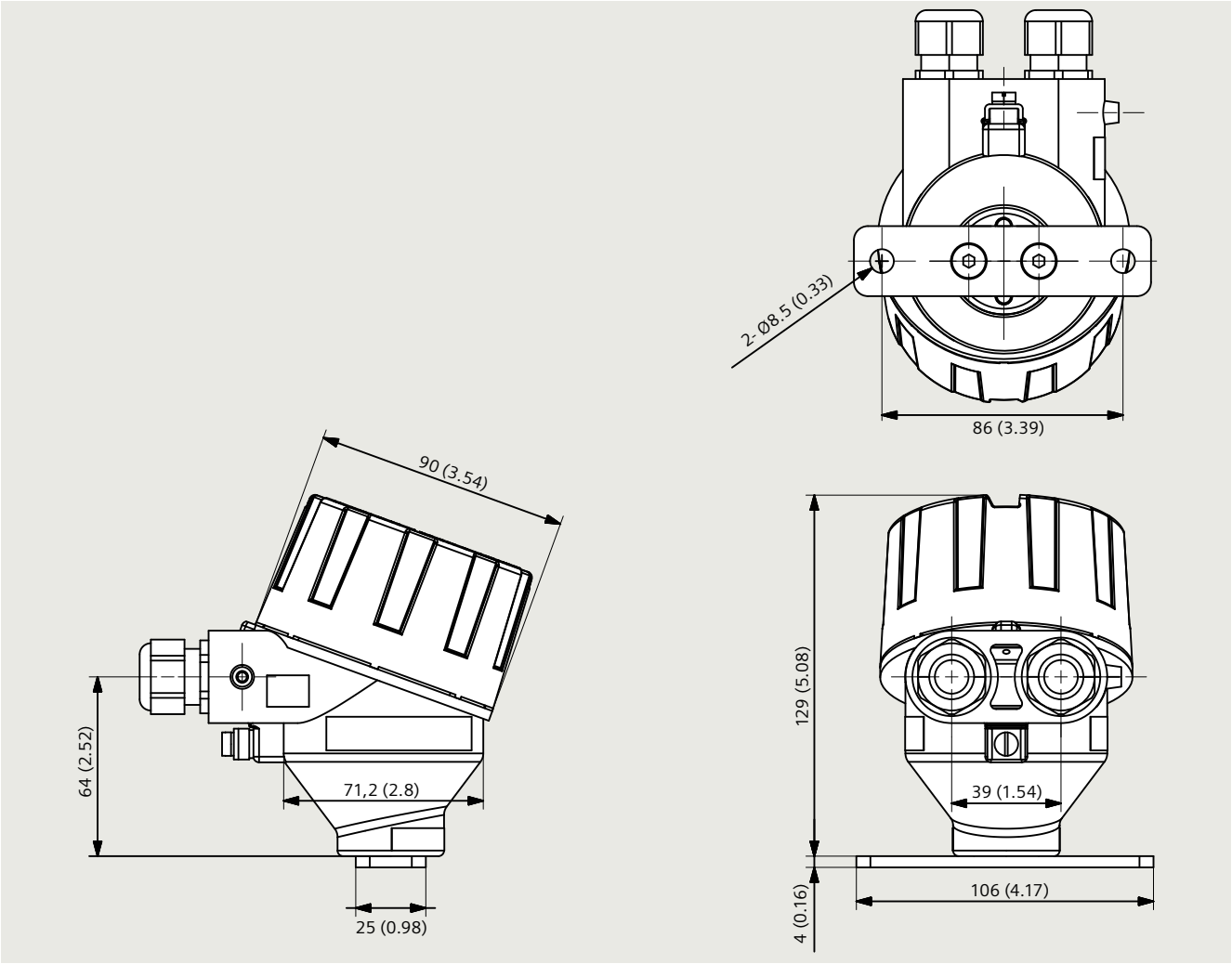
1) Temperature coefficients correspond to the specified values or 0.002% of the input span, depending on which value is greater.
2) Accuracy of the specification range > 400 °C (752 °F)
3) Accuracy of the specification range > 160 °C (320 °F) < 400 °C (752 °F)
4) Accuracy of the specification range > 85 °C (185 °F) < 160 °C (320 °F)
5) Accuracy of the specification range < 85 °C (185 °F)

Output accuracy

Output type	Basic accuracy	Temperature coefficient
Analog output	≤ ±1.6 µA (0.01% of the full output span)	≤ ±0.48 µA/K (≤ ±0.003% of the full output span/K)

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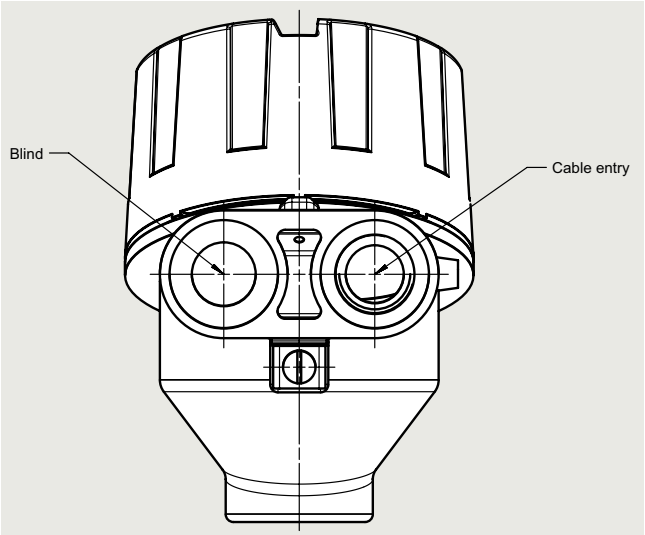
Dimensional drawings



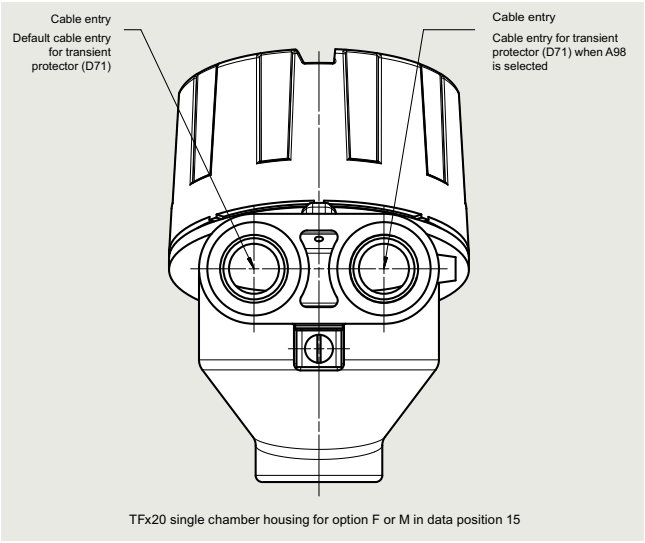
SITRANS TF320, single chamber enclosure, dimensions in mm (inch)

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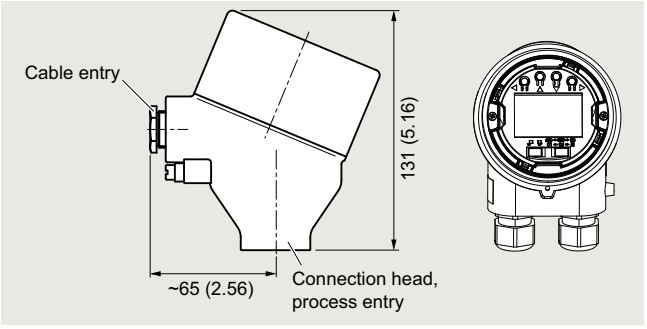
Dimensional drawings (continued)



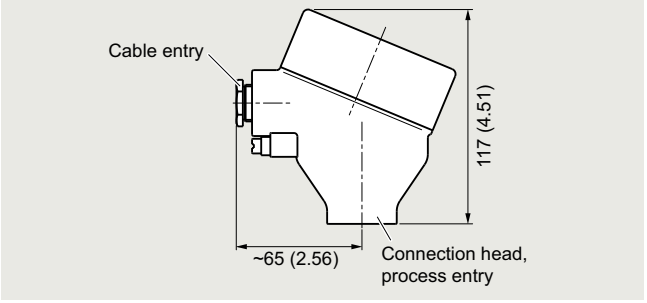
SITRANS TF320 single chamber enclosure



SITRANS TF320 single chamber enclosure



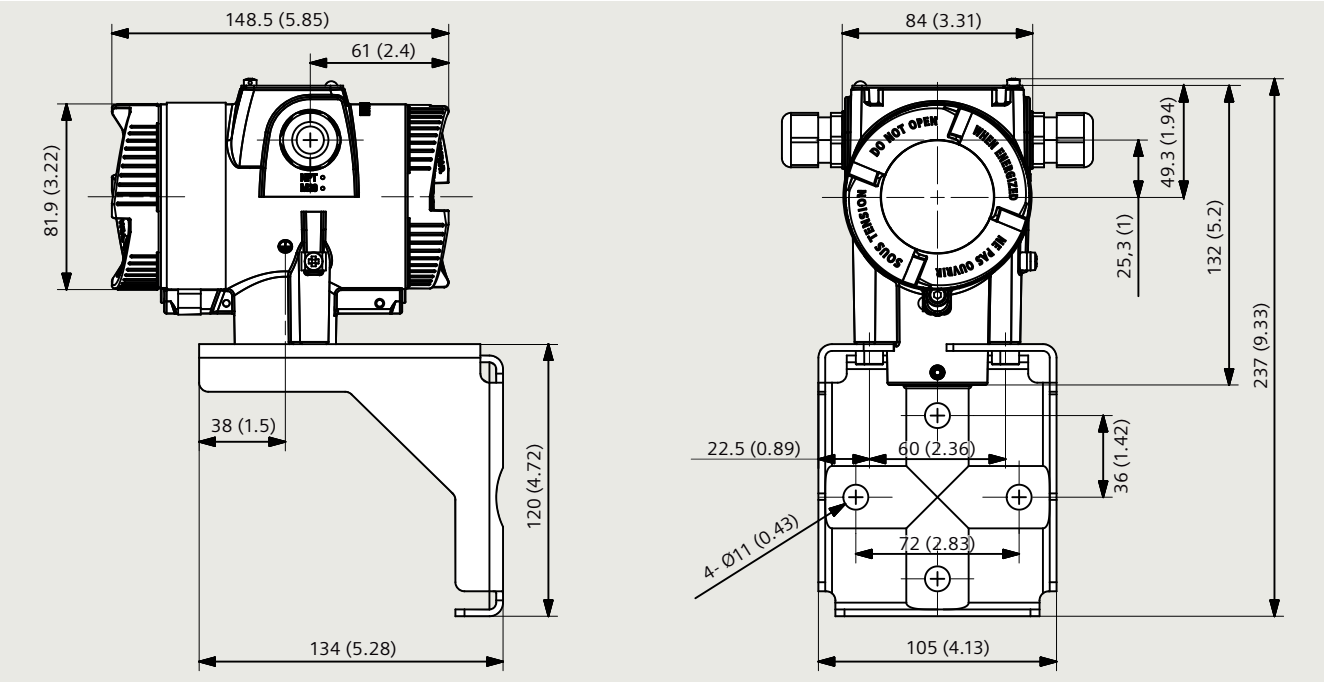
Connection head with 4-20 mA display, dimensions in mm (inch)



Connection head, dimensions in mm (inch)

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Dimensional drawings (continued)



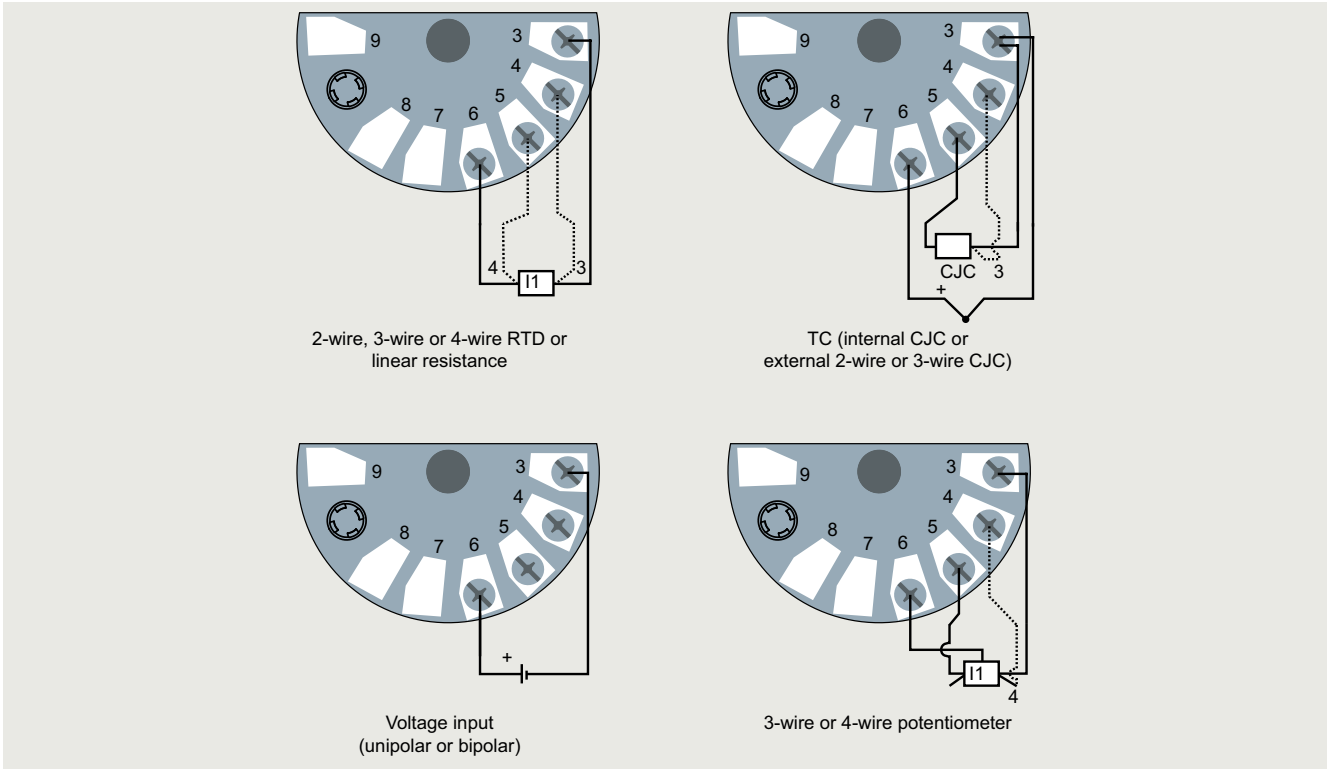
SITRANS TF320, dual chamber enclosure, dimensions in mm (inch)

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Circuit diagrams

Connections

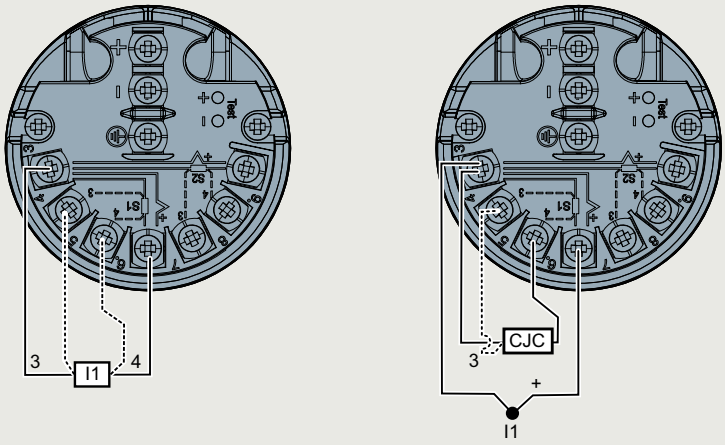
Input connection



SITRANS TF320 in single chamber enclosure (7NG034*), input connection assignment

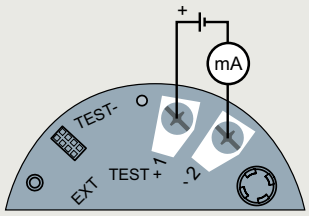
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Circuit diagrams (continued)



SITRANS TF320 in dual chamber enclosure (7NG035*), input connection assignment

Output connection



SITRANS TF320 in single chamber enclosure (7NG034*), output connection assignment

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Overview



SITRANS TF420 in dual chamber enclosure

Overview (continued)



SITRANS TF420 in single chamber enclosure

- 2-wire temperature transmitter with HART communication interface
- Universal input for virtually any type of temperature sensor
- Connection of two independent input circuits for redundant operation (high input availability)
- Input drift detection
- Configurable via PC, HART 7, Profibus PA or optional local operation

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Benefits

- Universally applicable as a temperature transmitter with galvanic isolation for:
  - Resistance thermometer (2-wire, 3-wire, 4-wire connection)
  - Thermocouples
  - Linear resistances, potentiometer and DC voltage sources
- Test terminals for ammeter for HART variant
- Input monitoring wire break, short-circuit and drift
- Self-monitoring
- Configuration status stored in EEPROM
- Expanded diagnostic functions, such as slave pointer, operating hours counter, etc.
- Special characteristic curve
- Up to 32 devices on a Profibus PA segment
- Backwards compatible to Profibus PA profile 3.x
- No GSD file update necessary if replacement for previous unit SITRANS TH400PA
- Transparent product lifecycle thanks to recording of supply voltage (PA variant only) and diagnostic messages
- Local operation of the temperature transmitter via display (single chamber enclosure) or control keys accessible from outside (dual chamber enclosure)
- Rugged single or dual chamber enclosure made of die-cast aluminum or stainless steel 316/316L
- Electronic compartment isolated (watertight) from terminal compartment in dual chamber enclosure
- Degree of protection IP66/68 (1.5 m/2 h)
- Electromagnetic compatibility according to EN 61326 and NE21
- Test terminals for direct read-out of the output signal without breaking the current loop
- Remote installation option:
  - Measuring point is difficult to access
  - Measuring point is subjected to high temperatures
  - Measuring point is subjected to vibration through plant
  - Long neck pipes and thermowells must be avoided
- Compact mounting directly on the sensor, via the optional process input with M24 or ½" NPT thread on the underside of the single chamber enclosure (see selection options "Thread cable entry / thread process input on underside")
- Temperature transmitters of the "intrinsically safe protection type, increased safety for zone 2, flameproof and dust-protected" type of protection can be installed in hazardous areas. The transmitter meets the requirements of the EU Directive 2014/34/EU (ATEX), the FM and CSA regulations as well as other national approvals, e.g. EACEx, NEPSI, KCs, Inmetro.
- SIL2/3 (with order note C20) according to IEC 61508 and Electrical Equipment For Furnaces And Ancillary Equipment (EN 50156-2)

Application

SITRANS TF420 with its two sensor inputs can be used everywhere where temperatures need to be measured without interruption under particularly adverse conditions and where a convenient local display is ideal. Which is why users from all industries have opted for this field device. The rugged enclosure protects the electronics. The stainless steel model is almost completely resistant to sea water and other aggressive substances. The inner workings offer high measuring accuracy, universal input and a wide range of diagnostic options.

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Function

Configuration

The communication capability via the HART protocol V 7 enables parameterization with a PC or HART Communicator (hand-held communicator) or Profibus PA. The SIMATIC PDM makes it easy.

The optional local operation on the device gives you the possibility to configure the device's most important functions very quickly.

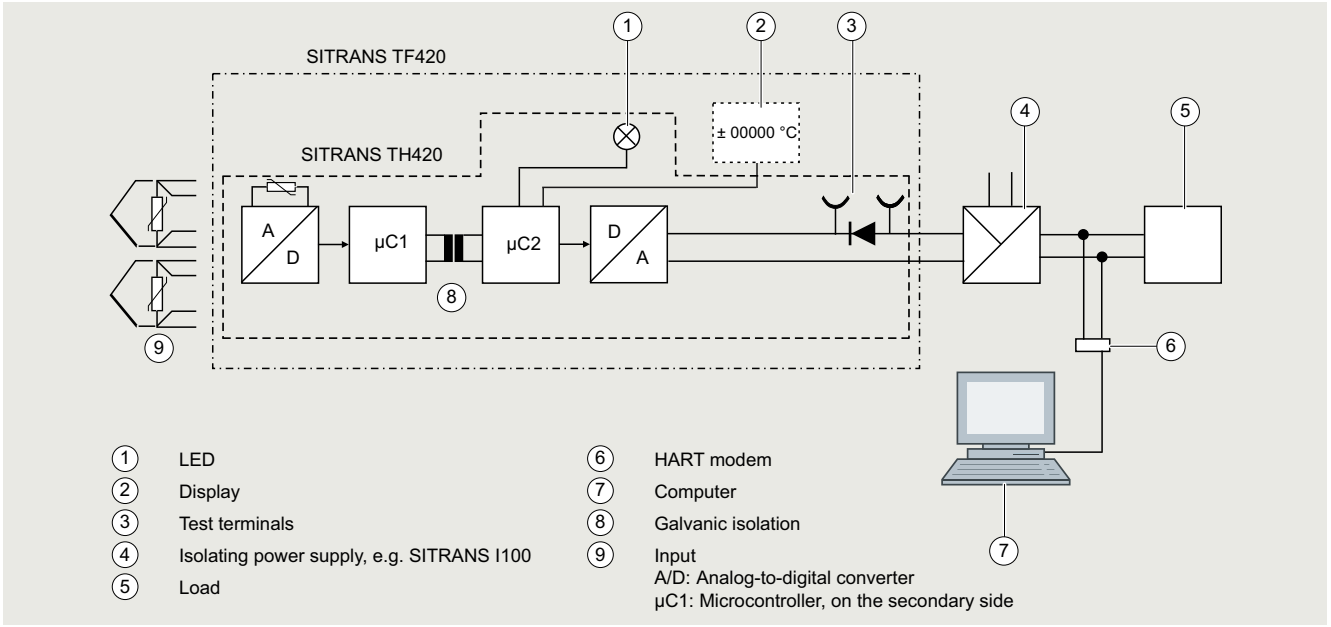
Principle of operation

SITRANS TF420 as temperature transmitter

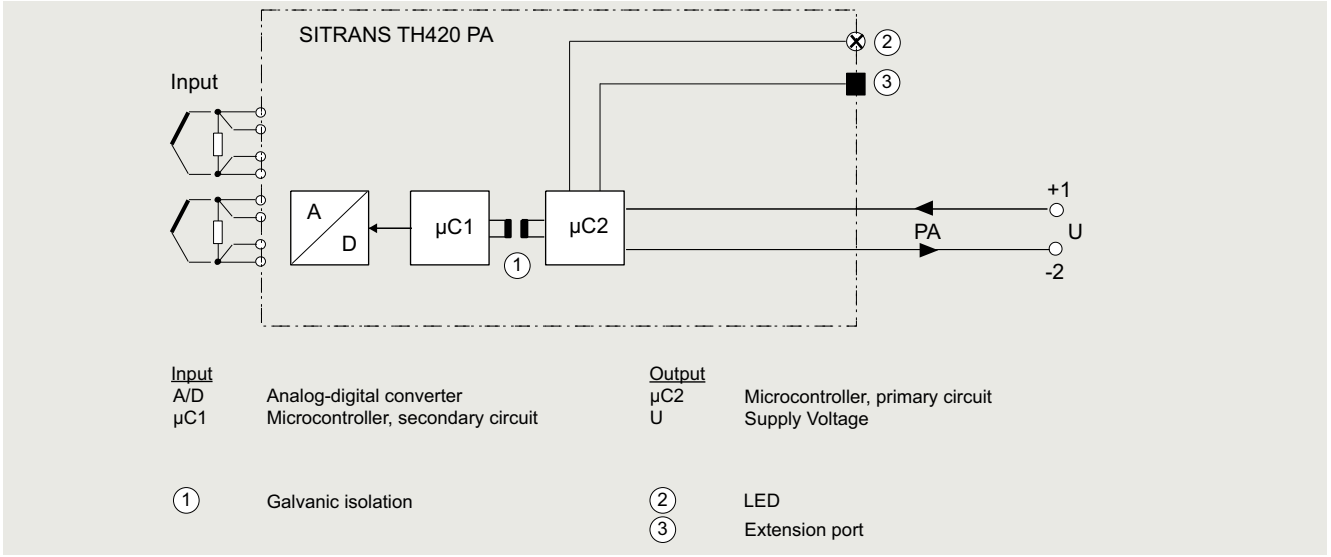
Two sensor signals, whether resistance thermometers (RTD), thermocouples (TC), Ω or mV signals, are amplified and linearized. Input and output side are galvanically isolated. An internal cold junction is integrated for measurements with thermocouples.

The device outputs a temperature-linear direct current from 4 to 20 mA. As well as the analog transmission of measured values from 4 to 20 mA, the HART/Profibus PA version also supports digital communication for online diagnostics, measured value transmission and configuration.

SITRANS TF420 automatically detects when a sensor should be interrupted or is indicating a short-circuit. If the back-up functionality has been selected in the primary value display, the SITRANS TF420 automatically switches to the 2nd input without interrupting the measured value; e.g. primary value input 1 with input 2 as backup. The practical test terminals allow direct measurement of 4 to 20 mA signals over an ammeter without interrupting the output current loop.



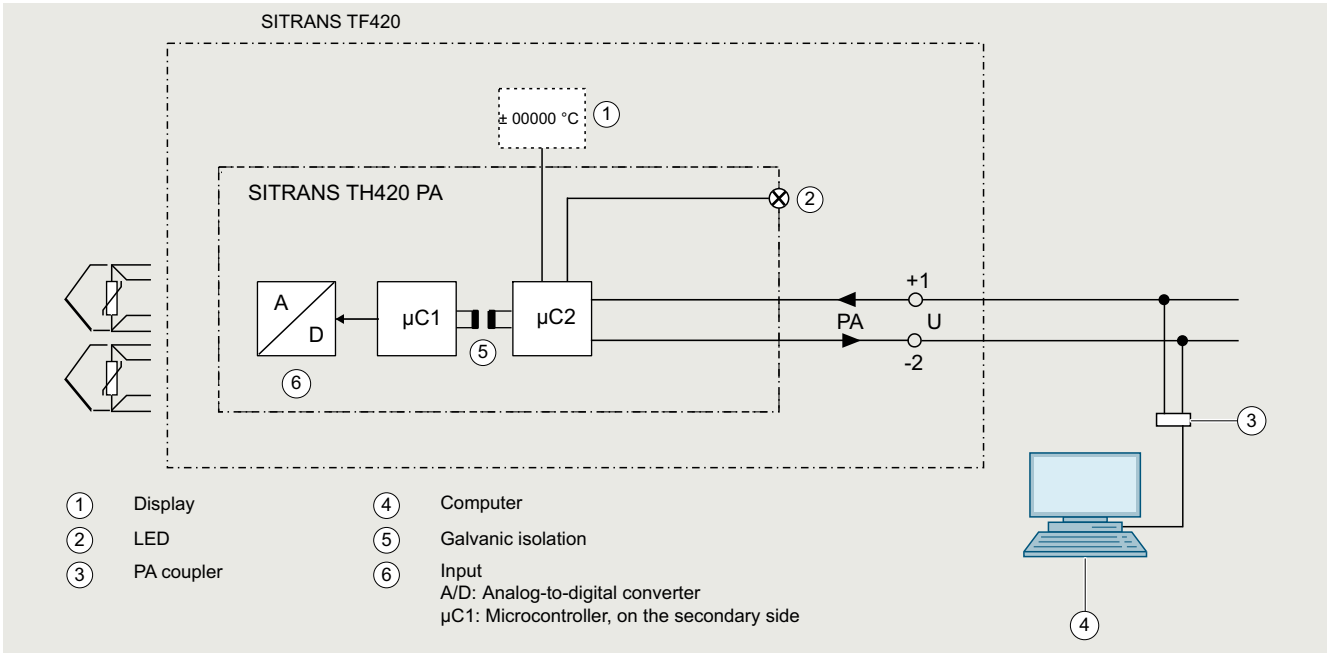
Function block diagram SITRANS TF420 with integrated SITRANS TH420



SITRANS TH420 PA, function block diagram

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Function (continued)



SITRANS TF420 PA, function block diagram

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Selection and ordering data

Single chamber enclosure

SITRANS TF420 temperature transmitter with single chamber enclosure for wall or pipe mounting, two separately configurable inputs and an electrically isolated 2-wire output.	Article No. 7NG044 ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Communication		
With HART (4 ... 20 mA)	**0**	
With Profibus PA	**1**	
Primary value output		
Input 1	**0**	
Input 1, input 2 as redundancy (hot backup)	**1**	
Input 2, input 1 as redundancy (hot backup)	**2**	
Mean value input 1 and input 2, both as redundancy (hot backup)	**3**	
Minimum input 1 and input 2, both as redundancy (hot backup)	**4**	
Maximum input 1 and input 2, both as redundancy (hot backup)	**5**	
Difference input 1 - input 2	**6**	
Difference input 2 - input 1	**7**	
Absolute difference	**8**	
Primary value output, customer-specific		
Minimum input 1 and input 2, without redundancy (hot backup)	**9**	**H 1 A**
Maximum input 1 and input 2, without redundancy (hot backup)	**9**	**H 1 B**
Mean value input 1 and input 2, without redundancy (hot backup)	**9**	**H 1 C**
Input 2	**9**	**H 1 D**
Input 1, type		
RTD		
• Pt100 (IEC 60751), 3-wire	**B**	
• Pt100 (IEC 60751), 4-wire	**C**	
• Pt1000 (IEC 60751), 3-wire	**D**	
• Pt1000 (IEC 60751), 4-wire	**E**	
TC		
• Type B	**F**	
• Type E	**G**	
• Type J	**H**	
• Type K	**J**	
• Type L	**K**	
• Type N	**L**	
• Type R	**N**	
• Type S	**P**	
• Type T	**Q**	
Potentiometer, 4-wire	**R**	
More types in option Vxx	**Y**	
Input 2, type		
No input	**A**	
RTD		
• Pt100 (IEC 60751), 3-wire	**B**	
• Pt100 (IEC 60751), 4-wire	**C**	
• Pt1000 (IEC 60751), 3-wire	**D**	
• Pt1000 (IEC 60751), 4-wire	**E**	
TC		
• Type B	**F**	
• Type E	**G**	
• Type J	**H**	
• Type K	**J**	
• Type L	**K**	
• Type N	**L**	

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Selection and ordering data (continued)

SITRANS TF420 temperature transmitter with single chamber enclosure for wall or pipe mounting, two separately configurable inputs and an electrically isolated 2-wire output.	Article No. 7NG044 ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
• Type R	N	
• Type S	P	
• Type T	Q	
Potentiometer, 4-wire	R	
More types in option Wxx	Y	
CJC configuration for TC		
Input 1: None CJC; Input 2: No CJC	0	
Input 1: Internal CJC; Input 2: Internal CJC	1	
Input 1: External CJC; input 2: External CJC; define type in option Jxx	2	
Input 1: External CJC; define type in option Jxx; input 2: Internal CJC	3	
Input 1: Internal CJC; Input 2: External CJC; define type in option Jxx	4	
Input 1: Internal CJC; Input 2: No CJC	5	
Input 1: External CJC (define type in option Jxx); input 2: No CJC	6	
Input 1: Define fixed CJC value with option Y60; Input 2: None CJC	7	
CJC configuration for TC, customer-specific		
Input 1: Fixed CJC value (define value in option Y60); Input 2: Fixed CJC value (define value in option Y61)	9	L 1 A
Input 1: External CJC (define type in option Jxx); Input 2: Define fixed CJC value with option Y61	9	L 1 B
Input 1: Define fixed CJC value with option Y60; Input 2: External CJC (define type in option Jxx)	9	L 1 C
Input 1: Define fixed CJC value with option Y60; Input 2: Internal CJC	9	L 1 D
Input 1: Internal CJC; Input 2: Define fixed CJC value with option Y61	9	L 1 E
Material of non-wetted parts		
Die-cast aluminum enclosure	1	
Enclosure made of stainless steel investment casting 1.4401 (similar to 316)	3	
Type of protection (Ex)		
General safety	A	
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW)	B	
Flameproof enclosure (Ex d) / Explosion proof (XP)	C	
Dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	L	
Flameproof enclosure (Ex d) / intrinsic safety (Ex i) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec)	S	
Flameproof enclosure (Ex d) / explosion proof (XP) / intrinsic safety (Ex i) / non-incendive / non-incendive field wiring (NIFW) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	T	
Thread cable entry / thread process input on underside		
2 × M20 × 1.5	F	
1 × M20 × 1.5 / M24 × 1.5	G	
1 × M20 × 1.5 / ½" – 14 NPT	H	
2 × ½" NPT / closed	M	
Local operation		
Without local operation	0	
Local operation (closed lid)	1	
Local operation (lid with glass window)	2	

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Cable gland included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn Cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches) Cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	**A11**
CAPRI ADE 4F, stainless steel Cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches) Cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	**A12**
Cable entry accessories	
Sealing element for 2 cables included	**A20**
Device plug Han mounted left	
Device plug Han 7D (metal, straight)	**A32**
Cable socket included	
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Mounting cable glands/plugs	
Cable gland mounted	**A97**
Device plug for output, mounted right	**A98**
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	**C11**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
PDF file with device settings	**D10**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Nameplate and approval plate, stainless steel 1.4404/316L	**D42**
Overvoltage protection up to 6 kV/3 kA (external)	**D71**
Jumper plug set on device for write protection	**D81**
Jumper plug set on device set for fault current >21 mA (instead of <3.6 mA) (only non-SIL)	**D82**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, KCC	**E00**
Global	**E01**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection certificates	
ATEX (Europe)	**E20**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST -R, -K, -B)	**E24**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
ATEX (Europe) and IECEx (Worldwide)	**E47**
ATEX, IECEx and FM	**E49**
Factory	
Made in France	**F00**
Mounting system (only single chamber enclosures)	
Pipe mounting kit for single chamber enclosure, stainless steel 316L	**H06**
Wall mounting kit for single chamber enclosure, stainless steel 316L	**H07**
External CJC types	
Pt100, IEC 60751, 3-wire	**J02**
Pt100, IEC 60751, 4-wire	**J03**
Ni100, DIN 43760-87, 3-wire	**J05**
Ni100, DIN 43760-87, 4-wire	**J06**
Noise damping	
Noise damping 60 Hz instead of 50 Hz	**P10**
Input 1: TC	
Type C W5	**V01**
Type D W3	**V02**
Type U	**V03**
Type Lr	**V04**
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	**V50**
3-wire (define Callendar Van Dusen parameter in option Y35)	**V51**
4-wire (define Callendar Van Dusen parameter in option Y35)	**V52**
Input 1: RTD	
Pt × (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V60**
Pt × (IEC 60751), 3-wire, define RTD factor × in option Y21	**V61**
Pt × (IEC 60751), 4-wire, define RTD factor × in option Y21	**V62**
Pt × (JIS C1604), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V63**
Pt × (JIS C1604-81), 3-wire, define RTD factor × in option Y21	**V64**
Pt × (JIS C1604-81), 4-wire, define RTD factor × in option Y21	**V65**
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V66**
Pt × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	**V67**
Pt × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	**V68**
Ni × (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V69**
Ni × (DIN 43760-87), 3-wire, define RTD factor × in option Y21	**V70**
Ni × (DIN 43760-87), 4-wire, define RTD factor × in option Y21	**V71**
Ni × (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V72**
Ni × (GOST 6651-2009), 3-wire, define RTD factor × in option Y21	**V73**
Ni × (GOST 6651-2009), 4-wire, define RTD factor × in option Y21	**V74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V75**
Cu × (ECW-15), 3-wire, define RTD factor × in option Y21	**V76**
Cu × (ECW-15), 4-wire, define RTD factor × in option Y21	**V77**
Cu × (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor × in option Y21)	**V78**
Cu × (GOST 6651-94), define 3-wire, define RTD factor × in option Y21	**V79**
Cu × (GOST 6651-94), define 4-wire, define RTD factor × in option Y21	**V80**
Cu × (GOST 6651-2009), define 3-wire, define RTD factor × in option Y21	**V82**
Cu × (GOST 6651-2009), define 4-wire, define RTD factor × in option Y21	**V83**

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Input 2: TC	
TC type W5	**W01**
TC type W3	**W02**
TC type U	**W03**
TC type Lr	**W04**
Input 2: RTD	
Pt x (IEC 60751), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W60**
Pt x (IEC 60721), 3-wire, define RTD factor x in option Y22	**W61**
Pt x (IEC 60721), 4-wire, define RTD factor x in option Y22	**W62**
Pt x (JIS C1604), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W63**
Pt x (JIS C1604-81), 3-wire, define RTD factor x in option Y22	**W64**
Pt x (JIS C1604-81), 4-wire, define RTD factor x in option Y22	**W65**
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W66**
Pt x (GOST 6651-2009), 3-wire, define RTD factor x in option Y22	**W67**
Pt x (GOST 6651-2009), 4-wire, define RTD factor x in option Y22	**W68**
Ni x (DIN 43760-87), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W69**
Ni x (DIN 43760-87), 3-wire, define RTD factor x in option Y22	**W70**
Ni x (DIN 43760-87), 4-wire, define RTD factor x in option Y22	**W71**
Ni x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W72**
Ni x (GOST 6651-2009), 3-wire, define RTD factor x in option Y22	**W73**
Ni x (GOST 6651-2009), 4-wire, define RTD factor x in option Y22	**W74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W75**
Cu x (ECW-15), 3-wire, define RTD factor x in option Y22	**W76**
Cu x (ECW-15), 4-wire, define RTD factor x in option Y22	**W77**
Cu x (GOST 6651-94), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W78**
Cu x (GOST 6651-94), 3-wire, define RTD factor x in option Y22	**W79**
Cu x (GOST 6651-94), 4-wire, define RTD factor x in option Y22	**W80**
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W81**
Cu x (GOST 6651-2009), 3-wire, define RTD factor x in option Y22	**W82**
Cu x (GOST 6651-2009), 4-wire, define RTD factor x in option Y22	**W83**
Device settings	
Measuring range setting temperature input (instead of 0 ... 100 °C): Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	**Y01**
Customer-specific programming in plain text (n-lines)	**Y09**
Tag (device parameters, max. 32 characters), adhesive label	**Y15**
Measuring point description (device parameters, max. 32 characters), adhesive label	**Y16**
Tag (device parameters, max. 8 characters), adhesive label	**Y17**
Descriptor (device parameters, max. 16 characters), adhesive label	**Y18**
Input 1: RTD factor; e.g. factor "200" = Pt200, adhesive label	**Y21**
Input 2: RTD factor (e.g. factor = 200 => RTD Pt200), adhesive label	**Y22**
Preset bus address	**Y25**
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	**Y31**
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y35**

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
CvD Sensor matching factors input 2 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	**Y36**
Wire resistance value input 1 in ohms (0 ... 100 ohms)	**Y51**
Wire resistance value input 2 in ohms (0 ... 100 ohms)	**Y52**
Input 1: CJC sensor, fixed value (see measuring range for unit)	**Y60**
Input 2: CJC sensor, fixed value (see measuring range for unit)	**Y61**
ID number of special design	**Y99**

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Selection and ordering data (continued)

Dual chamber enclosure

SITRANS TF420 temperature transmitter with dual chamber enclosure for wall or pipe mounting, two separately configurable inputs and an electrically isolated 2-wire output.	Article No. 7NG045 ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
Click the article number for online configuration in the PIA Life Cycle Portal.		
Communication		
With HART (4 ... 20 mA)	**0**	
With Profibus PA	**1**	
Primary value output		
Input 1	**0**	
Input 1, input 2 as redundancy (hot backup)	**1**	
Input 2, input 1 as redundancy (hot backup)	**2**	
Mean value input 1 and input 2, both as redundancy (hot backup)	**3**	
Minimum input 1 and input 2, both as redundancy (hot backup)	**4**	
Maximum input 1 and input 2, both as redundancy (hot backup)	**5**	
Difference input 1 - input 2	**6**	
Difference input 2 - input 1	**7**	
Absolute difference	**8**	
Primary value output, customer-specific		
Minimum input 1 and input 2, without redundancy (hot backup)	**9**	**H 1 A**
Maximum input 1 and input 2, without redundancy (hot backup)	**9**	**H 1 B**
Mean value input 1 and input 2, without redundancy (hot backup)	**9**	**H 1 C**
Input 2	**9**	**H 1 D**
Input 1, type		
RTD		
• Pt100 (IEC 60751), 3-wire	**B**	
• Pt100 (IEC 60751), 4-wire	**C**	
• Pt1000 (IEC 60751), 3-wire	**D**	
• Pt1000 (IEC 60751), 4-wire	**E**	
TC		
• Type B	**F**	
• Type E	**G**	
• Type J	**H**	
• Type K	**J**	
• Type L	**K**	
• Type N	**L**	
• Type R	**N**	
• Type S	**P**	
• Type T	**Q**	
Potentiometer, 4-wire	**R**	
More types in option Vxx	**Y**	
Input 2, type		
Without input 2	**A**	
RTD		
• Pt100 (IEC 60751), 3-wire	**B**	
• Pt100 (IEC 60751), 4-wire	**C**	
• Pt1000 (IEC 60751), 3-wire	**D**	
• Pt1000 (IEC 60751), 4-wire	**E**	
TC		
• Type B	**F**	
• Type E	**G**	
• Type J	**H**	
• Type K	**J**	
• Type L	**K**	
• Type N	**L**	

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Selection and ordering data (continued)

SITRANS TF420 temperature transmitter with dual chamber enclosure for wall or pipe mounting, two separately configurable inputs and an electrically isolated 2-wire output.	Article No. 7NG045 ● - ● ● ● ● ● - 0 ● ● ● ●	Order code ● ● ●
• Type R	N	
• Type S	P	
• Type T	Q	
Potentiometer, 4-wire	R	
More types in option Wxx	Y	
CJC configuration for TC		
Input 1: None CJC; Input 2: No CJC	0	
Input 1: Internal CJC; Input 2: Internal CJC	1	
Input 1: External CJC; input 2: External CJC; define type in option Jxx	2	
Input 1: External CJC; define type in option Jxx; input 2: Internal CJC	3	
Input 1: Internal CJC; Input 2: External CJC; define type in option Jxx	4	
Input 1: Internal CJC; Input 2: No CJC	5	
Input 1: External CJC (define type in option Jxx); input 2: No CJC	6	
Material of non-wetted parts		
Die-cast aluminum enclosure	1	
Enclosure made of stainless steel investment casting CF3M/1.4409 (similar to 316L)	2	
Type of protection (Ex)		
General safety (non-Ex)	A	
Intrinsic safety (Ex i) / non-incendive field wiring (NIFW)	B	
Flameproof enclosure (Ex d) / Explosion proof (XP)	C	
Dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	L	
Flameproof enclosure (Ex d) / intrinsic safety (Ex i) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec)	S	
Flameproof enclosure (Ex d) / explosion proof (XP) / intrinsic safety (Ex i) / non-incendive / non-incendive field wiring (NIFW) / dust ignition protection by enclosure zone 21/22 (Ex t) / increased safety zone 2 (Ex ec) / dust ignition proof (DIP) / non-incendive (NI)	T	
Electrical connection/cable entries		
2 × M20 × 1.5	F	
2 × ½" NPT	M	
Local operation		
Without local operation	0	
Local operation (closed lid)	1	
Local operation (lid with glass window)	2	

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Cable gland included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches), cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm (0.28 ... 0.47 inches), cable outer diameter 10 ... 16 mm (0.39 ... 0.63 inches)	A12
Cable entry accessories	
Sealing element for 2 cables included	A20
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Mounting cable glands/plugs	
Cable gland mounted	A97
Device plug for output, mounted right	A98

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Manufacturer's declarations	
Inspection certificate EN 10204-3.1: Manufacturer test certificate for transmitters (5 measured values)	**C11**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3; Electrical equipment for furnaces and ancillary equipment (EN 50156-2)	**C20**
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
Degree of protection IP66/IP68 (not for device plug M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV/3 kA (internal)	**D70**
Overvoltage protection up to 6 kV/3 kA (external)	**D71**
Jumper plug set on device for write protection	**D81**
Jumper plug set on device set for fault current >21 mA (instead of <3.6 mA) (only non-SIL)	**D82**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, KCC	**E00**
Global	**E01**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection certificates	
ATEX (Europe)	**E20**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST -R, -K, -B)	**E24**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
ECASEx (UAE)	**E32**
UKEX (United Kingdom)	**E33**
ATEX (Europe) and IECEx (Worldwide)	**E47**
ATEX, IECEx and FM	**E49**
Factory	
Made in France	**F00**
Mounting brackets (only dual chamber enclosure)	
Wall/pipe mounting bracket for dual chamber enclosure, steel	**H01**
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 304	**H02**
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 316L	**H03**
External CJC types	
Pt100, IEC 60751, 3-wire	**J02**
Pt100, IEC 60751, 4-wire	**J03**
Ni100, DIN 43760-87, 3-wire	**J05**
Ni100, DIN 43760-87, 4-wire	**J06**
Noise damping	
Noise damping 60 Hz instead of 50 Hz	**P10**
Input 1: TC	
Type C W5	**V01**
Type D W3	**V02**
Type U	**V03**
Type Lr	**V04**
Input 1: Callendar Van Dusen	
2-wire (define wire resistance value in option Y51 and Callendar Van Dusen parameter in option Y35)	**V50**
3-wire (define Callendar Van Dusen parameter in option Y35)	**V51**
4-wire (define Callendar Van Dusen parameter in option Y35)	**V52**
Input 1: RTD	
Pt x (IEC 60751), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V60**
Pt x (IEC 60751), 3-wire, define RTD factor x in option Y21	**V61**
Pt x (IEC 60751), 4-wire, define RTD factor x in option Y21	**V62**
Pt x (JIS C1604), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V63**
Pt x (JIS C1604-81), 3-wire, define RTD factor x in option Y21	**V64**
Pt x (JIS C1604-81), 4-wire, define RTD factor x in option Y21	**V65**
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V66**
Pt x (GOST 6651-2009), 3-wire, define RTD factor x in option Y21	**V67**
Pt x (GOST 6651-2009), 4-wire, define RTD factor x in option Y21	**V68**
Ni x (DIN 43760-87), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V69**
Ni x (DIN 43760-87), 3-wire, define RTD factor x in option Y21	**V70**
Ni x (DIN 43760-87), 4-wire, define RTD factor x in option Y21	**V71**
Ni x (GOST 6651-2009), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V72**
Ni x (GOST 6651-2009), 3-wire, define RTD factor x in option Y21	**V73**
Ni x (GOST 6651-2009), 4-wire, define RTD factor x in option Y21	**V74**
Cu x (ECW-15), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V75**
Cu x (ECW-15), 3-wire, define RTD factor x in option Y21	**V76**
Cu x (ECW-15), 4-wire, define RTD factor x in option Y21	**V77**
Cu x (GOST 6651-94), 2-wire (define wire resistance value in option Y51 and RTD factor x in option Y21)	**V78**
Cu x (GOST 6651-94), define 3-wire, define RTD factor x in option Y21	**V79**
Cu x (GOST 6651-94), define 4-wire, define RTD factor x in option Y21	**V80**
Cu x (GOST 6651-2009), define 3-wire, define RTD factor x in option Y21	**V82**
Cu x (GOST 6651-2009), define 4-wire, define RTD factor x in option Y21	**V83**
Input 2: TC	
TC type W5	**W01**
TC type W3	**W02**
TC type U	**W03**
TC type Lr	**W04**
Input 2: Callendar Van Dusen	
2-wire (define wire resistance value in option Y52 and Callendar Van Dusen parameter in option Y36)	**W50**
3-wire (define Callendar Van Dusen parameter in option Y36)	**W51**
4-wire (define Callendar Van Dusen parameter in option Y36)	**W52**
Input 2: RTD	
Pt x (IEC 60751), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W60**
Pt x (IEC 60721), 3-wire, define RTD factor x in option Y22	**W61**
Pt x (IEC 60721), 4-wire, define RTD factor x in option Y22	**W62**
Pt x (JIS C1604), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	**W63**
Pt x (JIS C1604-81), 3-wire, define RTD factor x in option Y22	**W64**
Pt x (JIS C1604-81), 4-wire, define RTD factor x in option Y22	**W65**

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and, if applicable, free text	Order code
Pt x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	W66
Pt x (GOST 6651-2009), 3-wire, define RTD factor x in option Y22	W67
Pt x (GOST 6651-2009), 4-wire, define RTD factor x in option Y22	W68
Ni x (DIN 43760-87), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	W69
Ni x (DIN 43760-87), 3-wire, define RTD factor x in option Y22	W70
Ni x (DIN 43760-87), 4-wire, define RTD factor x in option Y22	W71
Ni x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	W72
Ni x (GOST 6651-2009), 3-wire, define RTD factor x in option Y22	W73
Ni x (GOST 6651-2009), 4-wire, define RTD factor x in option Y22	W74
Cu x (ECW-15), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	W75
Cu x (ECW-15), 3-wire, define RTD factor x in option Y22	W76
Cu x (ECW-15), 4-wire, define RTD factor x in option Y22	W77
Cu x (GOST 6651-94), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	W78
Cu x (GOST 6651-94), 3-wire, define RTD factor x in option Y22	W79
Cu x (GOST 6651-94), 4-wire, define RTD factor x in option Y22	W80
Cu x (GOST 6651-2009), 2-wire (define wire resistance value in option Y52 and RTD factor x in option Y22)	W81
Cu x (GOST 6651-2009), 3-wire, define RTD factor x in option Y22	W82
Cu x (GOST 6651-2009), 4-wire, define RTD factor x in option Y22	W83
Device settings	
Measuring range setting temperature input: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit (°C, °F, °Ra, K)	Y01
Customer-specific programming in plain text (n-lines)	Y09
Tag (device parameters, max. 32 characters), plate, stainless steel 316L/1.4404	Y15
Measuring point description (device parameter, max. 32 characters), stainless steel 316L/1.4404	Y16
Tag (device parameters, max. 8 characters), stainless steel 316L/1.4404	Y17
Descriptor (device parameters, max. 16 characters), stainless steel 316L/1.4404	Y18
Input 1: RTD factor; e.g. factor "200" = Pt200, adhesive label	Y21
Input 2: RTD factor (e.g. factor = 200 => RTD Pt200), adhesive label	Y22
Fault current for input circuit short-circuit & interruption instead of 22.4 mA (short-circuit) and 22.8 mA (interruption) e.g. 3.6 mA and 22.4 mA [3.6 - 3.6; 3.6 - 22.8; 22.4 - 3.6]	Y31
CvD Sensor matching factors input 1 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	Y35
CvD Sensor matching factors input 2 R0, A, B, C, Beta, Delta Selection: CVDR - R0 (format for example 100.0), CVDA - A (format for example 0.003908), CVDB - B (format for example -5.775E-07), CVDC - C (format for example -4.183E-12)	Y36
Wire resistance value input 1 in ohms (0 ... 100 ohms)	Y51
Wire resistance value input 2 in ohms (0 ... 100 ohms)	Y52
Input 1: CJC sensor, fixed value (see measuring range for unit)	Y60
Input 2: CJC sensor, fixed value (see measuring range for unit)	Y61
ID number of special design	Y99

Accessories

	Article No.
See section "Other accessories for assembly, connection and transmitter configuration"	
Modems	
Modem with USB interface and SIPROM T software	7NG3092-8KN
HART modem with USB interface	7MF4997-1DC
Thread adapter	
Thread adapter M20×1.5 (external thread) to ½-14 NPT (internal thread)	7MP1990-0BA00
Thread adapter M20x1.5 (external thread) to G½ (internal thread)	7MP1990-0BB00
Local operation	
Local operation for temperature transmitter in dual chamber enclosure	7MF7902-1AD
Mounting system for local operation 7MF7902-1AD in single chamber enclosure	7MF7902-1AS
Mounting brackets (only dual chamber enclosure)	
Wall/pipe mounting bracket for dual chamber enclosure, steel, 5/16-24UNF	7MF7900-1AB
Wall/pipe mounting bracket for dual chamber enclosure, steel, M8	7MF7900-1AC
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 316L, 5/16-24UNF	7MF7900-1AH
Wall/pipe mounting bracket for dual chamber enclosure, stainless steel 316L, M8	7MF7900-1AJ
Mounting system (only single chamber enclosures)	
Pipe mounting kit for single chamber enclosure, stainless steel 316L	7MF7900-1AK
Wall mounting kit for single chamber enclosure, stainless steel 316L	7MF7900-1AL
Cable gland	
Cable gland, gray, non-Ex, M20	7MF7906-1AB
Cable gland, gray, non-Ex, NPT	7MF7906-1BB
Cable gland, metal, non-Ex, NPT	7MF7906-1BD
Cable gland, metal, non-Ex, M20	7MF7906-1AD
Cable gland, metal, Ex-d, NPT	7MF7906-1BE
Cable gland, metal, Ex-d, M20	7MF7906-1AE
Cable gland, 316L, non-Ex, NPT	7MF7906-1BH
Cable gland, 316L, non-Ex, M20	7MF7906-1AH
Cable gland, 316L, Ex-d, NPT	7MF7906-1BJ
Cable gland, 316L, Ex-d, M20	7MF7906-1AJ
Cable gland, E1FX Tri-Star 1/2-14NPT, CMP	7MF7906-1NE
Cable gland, ½ NPT Capri ADE 4F cpl., CuZn	7MF7906-1PE
Cable gland, ½ NPT Capri ADE 4F cpl., stainless steel	7MF7906-1PJ
Sealing element for 2 cables in cable gland.	7MF7906-1WN
Plug and cable socket	
Plug Han 7D, plastic, straight	7MF7906-2AB
Plug Han 7D, plastic, angled	7MF7906-2AC
Plug Han 7D, metal, straight, blue	7MF7906-2AQ
Plug Han 7D, metal, straight, gray	7MF7906-2AN
Plug Han 7D, metal, angled, blue	7MF7906-2AR
Plug Han 7D, metal, angled, gray	7MF7906-2AP
Plug Han 8D, plastic, straight	7MF7906-2EB
Plug Han 8D, plastic, angled	7MF7906-2EC
Plug Han 8D, metal, straight, blue	7MF7906-2EQ
Plug Han 8D, metal, straight, gray	7MF7906-2EN
Plug Han 8D, metal, angled, blue	7MF7906-2ER

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Selection and ordering data (continued)

	Article No.
Plug Han 8D, metal, angled, gray	**7MF7906-2EP**
Cable socket, plastic, for plug Han 7D	**7MF7906-2BB**
Cable socket, plastic, for plug Han 8D	**7MF7906-2FB**
Cable socket, metal, for Han 7D blue	**7MF7906-2BQ**
Cable socket, metal, for Han 8D blue	**7MF7906-2FQ**
Cable socket, metal, for Han 7D gray	**7MF7906-2BN**
Cable socket, metal, for Han 8D gray	**7MF7906-2FN**
Plug M12 with cable socket, stainless steel	**7MF7906-3AB**
Overvoltage protection	
Overvoltage protection up to 20 kV, M20	**7MF7906-3AC**
Overvoltage protection up to 20 kV, NPT	**7MF7906-3AD**
Lid	
Closed lid aluminum, painted 2×, without glass window, with seal NBR	**7MF7901-1BB**
Closed lid aluminum, painted 2×, without glass window, with seal FVMQ	**7MF7901-1BC**
Lid aluminum 2x coated, with glass window, with seal NBR	**7MF7901-1BG**
Lid aluminum 2x coated, with glass window, with seal FVMQ	**7MF7901-1BH**
Closed lid stainless steel investment casting, without glass window, with seal NBR	**7MF7901-2AB**
Closed lid stainless steel investment casting, without glass window, with seal FVMQ	**7MF7901-2AC**
Lid stainless steel investment casting, with glass window, with seal NBR	**7MF7901-2AG**
Lid stainless steel investment casting, with glass window, with seal FVMQ	**7MF7901-2AH**

Ordering example

SITRANS TF420 (single chamber enclosure)
7NG0450-0BA02-0AF2-Z Y01+Y17+P10
Y01: -10 ... +100 °C (32 ... 212 °F)
Y17: TICA123

Factory setting (HART)

- Input 1: Pt100 (IEC 751); 3-wire connection
- Input 2: not configured (inactive)
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Fault current
  - Input circuit wire break: 22.8 mA
  - Input circuit short-circuit: 22.4 mA
  - Input circuit drift: 22 mA (active when input 2 is active)
  - Input monitoring wire break and short-circuit
- No trimming of input and output (offset)
- Damping 0.0 s

Factory setting (Profibus PA)

- Input 1: Pt100 (IEC 751); 3-wire connection
- Input 2: not configured (inactive)
- No trimming of input and output (offset)
- Damping: 0.0 s
- Bus address: 126

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Technical specifications

	SITRANS TF420 (HART, universal)	SITRANS TF420 PA
General		
Supply voltage[1) 2)]		
• Without explosion protection (non-Ex)	10.5 ... 48 V DC	9 ... 32 V DC
• With explosion protection (Ex i)	10.5 ... 30 V DC	9 ... 30 V DC
Additional minimum supply voltage when using test terminals	0.8 V	
Maximum power loss	≤ 850 mW	≤ 544 mW
Minimum load resistance at supply voltage > 37 V	(V_{supply} - 37 V)/23 mA	
Insulation voltage, test/operation		
• Without explosion protection (non-Ex)	2.5 kV AC/55 V AC	2.5 kV AC/55 V AC
• With explosion protection (Ex i)	2.5 kV AC/42 V AC	2.5 kV AC/42 V AC
Polarity protection	All inputs and outputs	Non-sensitive
Write protection	Wire jumper (transmitter), switch (on display) or software	Wire jumper or software
Warm-up time	< 5 min	< 5 min
Starting time	< 2.75 s	< 15 s
Programming	HART	PA
Signal-to-noise ratio	> 60 dB	
Long-term stability	Better than: • ± 0.05% of measuring span/year • ± 0.18% of measuring span/5 years	Better than • ± 0.05 % of the measured value/year • ± 0.1 % of the measured value/5 years
Response time	4 ... 20 mA: ≤ 55 ms HART: ≤ 75 ms (typically 70 ms)	≤ 400 ms
Programmable damping	0 ... 60 s	< 100 ms
Signal dynamic		0 ... 60 s
• Input	24 bit	
• Output	18 bit	
Influence of change in supply voltage	< 0.005% of measuring span/V DC	
Input		
Resistance thermometer (RTD)		
Input type		
• Pt10 ... 10000	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen	• IEC 60751 • JIS C 1604-8 • GOST 6651_2009 • Callendar Van Dusen
• Ni10 ... 10000	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003	• DIN 43760-1987 • GOST 6651-2009/OIML R84:2003
• Cu5 ... 1000	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003	• Edison Copper Winding No. 15 • GOST 6651-2009/OIML R84:2003
Connection type	2-wire, 3-wire or 4-wire	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω	Max. 50 Ω
Input current	< 0.15 mA	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
Cable, wire-wire capacity		
• Pt1000, Pt10000 (IEC 60751 and JIS C 1604-8)	Max. 30 nF	Max. 30 nF
• All other input types	Max. 50 nF	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.	None, short-circuited, defective, short-circuited or defective **Note** When the low limit for the configured input type is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω	15 Ω
Error detection time (RTD)	≤ 75 ms (typically 70 ms)	≤ 400 ms
Error detection time (for 3-wire and 4-wire)	≤ 2 000 ms	≤ 2 000 ms
Thermocouples (TC)		
Input type		
• B	IEC 60584-1	IEC 60584-1
• E	IEC 60584-1	IEC 60584-1
• J	IEC 60584-1	IEC 60584-1
• K	IEC 60584-1	IEC 60584-1
• L	DIN 43710	DIN 43710
• Lr	GOST 3044-84	GOST 3044-84
• N	IEC 60584-1	IEC 60584-1
• R	IEC 60584-1	IEC 60584-1
• S	IEC 60584-1	IEC 60584-1
• T	IEC 60584-1	IEC 60584-1
• U	DIN 43710	DIN 43710
• W3	ASTM E988-96	ASTM E988-96
• W5	ASTM E988-96	ASTM E988-96
• LR	GOST 3044-84	GOST 3044-84
Cold Junction Compensation (CJC)	Constant, internal or external over Pt100 or Ni100 RTD	Constant, internal or external over Pt100 or Ni100 RTD
• Temperature range internal CJC	-50 ... +100 °C (-58 ... +212 °F)	-50 ... +100 °C (-58 ... +212 °F)
• Connection external CJC	2-wire or 3-wire	2-wire, 3-wire or 4-wire
• External CJC, wire resistance per wire (for 3-wire and 4-wire connections)	50 Ω	50 Ω
• Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
• Input current external CJC	< 0.15 mA	< 0.15 mA
• Temperature range external CJC	-50 ... +135 °C (-58 ... +275 °F)	-50 ... +135 °C (-58 ... +275 °F)
• Cable, wire-wire capacity	Max. 50 nF	Max. 50 nF
• Total wire resistance	Max. 10 kΩ	Max. 10 kΩ
• Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.	None, short-circuited, defective, short-circuited or defective **Note** The short-circuited error detection only applies to the CJC input.
• Error detection time (TC)	≤ 75 ms (typically 70 ms)	≤ 400 ms
• Error detection time, external CJC (for 3-wire and 4-wire)	≤ 2 000 ms	≤ 2 000 ms
Linear resistance		
Input range	10 Ω ... 100 kΩ	0 ... 100 kΩ

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Technical specifications (continued)

	SITRANS TF420 (HART, universal)	SITRANS TF420 PA
Minimum measuring span	25 Ω	25 Ω
Connection type	2-wire, 3-wire or 4-wire	2-wire, 3-wire or 4-wire
Wire resistance per wire	Max. 50 Ω	Max. 50 Ω
Input current	< 0.15 mA	< 0.15 mA
Effect of the wire resistance (with 3-wire and 4-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
Cable, wire-wire capacity		
• R > 400 Ω	Max. 30 nF	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF	Max. 50 nF
Error detection, programmable	None, defective	None, defective
Potentiometers		
Input range	0 ... 100 kΩ	10 ... 100 kΩ
Minimum measuring span	25 Ω	25 Ω
Connection type	2-wire, 3-wire or 4-wire	3-wire, 4-wire or 5-wire
Wire resistance per wire	Max. 50 Ω	Max. 50 Ω
Input current	< 0.15 mA	< 0.15 mA
Effect of the wire resistance (with 4-wire and 5-wire connections)	< 0.002 Ω/Ω	< 0.002 Ω/Ω
Cable, wire-wire capacity		
• R > 400 Ω	Max. 30 nF	Max. 30 nF
• R ≤ 400 Ω	Max. 50 nF	Max. 50 nF
Error detection, programmable	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.	None, short-circuited, defective, short-circuited or defective **Note** When the configured potentiometer size is below the constant detection limit for short-circuited inputs, the detection of short circuits is disabled regardless of the configuration of the error detection.
Detection limit for short-circuited input	15 Ω	15 Ω
Error detection time, wiper arm (no short-circuit detection)	≤ 75 ms (typically 70 ms)	≤ 400 ms
Error detection time, element	≤ 2 000 ms	≤ 2 000 ms
Error detection time (for 4-wire and 5-wire)	≤ 2 000 ms	≤ 2 000 ms
Supply voltage		
Measuring range		
• Unipolar	-100 ... 1700 mV	-100 ... 1700 mV
• Bipolar	-800 ... +800 mV	-800 ... +800 mV
Minimum measuring span	2.5 mV	2.5 mV
Input resistance	10 MΩ	10 MΩ
Cable, wire-wire capacity		
• Input range: -100 ... 1700 mV	Max. 30 nF	Max. 30 nF
• Input range: -20 ... 100 mV	Max. 50 nF	Max. 50 nF
Error detection, programmable	None, defective	None, defective
Error detection time	≤ 75 ms (typically 70 ms)	≤ 400 ms
Output and HART communication		
Normal range, programmable	3.8 ... 20.5 mA/20.5 ... 3.8 mA	
Extended range (output limits), programmable	3.5 ... 23 mA/23 ... 3.5 mA	
Programmable input/output limits		
• Fault current	Enable/disable	
• Fault current setting	3.5 ... 23 mA	
Update time	10 ms	100 ms
Load (with current output)	≤ (V_{Supply} - 10.5)/0.023 Ω	
Load stability	< 0.01% of measuring span/100 Ω (measuring span = currently selected range)	
Input error detection, programmable (detection of input short-circuits is ignored with TC and voltage inputs)	3.5 ... 23 mA	
NAMUR NE43 Upscale	> 21 mA	
NAMUR NE43 Downscale	< 3.6 mA	
HART protocol versions	HART 7	
Measuring accuracy		
Input accuracy	See "Input accuracy" table	See "Input accuracy" table
Output accuracy	See "Output accuracy" table	See "Output accuracy" table
Operating conditions		
Ambient temperature		
• Without local operation in single chamber enclosure	-50 ... +85 °C (-58 ... +185 °F)	-40 ... +85 °C (-40 ... +185 °F)
• With local operation	-40 ... +85 °C (-40 ... +185 °F)	
• For transmitters with functional safety	-40 ... +80 °C (-40 ... +176 °F)	
Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	-40 ... +85 °C (-40 ... +185 °F)
Reference temperature for sensor calibration	24 °C ±1.0 °C (75.2 °F ±1.8 °F)	24 °C ±1.0 °C (75.2 °F ±1.8 °F)
Relative humidity	< 99% (no condensation)	< 99% (no condensation)
Degree of protection		
• Temperature transmitter enclosure	IP66/IP68	IP68
• Terminals	IP00	IP00
Structural design		
Weight		50 g (0.11 lb)
• Single chamber enclosure	• Aluminum: 0.85 kg (1.87 lbs) • Stainless steel: 1.69 kg (3.73 lbs)	
• Dual chamber enclosure	• Aluminum: 1.3 kg (2.87 lbs) • Stainless steel: 3.3 kg (7.28 lbs)	
Maximum core cross-section		
• Single chamber enclosure	1.5 mm² (AWG 16)	1.5 mm² (AWG 16)
• Dual chamber enclosure	2.5 mm² (AWG 14)	2.5 mm² (AWG 14)
Tightening torque for clamping screws	• 0.4 Nm (single chamber enclosure) • 0.5 ... 0.6 Nm (dual chamber enclosure)	• 0.4 Nm (single chamber enclosure) • 0.5 ... 0.6 Nm (dual chamber enclosure)
Vibrations	IEC 60068-2-6	IEC 60068-2-6
• 2 ... 25 Hz	± 1.6 mm (0.07 inches)	± 1.6 mm (0.07 inches)
• 25 ... 100 Hz	± 4 g	± 4 g
Certificates and approvals		
Explosion protection ATEX/IECEx and others		
Certificates[3)]	• IECEx DEK 19.0069X • IECEx DEK 19.0070X • DEKRA 19ATEX0106 X (Category 1) • DEKRA 19ATEX0108X (Category 2) • DEKRA 19ATEX0107X (Category 3) • A5E50642461A-2021X (Category 3)	• in progress • in progress • in progress
"Intrinsic safety ia/ib" type of protection	For use in Zone 0, 1, 2, 21	For use in Zone 0, 1, 2, 20, 21, 22

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Technical specifications (continued)

	SITRANS TF420 (HART, universal)	SITRANS TF420 PA
• ATEX	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2 (1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 (1) D Ex ib [ia Da] IIIC T100 °C Db	• II 1 G Ex ia IIC T6 ... T4 Ga • II 2(1) G Ex ib [ia Ga] IIC T6 ... T4 Gb • II 2 D Ex ia IIIC Db • I M1 Ex ia I Ma
• IECEx and others	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ib [ia Da] IIIC T 100 °C Db	• Ex ia IIC T6 ... T4 Ga • Ex ib [ia Ga] IIC T6 ... T4 Gb • Ex ia IIIC Db • Ex ia I Ma
"Intrinsic safety ic" type of protection	For use in Zones 2 and 22	For use in Zones 2 and 22
• ATEX	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC T100 °C Dc	• II 3 G Ex ic IIC T6...T4 Gc • II 3 D Ex ic IIIC Dc
• IECEx and others	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC T100 °C Dc	• Ex ic IIC T6 ... T4 Gc • Ex ic IIIC Dc
"Increased safety ec" type of protection	For use in Zone 2	For use in Zones 2 and 22
• ATEX	II 3 G Ex ec IIC T6...T4 Gc	• II 3 G Ex ec IIC T6...T4 Gc
• IECEx and others	Ex ec IIC T6 ... T4 Gc	• Ex ec IIC T6 ... T4 Gc
• "Flameproof enclosure db" type of protection	For use in Zone 1	
• ATEX	II 2 G Ex db IIC T6...T4 Gb	
• IECEx and others	Ex db IIC T6 ... T4 Gb	
• "Protection by enclosure tb/tc" type of protection	For use in Zone 21 and 22	
• ATEX	• II 2 D Ex tb IIC T100 °C Db • II 3 D Ex tc IIIC T100 °C Dc	
• IECEx and others	• Ex tb IIC T100 °C Db • Ex tc IIIC T100 °C Dc	

1) Note that the minimum supply voltage must correspond to the value measured at the terminals of the SITRANS TF420. All external voltage drops must be taken into account.
2) Protect the device from overvoltage with the help of a suitable power supply or suitable overvoltage protection equipment.
3) Additional available certificates are listed on the internet at http://www.siemens.com/processinstrumentation/certificates

Measuring ranges/Minimum measuring span

RTD

Input type	Standard	Measuring range in °C (°F)	α_0 in °C^{-1} (°F^{-1})	Minimum measuring span in °C (°F)
Pt10 ... 10000	IEC 60751	-200 ... +850 (-328 ... +1 562)	0.003851 (0.002139)	10 (50)
	JIS C 1604-8	-200 ... +649 (-328 ... +1 200)	0.003916 (0.002176)	10 (50)
	GOST 6651_2009	-200 ... +850 (-328 ... +1 562)	0.003910 (0.002172)	10 (50)
	Callendar Van Dusen	-200 ... +850 (-328 ... +1 562)	-	10 (50)
Ni10 ... 10000	DIN 43760-1987	-60 ... +250 (-76 ... +482)	0.006180 (0.003433)	10 (50)
	GOST 6651-2009/OIML R84:2003	-60 ... +180 (-76 ... +356)	0.006170 (0.003428)	10 (50)
Cu5 ... 1000	Edison Copper Winding No. 15	-200 ... +260 (-328 ... +500)	0.004270 (0.002372)	100 (212)
	GOST 6651-2009/OIML R84:2003	-180 ... +200 (-292 ... +392)	0.004280 (0.002378)	100 (212)
	GOST 6651-94	-50 ... +200 (-58 ... +392)	0.004260 (0.002367)	100 (212)

TC

Input type	Standard	Measuring range in °C (°F)	Minimum measuring span in °C (°F)
B	IEC 60584-1	0 (85) ... 1 820 (32 (185) ... 3 308)	100 (212)
E	IEC 60584-1	-200 ... +1 000 (-392 ... +1 832)	50 (122)
J	IEC 60584-1	-100 ... +1 200 (-212 ... +2 192)	50 (122)
K	IEC 60584-1	-180 ... +1 372 (-356 ... +2 502)	50 (122)
L	DIN 43710	-200 ... +900 (-392 ... +1 652)	50 (122)
Lr	GOST 3044-84	-200 ... +800 (-392 ... +1 472)	50 (122)
N	IEC 60584-1	-180 ... +1 300 (-356 ... +2 372)	50 (122)
R	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
S	IEC 60584-1	-50 ... +1 760 (-122 ... +3 200)	100 (212)
T	IEC 60584-1	-200 ... +400 (-392 ... +752)	50 (122)
U	DIN 43710	-200 ... +600 (-392 ... +1 112)	50 (122)
W3	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
W5	ASTM E988-96	0 ... 2 300 (32 ... 4 172)	100 (212)
LR	GOST 3044-84	-200 ... +800 (-392 ... +1472)	50 (122)

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Technical specifications (continued)

Input accuracy

Basic values

Input type	Basic accuracy	Temperature coefficient[1)]
RTD		
Pt10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Pt20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Pt50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Pt100	≤ ±0.04 °C (0.072 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt500	$T_{max.}$ < 180 °C (356 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 180 °C (356 °F) = ≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt2000	$T_{max.}$ < 300 °C (572 °F) = ≤ ±0.08 °C (0.144 °F) $T_{max.}$ > 300 °C (572 °F) = ≤ ±0.4 °C (0.72 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt10000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Pt x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Ni10	≤ ±1.6 °C (2.88 °F)	≤ ±0.020 °C/°C (°F/°F)
Ni20	≤ ±0.8 °C (1.44 °F)	≤ ±0.010 °C/°C (°F/°F)
Ni50	≤ ±0.32 °C (0.576 °F)	≤ ±0.004 °C/°C (°F/°F)
Ni100	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni120	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni200	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni1000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni2000	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni10000	≤ ±0.32 °C (0.576 °F)	≤ ±0.002 °C/°C (°F/°F)
Ni x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Cu5	≤ ±1.6 °C (2.88 °F)	≤ ±0.040 °C/°C (°F/°F)
Cu10	≤ ±0.8 °C (1.44 °F)	≤ ±0.020 °C/°C (°F/°F)
Cu20	≤ ±0.4 °C (0.72 °F)	≤ ±0.010 °C/°C (°F/°F)
Cu50	≤ ±0.16 °C (0.288 °F)	≤ ±0.004 °C/°C (°F/°F)
Cu100	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu200	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu500	≤ ±0.16 °C (0.288 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu1000	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)
Cu x	Largest tolerance of neighboring points	Largest temperature coefficient of neighboring points
Linear resistance		
0 ... 400 Ω	≤ ±40 mΩ	≤ ±2 mΩ/°C (1.11 mΩ/°F)
0 ... 100 kΩ	≤ ±4 Ω	≤ ±0.2 Ω/°C (0.11 Ω/°F)
Potentiometers		
0 ... 100%	< 0.05%	< ± 0.005%
Supply voltage		
mV: -20 ... 100 mV	≤ ±5 µV	≤ ±0.2 µV/°C (0.11 µV/°F)
mV: -100 ... 1700 mV	≤ ±0.1 mV	≤ ±36 µV/°C (20 µV/°F)
mV: ± 800 mV	≤ ±0.1 mV	≤ ±32 µV/°C (17.8 µV/°F)
TC		
E	≤ ±0.2 °C (0.36 °F)	≤ ±0.025 °C/°C (°F/°F)
J	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
K	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
L	≤ ±0.35 °C (0.63 °F)	≤ ±0.025 °C/°C (°F/°F)
N	≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
T	≤ ±0.25 °C (0.45 °F)	≤ ±0.025 °C/°C (°F/°F)
U	< 0 °C (32 °F) ≤ ±0.8 °C (1.44 °F) ≥ 0 °C (32 °F) ≤ ±0.4 °C (0.72 °F)	≤ ±0.025 °C/°C (°F/°F)
Lr	≤ ±0.2 °C (0.36 °F)	≤ ±0.1 °C/°C (°F/°F)
R	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
S	< 200 °C (392 °F) ≤ ±0.5 °C (0.9 °F) ≥ 200 °C (392 °F) ≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
W3	≤ ±0.6 °C (1.08 °F)	≤ ±0.1 °C/°C (°F/°F)

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Technical specifications (continued)

Input type	Basic accuracy	Temperature coefficient[1]
W5	≤ ±0.4 °C (0.72 °F)	≤ ±0.1 °C/°C (°F/°F)
B[2]	≤ ±1 °C (1.8 °F)	≤ ±0.1 °C/°C (°F/°F)
B[3]	≤ ±3 °C (5.4 °F)	≤ ±0.1 °C/°C (°F/°F)
B[4]	≤ ±8 °C (14.4 °F)	≤ ±0.8 °C/°C (°F/°F)
B[5]	Not specified	Not specified
CJC (internal)	< ±0.5 °C (0.9 °F)	Included in basic accuracy
CJC (external)	≤ ±0.08 °C (0.144 °F)	≤ ±0.002 °C/°C (°F/°F)

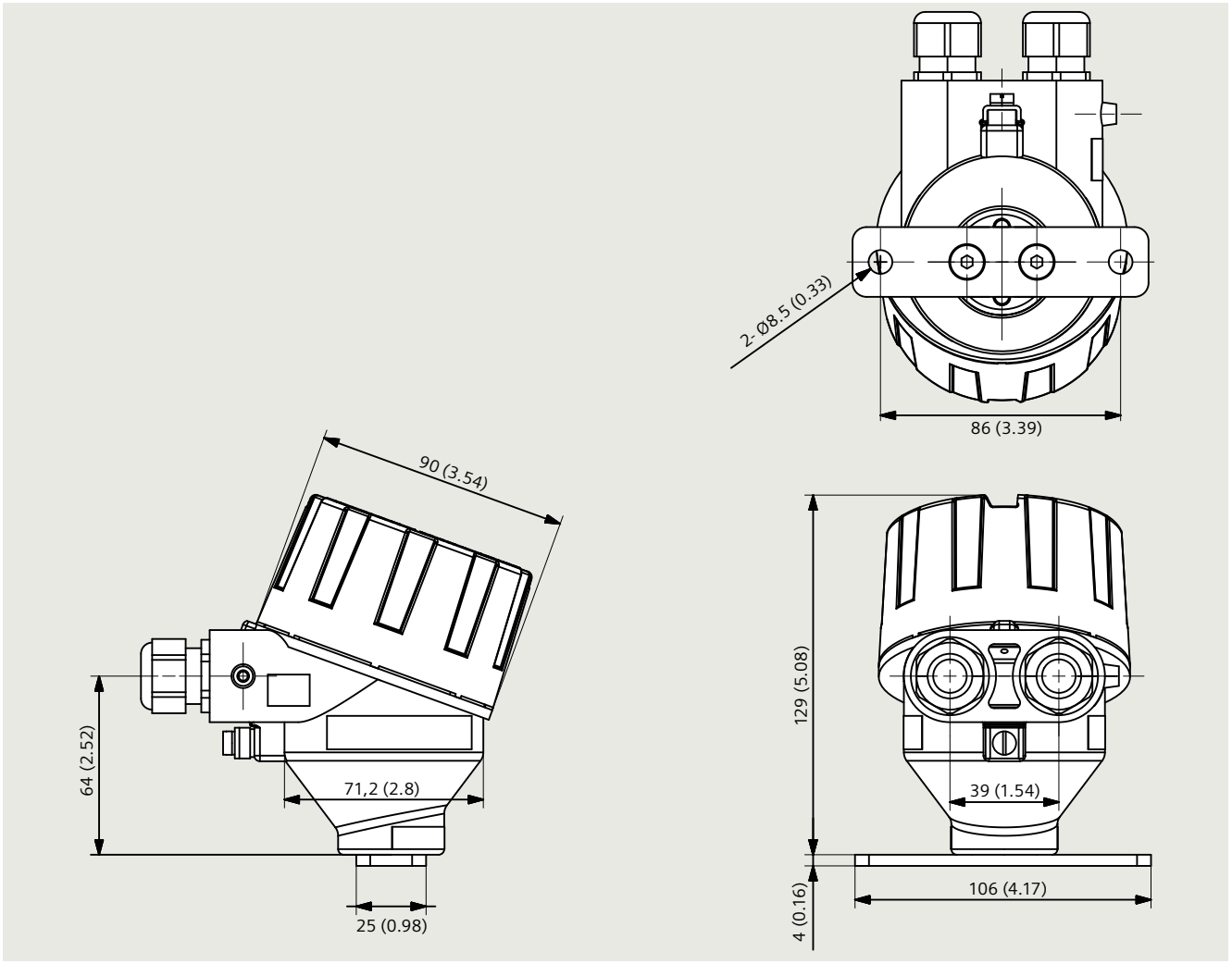
1) Temperature coefficients correspond to the specified values or 0.002% of the input span, depending on which value is greater.
2) Accuracy of the specification range > 400 °C (752 °F)
3) Accuracy of the specification range > 160 °C (320 °F) < 400 °C (752 °F)
4) Accuracy of the specification range > 85 °C (185 °F) < 160 °C (320 °F)
5) Accuracy of the specification range < 85 °C (185 °F)

Output accuracy

Output type	Basic accuracy	Temperature coefficient
Average value measurement	Average of accuracy of input 1 and input 2	Average of temperature coefficient of input 1 and input 2
Differential measurement	Sum of accuracy of input 1 and input 2	Sum of temperature coefficient of input 1 and input 2
Analog output	≤ ±1.6 µA (0.01% of the full output span)	≤ ±0.48 µA/K (≤ ±0.003% of the full output span/K)

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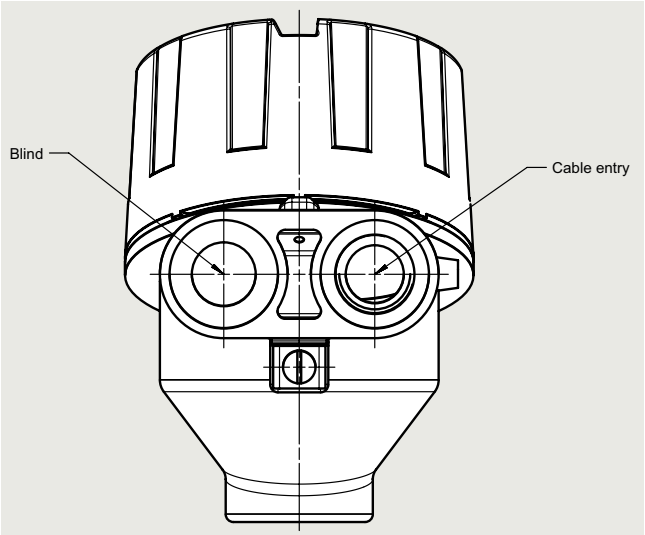
Dimensional drawings



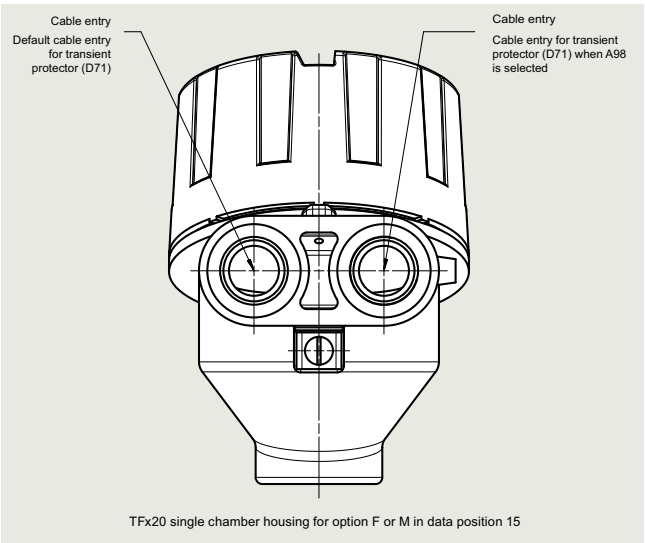
SITRANS TF420, single chamber enclosure, dimensions in mm (inch)

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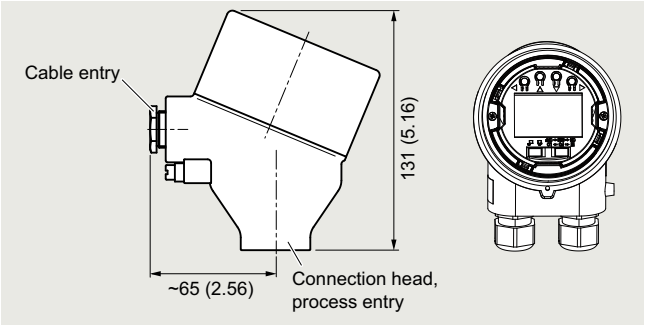
Dimensional drawings (continued)



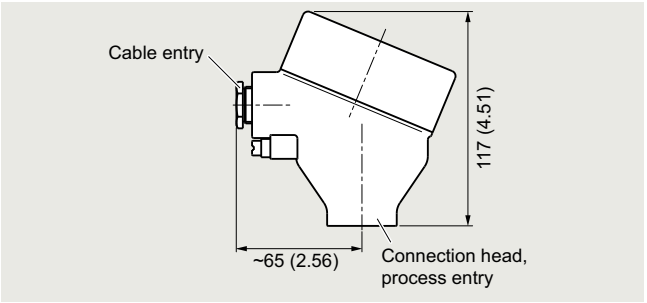
SITRANS TF420 single chamber enclosure



SITRANS TF420 single chamber enclosure



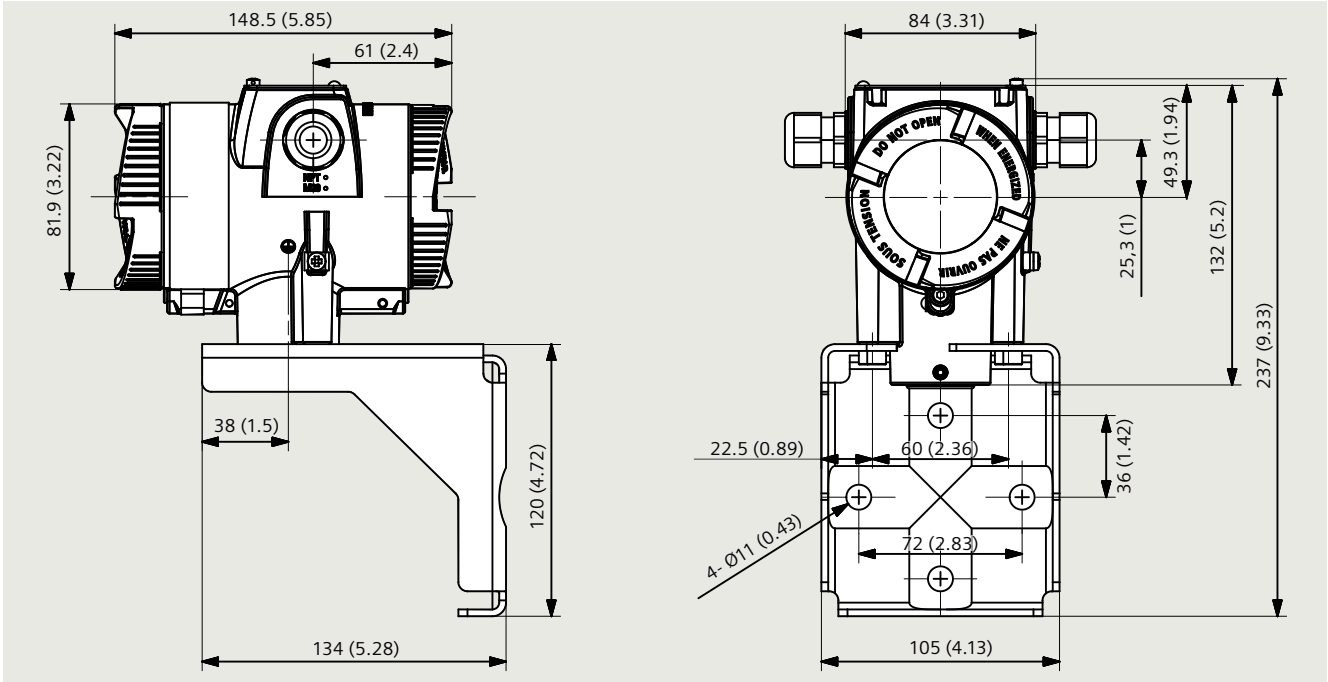
Connection head with 4-20 mA display, dimensions in mm (inch)



Connection head, dimensions in mm (inch)

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Dimensional drawings (continued)



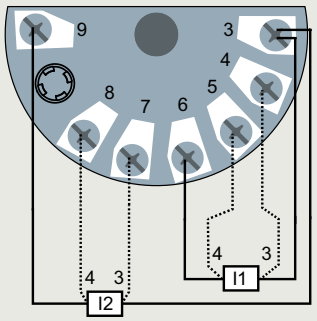
SITRANS TF420, dual chamber enclosure, dimensions in mm (inch)

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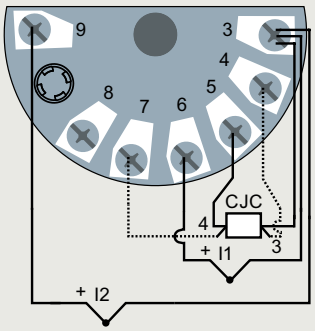
Circuit diagrams

Connections

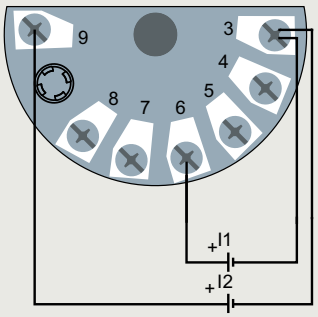
Input connection



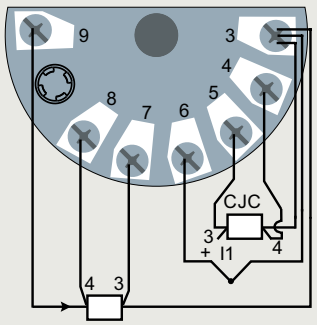
Input 1 and/or input 2:
2-wire, 3-wire or 4-wire RTD or
linear resistance



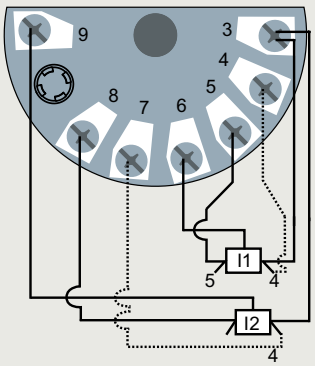
Input 1 and/or input 2:
TC (internal CJC or
external 2-wire, 3-wire or
4-wire CJC)



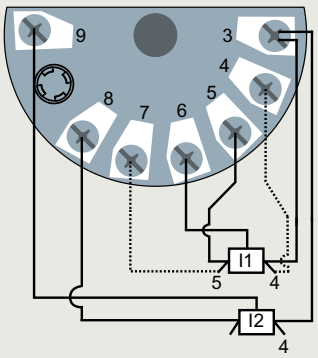
Input 1 and/or input 2:
Voltage input
(unipolar or bipolar)



Input 1: TC (internal CJC or
external 2-wire or 3-wire CJC)
Input 2: 2-wire, 3-wire or 4-wire RTD



Input 1 and/or Input 2:
3-wire or 4-wire potentiometer

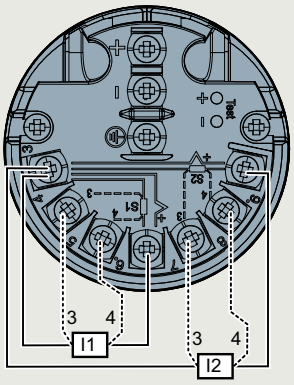


Input 1: 5-wire potentiometer
Input 2: 3-wire potentiometer

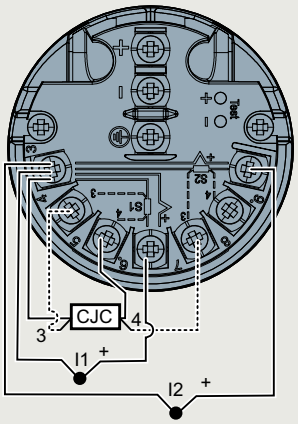
SITRANS TF420 in single chamber enclosure (7NG044*), input connection assignment

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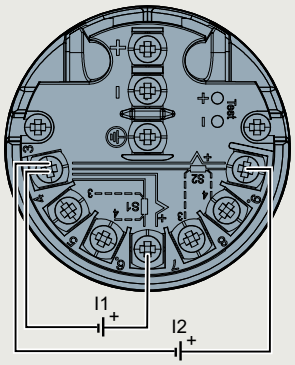
Circuit diagrams (continued)



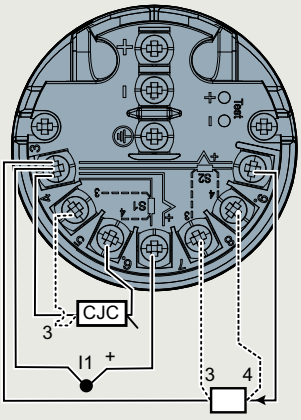
Input 1 (I1) and/or input 2 (I2):
2-wire, 3-wire or 4-wire RTD or
linear resistance



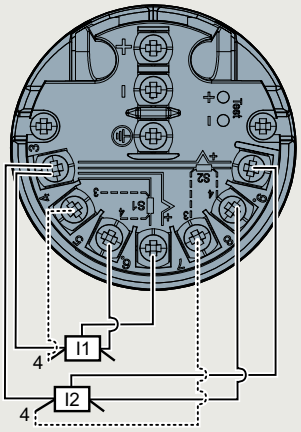
Input 1 (I1) and/or input 2 (I2):
TC (internal CJC or
external 2-wire, 3-wire or
4-wire CJC)



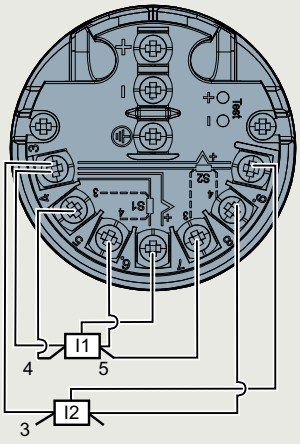
Input 1 (I1) and/or input 2 (I2):
Voltage input
(unipolar or bipolar)



Input 1: TC (internal CJC or
external 2-wire or 3-wire CJC)
Input 2: 2-wire, 3-wire or 4-wire RTD



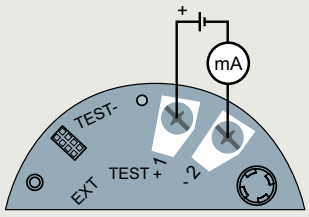
Input 1 (I1) and/or input 2 (I2):
3-wire or 4-wire potentiometer



Input 1 (I1): 5-wire potentiometer
Input 2 (I2): 3-wire potentiometer

SITRANS TF420 in dual chamber enclosure (7NG045*), input connection assignment

Output connection



SITRANS TF420 in single chamber enclosure (7NG044*), output
connection assignment

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Overview

Other accessories for assembly, connection and transmitter configuration

- Transmitter configuration for SITRANS TH / TR / TF and SITRANS TS
- Cable glands and adapters for SITRANS TF and SITRANS TS
- Lightning protection for SITRANS TF (SITRANS TS on request)
- Plugs for SITRANS TF and SITRANS TS
- Indicator for SITRANS TS500
- Connection and mounting accessories for SITRANS TH
- Connection and mounting accessories for field transmitter SITRANS TF
- Measuring inserts for SITRANS TS500 Measuring inserts: See SITRANS TSinsert
- Connection heads type B for SITRANS TS500 (accessory resistance thermometer)
- Enclosure gaskets for SITRANS TS500
- Connection heads type A and accessories for straight thermocouples
- Installation accessories for connection heads for straight thermocouples

Selection and ordering data

Transmitter configuration for SITRANS TH / TR / TF and SITRANS TS

	Article No.
Modems	
Modem with USB interface and SIPROM T software 4 ... 20 mA • With USB connection • For SITRANS TH100, TH200, TH320, TR200, TR320, TF320, TF420 and TF, with TH200	**7NG3092-8KN**
HART modem with USB interface for all HART devices • With USB connection • For SITRANS TH300, TH320, TH420, TR300, TR320, TR420, TF320, TF420, TF in HART	**7MF4997-1DB**
SIMATIC PDM parameterization software • For SITRANS TH300, TR300, TH400, TF320, TF420, TF in HART / PROFIBUS PA / FOUNDATION Fieldbus	**See section 8 "Digitalization and communication"**

Cable glands and adapters for SITRANS TF and SITRANS TS

	Article No.
M20 × 1.5 nickel-plated brass; with Ex-d approval	**7MF4997-2FR**
½-NPT nickel-plated brass; with Ex-d approval	**7MF4997-2FU**
CAPRI screw connection M20 × 1.5 nickel-plated brass; with Ex-d approval	**7MF4997-2LA**
CAPRI screw connection M20 × 1.5 stainless steel; with Ex-d approval	**7MF4997-2LB**
CAPRI screw connection ½-14 NPT nickel-plated brass; with Ex-d approval	**7MF4997-2LC**
CAPRI screw connection ½-14 NPT stainless steel; with Ex-d approval	**7MF4997-2LD**
Thread adapter M20 × 1.5 (external thread) to ½-14 NPT (internal thread)	**7MP1990-0BA00**
Thread adapter M20 × 1.5 (external thread) to G½ (internal thread)	**7MP1990-0BB00**

Lightning protection for SITRANS TF (SITRANS TS on request)

	Article No.
Transient protector M20 × 1.5 (lightning protection)	**7MF4997-2DU**
Transient protector ½-14 NPT (lightning protection)	**7MF4997-2DV**

Plugs for SITRANS TF and SITRANS TS

	Article No.
Han 7D plug made of plastic	**7MF4997-2FB**
Han 7D plug made of metal	**7MF4997-2FC**
M12 socket angled for cable diameter 4 ... 6 mm (0.158 ... 0.236 inches), -25 ... +85 °C (-13 ... 185 °F)	**3RK1902-4CA00-4A-A0**

Indicator for SITRANS TS500

	Article No.
Local operation with temperature transmitters SITRANS TH320/TH420 4 ... 20 mA/HART	**7MF7902-1AD**
Mounting system for local operation in single chamber enclosure including fastening and connecting cable	**7MF7902-1AS**

Connection and mounting accessories for SITRANS TH

	Article No.
Mounting rail adapter for head-mounted transmitter (order quantity: 5 units)	**7NG3092-8KA**
Connecting cable 4-wire, 200 mm (7.87 inches), for input connections when using head -mounted transmitters in the high spring flap (set with 5 units)	**7NG3092-8KC**

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Selection and ordering data (continued)

Connection and mounting accessories for field transmitter SITRANS TF

	Article No.
Mounting bracket and fastening parts	
Made of steel for 7NG313. -..B.. and 7MP1110	**7MF4997-1AC**
Made of steel for 7NG313 . -..C..	**7MF4997-1AB**
Made of stainless steel 304 for 7NG313. -..B.. and 7MP1110	**7MF4997-1AJ**
Made of stainless steel 304 for 7NG313. -..C..	**7MF4997-1AH**
Made of stainless steel 316L for 7NG313. -..B..	**7MF4997-1AQ**
Made of stainless steel 316L for 7NG313. -..C..	**7MF4997-1AP**
Digital indicator for SITRANS TF[1)]	**7MF4997-1BS**
Connection board for SITRANS TF	**A5E02391790**
Lid, die-cast aluminum, without inspection window	**7MF4997-1BB**
Lid, die-cast aluminum, with inspection window	**7MF4997-1BE**

1) Retrofitting not possible with Ex devices.

Measuring inserts for SITRANS TS500

Measuring inserts, see SITRANS TSinsert.

Connection heads type B for SITRANS TS500 (resistance thermometer accessories)

	Article No.
Degree of protection IP54	
Connection head type: similar to BA0; aluminum; flange cover	**7MC1907-1BA**
Connection head type: similar to BM0; plastic; screw cover	**7MC1907-1BK**
Degree of protection IP65	
Connection head type: similar to BB0; aluminum; small spring flap	**7MC1907-1BF**
Connection head type: similar to BC0; aluminum; high spring flap	**7MC1907-1BL**
Quick-release lock for connection heads BB0, BC0, degree of protection of connection head reduced to IP20, weight: 0.02 kg (0.04 lb)	**7MC1907-1BS**

Spare parts/enclosure gaskets for SITRANS TF320/TF420 and SITRANS TS500

	Article No.
Lid gasket SITRANS TF320/TF420 single chamber enclosure as well as for SITRANS TS500 enclosure AG0, AV0, AU0, AV0	**7MF7901-3AB**

Selection and ordering data (continued)

Connection heads type A and accessories for straight thermocouples

Metal thermowells for straight thermocouples according to EN 50446

	Article No.
X 10 CrAl 24, material no. 1.4749 Ø 22 × 2 mm (Ø 0.87 × 0.08 inches), 0.55 ... 1.10 kg (1.21 ... 2.42 lb), dished Nominal length/thermowell length in mm (inch):	
• 500 (19.7)/520 (20.5)	**7MC2900-1DA**
• 710 (28.0)/730 (28.7)	**7MC2900-2DA**
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3DA**
X 18 CrN28, material no. 1.4749 Ø 26 × 4 mm (Ø 1.02 × 0.16 inches), 1.25 ... 2.20 kg (2.76 ... 4.85 lb), dished Nominal length/thermowell length in mm (inch):	
• 500 (19.7)/520 (20.5)	**7MC2900-1EC**
• 710 (28.0)/730 (28.7)	**7MC2900-2EC**
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3EC**
X 15 CrNiSi 25 20, material no. 1.4841 Ø 22 × 2 mm (Ø 0.87 × 0.08 inches), 1.05 kg (2.31 lb), dished Nominal length/thermowell length in mm (inch):	
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3FA**
CrAl 205 (Kanthal AF), material no. 1.4767 Ø 22 × 2 mm (Ø 0.87 × 0.05 inches), 0.55 ... 1.10 kg (1.21 ... 2.42 lb) Nominal length/thermowell length in mm (inch):	
• 500 (19.7)/520 (20.5)	**7MC2900-1HA**
• 710 (28.0)/730 (28.7)	**7MC2900-2HA**
• 1 000 (39.4)/1 020 (40.2)	**7MC2900-3HA**

Thermocouples for straight thermocouples according to EN 50446

	Article No.
Base thermocouple with isolating pipe Wire diameter 3 mm (0.12 inches) Ni Cr/Ni, up to 1 000 °C (max. 1 300 °C), (up to 1 832 °F (max. 2 372 °F)) 0.55 ... 2.10 kg (1.21 ... 4.63 lb) Nominal length *L1*/Thermowell length *L2* in mm (inch):	
• 500 (19.7)/540 (21.3)	**7MC2903-1CA**
• 1 000 (39.4)/1 040 (40.9)	**7MC2903-3CA**

Connection heads for straight thermocouples

	Article No.
Connection head, type A (without terminal base and terminals), 1 cable entry, degree of protection IP53, 0.35 kg (0.77 lb)	
Light metal, screw-on cover, for thermowell diameter in mm (inch) (hole = thermowell diameter +0.5 mm) (0.02 inches)	
• 22 (0.87)	**7MC2905-1AA**
• 26 (1.02)	**7MC2905-1BA**
Light metal, high spring flap, for thermowell diameter in mm (inch) (hole = thermowell diameter +0.5 mm) (0.02 inches)	
• 22 (0.87)	**7MC2905-4AA**
• 26 (1.02)	**7MC2905-4BA**

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Selection and ordering data (continued)

Installation accessories for connection heads for straight thermocouples

- Terminal base
- Terminal
- Sealing rings
- Washer
- Stop flange
- Threaded sleeve

	Article No.
Terminal base without terminals for base thermocouples; 0.06 kg (0.13 lb)	**7MC2998-1AA**
Terminal for base thermocouples; 0.01 kg (0.02 lb)	**7MC2998-1BA**
Set of sealing rings (100 units) for the lid of the connection head; 0.01 kg (0.02 lb)	**7MC2998-1CA**
Set of washers (100 units) for the terminal base; 0.01 kg (0.02 lb)	**7MC2998-1CB**
Stop flange, adjustable, from GTW	
• For thermowell outer diameter 22 mm (0.87 inches); 0.35 kg (0.77 lb)	**7MC2998-2CB**
• For thermowell outer diameter 26 mm (1.02 inches); 0.32 kg (0.71 lb)	**7MC2998-2CC**
Threaded sleeve, gas-tight up to 1 bar (14.5 psi), adjustable, material no. 1.0718, with seal; 0.40 kg (0.88 lb)	
• For thermowell outer diameter 22 mm (0.87 inches), **G1**	**7MC2998-2DB**
• For thermowell outer diameter 26 mm (1.02 inches), **G1**	**7MC2998-2DC**

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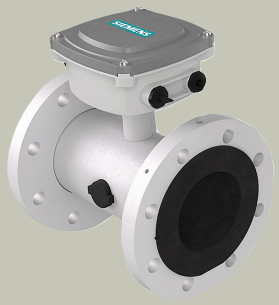
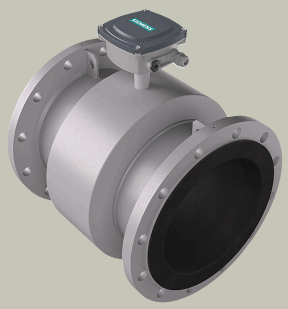
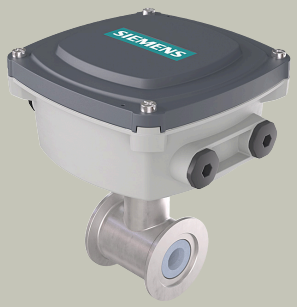
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Overview

SITRANS FM electromagnetic flowmeters – Flowmeter with pulsed DC field technology	Application	Description
FMT020 flow transmitter 	High performance, robust and intelligent product, designed to fit perfectly for a wide area of process applications that require accurate, and reliable flow measurement of conductive fluids.	• High accuracy up to 0.2% of rate • 3 totalizers for forward, reverse, and net flow • Backwards compatible with older (up to 15 years) flowmeter sensors (MAG 5100W) • Fast start-up without zero-point adjustments • Variety of functions for comprehensive device check, self-diagnosis, and onboard verification • Verificator compatible - Independently verifies performance of sensor, transmitter, and installation (including cable) without process interruption • Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications • Multi-functional outputs for process control, minimum configuration with analog, digital (pulse, frequency, status), and relay output • SD memory card for data logging, configuration backup, and firmware update • Seamless field device integration in host systems • Communication modules: HART, Modbus RTU, Modbus TCP/IP, PROFINET, EtherNet/IP, PROFIBUS
MAG 5000/6000 flow transmitter 	Versatile, microprocessor-based transmitter with multiple function outputs and a modular housing concept for more flexible installation options is the ideal product for a wide range of applications. Available in a robust polyamide housing or as a 19" rack-mount version, the product is designed to offer high performance, simple operation and reduced maintenance.	• High performance: Cost-effective transmitter with high accuracy • Rugged design: Suitable for universal applications with a durable construction • Function outputs: Includes 0 ... 20 mA or 4 ... 20 mA, digital, and relay outputs for process control • SENSORPROM Technology: Stores sensor characteristic data for easy commissioning • Plug & Play: Allows simple on-site replacement and commissioning in minutes • Hot swappable: Exchangeable during operation without downtime • Mounting Flexibility: Supports both compact (integral mount) and remote design • Comprehensive self-diagnostic, for error indication and logging • Service and diagnostics: Designed for on-site verification with traceable certification • Communication module: HART, MODBUS, PROFIBUS, FOUNDATION Fieldbus, DeviceNet • Custody transfer approvals: MI-001, PTB K7.2
MAG 6000 I flow transmitter 	Designed in robust die-cast aluminum housing for demanding applications and where explosion proof protection is necessary.	• Remote and compact mounting with all sensors • Communication modules: HART, Modbus, PROFIBUS, FOUNDATION Fieldbus, DeviceNet • Ex Approval: ATEX, IECEx, FM, CSA • Multi-lingual display and touchpad keypad • Comprehensive self-diagnostic

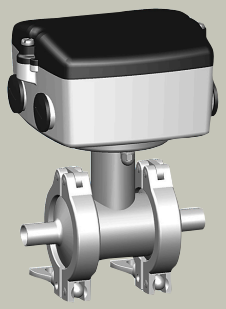
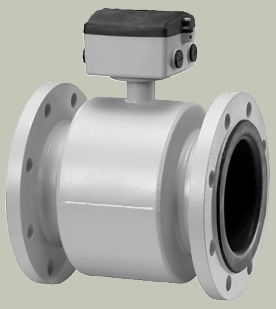
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Overview (continued)

SITRANS FM electromagnetic flowmeters – Flowmeter with pulsed DC field technology	Application	Description
SITRANS FMS500 flow sensor  	Magnetic flowmeter sensor for measuring of liquids (conductive), ideal for applications in water abstraction, wastewater treatment, water distribution networks and irrigation.	• Zero Up and Zero Down installation capabilities • NBR rubber liner for all water and wastewater applications • EPDM liner specifically for drinking water applications requiring special approvals • Increased low flow accuracy for water leak detection • Simple on-site upgrade to IP68 of a standard sensor allowing underground installation, permanent immersion or underwater installation • Built-in length according to ISO 20456 (up to DN 400) • SENSORPROM™ Technology provides an automatic upload of start-up settings and calibration data for easy commissioning • Designed to allow in-situ verification for easy performance check • In conformity with ISO 4064, OIML R49 and EN 14154
SITRANS FMS300 flow sensor 	Device with a large variety of pipe diameters and wetted materials to meet the demands of almost every flow application. A fully welded construction, liner and electrode materials capable of withstanding the most extreme process conditions provide a ruggedness that allows measurement of even the most extreme process media.	• Wide range of pipe dimensions: DN 15 ... 2200 (½" ... 88") • High-temperature version for application with temperatures up to 180 °C (355 °F) • Fully welded construction provides a ruggedness that suits the toughest applications and environments • Wide range of electrode and liner materials to fit even the most extreme process media
SITRANS FMS100 flow sensor 	Compact and cost-effective device suitable for measuring ultra low flows, for flow measurement in chemical applications and for use in industries with extreme process conditions. The obstructionless performance of the MAG 1100 is unaffected by the suspended solids, viscosity and temperature challenges. Specially designed for the food & beverage and pharmaceutical industry.	• Wafer type sensor (flangeless), diameter DN 2 ... 100, (1/12" ... 4") • Corrosion-resistant AISI 316 stainless steel housing • Highly resistant liner (ceramic or PFA) and electrodes fitting most extreme process media • Temperature rating up to 200 °C (390 °F) • AISI 316 stainless steel enclosure • Easy to clean • Supplied with optional connections according to your specification • 3A approval • FDA approval

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Overview (continued)

SITRANS FM electromagnetic flowmeters – Flowmeter with pulsed DC field technology	Application	Description
MAG 1100 / 1100 HT flow sensor 	Compact and cost-effective device suitable for measuring ultra low flows, for flow measurement in chemical applications and for use in industries with extreme process conditions. The obstructionless performance of the MAG 1100 is unaffected by the suspended solids, viscosity and temperature challenges.	• Wafer type sensor (flangeless), diameter DN 2 ... 100, ($^1/_{12}$" ... 4") • Corrosion-resistant AISI 316 stainless steel housing • Highly resistant liner (ceramic or PFA) and electrodes fitting most extreme process media • Temperature rating up to 200 °C (390 °F) • Approvals for use in hazardous areas
MAG 1100 F flow sensor 	Specially designed for the food & beverage and pharmaceutical industry.	• AISI 316 stainless steel enclosure • Hygienic seal, 3A • Easy to clean • Supplied with connections according to your specification • Ex approval: ATEX, FM
MAG 3100 flow sensor 	Device with a large variety of pipe diameters and wetted materials to meet the demands of almostevery flow application. A fully welded construction, liner and electrode materials capable of withstanding the most extreme process conditions provide a ruggedness that allows measurement of even the most extreme process media.	• Wide range of pipe dimensions: DN 15 ... 2200 (½" ... 88") • Fully welded construction provides a ruggedness that suits the toughest applications and environments • Wide range of electrode and liner materials to fit even the most extreme process media • Easy commissioning, the SENSORPROM™ memory unit automatically updates the settings • Approvals for use in hazardous areas
FM100 flowmeter 	Electromagnetic flowmeter for measuring and monitoring small and medium flows.	• Connection ½", ¾", 1", 2" • Flow- and temperature measurement • IO-Link communication • Dosing function with external control output • Flexible usage in different applications due to two individual configurable outputs • Bidirectional measurement • Robust stainless-steel design

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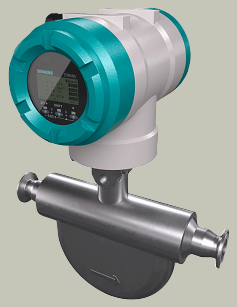
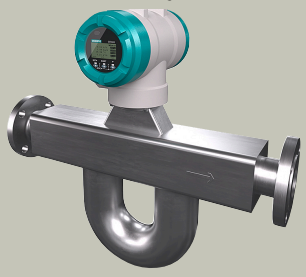
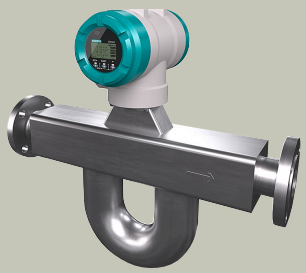
Overview (continued)

SITRANS FM electromagnetic flowmeters – High-power AC magnetic flowmeter	Application	Description
TRANSMAG 2 transmitter 	Designed for heavy-duty applications like pulp & paper stock over 3%; heavy mining slurries and mining slurries with magnetic particles.	• Magnetic flowmeter with a very strong pulsed AC magnetic field • PROFIBUS PA or HART communication • Comprehensive self-test function
MAG 911/E flow sensor 	Designed for heavy-duty applications like pulp & paper stock over 3%; heavy mining slurries and mining slurries with magnetic particles.	• Metering tube: DN 15 ... 1000 (½" ... 40") • Metering tube liner: Hard Rubber, Linatex, Soft rubber, PTFE and Novolak • Integral smartPLUG for storing of calibration values • Multi-lingual display and touchpad keypad • Only remote version

SITRANS FM electromagnetic flowmeters – Battery-operated water meter	Application	Description
MAG 8000 water meter 	Battery-operated electromagnetic water meter for water applications within abstraction, distribution network and revenue metering.	• Battery- and/or mains power operated water meter • Metering tube DN 25 ... 1200 (1 ... 48") • Remote and compact installation IP68/NEMA 6P enclosure • Custody transfer approval: PTB K7.2, OIML R 49 and MI-001 • Drinking water approvals • Communication modules: GSM/GPRS, Modbus, Encoder

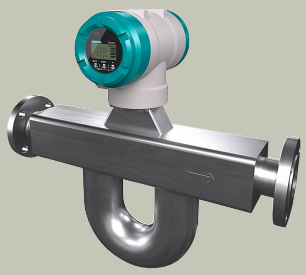
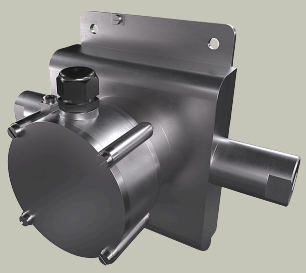
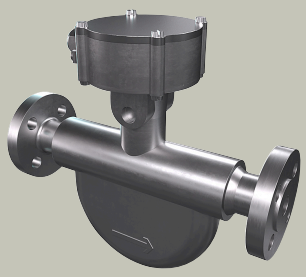
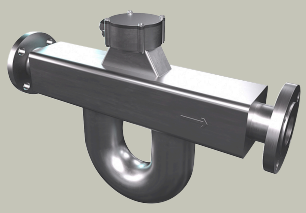
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Overview (continued)

SITRANS FC mass flowmeters Coriolis	Application	Description
FC120/FC140 flowmeter system 	The flowmeter systems of the SITRANS FC100 series are the precision Coriolis multi-parameter flowmeter for low flow applications.	• Batching function with batch leakage detection and batch control by transmitter for precise dosing • Accurate density measurement and up to four advanced concentration measurement data sets • Sizes to suit pilot plants, R&D labs and high value fluid additives • Wide choice of process connections, starting with DN 6 (¼") for reduced installation efforts
FC520/FC540 flowmeter system 	The flowmeter systems of the SITRANS FC500 series are the universal Coriolis multi-parameter flowmeter for routine and hygienic applications.	• Energy-efficient low pressure loss design with short tube paths and large tube diameter • Batching function with batch leakage detection and batch control by transmitter for precise dosing • Accurate density measurement and up to four advanced Concentration Measurement data sets • Benefit from viscosity function and capability to handle high viscous process fluids • Hygienic design, self-draining in vertical installation, with hygienic approval options
FC620/FC640 flowmeter system 	The flowmeter systems of the SITRANS FC600 series are the resistant Coriolis multi-parameter flowmeter for extreme conditions.	• Temperatures from -196 °C (-321 °F), for cryogenic fluids, up to +350 °C (+662 °F) • Insulation and heat tracing options for viscous and molten liquids • Dynamic pressure compensation for accurate measurement under changing process pressure • Accurate density measurement and up to four advanced concentration measurement data sets
FC720/FC740 flowmeter system 	The flowmeter systems of the SITRANS FC500 series are the grande Coriolis multi-parameter flowmeter for large pipes and high flows.	• Energy-efficient low pressure loss design with short tube paths and large tube diameter • Optimal decoupling of the dual tube measuring element from external stress and vibration • Accurate density measurement and up to four advanced concentration measurement data sets • Benefit from viscosity function and capability to handle high viscous process fluids • High power tube driver to detect gas content to maintain dependable measurements with entrained gas
FCT020 transmitter 	FCT020 is the standard transmitter, suitable for general purpose applications. It delivers accurate and precise measurements of mass flow rate, density, temperature and volume flow rate.	• Tube health check • Communicaion modules: HART, Modbus

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Overview (continued)

SITRANS FC mass flowmeters Coriolis	Application	Description
FCT040 transmitter 	FCT040 is the advanced transmitter, offering a wider range of application solutions with improved performance.	• Tube health check • Standard concentration measurement • Petroleum measurement function • Fraction (advanced concentration) • Viscosity function • Batching function • Communicaion modules: HART, Modbus, PROFIBUS, PROFINET over Ethernet-APL
FCS100 sensor 	SITRANS FCS100 sensor is the precision Coriolis flow sensor for low flow applications.	• Install in tight spaces with no inlet and outlet restrictions • Sizes to suit pilot plants, R&D labs, and high value fluid additives • Combination with a remote transmitter via a connecting cable • Installation of sensor and transmitter in different locations
FCS500 sensor 	SITRANS FCS500 sensor is the universal Coriolis flow sensor for routine and hygienic applications.	• Dual curved AISI 316L stainless steel tubes with polished option • Hygienic approvals for food, beverage, and pharmaceutical sectors • Versatile solution with superior turndown and low pressure loss • Combination with compact or remote transmitters
FCS600 sensor 	SITRANS FCS600 sensor is the resistant Coriolis flow sensor for extreme conditions and corrosive fluids.	• Dual curved AISI 316L or alloy 22 tubes with optimum decoupling from external influences • Temperatures from -196 °C (for cryogenic fluids), up to +350 °C • Insulation and heat tracing options for viscous and molten liquids • Combination with compact or remote transmitters
FCS700 sensor 	SITRANS FCS700 sensor is the grande Coriolis flow sensor for large pipes and high flows.	• Dual curved AISI 316L stainless steel or alloy 22 tubes with optimum decoupling from external influences • Energy efficient low pressure loss design with short tube paths and large tube diameter • High power tube driver for dependable measurements in high damping applications • Combination with compact or remote transmitters

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Overview (continued)

SITRANS FS in-line ultrasonic flowmeters	Application	Description
SITRANS FST030 transmitter 	SITRANS FST030 Inline is designed for all ultrasonic flowmetering. The SITRANS FST030 can measure liquids or oil with the SONOKIT.	• For SONOKIT up to DN 3000 and more • 1 or 2 path option • Single, dual or four path version • Hazardous area approvals for ATEX Zone 1,2, IECEx Zone 1,2 FMc Class I Div. 1,2
SITRANS FUS080/FUE080 transmitter 	SITRANS FUS080 is a time-based transmitter designed for ultrasonic flowmetering in pipes for the SONOKIT and DN 1200	• Battery or mains-powered • Easy one-button operation • Bidirectional measuring • IrDA optical eye communication • Robust polyamide enclosure
SITRANS FSS100 (SONOKIT) 	Installation of one, two or four transducer sets in existing concrete or steel pipes. Typically installed in pipes with large diameters or in hot/cold water applications	• SITRANS FST030 transmitter for separate mounting • DN 100 ... 3000 (4" ... 120") • Control and display unit • Temperature of medium: -20 ... +200 °C (-4 ... +395 °F) • Installation on empty pipes or pipes under pressure (hot-tap installation) • Standard 1-, 2- or 4-path
SITRANS FUE950 	Universal thermal energy calculator for district heating and cooling applications.	• Battery or mains-powered • 24 periods memory • 2 ports for plug-in modules as data output, extra input, M-Bus, RS 232/RS 485, current output • Complete set with temperature sensors and pockets • MID heating approval, PTB K7.2 cooling approval, MI004 type approval

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Overview (continued)

SITRANS FS clamp-on ultrasonic flowmeters	Application	Description
SITRANS FS230 	SITRANS FS clamp-on ultrasonic flowmeters provide highly accurate measurement while minimizing installation time and maintenance expense. These dedicated flowmeters are suitable for a wide variety of liquid applications, including those in the: • Water Industry • Wastewater Industry • HVAC Industry • Power Industry • Processing Industry • Hydrocarbon Industry	• Suitable for virtually any liquid, even those with high aeration or suspended solids • Hydrocarbon functions are ideal for applications carrying crude oil, refined petroleum or gas • Choice of single, dual or four path versions to suit your operating conditions and requirements • Easy installation; no need to cut pipe or stop flow • Minimal maintenance; external sensors do not require periodic cleaning • Easy to read display with intuitive menu system • Hazardous area approvals for ATEX Zone 1,2, IECEx Zone 1,2 FMc Class I Div. 1,2
SITRANS FS220 	SITRANS FS220 basic is a fast-to-install clamp-on ultrasonic flowmeter for accurate measurements with minimal maintenance. Based on latest technology, this flowmeter is ideal suitable for applications like: • Water Industry • Wastewater Industry • HVAC Industry • Power Industry • Process controls	• Easy installation during process condition, no need to cut pipe or stop flow • Minimal maintenance; external sensors do not require periodic cleaning • No media-contacting parts, no wear, no pressure drop, no energy loss • Wide turn-down ratio, very sensitive in low flow condition • Optional WideBeam technology ensures high performance • Compatible with all previously fielded transit time sensors
SITRANS FS290 	The portable clamp-on ultrasonic flow measurement system SITRANS FS290 is formed by the SITRANS FST090 portable clamp-on flowmeter with FSS200 sensors. This system represents the next generation of digital flow measurement which allows you to easily measure or check flows in pipes.	• Easy installation: just clamp it on, with no need to cut pipe or stop flow • Minimal maintenance: sensors do not require upkeep or cleaning • No moving parts to foul or wear • No pressure drop or energy loss • Wide turn-down ratio • Precise single path measuring
SITRANS FST070 	The technology module SITRANS FST070 is an ultrasonic clamp-on flowmeter transmitter for the SIMATIC ET200SP. The SITRANS FST070 can be used for machine builders, in the chemical industry or water treatments and is suitable for measuring on liquid, hydrocarbon and gas	• Easy integration into automation process control as TIA Portal and PCS 7 (SIMATIC) • Easy selection and integration of flowmeters via TIA selector • Precast face plates for TIA Portal and PCS 7 • No additional transmitter between automation and clamp-on sensors required • Cost effective integration of clamp-on flowmeters for water treatments, control rooms with PCS 7 • SITRANS FST070 ET 200SP technology module can combined with all other SIMATIC ET200 modules • Fast and trouble-free communication between the flowmeter and the PLC through digital data communication with up to 10 ms update rate • ATEX Zone 2 Class 1 Div. 2

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Overview (continued)

SITRANS FX Vortex flowmeter	Application	Description
SITRANS FX330 	Very versatile and flexible for use in many process applications. Flow sensors combines flow, pressure and temperature measurement into one user-friendly, two-wire device. • Measurement of saturated steam and superheated steam • Heat metering of steam and hot water • Measurement of consumption in compressed air systems • Evaluation of Free Air Delivery (FAD) • SIP and CIP processes in the food, beverage and pharmaceutical industries • Measurement of conductive and non-conductive liquids • Safety-related measurement in SIL applications (SIL2).	• Integrated pressure and temperature compensation • Temperature compensation for saturated steam included as standard • SIL2 certified according to IEC 61508 Edition 2 • Use in hazardous areas • Integrated reduction of nominal diameter for space-saving and economic installation • Exchange of electronics without loss of calibration and configuration data • Gross and net heat calculation to support energy management • Remote version with cable length up to 50 m (164 ft)

SITRANS FVA variable area meters	Application	Description
FVA250 	Measurement of flow of liquids and gases, also highly suitable for corrosive media, high temperatures and high pressures.	• All-metal variable area meter with various float materials • Connections: DN 15 ... 100 (½" ... 4") • Temperature of medium: -20 °C ... +300 °C (-4 ... +572 °F) • Optionally available with analog output or contacts

SITRANS FP differential pressure flow measurement	Application	Description
	SITRANS FP product line is suitable for all kinds of applications – liquids, dry or humid gases and steam. Due to the robust though variable design it has been and still is one of the main technologies for flow measurement in various industries. A new digital sizing process ensures minimum effort during presales and full traceability in aftersales. The differential pressure portfolio consists of • pitot tubes SITRANS FPS300 • primary elements according to ISO 5167 (orifices) SITRANS FPS200	• Suitable for a vast range of different applications • Available as pre-mounted compact system as well as remote parts • Advanced intelligent sizing procedure • Web-based sizing and data storage enables full traceability and easy communication • All benefits of SITRANS P320 available

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Overview

Criteria for selection of flowmeter

Each method for measuring flow has specific properties, and each flow measuring point is characterized by specific requirements. The table shown below compares the properties of the various measuring instruments and thus provides assistance in selection of the optimum device.

This section of the field device catalog includes the following instruments for measuring flow:

- Electromagnetic
- Coriolis mass flow
- Ultrasonic
- Vortex volumetric- and mass flow
- Variable area meter
- Primary element

Measurement principle	Electromagnetic	Coriolis	Ultrasonic (inline)	Ultrasonic (clamp-on)	Vortex	Variable area meter	Primary element
Medium	Liquid (conductive)	Liquid or gas	Liquid	Liquid or gas	Steam/vapor, gases, liquid	Liquid or gas	Liquid, vapor, gas
Nominal size	DN 2 ... 2200 (0.08" ... 88")	DN 1 ... 200 (0.04" ... 8")	DN 50 ... 1200 (2" ... 48")	6.4 mm ... 9.14 m (0.25" ... 360")	DN 15 ... 300 (½" ... 12")	DN 10 ... 100 (0.4" ... 4") G½" ... G3"	DN 10 ... 4000 (0.4" ... 160")
Temperature range [°C (°F)]	-40 ... +200 (-40 ... +392)	-50 ... +180 (-58 ... +356)	-20 ... +200 (-4 ... +392)	-40 ... +120 (-40 ... +248)	-40 ... +240 (-40 ... +464)	-20 ... +300 (-4 ... +572)	-100 ... +490 (-148 ... +914)
Max. pressure [bar (psi)]	160 (2 320), optional higher	Up to 410 (Up to 5 950)	40 (580)	Unlimited	100 (1 450)	100 (1 450)	315 (4 569)
Accuracy [%]	± 0.25 or ± 0.4	± 0.1 or ± 0.15	± 0.5 ... ± 2	0.5 ... 1.0 % of flow, for velocities greater than 0.3 m/s (1 ft/s)	± 0.75 ... ± 1	± 1.6 ... ± 2.0	± 0.5 ... ± 1.2
Repeatability [%]	0.1/0.2	0.05	0.25	0.15% of flow, for velocities greater than 0.3 m/s (1 ft/s)	0.1	0.5	0.1
Dynamic response range	1:100	1:100	1:400	1:100	1:25	1:10	1:6
Start-of-scale value [m/s (ft/s)]	0 (0)	0 (0)	0.1 (0.33)	0 (0)	0.4 (1.31) 2.0 (6.56)	0.2 (0.66)	Re > 500
Full-scale value				± 36/120			Re < 10^8
• For liquids [m/s (ft/s)]	0.25 ... 10 (0.825 ... 32.8)	10 (32.8)	10 (32.8)	± 12/40	10 (32.8)	3.5 (11.4)	3 (9.8)
• For steam/vapor, gases [m/s (ft/s)]		Approx. 300 (1000)		± 12/40	80 (262.5)	60 (197)	50/25 (164/82)
Measured values							
Volume flow	●	●	●	●	●	●	●
Flow velocity	●		●	●			
Electrical conductivity	●		●	●			
Density		●		●			
Mass flow		●	●	●	●		
Bidirectional measurement	●	●	●	●			●
Use							
• For custody transfer	●	●	●	●			
• As batching system	●	●		●			
• In viscosity range [mPa s (cp)]	0.1 ... 100 000 (0.1 ... 100 000)	0 ... 100 000 (0 ... 100 000)	0 ... 350 (0 ... 350)	0.5 ... 2800 (0.5 ... 2800)	0 ... 10 (0 ... 10)	0.5 ... 100 (0.5 ... 100)	0 ... 10 (0 ... 10)
Power supply	Mains or battery	Mains	Mains or battery	90 ... 240 V AC, 50 ... 60 Hz, 15 VA or 9 ... 36 V DC, 10 W	2-wire	non	2-wire

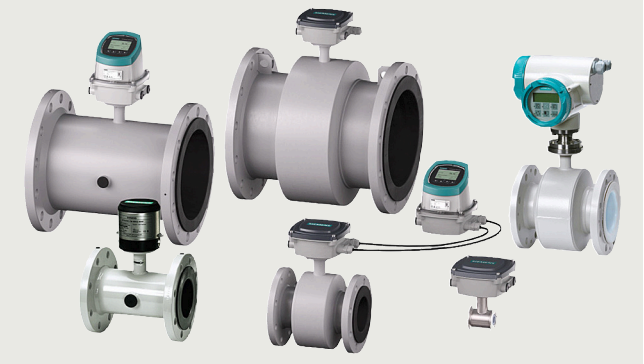
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Overview

SITRANS FM electromagnetic flowmeters are designed for measuring the flow of electrically conductive liquids.

The full SITRANS FM program consists of three different types of flowmeters making Siemens unique in that it covers all possible applications where electromagnetic flowmeters are a suitable match:

Flowmeters with pulsed DC field technology cover all ordinary applications within all industries. The wide variety of combinations and versions from the modular system means that ideal adaptation is possible to each measuring task and application.



SITRANS FM products

Battery-operated water meters (fully electronic) are the perfect match for drinking water applications like network distribution, revenue metering and irrigation where mains power is not available. In addition, it complies with the MID (EU) and OIML R 49 water meter standards and has the MCERTS certificate.



SITRANS FM MAG 8000

Flowmeters with alternating (AC) field technology are used for difficult applications where other flowmeters cannot stand up to the task. This flowmeter can handle liquids and heavy slurries in industries such as mining, cement and pulp and paper.

Overview (continued)





SITRANS FM MAG 911/E

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Benefits



Greater flexibility

- Wide product program
- Harmonized design for compact or wall mounting (separate installations)
- Modular concept for easy field device integration with all bus communication systems

Easier commissioning and service

All SITRANS FM pulsed DC electromagnetic flowmeters feature a unique SENSORPROM memory unit which stores sensor calibration data and transmitter settings for the lifetime of the product.

Transmitter replacement requires no programming. SENSORPROM automatically updates all settings after initialization.

At commissioning the flowmeter commences measurement without any initial programming.

The factory settings matching the sensor size are stored in the SENSORPROM unit. Also customer specified settings are downloaded to the unit. Should the transmitter be replaced, the new transmitter will upload all previous settings and resume measurement without any need for reprogramming.

Further, the "fingerprint" used in connection with the verification device is stored during the initial sensor calibration.

Room for growth

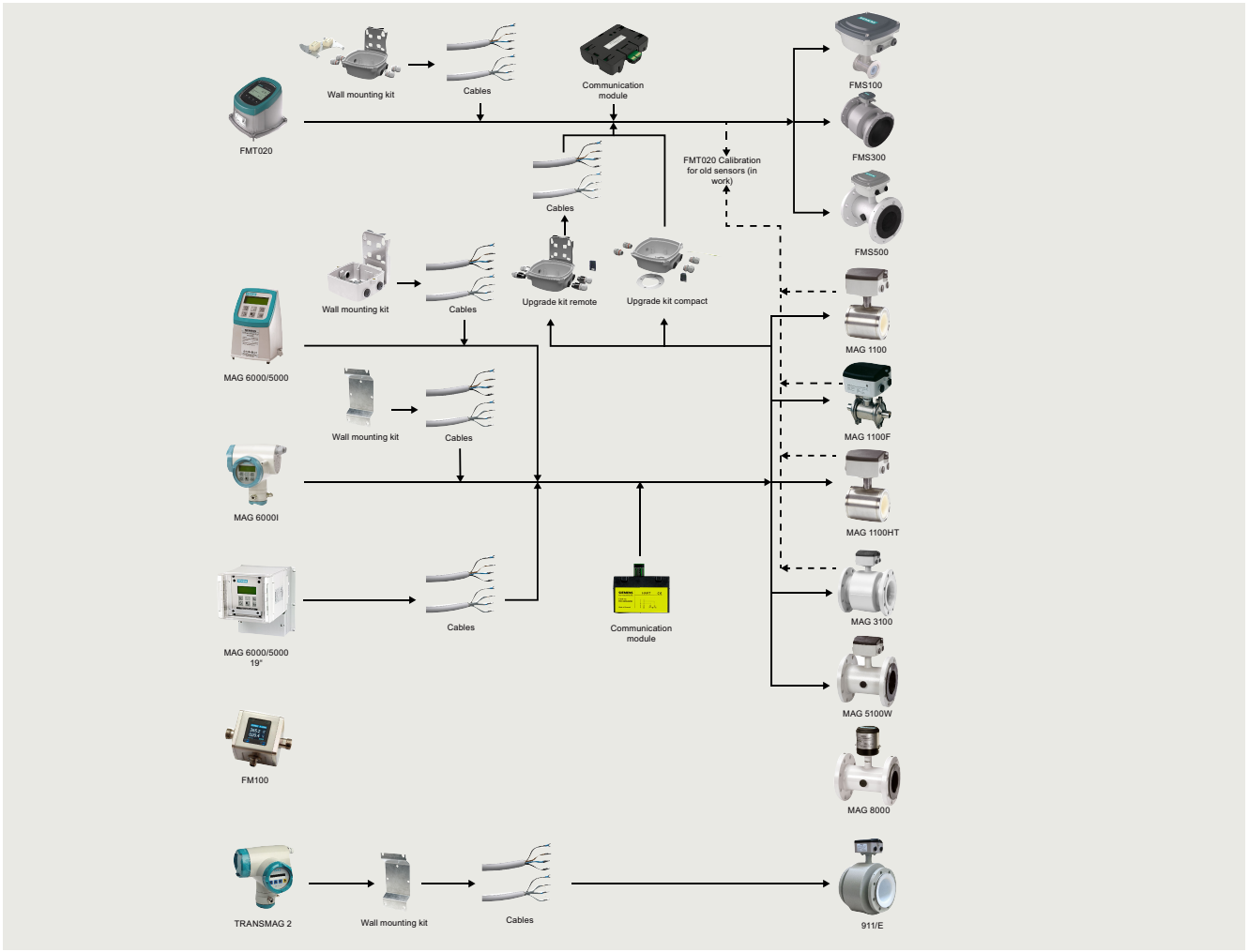
The communication add-on modules with "plug & play" simplicity, makes it easy to access and integrate the flow measurement with almost any system and bus-protocol and it ensures the flowmeter will be easy to upgrade to future communication/bus platforms.



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Benefits (continued)

SITRANS FM platform concept



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Application

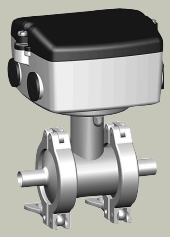
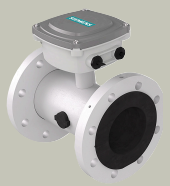
Electromagnetic flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes and slurries.

A prerequisite is that the medium must have a minimum conductivity. The temperature, pressure, density and viscosity have no influence on the result.

The main applications of the electromagnetic flowmeters can be found in the following sectors:

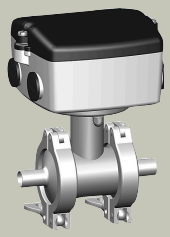
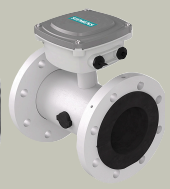
- Water and waste water
- Chemical industries
- Pharmaceutical industries
- Food and beverage industry
- Mining, aggregates and cements industries
- Pulp and paper industry
- Steel industry
- Power; utility and chilled water industry

The wide variety of combinations and versions from the modular system means that ideal adaptation is possible to each measuring task.

Please see Product selector on the Internet, because some constrains might be related to some of the features: www.pia-portal.automation.siemens.com PIA Life Cycle Portal The tool for Engineering, Ordering, Installation and Operation	**FM100** 	**MAG 1100 MAG 1100 HT** 	**MAG 1100 F** 	**MAG 3100 FMS300** 	**FMS500** 	**MAG 911/E** 	**MAG 8000 MAG 8000 CT** 
	7ME6010	**7ME6110 7ME6120 7ME616**	**7ME6140 7ME616**	**7ME6310 7ME636**	**7ME653**	**7ME5610**	**7ME6810 7ME6820**
Industry							
Water/waste water		XX		XX	XXX	X	XXX[1]
Chemical	X	XXX	XX	XXX	X		X
Pharmaceutical	X	XX	XXX	XX	X		X
Food and beverage		XX	XXX	X	X		X
Mining, aggregates and cement		XX		XXX	X	XXX	X
HPI		XX		XX	X		X
Other	X	XX	XX	XX	XX	XXX	X
Size							
DN 2 ($^1/_{12}$")		●[2]					
DN 3 ($^1/_8$")		●[2]					
DN 6 (¼")		●[2]					
DN 10 ($^3/_8$")		●	●				
DN 15 (½")	●	●	●	●	●	●	
DN 25 (1")	●	●	●	●	●	●	●[4]
DN 32 (1¼")			●[5]	●			
DN 40 (1½")		●	●	●	●	●	●[4]
DN 50 (2")	●	●	●	●	●	●	●
DN 65 (2½")		●	●	●	●	●	●
DN 80 (3")		●	●	●	●	●	●
DN 100 (4")		●	●	●	●	●	●
DN 125 (5")				●	●	●	●
DN 150 (6")				●	●	●	●
DN 200 (8")				●	●	●	●
DN 250 (10")				●	●	●	●
DN 300 (12")				●	●	●	●
DN 350 (14")				●	●	●	●
DN 400 (16")				●	●	●	●
DN 450 (18")				●	●	●	●
DN 500 (20")				●	●	●	●

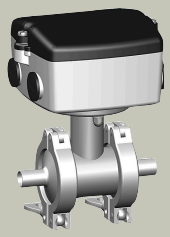
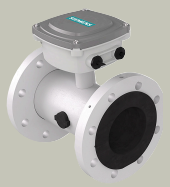
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Application (continued)

Please see Product selector on the Internet, because some constrains might be related to some of the features: www.pia-portal.automation.siemens.com PIA Life Cycle Portal The tool for Engineering, Ordering, Installation and Operation	FM100	MAG 1100 MAG 1100 HT	MAG 1100 F	MAG 3100 FMS300	FMS500	MAG 911/E	MAG 8000 MAG 8000 CT
							
	7ME6010	7ME6110 7ME6120 7ME616	7ME6140 7ME616	7ME6310 7ME636	7ME653	7ME5610	7ME6810 7ME6820
DN 600 (24")				●	●	●	●
DN 700 (28")				●	●	●	●4)
DN 750 (30")				●	●	●	●4)
DN 800 (32")				●	●	●	●4)
DN 900 (36")				●	●	●	●4)
DN 1000 (40")				●	●	●	●4)
DN 1050 (42")				●	●		●4)
DN 1100 (44")				●	●		●4)
DN 1200 (48")				●	●		●4)
DN 1400 (54")				●	●		
DN 1500 (60")				●	●		
DN 1600 (66")				●	●		
DN 1800 (72")				●	●		
DN 2000 (78")				●	●		
DN 2200 (88")				●3)			
Process connection							
Wafer design		●					
Sanitary process connections			●				
Flanges				●	●	●	●
Pressure ratings							
EN 1092-1 PN 6				●	●		
EN 1092-1 PN 10				●	●	●	●
EN 1092-1 PN 16		●2)	●	●	●	●	●
EN 1092-1 PN 25				●		●	
EN 1092-1 PN 40		●	●	●	●	●	●
EN 1092-1 PN 63				●			
EN 1092-1 PN 100				●			
ANSI B16.5 class 150				●	●	●	●
ANSI B16.5 class 300				●		●	
ANSI B16.5 class 600				●			
AWWA C-207 class D				●	●	●	●
AS 2129 table E				●			
AS 4087, PN 16				●	●		●
AS 4087, PN 21				●			
AS 4087, PN 35				●			
JIS B 2220:2004 10K				●	●	●	
JIS B 2220:2004 20K				●			
Accuracy							
Error +/- 0.15% of flow rate, via PVR				●8)	●20)		
Error +/- 0.2% of flow rate		●	●	●	●		●
Error +/- 0.4% of flow rate		●	●	●	●		●
Error +/- 0.5% of flow rate						●	
Repeatability 7)							
0.1 %		●	●	●	●		●

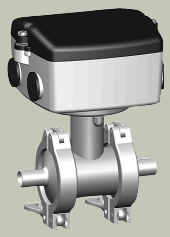
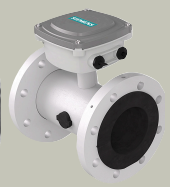
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Application (continued)

Please see Product selector on the Internet, because some constrains might be related to some of the features: www.pia-portal.automation.siemens.com PIA Life Cycle Portal The tool for Engineering, Ordering, Installation and Operation	FM100	MAG 1100 MAG 1100 HT	MAG 1100 F	MAG 3100 FMS300	FMS500	MAG 911/E	MAG 8000 MAG 8000 CT
							
	7ME6010	7ME6110 7ME6120 7ME616	7ME6140 7ME616	7ME6310 7ME636	7ME653	7ME5610	7ME6810 7ME6820
0.2 %	●					●	
Grounding							
Grounding electrodes, incl.	●			●	●	●	●
Grounding ring		●	●	●	●	●	●
Materials							
Liners (with max. operating temperature)							
NBR: 70 °C (158 °F)					●		
EPDM: 70 °C (158 °F)				●	●		●
Soft rubber: 70 °C (158 °F)[21]				●		●	
PTFE: 100 °C (212 °F)				●			
PTFE: 150°C (302 °F)				●[8]		●	
PTFE: 180 °C (356 °F)				●[8]		●	
Ebonite: 95 °C (203 °F)				●		●	
Linatex: 70 °C (158 °F)				●		●	
Ceramic: 150 °C (302 °F)		●	●				
Ceramic: 200 °C (392 °F)		●[6]					
PFA: 100 °C (212 °F)				●			
PFA: 150 °C (302 °F)		●	●	●[8]			
Novolak: 130 °C (266 °F)						●	
Electrodes							
Stainless steel	●			●		●	
Hastelloy C		●[2]	●	●	●	●	●
Platinum		●	●	●		●	
Titanium				●		●	
Tantalum				●		●	
Ceramic coated stainless steel				●[3]			
Ceramic coated Hastelloy C				●[3]			
Flange / sensor housing							
Carbon steel				●	●	●	●
Stainless steel/carbon steel	●			●		●	
Polished stainless steel		●	●	●			
Approvals							
Custody transfer							
Cold Water – MI-001 (EU)				●[8]	●		●
Cold water approval - OIML R 49/OIML R 49 MAA				●[8]	●[20]		●
NMI 10 (Australia)					●		●
Chilled water pattern approval - PTB K 7.2					●		

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Application (continued)

Please see Product selector on the Internet, because some constrains might be related to some of the features: www.pia-portal.automation.siemens.com PIA Life Cycle Portal The tool for Engineering, Ordering, Installation and Operation	FM100	MAG 1100 MAG 1100 HT	MAG 1100 F	MAG 3100 FMS300	FMS500	MAG 911/E	MAG 8000 MAG 8000 CT
							
	7ME6010	7ME6110 7ME6120 7ME616	7ME6140 7ME616	7ME6310 7ME636	7ME653	7ME5610	7ME6810 7ME6820
OE 12/C 040 (Austria) Chilled water pattern approval					●		
KIWA water approval					●		●
Marine							
DNV					●		
Hazardous areas							
ATEX 2 GD (Zone 1/21)		●	●	●			
ATEX Zone 2/22					●[20]		
IECEx Zone 1/21				●			
IECEx Zone 2/22					●[20]		
FM Class I, Div 1				●[15]			
FM Class I, Zone 1/21				●			
FM Class I, Div 2		●	●	●	●		
FM Class I, Zone 2		●	●	●	●		
CSA Class I, Zone 1/21				●			
CSA Class I, Div 2				●	●		
NEPSI				●			
EAC Ex		●	●	●			
Hygienic							
3A			●				
EC 1935:2004 European food contact material			●				
Drinking water							
WRAS (WR_c)				●[11]	●[9]		●
ANSI/NSF 61 (US)[18]				●[11]	●[9]		●
ACS (FR)				●[10]	●[9]		●
Belgaqua (B)				●[9]	●[9]		●
KTW-BWGL (Germany)				●[9]	●[9]		●
KIWA (NL)				●[9]	●[9]		●
AS/NZS 4020 (AU)				●[10]	●[9]		●
GB/T5750 (China)				●[11]			
Other							
CRN (Canada)		●[16]		●	●		●
FM Fire Service Meters (class number 1044)					●[14]		●[14]
MCERTS (GB)				●[12]	●[9]		●
EAC (Kasakhstan)		●	●	●	●	●	●
CPA (China)		●	●	●	●	●	●
VdS					●[13]		
Field device verification							
Verificator compatible		●[19]	●[19]	●[19]	●[19]		

● = available
X = can be used
XX = often used
XXX = most often used

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Application (continued)

1) Not suitable for wastewater applications
2) Only for MAG 1100
3) Only for MAG 3100
4) Only for MAG 8000
5) Only in combination with DN 32 adapter A5E02054637, A5E02218297, FDK:083G2120 and FDK:083G2160
6) Only for MAG 1100 HT (Ex sensor: max. 180 °C (356 °F))
7) Of actual flow for v ≥ 0.5 m/s (1.5 ft/s) and conductivity > 10 µS/cm
8) Only for FMS300
9) EPDM liner
10) Only EPDM liner with Hastelloy C276 electrodes
11) Only EPDM or Ebonite liner
12) EPDM or PTFE liner with AISI 316 or Hastelloy electrodes
13) Only valid for DN 50 to DN 300 (2" to 12")
14) Sizes: DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges
15) Only DN 15 to DN 300 (½" to 12") with MAG 6000 I Ex, compact mounted
16) Only PFA liner
17) Only for PTFE
18) Including Annex G
19) Only in combination with MAG 5000 / 6000 or FMT020 transmitter
20) Only FMS500
21) Devices made in France use Neoprene; Devices made in China use Butyl

Please see Product selector on the Internet, because some constrains might be related to some of the features: www.pia-portal.automation.siemens.com PIA Life Cycle Portal The tool for Engineering, Ordering, Installation and Operation	**MAG 5000**  **7ME6910**	**MAG 6000**  **7ME6920**	**FMT020**  **7ME6942**	**MAG 6000 I MAG 6000 I Ex**  **7ME6930**	**TRANSMAG 2**  **7ME5034**	**MAG 8000 MAG 8000 CT**  **7ME6810 7ME6820**
Industry						
Water/waste water	XXX	XXX	XXX	XX	X	XXX
Chemical	X	XX	X	XX		X
Pharmaceutical	X	XXX	X	XX		X
Food and beverage	XX	XXX	XX	XX		X
Mining, aggregates and cement	XX	X	XX	XX	XXX	X
HPI	X	X	X	X		X
Other	XX	XX	XX	XX	XX	X
Design						
Compact		●	●	●		●
Remote	●	●	●	●	●	●
Housing						
Polyamide, Polycarbonate		●	●			
Die-cast aluminum				●	●	
Stainless steel		●				● [1]
19" Rack / Panel mounting	●	●				
Accuracy						
Flow error ± 0.2 % of rate		●	●	●		●
Flow error ± 0.4 % of rate	●		●			●
Flow error ± 0.5 % of rate					●	
Repeatability[3]						
0.1 %	●	●	●	●		
0.2 %					●	
Communication						
HART		●	●	●	●	
PROFIBUS PA		●	●	●	●	
PROFIBUS DP		●	●	●[4]		
FOUNDATION Fieldbus H1		●		●		
DeviceNet		●		●[4]		

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Application (continued)

Please see Product selector on the Internet, because some constrains might be related to some of the features: www.pia-portal.automation.siemens.com	MAG 5000	MAG 6000	FMT020	MAG 6000 I MAG 6000 I Ex	TRANSMAG 2	MAG 8000 MAG 8000 CT
						
	7ME6910	7ME6920	7ME6942	7ME6930	7ME5034	7ME6810 7ME6820
Modbus RTU/RS 485		●	●	● [4]		● [2]
Modbus TCP/IP			●			
PROFINET			●			
EtherNet/IP			●			
Bluetooth			● [10]			
GSM/GPRS (3G)						●
NBIoT/LTE-M (4G)						●
LW BLE						●
Power supply						
24 V	● [6]	● [6]	●	●		● [6] [7]
115 V - 230 V	●	●	●	●	●	● [7]
Battery						●
Approvals						
Custody transfer						
Cold water - MI-001 (EU)			●			●
Cold water approval - OIML R 49/OIML R 49 MAA			●			●
NMI 10 (Australia)		●				●
Chilled water pattern approval PTB K 7.2	●	●				
OE12/C 040 (Austria) Chilled water pattern approval	●	●				
KIWA water approval		●				●
Marine						
DNV	●	●				
Hazardous areas						
ATEX - 2G GD (Zone 1/21)				● [5]		
ATEX Zone 2/22			●			
IECEx Gb Zone 1/21				● [5]		
IECEx Zone 2/22			●			
FM Class I, Div 1				● [5] [9]		
FM Class I, Zone 1/21				● [5]		
FM Class I, Div 2	●	●	●	● [5]		
FM Class I, Zone 2	●	●		● [5]		
CSA Class I, Zone 1/21				● [5]		
CSA Class I, Div 2	●	●		● [5]		
NEPSI Zone 1				● [5]		
EAC Ex				● [5]		
Other						
UL General safety	●	●	●			

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Application (continued)

Please see Product selector on the Internet, because some constrains might be related to some of the features: www.pia-portal.automation.siemens.com	MAG 5000  7ME6910	MAG 6000  7ME6920	FMT020  7ME6942	MAG 6000 I MAG 6000 I Ex  7ME6930	TRANSMAG 2  7ME5034	MAG 8000 MAG 8000 CT  7ME6810 7ME6820
CSA General purpose	●	●	●			
FM Fire Service Meters (1044)	●	●				●
KCs (South Korea)	●	●		●		
EAC (Kazakhstan)	●	●		●	●	●
CPA (China)	●	●	●	●	●	●
VdS	●	●				
Other national approvals, see internet	●	●		●	●	●
Field device verification						
Verificator compatible	●	●	●			

● = available
X = can be used
XX = often used
XXX = most often used

1) IP68 enclosure
2) Modbus RTU also as serial RS 232
3) Of actual flow for v ≥ 0.5 m/s (1.5 ft/s) and conductivity > 10 µS/cm
4) Only for MAG 6000 I
5) Only for MAG 6000 I Ex
6) 12/24 V AC/DC
7) Main power with battery backup
8) Only sensor in hazardous area
9) Only with sensors sizes DN 15 to DN 300 (½" to 12") compact
10) Only as an accessory

For more national approvals please check our internet page http://support.automation.siemens.com/WW/view/en/10806954/134200

SITRANS FM flowmeter in compact installation



Magnetic flow sensor with compact mounted transmitter

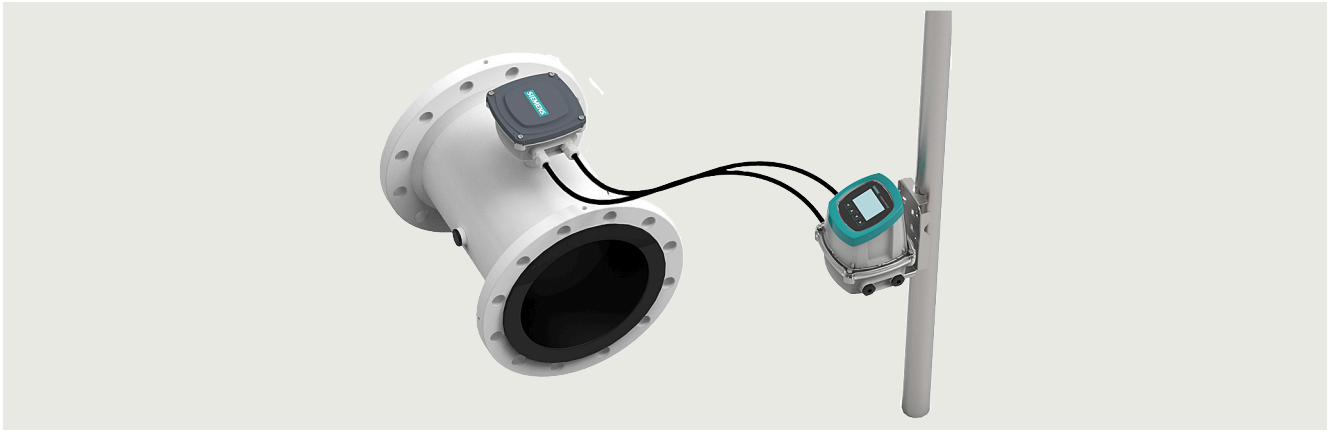
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Application (continued)

With compact installation, the sensor and transmitter form a single mechanical unit.

Example of a SITRANS FM flowmeter in compact installation	
Sensor	**7ME6532-3TC02-1GA3-Z A02**
Diameter	DN 100
Liner	EPDM
Electrode material	Hastelloy C276 / 2.4819
Process connection	EN 1092-1, PN 16
Transmitter	**FMT020, Polycarbonate housing**
Power supply	230 V AC, 50/60 Hz
Cable glands	M20x1.5, material polyamide
Accuracy	± 0.4% ± 0.9 mm/s

SITRANS FM flowmeter in remote installation



Magnetic flow sensor with remote mounted transmitter

With remote installation, the transmitter and sensor are mounted in separate locations. The electrical connection between the transmitter and the sensor is provided by sensor cables.

Example of a SITRANS FM flowmeter in remote installation	
Sensor	**7ME6532-3TC02-1JA3-Z A02+T07**
Diameter	DN 100
Liner	EPDM
Electrode material	Hastelloy C276 / 2.4819
Process connection	EN 1092-1, PN 16
Transmitter	**FMT020, Polycarbonate housing**
Power supply	230 V AC, 50/60 Hz
Cable glands	M20x1.5, material polyamide
Accessories	Wall mounting kit Cable kit with coil and electrode cable, standard type
Accuracy	± 0.4% ± 0.9 mm/s

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Technical specifications

Flowmeter calibration and traceability

To ensure continuous accurate measurement, flowmeters must be calibrated. The calibration is conducted at Siemens facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

Therefore, the calibration certificate ensures recognition of the test results worldwide, including the US (NIST traceability).

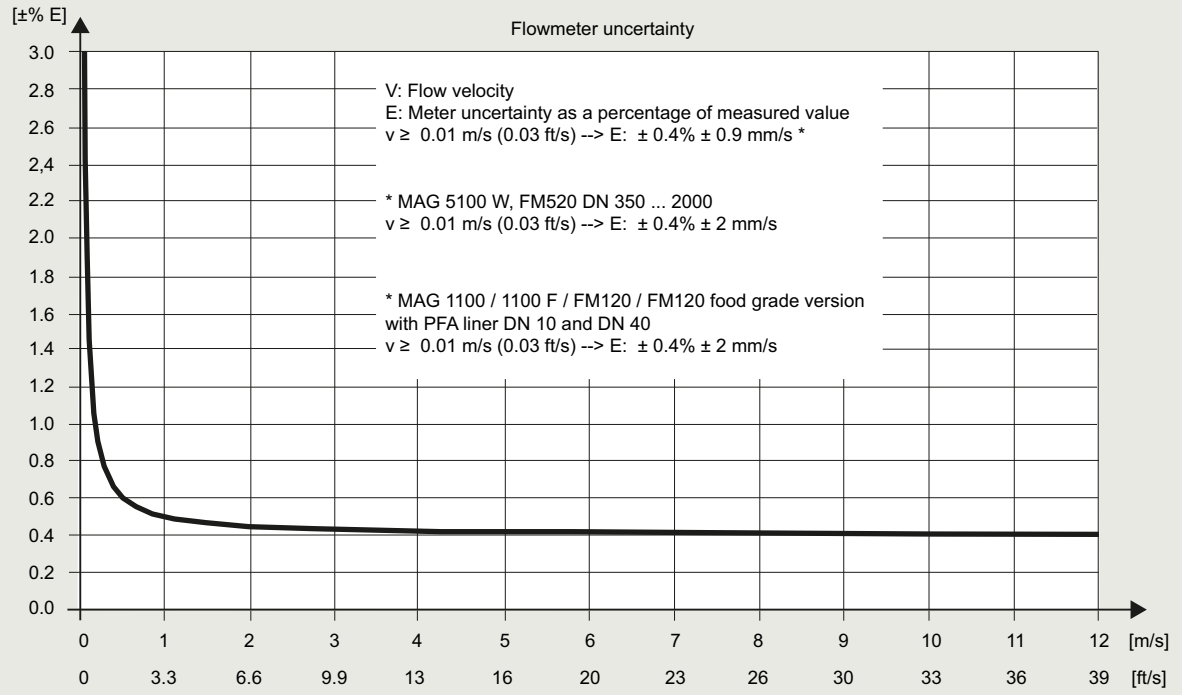
Siemens offers accredited calibrations assured to ISO 17025 in the flow range from 0.0001 m^3/h to 10 000 m^3/h.

The calibration follows the ISO 4185 performing calibrations under two methods: Static Weighing and Reference meter. Providing a measurement uncertainty of ±0.1 %.

Siemens accredited laboratories are recognized by ILAC MRA (International Laboratory Accreditation Corporation - Mutual Recognition Arrangement) ensuring international traceability and recognition of the test results worldwide.

A calibration certificate is shipped with every sensor and calibration data are stored in the SENSORPROM™ memory unit.

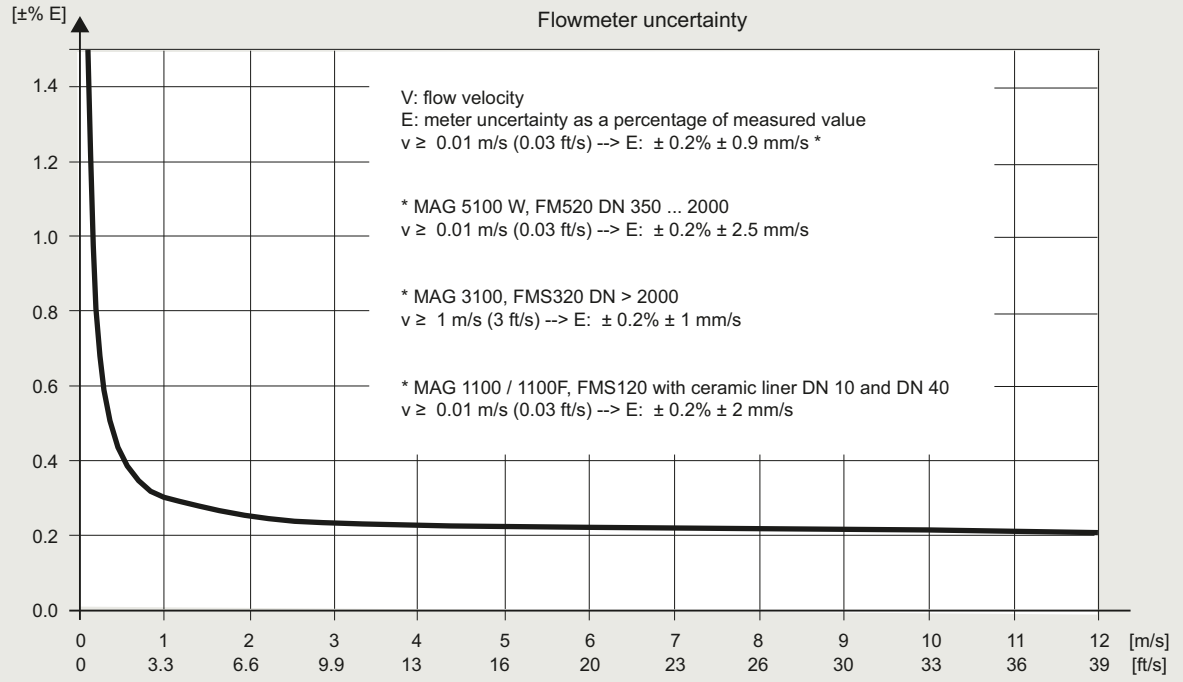
Flowmeter uncertainty



MAG 5000 with MAG 1100 / 1100 F, MAG 3100, MAG 5100 W
MAG 6000 with MAG 1100 / 1100 F (PFA)
FM520 with standard calibration
FM320 with standard calibration
FM120 with standard calibration

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Technical specifications (continued)



MAG 6000 / 6000 I with MAG 1100 / 1100 F (Ceramic), MAG 3100, MAG 5100 W
FM520 with high accuracy calibration
FM320 with high accuracy calibration
FM120 with high accuracy calibration

Calibration reference conditions

Calibration reference conditions	
Reference conditions (ISO 9104 and EN 29104)	
Temperature medium	20 °C ± 10 K (68 °F ± 18 °F)
Temperature ambient	25 °C ± 10 K (77 °F ± 18 °F)
Supply voltage	U_n ± 1 %
Warming-up time	30 minutes
Incorporation in conductive pipe section	
• Inlet section	10 × DN (DN ≤ 1200/48") 5 × DN (DN > 1200/48")
• Outlet section	5 × DN (DN ≤ 1200/48") 3 × DN (DN > 1200/48")
Flow conditions	Developed flow profile
Additions in the event of deviations from reference conditions	
Current output	As pulse output (± 0,1 % of actual flow +0,05 % FSO)
Effect of ambient temperature	
• Display frequency/pulse output	< ± 0.003 %/K act.
• Current output	< ± 0.005 %/K act.
Effect of supply voltage	< 0.005 % of measuring value on 1 % change
Repeatability	± 0.1 % of actual flow for v ≥ 0,5 m/s (1.5 ft/s) and conductivity > 10 µS/cm

Calibration test points

Test points for default calibration at 25% and 90% of factory Q_{max}.

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Technical specifications (continued)

Size mm	Q_{max} m^3/h	90% m^3/h	25% m^3/h
2	0.055	0.0495	0.01375
3	0.127	0.1143	0.01375
6	0.5	0.45	0.125
10	1.4	1.26	0.35
15	3	2.7	0.75
25	9	8.1	2.25
40	23	20.7	5.75
50	35	31.5	8.75
65	60	54	15
80	90	81	22.5
100	140	126	35
125	220	198	55
150	320	288	80
200	550	495	137.5
250	900	810	225
300	1300	1170	325
350	1700	1530	425
400	2250	2025	562.5
450	2800	2520	700
500	2800	2520	700
600	2800	2520	700
700	6000	5400	1500
750	6000	5400	1500
800	6000	5400	1500
900	6000	5400	1500
1000	6000	5400	1500
1050	6000	5400	1500
1100	6000	5400	1500
1200	6000	5400	1500
1400	7000	6300	1750
1500	7000	6300	1750
1600	7000	6300	1750
1800	7000	6300	1750
2000	7000	6300	1750

Performance under 0D inlet and outlet installation conditions

SITRANS FM flow meters have been verified on flow rigs of certification bodies, and the performance results of these tests have proven the following accuracy under 0D inlet / outlet installation conditions according to OIML R 49-2:2013, 7.10 Flow disturbance test in nominal measuring range of 0.3 ... 10 m/s.

SITRANS FM MAG 5100W / MAG 3100 with transmitter SITRANS FM MAG 5000/6000

Accuracy	Sensor
±0.6% ± 1 mm/s	DN 50 ... 2000 (2" ... 80") - sensor installed in all orientations

SITRANS FM520 / FM320

Accuracy	Sensor
±0.6% ± 1 mm/s	DN 50 ... 2000 (2" ... 80") - sensor installed in all orientations

SITRANS FM MAG 8000

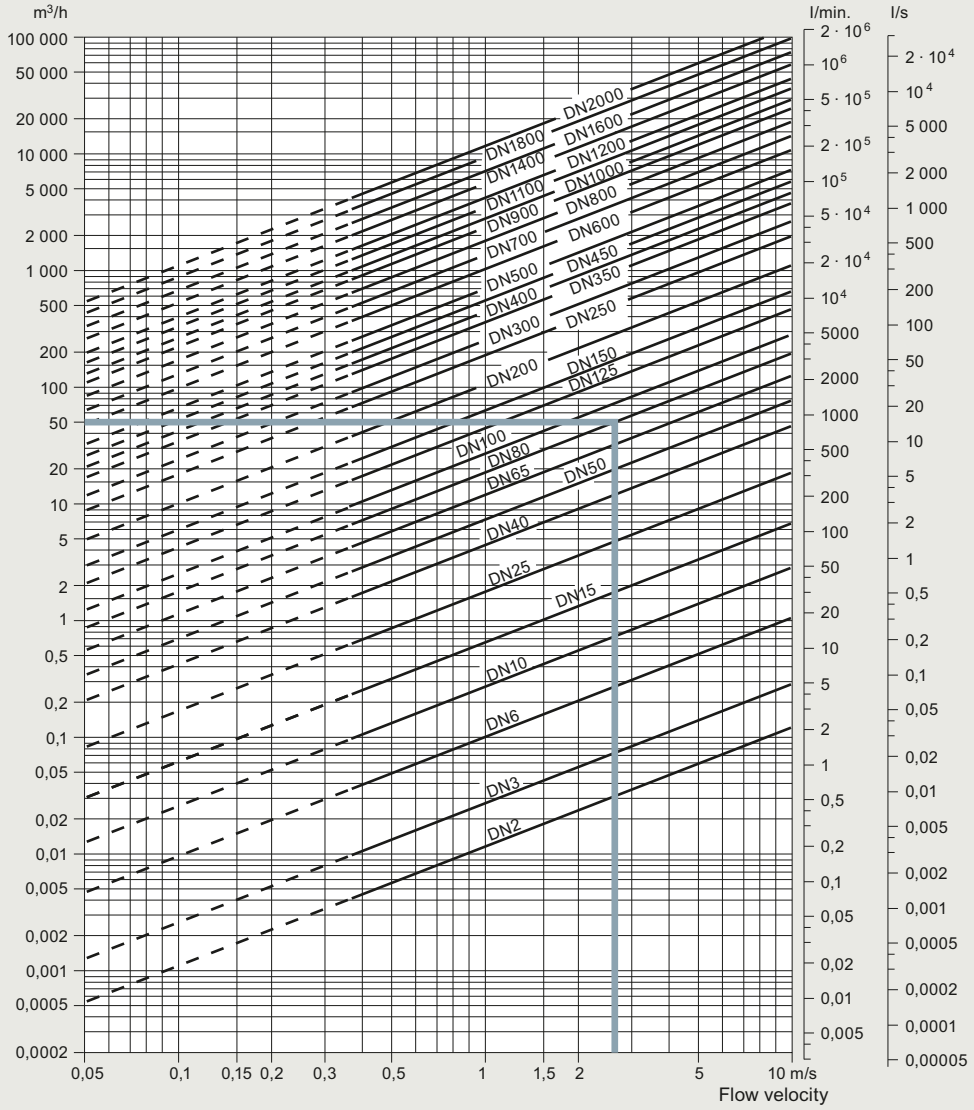
Accuracy	Sensor
±0.6% ± 2 mm/s	DN 50 ... 300 (2" ... 12") - sensor installed in all orientations

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Technical specifications (continued)

Volume flow and flow velocity chart

Metric



Sizing table (DN 2 ... DN 2000)

The table shows the relationship between flow velocity v, flow quantity Q and sensor dimension DN.

Guidelines for selection of sensor

Min. measuring range: 0 ... 0.25 m/s

Max. measuring range: 0 ... 10 m/s

Normally the sensor size is selected so that nominal flow velocity v lies within the measuring range 1 to 3 m/s.

Example:

Flow quantity of 50 m^3/h and a sensor dimension of DN 80 gives a flow velocity of 2.7 m/s, which is within the recommended measuring range of 1 to 3 m/s.

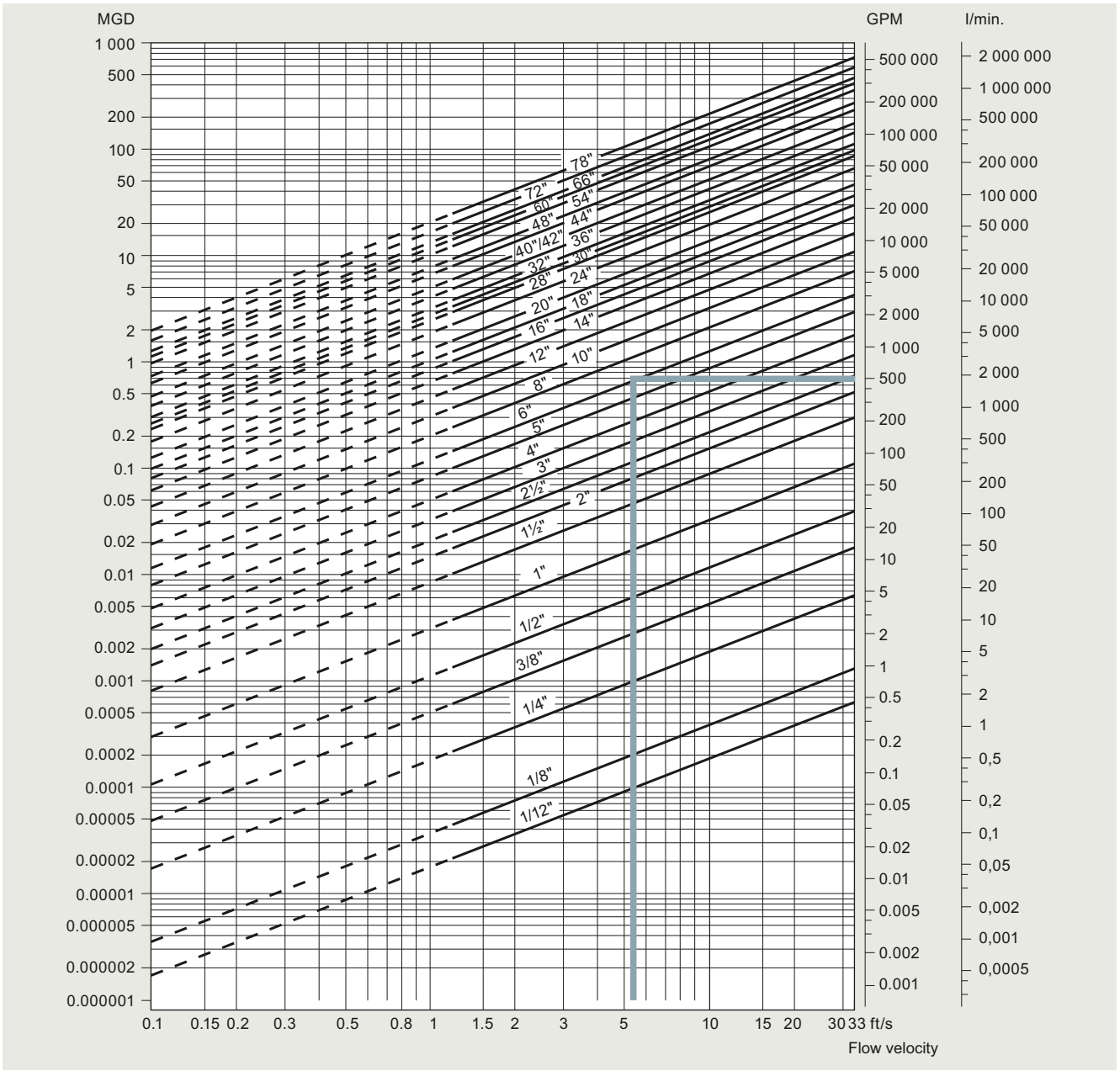
Flow velocity calculation formula	Units
$v = 1273.24 \cdot Q/DN^2$ or	v: [m/s], Q: [l/s], DN: [mm]
$v = 353.68 \cdot Q/DN^2$	v: [m/s], Q: [m^3/h], DN: [mm]

For more information visit:
https://new.siemens.com/global/en/products/automation/process-instrumentation/flow-measurement/electromagnetic.html

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Technical specifications (continued)

Imperial



Sizing table (1/12" ... 78")

The table shows the relationship between flow velocity v, flow quantity Q and sensor dimension size.

Guidelines for selection of sensor

Min. measuring range: 0 ... 0.8 ft/s

Max. measuring range: 0 ... 33 ft/s

Normally the sensor size is selected so that nominal flow velocity v lies within the measuring range 3 to 10 ft/s.

Example:

Flow quantity of 500 GPM and a sensor dimension of 6" gives a flow velocity of 5.6 ft/s, which is within the recommended measuring range of 3 to 10 ft/s.

Flow velocity calculation formula	Units
$v = 0.408 \cdot Q/(\text{Pipe I.D.})^2$ or	v: [ft/s], Q: [GPM], Pipe I.D.: [inch]
$v = 283.67 \cdot Q/(\text{Pipe I.D.})^2$	v: [ft/s], Q: [MGD], Pipe I.D.: [inch]

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Technical specifications (continued)

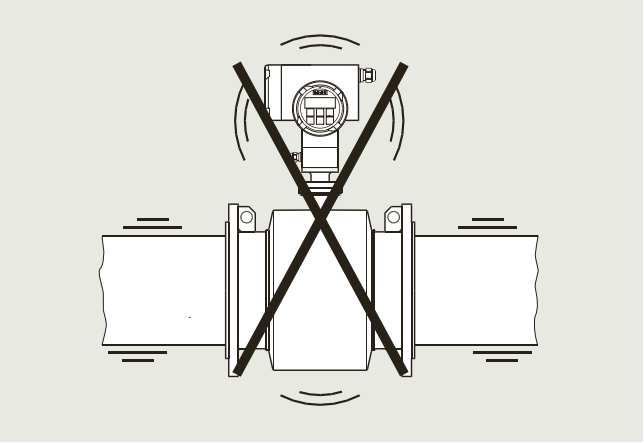
For more information visit:
https://new.siemens.com/global/en/products/automation/process-instrumentation/flow-measurement/electromagnetic.html

Installation conditions

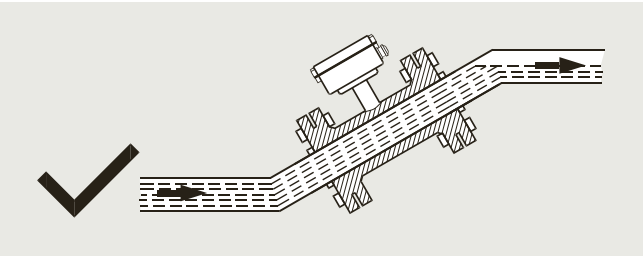
Vibrations

Strong vibrations should be avoided.

In applications with strong vibrations, remote mounting of the transmitter is recommended.



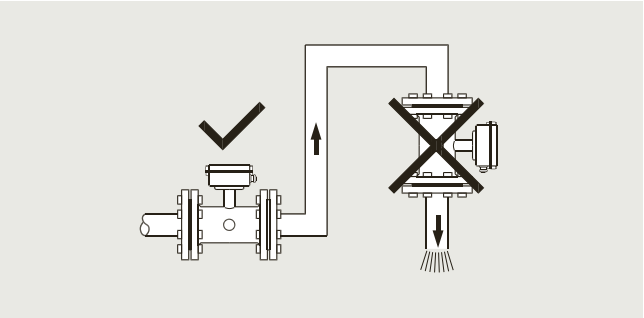
The sensor must always be completely filled with liquid.

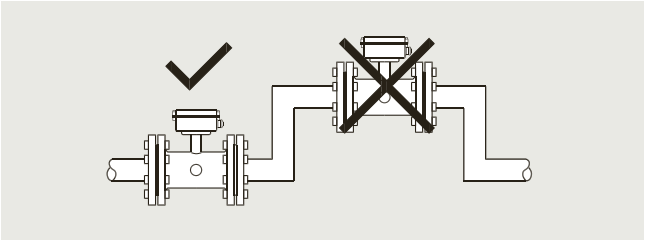


Install in pipelines which are always full

The sensor must always be completely filled with liquid. Therefore avoid:

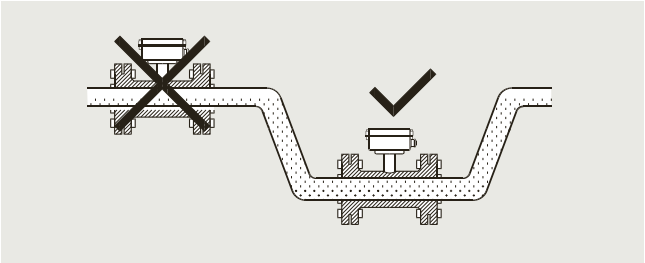
- Installation at the highest point in the pipe system
- Installation in vertical pipes with free outlet





Do not install in pipelines which can run empty

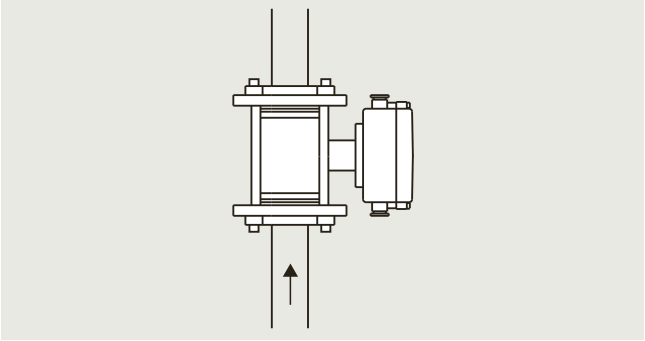
For partially filled pipes or pipes with downward flow and free outlet the flowmeter should be located in a U-Tube.



Install in U-tubes when pipe is partially filled

Installation in vertical pipes

Recommended flow direction: upwards. This minimizes the effect on the measurement of any gas/air bubbles in the liquid.



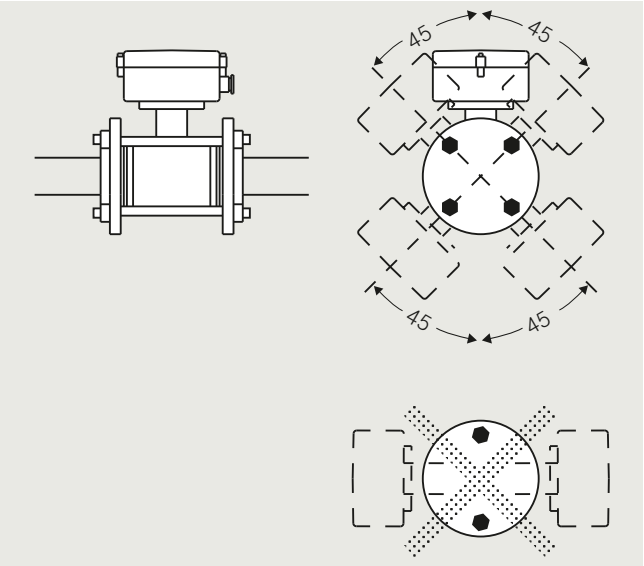
Install in vertical pipes with upward flow direction

Installation in horizontal pipes

The sensor must be mounted as shown in the below figure. Do not mount the sensor as shown in the lower figure. This will position the electrodes at the top where there is possibility for air bubbles and at the bottom where there is possibility for mud, sludge, sand etc.

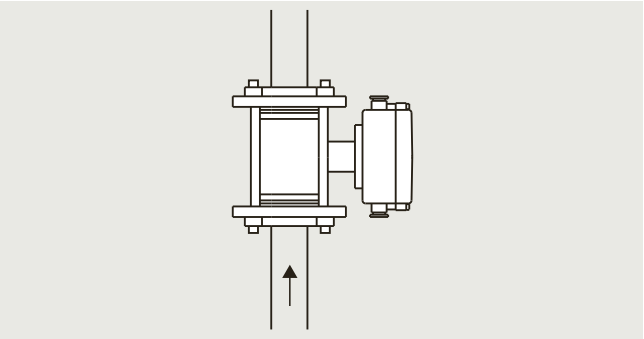
© Siemens AG 2026

Technical specifications (continued)



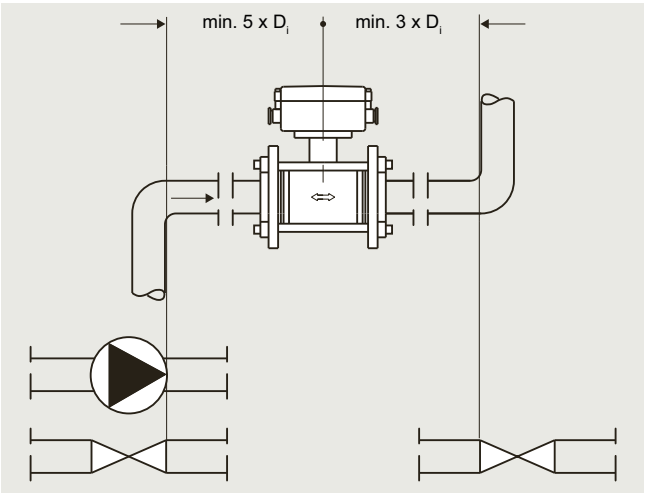
Measuring abrasive liquids and liquids containing particles

Recommended installation is in a vertical/inclined pipe to minimize the wear and deposits in the sensor.



Install in vertical pipelines with upward flow direction if measuring abrasive liquids

Inlet and outlet conditions



Recommended straight pipe lengths up and downstream for installations between elbows, pumps and valves

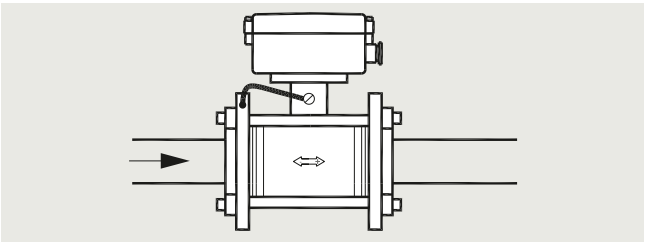
To achieve maximum accurate flow measurement it is essential to have straight pipe lengths up and downstream. For installations with non-optimal piping arrangements MAG 5100W, FM520 and MAG 8000 still provide acceptable accuracy.

Tested in accordance with OIML R49 in various configurations that do not meet the suggested installation conditions MAG 5100W, FM520 and MAG 8000 have received the qualification for mounting in zero diameter (0xDN) inlet/outlet installations.

Ambient temperature-Installation

Temperature changes can cause expansion or contraction in the pipe system. To avoid damage on the sensor use of proper gasket and torque should be ensured. For more information see sensor instruction.

Potential equalization



Potential equalization

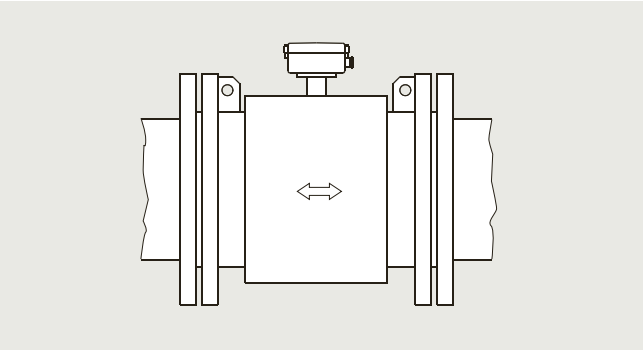
The electrical potential of the liquid must always be equal to the electrical potential of the sensor. This can be achieved in different ways depending on the application:

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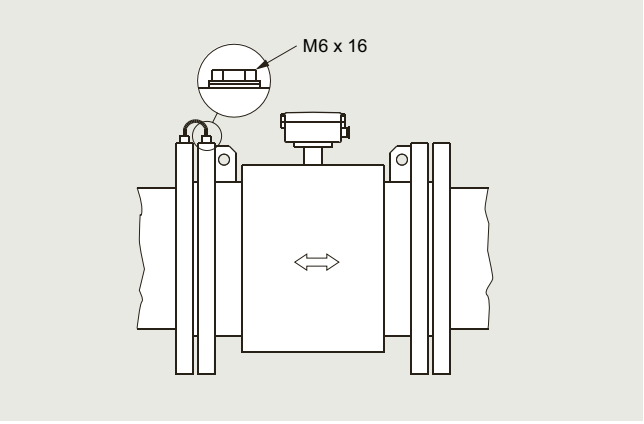
Technical specifications (continued)

- Wire jumper between sensor and adjacent flange (MAG 1100, FMS100, MAG 3100, FMS300)
- Direct metallic contact between sensor and fittings (MAG 1100 F, FMS100)
- Built-in grounding electrodes (MAG 3100, MAG 5100 W, FMS500, FMS300)
- Optional grounding/protection flanges/rings (MAG 1100, FMS100, MAG 3100, FMS300, MAG 8000)
- Optional graphite gaskets on MAG 1100, FMS100 (standard for MAG 1100 High Temperature)
- MAG 8000 installed in plastic or coated pipes: two grounding rings to be used.

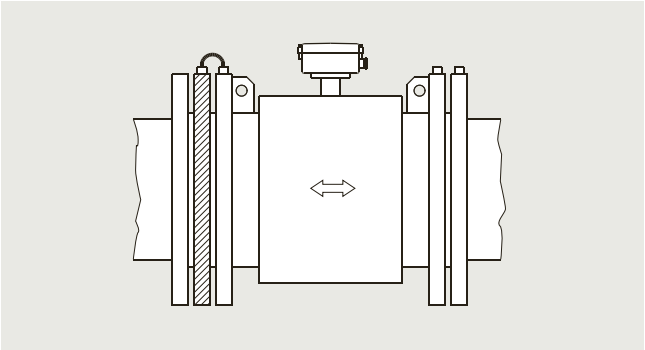
Grounding



MAG 3100, MAG 5100W and FMS500: with grounding electrodes in conductive and non-conductive pipes (no further action necessary)



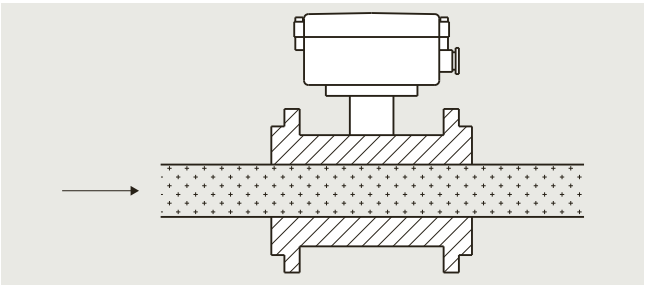
MAG 1100 and MAG 3100; without grounding electrodes in conductive pipes (optionally use graphite gaskets with MAG 1100, FMS100)



Without grounding electrodes in non-conductive pipes use grounding ring (optionally use graphite gaskets with MAG 1100, FMS100)

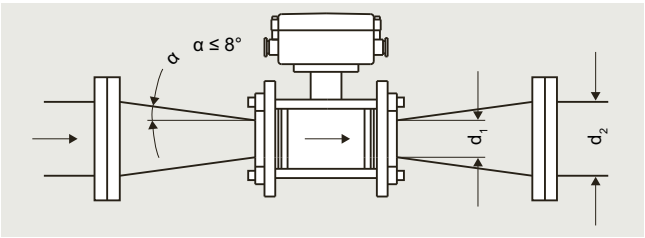
MAG 1100 F, FMS100 grounding via process connections. MAG 8000 grounding see the section about MAG 8000.

Vacuum



In order to prevent damages of liner when operating meters under vacuum please take note of the information "Operating pressure" given in section "Technical specification".

Installation in large pipes

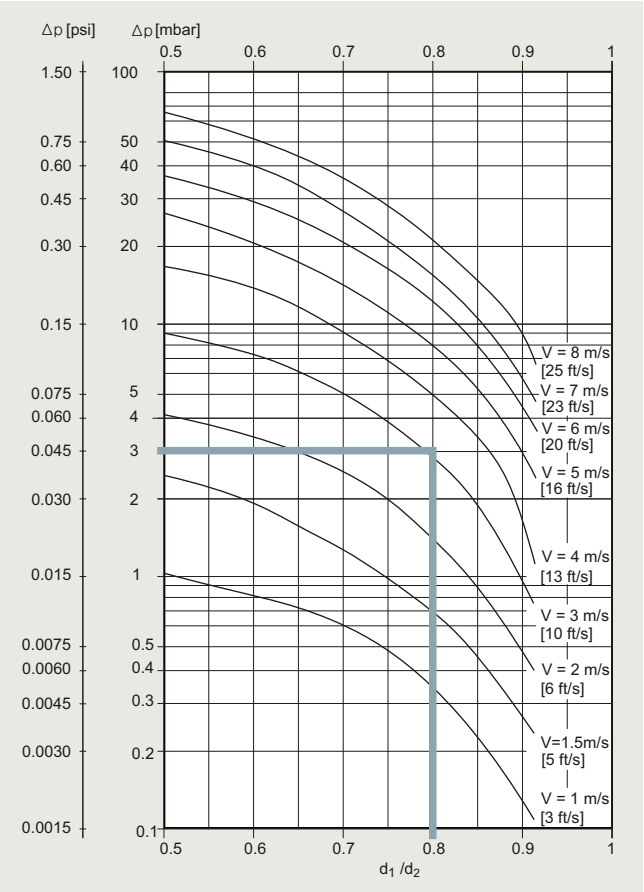


Reduction in nominal pipe diameter

The flowmeter can be installed between two reducers (e.g. DIN 28545). Assuming that at 8° the following pressure drop curve applies. The curves are applicable to water.

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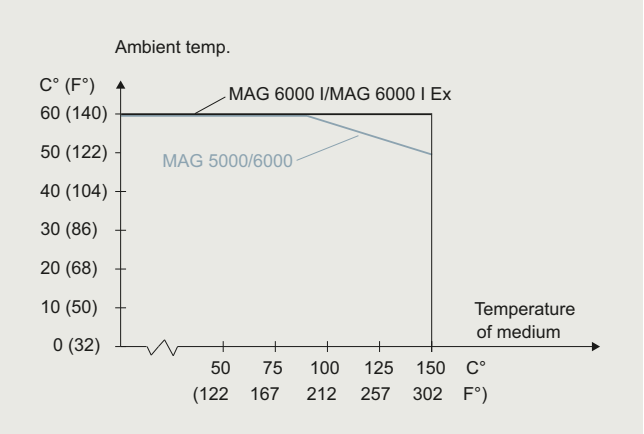
Technical specifications (continued)



Pressure drop as function of diameter reduction between reducers

Example:
Flow velocity (v) of 3 m/s (10 ft/s) in a sensor with a diameter reduction DN 100 (4") to DN 80 (3") (d_1/d_2 = 0.8) gives a pressure drop of 2.9 mbar (0.04 psi).

Ambient temperature



Max. ambient temperature as a function of temperature of medium

The transmitter can be installed either compact or remote.

With compact installation the temperature of medium must be according to the graph.

Sensor cables and conductivity of medium

Compact installation:

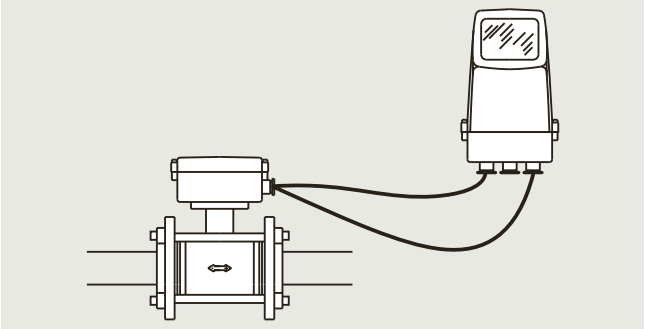
Liquids with an electrical conductivity ≥ 5 µS/cm.

Note for MAG 1100, FMS100 sizes DN 2 and DN 3:

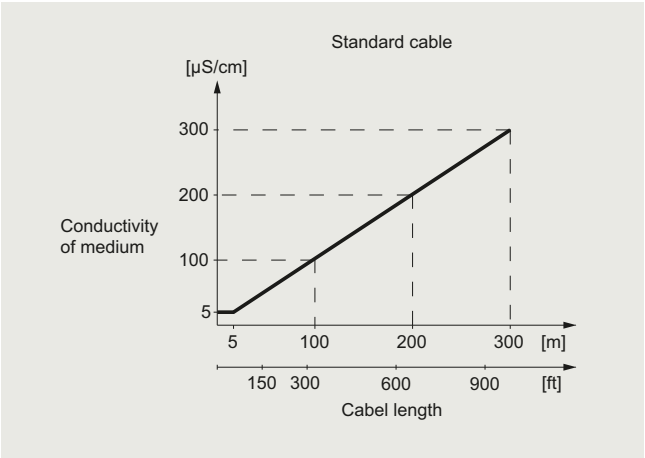
- The media conductivity must be ≥ 30 uS/cm

Note for MAG 8000:

- The media conductivity must be ≥ 20 uS/cm



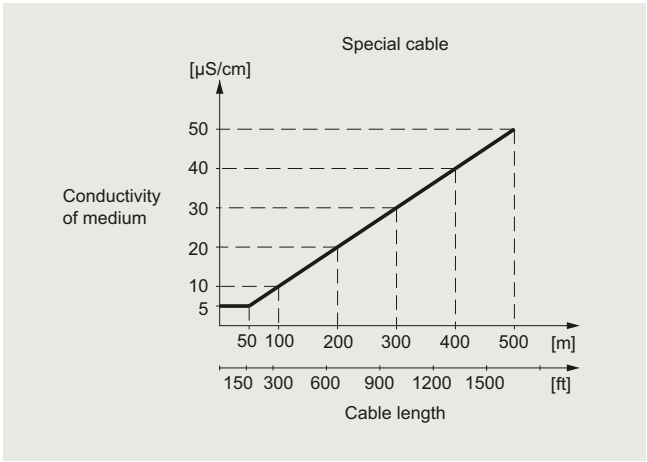
Remote installation



Minimum conductivity of medium (using standard electrode cable)

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Technical specifications (continued)



Minimum conductivity of medium (using special electrode cable)

Empty pipe detection

The installation has to fulfill the following limitations for usage of the empty pipe detection function:

- Media conductivity ≥ 20 µS/cm
- Length of cable at remote installation ≤ 50 m (150 ft)
- Special shield cable must be used

Note for MAG 1100 sizes DN 2 and DN 3:

- Empty pipe detection is not available

Note for MAG 5000/6000 CT:

- Empty pipe detection is not available

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Overview



The SITRANS FMS500 is a magnetic flowmeter sensor suitable for volume flow measurement of liquids (conductive) and is the ideal product for applications in water abstraction, wastewater treatment, water distribution networks, and irrigation.

The rugged, fully welded design supports direct burial, constant flooding and to stand up a wide range of harsh chemicals found in water-based applications in many different industries.

Designed for highly accurate measurement in low-flow conditions, these meters can measure from very low velocities up to 10 m/s, giving it a very wide measurement range.

Combined with a flowmeter transmitter it is a traditional externally powered electromagnetic flowmeter system

Benefits

- Zero Up and Zero Down installation capabilities
- NBR rubber liner for all water and wastewater applications
- EPDM liner specifically for drinking water applications requiring special approvals
- Soft elastomer facing provides high abrasion resistance
- Increased low flow accuracy for water leak detection
- Rugged construction with no moving parts for maintenance-free operation over many years
- Simple on-site upgrade to IP68 of a standard sensor allowing underground installation, permanent immersion or underwater installation
- Integrated grounding electrodes – no grounding rings required for many applications
- Short delivery time
- Built-in length according to ISO 20456 (up to DN 400 mm)
- SENSORPROM™ Technology provides an automatic upload of start-up settings and calibration data for easy commissioning
- Designed to allow in-situ verification for easy performance check
- In conformity with ISO 4064, OIML R49 and EN 14154
- Custody transfer approvals for cold water billing (MI-001)

Application

- Water abstraction
- Water treatment
- Water distribution network (leak detection management)
- Custody transfer water meters
- Irrigation
- Waste water treatment
- Filtration plant (e.g. reverse osmosis and ultra-filtration)
- Industrial water applications

The SITRANS FMS500 with its NBR or EPDM rubber lining is a flow meter sensor for all kinds of water applications such as ground water, potable water, cooling water, wastewater, sewage, or sludge applications.

Connected to the compatible transmitter SITRANS FMT020, either mounted remotely or as a compact unit, it forms the magnetic flow meter system SITRANS FM520 which can be used in almost all general-purpose water applications.

SITRANS FM520

Perfect match for a cost-effective solution for all water and wastewater applications. Standard measuring accuracy ±0.4% of the actual flow rate, optional a high accuracy calibration with ±0.2% of flow actual rate is available.

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Selection and ordering data

Sensor SITRANS FMS500	Article No. 7ME653- • - • • • • • - 1 • A •
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Transmitter variant	
No transmitter (sensor only)	0
Transmitter SITRANS FMT020	2
Diameter	
DN 15, ½ inch	1 V
DN 25, 1 inch	2 D
DN 40, 1½ inch	2 R
DN 50, 2 inch	2 Y
DN 65, 2½ inch	3 F
DN 80, 3 inch	3 M
DN 100, 4 inch	3 T
DN 125, 5 inch	4 B
DN 150, 6 inch	4 H
DN 200, 8 inch	4 P
DN 250, 10 inch	4 V
DN 300, 12 inch	5 B
DN 350, 14 inch	5 D
DN 400, 16 inch	5 H
DN 450, 18 inch	5 K
DN 500, 20 inch	5 R
DN 600, 24 inch	5 Y
DN 700, 28 inch	6 B
DN 750, 30 inch	6 D
DN 800, 32 inch	6 H
DN 900, 36 inch	6 K
DN 1000, 40 inch	6 R
DN 1050, 42 inch	6 Y
DN 1100, 44 inch	7 D
DN 1200, 48 inch	7 H
DN 1400, 54 inch	7 M
DN 1500, 60 inch	7 R
DN 1600, 66 inch	7 V
DN 1800, 72 inch	7 Y
DN 2000, 78 inch	8 B
Process connection	
EN 1092-1 PN 6 flanges	A
EN 1092-1 PN 10 flanges	B
EN 1092-1 PN 16 flanges (PED compliant)	C
EN 1092-1 PN 16 flanges, non-PED type of equipment (excluded from scope of PED 2014/68/EU)	D
EN 1092-1 PN 40 flanges	F
ANSI B16.5 Class 150 flanges	J
AWWA C-207 Class D flanges	M
AS 4087 PN 16 flanges	S
JIS B 2220:2004 10K flanges	W
Process connection material	
Carbon steel ASTM A 105 with corrosion-resistant coating acc. to EN ISO 12944 grade C4	0
Carbon steel ASTM A 105 with corrosion-resistant coating acc. to EN ISO 12944 grade C5 (300 µm)	1
Liner material	
EPDM	2
NBR	3

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Selection and ordering data (continued)

Sensor SITRANS FMS500	Article No. 7ME653- • - • • • • • - 1 • A •
Electrode material	
Hastelloy C276 / 2.4819	1
Transmitter mounting & enclosure type	
No transmitter (sensor only)	A
Compact design (integral mount), polycarbonate enclosure	G
Remote design, polycarbonate enclosure (wall-mounting unit and sensor terminal board included)	J
Power supply	
None (sensor only)	0
12 ... 42 V DC	2
100 ... 240 V AC, 50/60 Hz	3

Additional information	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Without cable glands (blind plugs)	**A00**
M20x1.5 cable glands, grey, material polyamide	**A02**
M20x1.5 cable glands, Ex, black, material polyamide	**A03**
1/2 inch NPT cable glands, grey, material polyamide	**A05**
1/2 inch NPT cable glands, Ex, black, material polyamide	**A06**
Certificates	
Declaration of compliance with the order 2.1 (EN 10204)	**C00**
Inspection certificate 3.1 (EN 10204) - Material of pressure-containing and wetted parts	**C12**
Test report 2.2 (EN 10204)	**C14**
Inspection certificate 3.1(EN 10204) - Pressure test	**C18**
High accuracy calibration	
High accuracy calibration +/- 0.2% of the act. vol. flow, DN ≤ 200, ≤ 8 inch	**D01**
High accuracy calibration +/- 0.2% of the act. vol. flow, DN 250 ... 600, 10 ... 24 inch	**D02**
High accuracy calibration +/- 0.2% of the act. vol. flow, DN 700 ... 1200, 28 ... 48 inch	**D03**
High accuracy calibration +/- 0.2% of the act. vol. flow, DN ≥ 1400, ≥ 54 inch	**D04**
5-point calibration	
5-point factory calibration, DN ≤200, ≤ 8 inch	**D10**
5-point factory calibration, DN 250 ... 600, 10 ... 24 inch	**D11**
5-point factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D12**
5-point factory calibration, DN ≥ 1400, ≥ 54 inch	**D13**
10-point calibration	
10-point factory calibration, DN ≤ 200, ≤ 8 inch	**D15**
10-point factory calibration, DN 250 ... 600, 10 ... 24 inch	**D16**
10-point factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D17**
10-point factory calibration, DN ≥ 1400, ≥ 54 inch	**D18**
Default matched-pair calibration	
Default matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D20**
Default matched-pair factory calibration, DN 250 ... 600, 10 ... 24 inch	**D21**
Default matched-pair factory calibration, DN 700 ... 1200, 28 ...48 inch	**D22**
Default matched-pair factory calibration, DN ≥ 1400, ≥ 54 inch	**D23**
5-point matched-pair calibration	
5-point, matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D25**
5-point, matched-pair factory calibration, DN 250 ... 600, 10 ... 24 inch	**D26**

Additional information	Order code
5-point, matched-pair factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D27**
5-point, matched-pair factory calibration, DN ≥ 1400, ≥ 54 inch	**D28**
10-point matched-pair calibration	
10-point, matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D30**
10-point, matched-pair factory calibration, DN 250 ... 600, 10 ... 24 inch	**D31**
10-point, matched-pair factory calibration, DN 700 ... 1200, 28 ...48 inch	**D32**
10-point, matched-pair factory calibration, DN ≥ 1400, ≥ 54 inch	**D33**
Accredited ISO/IEC 17025 calibration	
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D35**
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN 250 ... 600, 10 ...24 inch	**D36**
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D37**
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN ≥ 1400, ≥ 54 inch	**D38**
FM-Fire Service	
VdS	**D40**
General safety	
CSA General Purpose	**E06**
Explosion protection	
ATEX (Europe) & IECEx (World)	**E20**
FM (USA & Canada)	**E22**
IECEx (World)	**E23**
Country specific approvals	
CRN (Canadian Reg. Number)	**E70**
CPA (China)	**E75**
FP2A (France)	**E76**
Drinking water approvals	
WRAS (WRc, BS 6920, GB)	**E80**
NSF/ANSI 61 (Cold water, US)	**E81**
ACS (France)	**E82**
KTW-BWGL (Germany)	**E83**
Belgaqua (Belgium)	**E84**
AS/NZS 4020 (Australia/New Zealand)	**E85**
GB/T 5750 (China)	**E86**
KIWA (Netherlands)	**E87**
General purpose / Without drinking water approval	**E89**
Country of origin	
France	**E90**

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Selection and ordering data (continued)

Additional information	Order code
Communication	
HART with 4 ... 20 mA output, active or passive	**F01**
Modbus RTU / RS485	**F04**
PROFIBUS PA	**F05**
PROFIBUS DP	**F06**
PROFINET	**F07**
EtherNet/IP	**F09**
MODBUS TCP/IP	**F10**
I/O extension	
Digital input / output, passive	**F30**
Custody transfer approval	
Wtihout approval	**G00**
MI-001 cold water meter	**G01**
OIML R49 - Class 2 accuracy	**G05**
OIML R49 - Class 1 accuracy	**G06**
MI-001 - OIML R49 verification	
No initial verification, without certification, default factory calibration for DN 50 ... 300, 2 ... 12 inch	**G10**
Dynamic range Q3/Q1 = 40 DN 50 ... 300, 2 ... 12 inch	**G11**
Dynamic range Q3/Q1 = 80 DN 50 ... 300, 2 ... 12 inch	**G13**
Dynamic range Q3/Q1 = 160 DN 50 ... 300, 1 ... 12 inch	**G16**
Dynamic range Q3/Q1 = 200 DN 50 ... 300, 2 ... 12 inch	**G17**
Dynamic range Q3/Q1 = 400 DN 50 ... 300, 2 ... 12 inch	**G20**
No initial verification, without certification default factory calibration for DN 350 ... 600, 14 ... 24 inch	**G30**
Dynamic range Q3/Q1 = 40; DN 350 ... 600, 14 ... 24 inch	**G31**
Dynamic range Q3/Q1 = 80; DN 350 ... 600, 14 ... 24 inch	**G33**
Dynamic range Q3/Q1 = 160; DN 350 ... 600, 14 ... 24 inch	**G36**
Dynamic range Q3/Q1 = 200; DN 350 ... 600, 14 ... 24 inch	**G37**
Dynamic range Q3/Q1 = 400; DN 350 ... 600, 14 ... 24 inch	**G40**
No initial verification, without certification default factory calibration for DN 700 ... 1200, 28 ... 48 inch	**G50**
Dynamic range Q3/Q1 = 40; DN 700 ... 1200, 28 ... 48 inch	**G51**
Dynamic range Q3/Q1 = 80; DN 700 ... 1200, 28 ... 48 inch	**G53**
Dynamic range Q3/Q1 = 125; DN 700 ... 1200, 28 ... 48 inch	**G55**
Dynamic range Q3/Q1 = 160; DN 700 ... 1200, 28 ... 48 inch	**G56**
No initial verification, without certification, default factory calibration for DN 1400 ... 2000, 54 ... 78 inch	**G60**
Dynamic range Q3/Q1 = 40; DN 1400 ... 2000, 54 ... 78 inch	**G61**
Dynamic range Q3/Q1 = 80; DN 1400 ... 2000, 54 ... 78 inch	**G63**
Device options	
Sensor terminal board factory mounted	**J00**
Sensor cables factory mounted	**J01**
Factory preconfigured for transmitter mounting in compact design (integral mount)	**J02**
Display with protection cover	**J03**
Breathing vent M20 thread, IP67	**J04**
Breathing vent ½" NPT thread, IP67	**J05**
Industrial Micro-SD memory card, 20 GB storage capacity	**J06**
Nameplate in Chinese language	**J20**
Type of Ex protection	
Increased safety (Ex e) Zone 2	**L12**
Non-incendive (NI) Class I, Division 2	**L15**
Type of protection (IP)	
IP68 (NEMA 6P) protection class for sensor and transmitter, without potting (to 2 m depth, 10 days)	**L50**
IP68 (NEMA 6P) protection class for sensor in remote design, factory potted (to 10 m depth, continuously)	**L51**
PED options	
Not compliant to PED Cat I/II/III, approved for use under 2014/68/EU Art. 1 §2	**P30**
Sensor cables	
Cable kit with coil and electrode cable, standard type (3 × 1.5 mm²), PVC jacket	
• 5 m (16 ft)	**T00**
• 10 m (33 ft)	**T01**
• 20 m (65 ft)	**T03**
• 30 m (98 ft)	**T05**
• 40 m (131 ft)	**T06**
• 50 m (164 ft)	**T07**
• 60 m (197 ft)	**T08**
• 100 m (328 ft)	**T11**
• 150 m (492 ft)	**T14**
• 200 m (656 ft)	**T16**
• 500 m (1640 ft)	**T18**
Cable kit with coil cable standard type (3 × 1.5 mm²) and electrode cable special type (3 × 0.25 mm²), PVC jacket	
• 5 m (16 ft)	**T50**
• 10 m (33 ft)	**T51**
• 15 m (49 ft)	**T52**
• 20 m (65 ft)	**T53**
• 25 m (82 ft)	**T54**
• 30 m (98 ft)	**T55**
• 40 m (131 ft)	**T56**
• 50 m (164 ft)	**T57**
• 60 m (197 ft)	**T58**
• 100 m (328 ft)	**T61**
• 150 m (492 ft)	**T64**
• 200 m (656 ft)	**T66**
• 500 m (1640 ft)	**T68**
Device settings	
Measuring range: Upper range value for analog and frequency output (Q_{max}), unit, analog output is activated	**Y01**
Current output damping	**Y02**
Current output signal range (Default setting: 4 ... 20 mA NAMUR)	**Y03**
Low flow cut off	**Y04**
Flow direction (Default setting: Positive)	**Y05**
Empty pipe detection (Default setting: Off)	**Y06**
Mains frequency (Default setting: 50 Hz)	**Y07**
Operation language display (Default setting English)	**Y24**
Device address (PROFIBUS 0 ... 125)	**Y25**
Device identification	
Stainless steel TAG shield for transmitter, line 1, max. 32 characters	**Y11**
Stainless steel TAG shield for transmitter, line 2, max. 32 characters	**Y12**
TAG adhesive label for transmitter, line 1, max. 32 characters	**Y13**
TAG adhesive label for transmitter, line 2, max. 32 characters	**Y14**
Stainless steel TAG shield for sensor, line 1, max. 32 characters	**Y15**
Stainless steel TAG shield for sensor, line 2, max. 32 characters	**Y16**
TAG adhesive label for sensor, line 1, max. 32 characters	**Y18**
TAG adhesive label for sensor, line 2, max. 32 characters	**Y19**

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Selection and ordering data (continued)

Additional information	Order code
Totalizer 1 settings	
Preset value	**Y30**
Unit (Default setting: m^3)	**Y31**
Direction (Default setting: Forward counting)	**Y32**
Failure mode (Default setting: Stop counting)	**Y33**
Decimal places (Default setting: 2)	**Y34**
Totalizer 2 settings	
Preset value	**Y35**
Unit (Default setting: m^3)	**Y36**
Direction (Default setting: Backward counting)	**Y37**
Failure mode (Default setting: Stop counting)	**Y38**
Decimal places (Default setting: 2)	**Y39**
Totalizer 3 settings	
Preset value	**Y40**
Unit (Default setting: m^3)	**Y41**
Direction (Default setting: Forward / backward counting, net)	**Y42**
Failure mode (Default setting: Stop counting)	**Y43**
Decimal places (Default setting: 2)	**Y44**
Pulse output settings	
Volume per pulse	**Y50**
Pulse width	**Y51**

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Technical specifications

SITRANS FMS500 flowmeter sensor	
Product characteristic	For demanding applications in the water & wastewater industry
Measurement of	Volume flow, flow velocity, electrical conductivity
Nominal diameter	Coned sensor (octagon liner): DN 15 ... 40 (½" ... 1½") Coned sensor: DN 50 ... 300 (2" ... 12") Full bore sensor: DN 350 ... 2000 (14" ... 78")
Mode of operation	
Measuring principle	Electromagnetic induction
Medium conductivity	Liquids with an electrical conductivity ≥ 5 µS/cm
Excitation frequency (mains supply: 50 Hz / 60 Hz)	DN 15 ... 65 (½" ... 2½"): 12.5 Hz / 15 Hz DN 80 ... 150 (3" ... 6"): 6.25 Hz / 7.5 Hz DN 200 ... 300 (8" ... 12"): 3.125 Hz / 3.75 Hz DN 350 ... 2000 (14" ... 78"): 1.5625 Hz / 1.875 Hz
Performance characteristics	
Electrical conductivity	Repeatability: Max. ±5 % of measured value [1]
Process connection	
Flanges	
• EN 1092-1	PN 6 (87 psi): Raised face DN 1400 ... 2000 (54" ... 78") PN 10 (145 psi) Flat face DN 200 ... 300 (8" ... 12") PN 10 (145 psi) Raised face DN 350 ... 2000 (14" ... 78") PN 16 (232 psi) Flat face DN 50 ... 300 (2" ... 12") PN 16 (232 psi) Raised face DN 350 ... 1200 (14" ... 48") PN 40 (580 psi) Flat face DN 15 ... 40 (½" ... 1½")
• ANSI B16.5	Class 150 Flat face ½" ... 12" Class 150 Raised face 14" ... 24"
• AWWA C-207	Class D Flat face 28 ... 80"
• AS/NZS 4087	PN 16 (232 psi) Flat face DN 50 ... 300 (2" ... 12") PN 16 (232 psi) Raised face DN 350 ... 1200 (14" ... 48")
• JIS B 2220:2004	10K DN 15 ... 600 (1" ... 24")
Rated operating conditions	
Storage temperature	-20 ... +70 °C (-4 ... +158 °F)
Ambient temperature	
• Sensor	-20 ... +70 °C (-4 ... +158 °F)
• Compact with transmitter	-20 ... +65 °C (-4 ... +149 °F)
• Display	-20 ... +60 °C (-4 ... +140 °F)
Operating pressure (maximum operating pressure depending on flange type)	DN 15 ... 40 (1/2" ... 1½"): 0.01 bar_a ... 40 bar_g (0.15 psi_a ... 580 psi_g) DN 50 ... 300 (2" ... 12"): 0.03 bar_a... 20 bar_g (0.44 psi_a ... 290 psi_g) DN 350 ... 1200 (14" ... 48"): 0.01 bar_a ... 16 bar_g (0.15 psi_a ... 232 psi_g) DN 1400 ... 2000 (54" ... 78"): 0.01 bar_a ... 10 bar_g (0.15 psi_a ... 145 psi_g)
Protection class	
• Standard	IP66/67, NEMA 4X/6
• Optional	IP68 and NEMA 6P (2 m, 10 days) for sensor in compact (integral mount) and remote design IP68 and NEMA 6P (10 m, continuously) for sensor in remote design
Mechanical load (vibration)	
• Integral mount / compact version	Vibration, sinusoidal according to IEC 60068-2-6 • 2 ... 4 Hz, 3.5 mm peak • 8.4 ... 500 Hz, 1 g peak Vibration broad-band random, according to IEC 60068-2-64 • 10 ... 200 Hz, 0.003 g^2/Hz • 200 ... 500 Hz, 0.001 g^2/Hz • Total: 0.93 g rms
• Remote version	Vibration, sinusoidal according to IEC 60068-2-6 Sensor • 2 ... 8.4 Hz, 7.5 mm peak • 8.4 ... 500 Hz, 2 g peak Transmitter • 2 ... 8.4 Hz, 1.5 mm peak • 8.4 ... 500 Hz, 0.7 g peak Vibration broad-band random, according to IEC 60068-2 64 Sensor • 10 ... 200 Hz, 0.01 g^2/Hz • 200 ... 500 Hz, 0.003 g^2/Hz • Total: 1.67 g rms Transmitter • 10 ... 200 Hz, 0.003 g^2/Hz • 200 ... 500 Hz, 0.001 g^2/Hz • Total: 0.93 g rms
Process temperature	
• NBR liner	-10 ... +70 °C (14 ... 158 °F)
• EPDM liner	-10 ... +70 °C (14 ... 158 °F)
Pressure drop	DN 15 and 25 (½" and 1"): Max. 20 mbar (0.29 psi) at 1 m/s (3 ft/s) DN 40 ... 300 (1½" ... 12"): Max. 25 mbar (0.36 psi) at 3 m/s (10 ft/s) DN 350 ... 2000 (14" ... 78"): Insignificant
Test pressure	1.5 × PN (where applicable)

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Technical specifications (continued)

SITRANS FMS500 flowmeter sensor	
Design	
Dimensions	See dimensional drawings
Weight	See dimensional drawings
Material	
• Housing and flanges	Carbon steel ASTM A 105 with corrosion resistant coating of Class C4 or C5 (durability up to 15 years) EN ISO 12944
• Measuring electrode	Hastelloy C276 / 2.4819
• Grounding electrode	Hastelloy C276 / 2.4819
• Measuring tube [2]	Stainless steel AISI 304 / 1.4301
• Terminal box	Polycarbonate
Cable entries	4 × metric thread (size M20 × 1.5)
Calibration	
Standard	Zero-point, 2 × 25 % and 2 × 90 %
Optional	• 5-point calibration: 20 %, 40 %, 60 %, 80 %, 100 % of factory Qmax • 10-point calibration: ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Qmax • Matched pair calibration: default, 5-point or 10-point • ISO/IEC 17025 accredited, 5-point, matched-pair calibration
Certificates and approvals	
General purpose	CE (LVD, PED, EMC, RoHS), UKCA
Drinking water	EPDM: • WRAS (WRc, BS 6920 material approval for cold water, GB) • NSF/ANSI Standard 61 (Cold water, US) • ACS listed (France) • KTW-BWGL (Germany) • Belgaqua (Belgium) • AS/NZS 4020 (Australia/New Zealand) • GB/T 5750 (China)
Custody transfer	• MI-001 cold water (EU): DN 50 ... 2000 (2 ... 78 inch)
Explosion protection	• FM - Non-incendive (NI) Class I, Division 2 [3), 4)] • ATEX / IECEx - Increased safety (Ex e) Zone 2 [3), 4)]
Others	• Environmental Product Declaration (EPD) • MCERTS (GB environmental) • EAC (Kazakhstan)

1) The value applies for measurement between 15 µS/cm and 5000 µS/cm at a reference temperature of 25 °C (77 °F)
2) DN > 300 (12")
3) IP64 for EX version; option L51 upgrades the sensor to IP68 (remote only)
4) Only allowed with flexible conduits

FMS500 (7ME653) with FMT020 (7ME694)

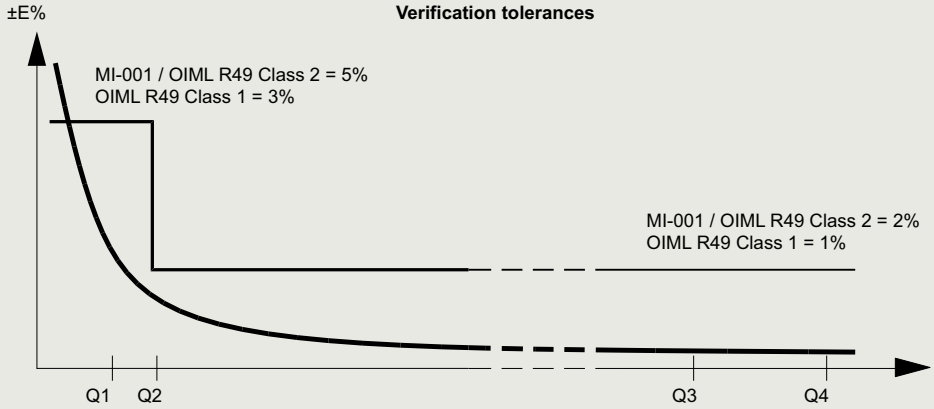
The FM520 water meter, which combines the FMS500 sensor and FMT020 transmitter, is EU-type approved according to MID Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on Measuring Instruments (Annex III – Water Meters MI-001). It also meets OIML R49 recommendations for Class 1 and 2 (Water meters for cold potable water and hot water).

Extensive testing has ensured its superior measurement accuracy, even under challenging inlet and outlet conditions. This allows for flexible installation in tight spaces without the need for pipe re-routing, as the FMS500 functions as a 0D/0D device for both Class 1 and Class 2 accuracy, requiring no inlet or outlet sections.

Furthermore, while primarily a cold water meter, the FM520 has been rigorously tested and passed at temperatures up to 50 °C (122 °F), including 30 °C (86 °F). This robust performance means it can be used for custody transfer (CT) purposes up to 50 °C (122 °F).

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Technical specifications (continued)



G00 - Without custody transfer approval Order code: G10 Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN								
Orientation	All orientations								
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G11 Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN								
Orientation	All orientations								
"R" Q3/Q1	40	40	40	40	40	40	40	40	40
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	2.52	4	6.40	10	16	25.20	40	64	64
Q1 [m³/h]	1.58	2.50	4	6.25	10	15.75	25	40	40

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G13 Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN								
Orientation	All orientations								
"R" Q3/Q1	80	80	80	80	80	80	80	80	80
Q4 [m³/h]	78.75	125	200	312.50	500	787.50	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	1.26	2	3.20	5	8	12.60	20	32	32
Q1 [m³/h]	0.79	1.25	2	3.13	5	7.88	12.50	20	20

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Technical specifications (continued)

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G16

Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN								
Orientation	All orientations								
"R" Q3/Q1	160	160	160	160	160	160	160	160	160
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	0.63	1	1.60	2.50	4	6.3	10	16	16
Q1 [m³/h]	0.39	0.63	1	1.56	2.5	3.94	6.25	10	10

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G17

Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN								
Orientation	All orientations								
"R" Q3/Q1	200	200	200	200	200	200	200	200	200
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	0.5	0.8	1.28	2	3.2	5.04	8.00	12.8	12.8
Q1 [m³/h]	0.32	0.5	0.8	1.25	2	3.15	5.00	8	8

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G20

Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN								
Orientation	All orientations								
"R" Q3/Q1	400	400	400	400	400	400	400	400	400
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	0.25	0.4	0.64	1	1.6	2.52	4	6.4	6.4
Q1 [m³/h]	0.16	0.25	0.4	0.63	1	1.58	2.5	4	4

G00 - Without custody transfer approval
Order code: G30

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	0 × DN				
Orientation	Horizontal and vertical				
Q3 [m³/h]	2500	4000	4000	6300	6300

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G31

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	0 × DN				
Orientation	Horizontal and vertical				
"R" Q3/Q1	40	40	40	40	40
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	2500	4000	4000	6300	6300
Q2 [m³/h]	100	160	160	252	252
Q1 [m³/h]	62.5	100	100	157.5	157.5

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Technical specifications (continued)

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G33

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**80**	**80**	**80**	**80**	**80**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	50	80	80	126	126
Q1 [m³/h]	31.25	50	50	78.75	78.75

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G36

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**160**	**160**	**160**	**160**	**160**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	25	40	40	63	63
Q1 [m³/h]	15.63	25	25	39.38	39.38

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G37

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**200**	**200**	**200**	**200**	**200**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	20	32	32	50.40	50.40
Q1 [m³/h]	12.50	20	20	31.50	31.50

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G40

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**400**	**400**	**400**	**400**	**400**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	10	16	16	25.20	25.20
Q1 [m³/h]	6.25	10	10	15.75	15.75

G00 - Without custody transfer approval
Order code: G50

Size	DN 700 (28")	DN 750 (30")	DN 800 (32")	DN 900 (36")	DN 1000 (40")	DN 1200 (48")
UxDx	**0 × DN**					
Orientation	**Horizontal and vertical**					
Q3 [m³/h]	**6300**	**6300**	**6300**	**10000**	**10000**	**10000**

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Technical specifications (continued)

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G51 Size	DN 700 (28")	DN 750 (30")	DN 800 (32")	DN 900 (36")	DN 1000 (40")	DN 1200 (48")
UxDx	**0 × DN**					
Orientation	**Horizontal and vertical**					
"R" Q3/Q1	**40**	**40**	**40**	**40**	**40**	**40**
Q4 [m³/h]	7875	7875	7875	12500	12500	12500
Q3 [m³/h]	**6300**	**6300**	**6300**	**10000**	**10000**	**10000**
Q2 [m³/h]	252	252	252	400	400	400
Q1 [m³/h]	157.5	157.5	157.5	250	250	250

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G53 Size	DN 700 (28")	DN 750 (30")	DN 800 (32")	DN 900 (36")	DN 1000 (40")	DN 1200 (48")
UxDx	**0 × DN**					
Orientation	**Horizontal and vertical**					
"R" Q3/Q1	**80**	**80**	**80**	**80**	**80**	**80**
Q4 [m³/h]	7875	7875	7875	12500	12500	12500
Q3 [m³/h]	**6300**	**6300**	**6300**	**10000**	**10000**	**10000**
Q2 [m³/h]	126	126	126	200	200	200
Q1 [m³/h]	78.75	78.75	78.75	125	125	125

G06 - OIML R49 Class 1 Order code: G55 Size	DN 700 (28")	DN 750 (30")	DN 800 (32")	DN 900 (36")	DN 1000 (40")	DN 1200 (48")
UxDx	**0 × DN**					
Orientation	**Horizontal and vertical**					
"R" Q3/Q1	**125**	**125**	**125**	**125**	**125**	**125**
Q4 [m³/h]	7875	7875	7875	12500	12500	12500
Q3 [m³/h]	**6300**	**6300**	**6300**	**10000**	**10000**	**10000**
Q2 [m³/h]	80.64	80.64	80.64	128	128	128
Q1 [m³/h]	50.4	50.40	50.40	80	80	80

G01 - MI-001 G05 - OIML R49 Class 2 Order code: G56 Size	DN 700 (28")	DN 750 (30")	DN 800 (32")	DN 900 (36")	DN 1000 (40")	DN 1200 (48")
UxDx	**0 × DN**					
Orientation	**Horizontal and vertical**					
"R" Q3/Q1	**160**	**160**	**160**	**160**	**160**	**160**
Q4 [m³/h]	7875	7875	7875	12500	12500	12500
Q3 [m³/h]	**6300**	**6300**	**6300**	**10000**	**10000**	**10000**
Q2 [m³/h]	63	63	63	100	100	100
Q1 [m³/h]	39.375	39.38	39.38	62.50	62.50	62.50

G00 - Without custody transfer approval Order code: G60 Size	DN 1400 (54")	DN 1500 (60")	DN 1600 (66")	DN 1800 (72")	DN 2000 (78")
UxDx	**0 × DN**				
Orientation	**Horizontal**				
Q3 [m³/h]	**10000**	**10000**	**10000**	**10000**	**10000**

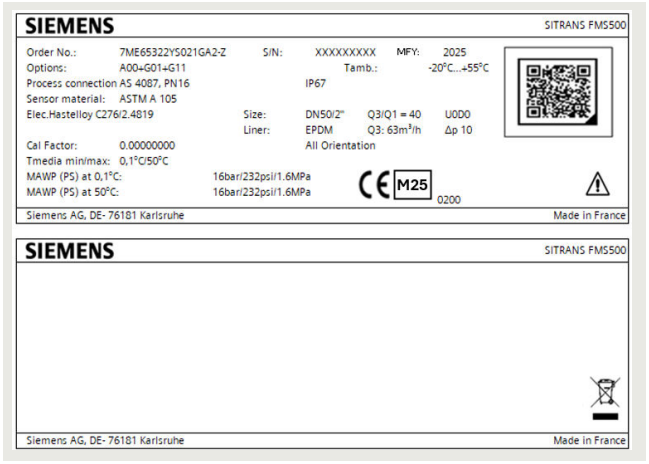
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Technical specifications (continued)

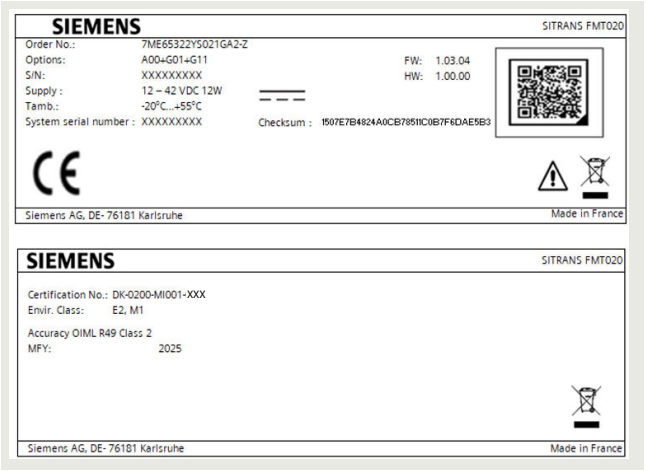
G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G61 Size	DN 1400 (54")	DN 1500 (60")	DN 1600 (66")	DN 1800 (72")	DN 2000 (78")
UxDx	**0 × DN**				
Orientation	**Horizontal**				
"R" Q3/Q1	**40**	**40**	**40**	**40**	**40**
Q4 [m³/h]	12500	12500	12500	12500	12500
Q3 [m³/h]	**10000**	**10000**	**10000**	**10000**	**10000**
Q2 [m³/h]	400	400	400	400	400
Q1 [m³/h]	250	250	250	250	250

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G63 Size	DN 1400 (54")	DN 1500 (60")	DN 1600 (66")	DN 1800 (72")	DN 2000 (78")
UxDx	**0 × DN**				
Orientation	**Horizontal**				
"R" Q3/Q1	**80**	**80**	**80**	**80**	**80**
Q4 [m³/h]	12500	12500	12500	12500	12500
Q3 [m³/h]	**10000**	**10000**	**10000**	**10000**	**10000**
Q2 [m³/h]	200	200	200	200	200
Q1 [m³/h]	125	125	125	125	125

The following label is placed on the sensor terminal box and on the transmitter housing. An example of the product label is shown below:



Sensor label



Transmitter label

FM520 approvals are valid for:

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Technical specifications (continued)

Sizes	DN 50 ... 2000 (2" ... 78")
Performance range	R400 Class 2 & Class 1
Installation	• All orientation for DN 50 ... 300 (2 ... 12") • Horizontal and vertical for DN 350 ... 1200 (14 ... 48") • Horizontal for DN 1400 ... 2000 (54 ... 78") • Compact or remote with max. 500 m cable • Approved for forward metering but also designed to be used in reverse
Sensitivity class	U0D0 (The meter requires 0xD straight pipe upstream and 0xD straight pipe downstream from the sensor)
Temperature class	• T30 (0.1 ... 30 °C) • T50 (0.1 ... 50 °C)
Pressure	MAWP 16 (Maximum Allowable Working Pressure)
Electromagnetic class	E2
Mechanical class	M1, Class B and O (building and outdoors)
Climatic class	-20 ... 55 °C (-4 ... 131 °F)
Power supply	• 12 ... 42 V DC, 12 W • 100 ... 240 V AC, 50 ... 60 Hz, 25 VA
Software	Designed according to WELMEC 7.2
Communication modules [1]	HART, PROFINET, MODBUS and EtherNet/IP have been certified and can only be used where national regulations permit it. The reading of ancillary devices may be used for testing and verification and for remote reading of the water meter.

[1] Communication module need to be ordered together with the system (FM520), a retrofit of the communication module is not possible since it would break the CT seals.

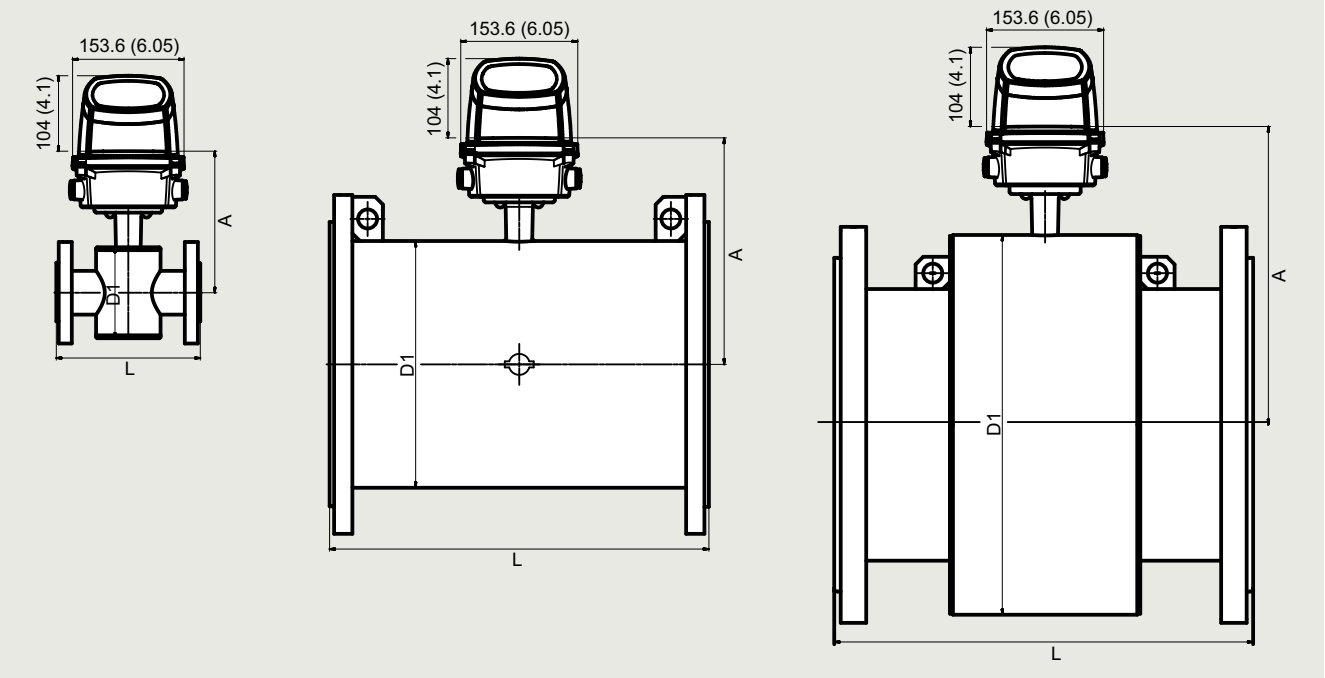
Special MI-001 settings:

- Unit: m^3
- Low flow cut-off: 9 mm/s
- Digital output: pulses

For other factory settings, see the operating instructions.

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Dimensional drawings



SITRANS FMS500 Sensor: DN 15 ... 40, ½" ... 1½" (left), DN 50 ... 300, 2" ... 12" (middle) and DN 350 ... 2000, 14" ... 80" (right)

Sensor SITRANS FMS500 (7ME653)									
Nominal diameter		A		D1		L [1]		Weight [1]	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[kg]	[lbs]
15	½	170	6.7	77	3.0	200	7.9	5	11
25	1	180	7.1	96	3.8	200	7.9	6	13
40	1½	195	7.7	127	5.0	200	7.9	9	20
50	2	181	7.1	76	3.0	200	7.9	10	22
65	2½	187	7.4	89	3.5	200	7.9	12	26
80	3	193	7.6	102	4.0	200	7.9	13	29
100	4	200	7.9	114	4.5	250	9.8	17	37
125	5	210	8.3	140	5.5	250	9.8	20	44
150	6	225	8.9	168	6.6	300	11.8	27	60
200	8	250	9.8	219	8.6	350	13.8	39	86
250	10	277	10.9	273	10.8	450	17.7	56	123
300	12	303	11.9	324	12.8	500	19.7	72	159
350	14	375	14.8	451	17.8	550	21.7	115	254
400	16	400	15.7	502	19.8	600	23.6	143	315
450	18	431	17.0	563	22.2	600	23.6	177	390
500	20	456	18.0	614	24.2	600	23.6	222	489
600	24	507	20.0	715	28.2	600	23.6	321	708
700	28	557	21.9	816	32.1	700	27.6	331	730
750	30	584	23.0	869	34.2	750	29.5	-	-
800	32	609	24.0	927	36.5	800	31.5	386	851
900	36	656	25.8	1032	40.6	900	35.4	482	1063
1000	40	707	27.8	1136	44.7	1000	39.4	672	1482
1050	42	707	27.8	1136	44.7	1000	39.4	-	-
1100	44	758	29.8	1238	48.7	1100	43.3	-	-
1200	48	813	32.0	1348	53.1	1200	47.2	1116	2460
1400	54	918	36.1	1574	65.94	1400	55.1	1592	3502
1500	60	965	38.0	1672	65.83	1500	59.1	1850	4070
1600	66	1018	40.1	1774	75.39	1600	63.0	2110	4642
1800	72	1116	43.9	1974	77.72	1800	70.9	2560	5632
2000	78	1216	47.9	2174	85.59	2000	78.9	3640	8008

[1] Weights are appr. for sensor with EN 1092-1 PN 16 flanges without transmitter. With transmitter FMT020 mounted, weight is increased by appr. 1.0 kg (2.2 lb).

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Overview



The SITRANS FMS300 is a magnetic flow sensor suitable for volume flow measurement of liquids (conductive) providing a high flexibility in the product configuration making the meter work in almost any flow applications.

The FMS300 is deliverable in a wide range of sizes, grounding electrodes are included as standard, measuring electrodes capable of withstanding the most extreme processes and various liners are also available. The fully welded construction provides supreme ruggedness and durability even under the toughest operating conditions.

Combined with a flow meter transmitter it is a traditional externally powered electromagnetic flow meter system.

Benefits

- Wide range of electrode and liner materials to fit even the most extreme process media
- Excellent chemical resistance also during high process temperature
- Reinforced PFA liner to perform extremely well under vacuum conditions and during high process temperatures up to 100 °C (212 °F)
- Fully welded construction with no moving parts for maintenance-free operation over many years
- Smooth surface with minimal risk of build-up
- Sensor face-to-face length according to ISO 20456 (up to DN 400)
- SENSORPROM™ Technology provides an automatic upload of start-up settings and calibration data for easy commissioning
- Designed to allow in-situ verification for easy performance check
- Meets EEC directive PED 2014/68/EU

Application

The SITRANS FMS300 is designed to meet the most common specifications within the chemical and process industries. The field proven flow sensor with high chemical resistance is also the ideal solution for the tough and challenging applications.

The main applications of the SITRANS FMS300 flow sensor can be found in the following fields:

- Process industry
- Chemical industry
- Steel industry
- Mining
- Pulp and paper
- Utility
- Power generation and distribution
- Oil and gas / HPI
- Water and wastewater

For a complete magnetic flowmeter, the FMS300 flow sensor can be combined with a FMT020 transmitter. The entire flowmeter system either mounted remotely or as a compact unit is operated under the product name SITRANS FM320.

SITRANS FM320: This versatile magnetic flowmeter finds its primary applications in the chemical industry, process industry, pulp and paper sector, and industrial wastewater management.

Available sensor sizes from DN 15 to DN 2200 (½" ... 88")

Measuring accuracy ±0.4% of flow rate, optional ±0.2% of flow rate available.

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Selection and ordering data

Sensor SITRANS FMS300	Article No. 7ME636 ● - ● ● ● ● ● - ● ● A ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Transmitter variant	
No transmitter (sensor only)	**0**
Transmitter SITRANS FMT020	**2**
Diameter	
DN 15, ½ inch	**1 V**
DN 25, 1 inch	**2 D**
DN 32, 1¼ inch	**2 H**
DN 40, 1½ inch	**2 R**
DN 50, 2 inch	**2 Y**
DN 65, 2½ inch	**3 F**
DN 80, 3 inch	**3 M**
DN 100, 4 inch	**3 T**
DN 125, 5 inch	**4 B**
DN 150, 6 inch	**4 H**
DN 200, 8 inch	**4 P**
DN 250, 10 inch	**4 V**
DN 300, 12 inch	**5 B**
DN 350, 14 inch	**5 D**
DN 400, 16 inch	**5 H**
DN 450, 18 inch	**5 K**
DN 500, 20 inch	**5 R**
DN 600, 24 inch	**5 Y**
DN 700, 28 inch	**6 B**
DN 750, 30 inch	**6 D**
DN 800, 32 inch	**6 H**
DN 900, 36 inch	**6 K**
DN 1000, 40 inch	**6 R**
DN 1050, 42 inch	**6 Y**
DN 1100, 44 inch	**7 D**
DN 1200, 48 inch	**7 H**
DN 1400, 54 inch	**7 M**
DN 1500, 60 inch	**7 R**
DN 1600, 66 inch	**7 V**
DN 1800, 72 inch	**7 Y**
DN 2000, 78 inch	**8 B**
DN 2200, 88 inch	**8 F**
Process connection	
EN 1092-1 PN 6 flanges	**A**
EN 1092-1 PN 10 flanges	**B**
EN 1092-1 PN 16 flanges, standard face-to-face length for sensor (1.25 × DN, PED compliant)	**C**
EN 1092-1 PN 16 flanges, short face-to-face length for sensor (1.0 × DN) (not PED compliant)	**D**
EN 1092-1 PN 25 flanges	**E**
EN 1092-1 PN 40 flanges	**F**
EN 1092-1 PN 63 flanges	**G**
EN 1092-1 PN 100 flanges	**H**
ANSI B16.5 Class 150 flanges	**J**
ANSI B16.5 Class 300 flanges	**K**
ANSI B16.5 Class 600 flanges	**L**
AWWA C-207 Class D flanges	**M**
AS 2129 table E flanges	**Q**

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Selection and ordering data (continued)

Sensor SITRANS FMS300	Article No. 7ME636 ● - ● ● ● ● ● - ● ● A ●
AS 4087 PN 16 flanges	S
AS 4087 PN 21 flanges	T
AS 4087 PN 35 flanges	U
JIS B 2220:2004 10K flanges	W
JIS B 2220:2004 20K flanges	Y
Process connection material	
Carbon steel ASTM A 105 with corrosion-resistant coating acc. to EN ISO 12944 class C4	0
Carbon steel ASTM A 105 with corrosion-resistant coating acc. to EN ISO 12944 class C5	1
Stainless steel AISI 304 flange with corrosion-resistant coating acc. to EN ISO 12944 class C4	3
Stainless steel AISI 304 flange with corrosion-resistant coating acc. to EN ISO 12944 class C5	4
Stainless steel AISI 316L flange (including sensor housing), polished	8
Liner material	
Soft rubber[1)]	1
EPDM	2
PTFE	3
Ebonite	4
Linatex	5
PFA	7
Electrode material	
Stainless steel AISI 316Ti / 1.4571	0
Hastelloy C276 / 2.4819 (PFA: Hastelloy C22 / 2.4602)	1
Platinum	2
Titanium	3
Tantalum	4
Ceramic coated stainless steel AISI 316Ti / 1.4571	5
Ceramic coated Hastelloy C276 / 2.4819	6
Transmitter mounting & enclosure type	
No transmitter (sensor only)	A
Compact design (integral mount), polycarbonate enclosure	G
Remote design, polycarbonate enclosure (wall-mounting unit and sensor terminal board included)	J
Power supply	
No transmitter (sensor only)	0
12 ... 42 V DC	2
100 ... 240 V AC, 50/60 Hz	3

[1)] Devices made in France use Neoprene; Devices made in China use Butyl

Selection and Ordering data Additional information	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Without cable glands (blind plugs)	**A00**
M20×1.5 cable glands, grey, material polyamide	**A02**
½ inch NPT cable glands, grey, material polyamide	**A05**
Certificates	
Declaration of compliance with the order 2.1 (EN 10204)	**C00**
Inspection certificate 3.1 (EN 10204) - Material of pressure-containing and wetted parts	**C12**
Test report 2.2 (EN 10204)	**C14**
Inspection certificate 3.1(EN 10204) - Pressure test	**C18**

Selection and Ordering data Additional information	Order code
High accuracy calibration	
High accuracy calibration +/- 0.2% of the act. vol. flow, DN ≤ 200, ≤ 8 inch	**D01**
High accuracy calibration +/- 0.2% of the act. vol. flow, DN 250 ... 600, 10 ... 24 inch	**D02**
High accuracy calibration +/- 0.2% of the act. vol. flow, DN 700 ... 1200, 28 ... 48 inch	**D03**
High accuracy calibration +/- 0.2% of the act. vol. flow, DN ≥ 1400, ≥ 54 inch	**D04**
5-point calibration	
5-point factory calibration, DN ≤ 200, ≤ 8 inch	**D10**
5-point factory calibration, DN 250 ... 600, 10 ... 24 inch	**D11**
5-point factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D12**
5-point factory calibration, DN ≥ 1400, ≥ 54 inch	**D13**
10-point calibration	
10-point factory calibration, DN ≤ 200, ≤ 8 inch	**D15**

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Selection and ordering data (continued)

Selection and Ordering data Additional information	Order code
10-point factory calibration, DN 250 ... 600, 10 ... 24 inch	**D16**
10-point factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D17**
10-point factory calibration, DN ≥ 1400, ≥ 54 inch	**D18**
Default matched-pair calibration	
Default matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D20**
Default matched-pair factory calibration, DN 250 ... 600, 10 ... 24 inch	**D21**
Default matched-pair factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D22**
Default matched-pair factory calibration, DN ≥ 1400, ≥ 54 inch	**D23**
5-point matched-pair calibration	
5-point, matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D25**
5-point, matched-pair factory calibration, DN 250 ... 600, 10 ... 24 inch	**D26**
5-point, matched-pair factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D27**
5-point, matched-pair factory calibration DN ≥ 1400, ≥ 54 inch	**D28**
10-point matched-pair calibration	
10-point, matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D30**
10-point, matched-pair factory calibration, DN 250 ... 600, 10 ... 24 inch	**D31**
10-point, matched-pair factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D32**
10-point, matched-pair factory calibration, DN ≥ 1400, ≥ 54 inch	**D33**
Accredited ISO/IEC 17025 calibration	
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN ≤ 200, ≤ 8 inch	**D35**
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN 250 ... 600, 10 ... 24 inch	**D36**
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN 700 ... 1200, 28 ... 48 inch	**D37**
ISO/IEC 17025 accredited, 5-point, matched-pair factory calibration, DN ≥ 1400, ≥ 54 inch	**D38**
FM-Fire Service	
VdS	**D40**
General safety	
CSA General Purpose	**E06**
Country specific approvals	
CRN (Canadian Reg. Number)	**E70**
CPA (China)	**E75**
FP2A (France)	**E76**
Drinking water approvals	
WRAS (WRc, BS 6920, GB)	**E80**
NSF/ANSI 61 (Cold water, US)	**E81**
ACS (France)	**E82**
KTW-BWGL (Germany)	**E83**
Belgaqua (Belgium)	**E84**
AS/NZS 4020 (Australia/New Zealand)	**E85**
GB/T 5750 (China)	**E86**
KIWA (Netherlands)	**E87**
General purpose / Without drinking water approval	**E89**
Country of origin	
France	**E90**
Communication	
HART with 4 ... 20 mA output, active or passive	**F01**
Modbus RTU / RS485	**F04**
PROFIBUS PA	**F05**
PROFIBUS DP	**F06**

Selection and Ordering data Additional information	Order code
PROFINET	**F07**
EtherNet/IP	**F09**
MODBUS TCP/IP	**F10**
I/O extension	
Digital input or output, passive	**F30**
Custody transfer approval	
Wtihout approval	**G00**
MI-001 cold water meter	**G01**
OIML R49 - Class 2 accuracy	**G05**
OIML R49 - Class 1 accuracy	**G06**
MI-001 - OIML R49 verification	
No initial verification, without certification, default factory calibration for DN 25 ... 300, 1 ... 12 inch	**G10**
Dynamic range Q3/Q1 = 40, DN 25 ... 300, 1 ... 12 inch	**G11**
Dynamic range Q3/Q1 = 80, DN 25 ... 300, 1 ... 12 inch	**G13**
Dynamic range Q3/Q1 = 125, DN 25 ... 40, 1 ... 1¾ inch	**G15**
Dynamic range Q3/Q1 = 160, DN 25 ... 300, 1 ... 12 inch	**G16**
Dynamic range Q3/Q1 = 200, DN 25 ... 300, 1 ... 12 inch	**G17**
Dynamic range Q3/Q1 = 250, DN 25 ... 40, 1 ... 1¾ inch	**G18**
Dynamic range Q3/Q1 = 400, DN 50 ... 300, 2 ... 12 inch	**G20**
No initial verification, without certification, default factory calibration for DN 350 ... 600, 14 ... 24 inch	**G30**
Dynamic range Q3/Q1 = 40; DN 350 ... 600, 14 ... 24 inch	**G31**
Dynamic range Q3/Q1 = 80; DN 350 ... 600, 14 ... 24 inch	**G33**
Dynamic range Q3/Q1 = 160; DN 350 ... 600, 14 ... 24 inch	**G36**
Dynamic range Q3/Q1 = 200; DN 350 ... 600, 14 ... 24 inch	**G37**
Dynamic range Q3/Q1 = 400; DN 350 ... 600, 14 ... 24 inch	**G40**
Device options	
Sensor terminal board factory mounted	**J00**
Sensor cables factory mounted	**J01**
Factory preconfigured for transmitter mounting in compact design (integral mount)	**J02**
Display with protection cover	**J03**
Breathing vent M20 thread, IP67	**J04**
Breathing vent ½" NPT thread, IP67	**J05**
Industrial Micro-SD memory card, 20 GB storage capacity	**J06**
Special sensor design	
High temperature version (PTFE; PFA: 150 °C)	**J30**
High temperature version (PTFE: 180 °C incl. type E protection rings AISI 316/1.4436)	**J31**
Quick shipment (≤ DN 300; PTFE; PFA; 10 days excluding shipment)	**J32**
Grounding electrodes (Rubber lining)	
Without	**J40**
Stainless steel AISI 316Ti / 1.4571	**J41**
Hastelloy C276 / 2.4819	**J42**
Titanium	**J44**
Grounding electrodes (PTFE / PFA lining)	
Without	**J50**
Stainless steel AISI 316Ti / 1.4571	**J51**
Hastelloy C276 / 2.4819 (PFA: Hastelloy C22 / 2.4602)	**J52**
Platinum	**J53**
Titanium	**J54**
Tantalum	**J55**

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Selection and ordering data (continued)

Selection and Ordering data Additional information	Order code
Type of protection (IP)	
IP68 (NEMA 6P) protection type for sensor and transmitter, without potting (to 2 m depth, 10 days)	**L50**
IP68 (NEMA 6P) protection class for sensor in remote design, factory potted (to 10 m depth, continuously)	**L51**
PED options	
Not compliant to PED Cat I/II/III, approved for use under 2014/68/EU Art. 1 §2	**P30**
Sensor cables	
Cable kit with coil and electrode cable, standard type (3 × 1.5 mm²), PVC jacket	
• 5 m (16 ft)	**T00**
• 10 m (33 ft)	**T01**
• 20 m (65 ft)	**T03**
• 30 m (98 ft)	**T05**
• 40 m (131 ft)	**T06**
• 50 m (164 ft)	**T07**
• 60 m (197 ft)	**T08**
• 100 m (328 ft)	**T11**
• 150 m (492 ft)	**T14**
• 200 m (656 ft)	**T16**
• 500 m (1640 ft)	**T18**
Cable kit with coil cable standard type (3 × 1.5 mm²) and electrode cable special type (3 × 0.25 mm²), PVC jacket	
• 5 m (16 ft)	**T50**
• 10 m (33 ft)	**T51**
• 15 m (49 ft)	**T52**
• 20 m (65 ft)	**T53**
• 25 m (82 ft)	**T54**
• 30 m (98 ft)	**T55**
• 40 m (131 ft)	**T56**
• 50 m (164 ft)	**T57**
• 60 m (197 ft)	**T58**
• 100 m (328 ft)	**T61**
• 150 m (492 ft)	**T64**
• 200 m (656 ft)	**T66**
• 500 m (1640 ft)	**T68**
Device settings	
Measuring range setting: Upper range value (Q_{max}), unit	**Y01**
Current output damping	**Y02**
Current output signal range	**Y03**
Low flow cut off	**Y04**
Flow direction (Default setting: Positive)	**Y05**
Empty pipe detection (Default setting: Off)	**Y06**
Mains frequency (Default setting: 50 Hz)	**Y07**
Operation language display (Default setting: English)	**Y24**
Device address (PROFIBUS 0 ... 125)	**Y25**
Device identification	
Stainless steel TAG shield for transmitter, line 1, max. 32 characters	**Y11**
Stainless steel TAG shield for transmitter, line 2, max. 32 characters	**Y12**
TAG adhesive label for transmitter, line 1, max. 32 characters	**Y13**
TAG adhesive label for transmitter, line 2, max. 32 characters	**Y14**
Stainless steel TAG shield for sensor, line 1, max. 32 characters	**Y15**
Stainless steel TAG shield for sensor, line 2, max. 32 characters	**Y16**

Selection and Ordering data Additional information	Order code
TAG adhesive label for sensor, line 1, max. 32 characters	**Y18**
TAG adhesive label for sensor, line 2, max. 32 characters	**Y19**
Totalizer 1 settings	
Preset value	**Y30**
Unit (Default setting: m3)	**Y31**
Direction (Default setting: Forward counting)	**Y32**
Failure mode (Default setting: Stop counting)	**Y33**
Decimal places (Default setting: 2)	**Y34**
Totalizer 2 settings	
Preset value	**Y35**
Unit (Default setting: m3)	**Y36**
Direction (Default setting: Backward counting)	**Y37**
Failure mode (Default setting: Stop counting)	**Y38**
Decimal places (Default setting: 2)	**Y39**
Totalizer 3 settings	
Preset value	**Y40**
Unit (Default setting: m3)	**Y41**
Direction (Default setting: Forward / backward counting, net)	**Y42**
Failure mode (Default setting: Stop counting)	**Y43**
Decimal places (Default setting: 2)	**Y44**
Pulse output settings	
Volume per pulse	**Y50**
Pulse width	**Y51**

Accessories for FMS300

Grounding and protection ring - Type C [1)]



- Material: Stainless steel AISI 304
- For all liners except PTFE and PFA
- 1 pc.

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Selection and ordering data (continued)

Size DN	EN 1092-1 PN 6	PN 10	PN 16	PN 25	PN 40	AS 2129 Table E
	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.
DN 25					**FDK:083N8361**	**FDK:083N8361**
DN 40					**FDK:083N8362**	**FDK:083N8362**
DN 50					**FDK:083N8344**	**FDK:083N8344**
DN 65	**FDK:083N8345**		**FDK:083N8345**		**FDK:083N8345**	**FDK:083N8346**
DN 80	**FDK:083N8347**		**FDK:083N8347**		**FDK:083N8347**	**FDK:083N8347**
DN 100	**FDK:083N8070**		**FDK:083N8025**		**FDK:083N8025**	**FDK:083N8025**
DN 125	**FDK:083N8071**		**FDK:083N8071**		**FDK:083N8071**	**FDK:083N8071**
DN 150	**FDK:083N8072**		**FDK:083N8008**		**FDK:083N8073**	**FDK:083N8008**
DN 200	**FDK:083N8074**	**FDK:083N8011**	**FDK:083N8011**	**FDK:083N8011**	**FDK:083N8075**	**FDK:083N8011**
DN 250	**FDK:083N8078**	**FDK:083N8013**	**FDK:083N8013**	**FDK:083N8013**	**FDK:083N8079**	**FDK:083N8013**
DN 300	**FDK:083N8080**	**FDK:083N8012**	**FDK:083N8012**	**FDK:083N8081**	**FDK:083N8082**	**FDK:083N8012**
DN 350	**FDK:083N8083**	**FDK:083N8039**	**FDK:083N8039**	**FDK:083N8084**	**FDK:083N8085**	**FDK:083N8039**
DN 400	**FDK:083N8099**	**FDK:083N8100**	**FDK:083N8100**	**FDK:083N8101**	**FDK:083N8102**	**FDK:083N8100**
DN 450	**FDK:083N8103**	**FDK:083N8103**	**FDK:083N8104**	**FDK:083N8104**	**FDK:083N8105**	**FDK:083N8104**
DN 500	**FDK:083N8107**	**FDK:083N8107**	**FDK:083N8108**	**FDK:083N8108**	**FDK:083N8109**	**FDK:083N8108**
DN 600	**FDK:083N8111**	**FDK:083N8111**	**FDK:083N8112**	**FDK:083N8112**		**FDK:083N8113**
DN 700	**FDK:083N8300**	**FDK:083N8294**	**FDK:083N8294**			**FDK:083N8372**
DN 750						
DN 800	**FDK:083N8303**	**FDK:083N8304**	**FDK:083N8304**			**FDK:083N8373**
DN 900	**FDK:083N8306**	**FDK:083N8307**	**FDK:083N8307**			**FDK:083N8396**
DN 1000	**FDK:083N8309**	**FDK:083N8310**	**FDK:083N8310**			**FDK:083N8397**
DN 1100		**FDK:083N8367**	**FDK:083N8367**			**FDK:083N8367**
DN 1200	**FDK:083N8312**	**FDK:083N8313**	**FDK:083N8313**			**FDK:083N8398**
DN 1400	**FDK:083N8467**	**FDK:083N8468**	**FDK:083N8469**			
DN 1500	**FDK:083N8471**	**FDK:083N8472**	**FDK:083N8473**			
DN 1600	**FDK:083N8475**	**FDK:083N8476**	**FDK:083N8477**			
DN 1800	**FDK:083N8479**	**FDK:083N8480**	**FDK:083N8481**			
DN 2000	**FDK:083N8483**	**FDK:083N8484**	**FDK:083N8485**			

Size Inch	ANSI B16.5 Class 150	Class 300	JIS B 2220:2004 10K	20K	AWWA C-207 Class D
	Article No.	Article No.	Article No.	Article No.	
1"	**FDK:083N8361**	**FDK:083N8361**	**FDK:083N8361**	**FDK:083N8361**	
1½"	**FDK:083N8362**	**FDK:083N8362**	**FDK:083N8362**	**FDK:083N8362**	
2"	**FDK:083N8344**	**FDK:083N8344**	**FDK:083N8344**	**FDK:083N8344**	
2½"	**FDK:083N8345**	**FDK:083N8345**	**FDK:083N8345**	**FDK:083N8345**	
3"	**FDK:083N8347**	**FDK:083N8347**	**FDK:083N8347**	**FDK:083N8347**	
4"	**FDK:083N8025**	**FDK:083N8025**	**FDK:083N8070**	**FDK:083N8025**	
5"	**FDK:083N8071**	**FDK:083N8071**	**FDK:083N8071**	**FDK:083N8071**	
6"	**FDK:083N8008**	**FDK:083N8073**	**FDK:083N8008**	**FDK:083N8008**	
8"	**FDK:083N8011**	**FDK:083N8076**	**FDK:083N8011**	**FDK:083N8011**	
10"	**FDK:083N8013**	**FDK:083N8079**	**FDK:083N8013**	**FDK:083N8079**	
12"	**FDK:083N8012**	**FDK:083N8082**	**FDK:083N8012**	**FDK:083N8081**	
14"	**FDK:083N8039**	**FDK:083N8085**	**FDK:083N8083**	**FDK:083N8039**	
16"	**FDK:083N8100**	**FDK:083N8102**	**FDK:083N8100**	**FDK:083N8101**	
18"	**FDK:083N8104**	**FDK:083N8106**	**FDK:083N8103**	**FDK:083N8104**	
20"	**FDK:083N8107**	**FDK:083N8110**	**FDK:083N8107**	**FDK:083N8108**	

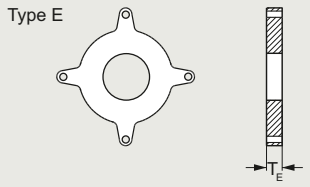
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Selection and ordering data (continued)

Size Inch	ANSI B16.5 Class 150	Class 300	JIS B 2220:2004 10K	20K	AWWA C-207 Class D
24"	FDK:083N8113	FDK:083N8114	FDK:083N8111	FDK:083N8112	
28"					FDK:083N8302
30"					FDK:083N8366
32"					FDK:083N8305
36"					FDK:083N8308
40"					FDK:083N8311
42"					FDK:083N8394
44"					FDK:083N8395
48"					FDK:083N8314
54"					FDK:083N8470
60"					FDK:083N8474
66"					FDK:083N8478
72"					FDK:083N8482
78"					FDK:083N8486

1) Also for FMS500 (7ME653 DN > 300 / 12")

Grounding and protection ring - Type E



- Material: Stainless steel AISI 316
- Only for PTFE liner
- 1 pc. incl. straps and screws

Note:
For use as protection ring order 2 pcs. For use as grounding ring order 1 pc.

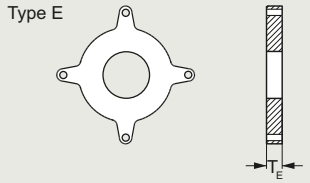
Size DN	EN 1092-1 PN 6	PN 10	PN 16	PN 25	PN 40	AS 2129 Table E
	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.
DN 15					FDK:083N8365	FDK:083N8365
DN 25					FDK:083N8271	FDK:083N8272
DN 32					FDK:083N8274	
DN 40					FDK:083N8278	FDK:083N8280
DN 50					FDK:083N8282	FDK:083N8281
DN 65	FDK:083N8284		FDK:083N8285		FDK:083N8286	FDK:083N8284
DN 80	FDK:083N8288		FDK:083N8289		FDK:083N8290	FDK:083N8293
DN 100	FDK:083N8116		FDK:083N8117		FDK:083N8118	FDK:083N8117
DN 125	FDK:083N8120		FDK:083N8121		FDK:083N8122	FDK:083N8121
DN 150	FDK:083N8124		FDK:083N8125		FDK:083N8126	FDK:083N8128
DN 200	FDK:083N8129	FDK:083N8130	FDK:083N8130	FDK:083N8131	FDK:083N8132	FDK:083N8134
DN 250	FDK:083N8135	FDK:083N8136	FDK:083N8137	FDK:083N8138	FDK:083N8139	FDK:083N8143
DN 300	FDK:083N8144	FDK:083N8144	FDK:083N8145	FDK:083N8146	FDK:083N8147	FDK:083N8151
DN 350	FDK:083N8152	FDK:083N8153	FDK:083N8154	FDK:083N8155	FDK:083N8156	FDK:083N8153
DN 400	FDK:083N8160	FDK:083N8161	FDK:083N8162	FDK:083N8163	FDK:083N8164	FDK:083N8161
DN 450	FDK:083N8168	FDK:083N8169	FDK:083N8170	FDK:083N8171	FDK:083N8172	FDK:083N8176
DN 500	FDK:083N8177	FDK:083N8178	FDK:083N8179	FDK:083N8180	FDK:083N8181	FDK:083N8185
DN 600	FDK:083N8186	FDK:083N8187	FDK:083N8188	FDK:083N8189		A5E32710253

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Selection and ordering data (continued)

Size Inch	ANSI B16.5 Class 150	Class 300	JIS B 2220:2004 10K	20K
	Article No.	Article No.	Article No.	Article No.
½"	**FDK:083N8365**	**FDK:083N8365**		
1"	**FDK:083N8272**	**FDK:083N8272**	**FDK:083N8271**	**FDK:083N8271**
1½"	**FDK:083N8279**	**FDK:083N8279**	**FDK:083N8278**	**FDK:083N8278**
2"	**FDK:083N8283**	**FDK:083N8283**	**FDK:083N8282**	**FDK:083N8282**
2½"	**FDK:083N8287**	**FDK:083N8287**	**FDK:083N8285**	**FDK:083N8285**
3"	**FDK:083N8291**	**FDK:083N8292**	**FDK:083N8288**	**FDK:083N8289**
4"	**FDK:083N8118**	**FDK:083N8119**	**FDK:083N8116**	**FDK:083N8117**
5"	**FDK:083N8122**	**FDK:083N8123**	**FDK:083N8121**	**FDK:083N8122**
6"	**FDK:083N8126**	**FDK:083N8127**	**FDK:083N8125**	**FDK:083N8126**
8"	**FDK:083N8370**	**FDK:083N8133**	**FDK:083N8130**	**FDK:083N8370**
10"	**FDK:083N8140**	**FDK:083N8141**	**FDK:083N8137**	**FDK:083N8139**
12"	**FDK:083N8148**	**FDK:083N8149**	**FDK:083N8144**	**FDK:083N8146**
14"	**FDK:083N8157**	**FDK:083N8158**	**FDK:083N8152**	**FDK:083N8154**
16"	**FDK:083N8165**	**FDK:083N8166**	**FDK:083N8160**	**FDK:083N8165**
18"	**FDK:083N8173**	**FDK:083N8174**	**FDK:083N8169**	**FDK:083N8171**
20"	**FDK:083N8182**	**FDK:083N8183**	**FDK:083N8178**	**FDK:083N8180**
24"	**FDK:083N8190**	**FDK:083N8191**	**A5E32709738**	**A5E32710253**

Grounding and protecting ring - Type E



- Material: Hastelloy C276
- Only for PTFE liner
- 1 pc. incl. straps and screws

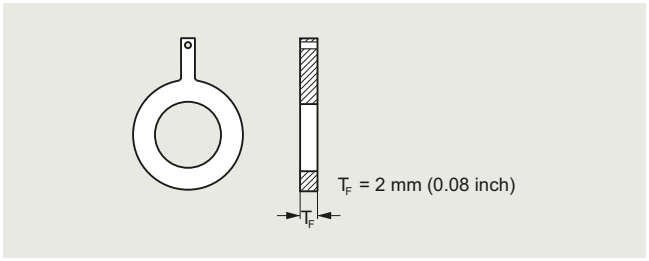
Note:
For use as protection ring order 2 pcs. For use as grounding ring order 1 pc.

Size DN	EN 1092-1 PN 6	PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.	Article No.		Article No.	Article No.
DN 15			**FDK:083N8487**	½"	**FDK:083N8487**	**FDK:083N8487**
DN 25			**FDK:083N8488**	1"	**FDK:083N8489**	**FDK:083N8489**
DN 40			**FDK:083N8490**	1½"	**FDK:083N8491**	**FDK:083N8491**
DN 50			**FDK:083N8492**	2"	**FDK:083N8493**	**FDK:083N8493**
DN 65	**FDK:083N8494**	**FDK:083N8495**	**FDK:083N8496**	2½"	**FDK:083N8497**	**FDK:083N8497**
DN 80	**FDK:083N8498**	**FDK:083N8499**	**FDK:083N8500**	3"	**FDK:083N8501**	**FDK:083N8502**
DN 100	**FDK:083N8503**	**FDK:083N8504**	**FDK:083N8505**	4"	**FDK:083N8506**	**FDK:083N8507**

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Selection and ordering data (continued)

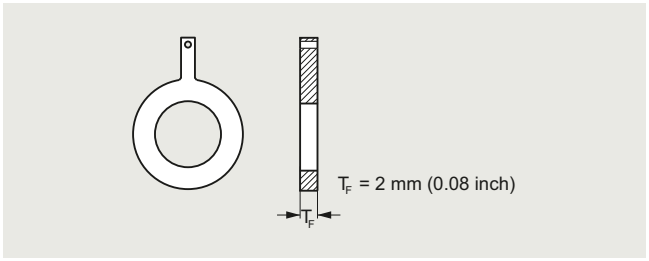
Grounding ring - Type Flat ring



- Material: Stainless steel AISI 316
- For all liners
- 1 pc.

Size DN	EN 1092-1 PN 10	PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.	Article No.		Article No.	Article No.
DN 15			**A5E01191968**	½"	**A5E01191969**	
DN 25			**A5E01150880**	1"	**A5E01150022**	**A5E01150378**
DN 32			**A5E50640502**	1¼"	**A5E50640507**	**A5E50640516**
DN 40			**A5E01191952**	1½"	**A5E01191961**	
DN 50			**A5E01150918**	2"	**A5E01151121**	**A5E01151194**
DN 65		**A5E01191940**	**A5E01191954**	2½"	**A5E01191962**	
DN 80		**A5E01152876**	**A5E01152876**	3"	**A5E01152910**	**A5E01153422**
DN 100		**A5E01158875**	**A5E01159072**	4"	**A5E01159146**	**A5E01159628**
DN 125		**A5E01191941**	**A5E01191956**	5"	**A5E01191963**	
DN 150		**A5E01191943**	**A5E01191957**	6"	**A5E01191964**	
DN 200	**A5E01191951**	**A5E01191944**	**A5E01191958**	8"	**A5E01191965**	
DN 250	**A5E01191950**	**A5E01191946**	**A5E01191959**	10"	**A5E01191966**	
DN 300	**A5E01191949**	**A5E01191947**	**A5E01191960**	12"	**A5E01191967**	

Grounding ring - Type Flat ring



- Material: Hastelloy C276
- For all liners
- 1 pc.

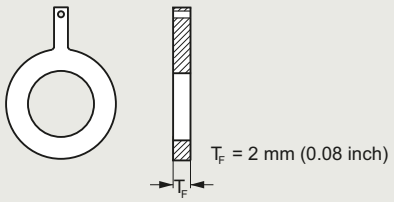
Size DN	EN 1092-1 PN 6	PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.	Article No.		Article No.	Article No.
DN 15			**A5E01191981**	½"	**A5E01191989**	
DN 25			**A5E01150882**	1"	**A5E01150028**	**A5E01150379**
DN 40			**A5E01191982**	1½"	**A5E01191990**	
DN 50			**A5E01150922**	2"	**A5E01151124**	**A5E01151197**
DN 65		**A5E01191971**	**A5E01191983**	2½"	**A5E01191991**	
DN 80		**A5E01152889**	**A5E01152889**	3"	**A5E01152913**	**A5E01153424**
DN 100		**A5E01158886**	**A5E01159074**	4"	**A5E01159150**	**A5E01159629**
DN 125		**A5E01191973**	**A5E01191984**	5"	**A5E01191992**	
DN 150		**A5E01191974**	**A5E01191985**	6"	**A5E01191993**	

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Selection and ordering data (continued)

Size DN	EN 1092-1 PN 6	PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
DN 200	**A5E01191978**	**A5E01191975**	**A5E01191986**	8"	**A5E01191994**	
DN 250	**A5E01191979**	**A5E01191976**	**A5E01191987**	10"	**A5E01191995**	
DN 300	**A5E01191980**	**A5E01191977**	**A5E01191988**	12"	**A5E01191996**	

Grounding ring - Type Flat ring



- Material: Tantalum
- For all liners
- 1 pc.

Size DN	EN 1092-1 PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.		Article No.	Article No.
DN 15		**A5E01192007**	½"	**A5E01192010**	
DN 25		**A5E01150883**	1"	**A5E01150030**	**A5E01150381**
DN 40		**A5E01192008**	1½"	**A5E01192011**	
DN 50		**A5E01150926**	2"	**A5E01151129**	**A5E01151199**
DN 65	**A5E01192005**	**A5E01192009**	2½"	**A5E01192012**	
DN 80	**A5E01152890**	**A5E01152890**	3"	**A5E01152916**	**A5E01153427**
DN 100	**A5E01158891**	**A5E01159076**	4"	**A5E01159156**	**A5E01159631**

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Technical specifications

SITRANS FMS300	
Product characteristic	Versatile product to meet the diverse demands of various industries such as process, chemical, steel, mining, utility, power generation and distribution, oil and gas/HPI, water and wastewater
Measurement of	Volume flow, flow velocity, electrical conductivity
Nominal diameter	Full bore sensor: DN 15 ... 2200 (½" ... 88")
Mode of operation	
Measuring principle	Electromagnetic induction
Medium conductivity	Liquids with an electrical conductivity ≥ 5 µS/cm
Excitation frequency (mains supply: 50 Hz / 60 Hz)	DN 15 ... 65 (½ ... 2½ inch):12.5 Hz / 15 Hz DN 80 ... 150 (3 ... 6 inch): 6.25 Hz / 7.5 Hz DN 200 ... 1200 (8 ... 48 inch): 3.125 Hz / 3.75 Hz DN 1400 ... 2200 (54 ... 88 inch): 1.5625 Hz / 1.875 Hz
Performance characteristics	
Electrical conductivity	Repeatability: Max. ±5% of meaured value [4]
Process connection	
Flanges	
• EN 1092-1 [1] [2]	PN 6 (87 psi) Raised face DN 65 ... 2200 (2½ ... 88 inch) PN 10 (145 psi) Raised face DN 200 ... 2200 (8 ... 88 inch) PN 16 (232 psi) Raised face DN 65 ... 2000 (2½ ... 80 inch) PN 25 (362 psi) Raised face DN 200 ... 600 (8 ... 24 inch) PN 40 (580 psi) Raised face DN 15 ... 600 (½ ... 24 inch) PN 63 (913 psi) Raised face DN 50 ... 300 (2 ... 12 inch) PN 100 (1450 psi) Raised face DN 25 ... 300 (1 ... 12 inch)
• ANSI B16.5	Class 150 (290 psi) Raised face ½ ... 24 inch Class 300 (725 psi) Raised face ½ ... 24 inch Class 600 (1450 psi) Raised face 1 ... 16 inch
• AWWA C-207	Class D (145 psi) Flat face 28 ... 88 inch
• AS 2129	Table E (145 psi) Raised face DN 15 ... 1200 (½ ... 48 inch)
• AS 4087 [1]	PN 16 (232 psi) Raised face DN 50 ... 1200 (2 ... 48 inch) PN 21 (304 psi) Raised face DN 50 ... 600 (2 ... 24 inch) PN 35 (508 psi) Raised face DN 50 ... 600 (2 ... 24 inch)
• JIS B 2220:2004	10K DN 25 ... 600 (1 ... 24 inch) 20K DN 25 ... 600 (1 ... 24 inch)
Rated operating conditions	
Storage temperature	-20 ... +70 °C (-4 ... +158 °F)
Ambient temperature (conditions also dependent on material characteristics)	
• Sensor	-40 ... +100 °C (-40 ... +212 °F)
• Compact with transmitter	-40 ... +65 °C (-40 ... +149 °F)
• Display	-20 ... +60 °C (-4 ... +140 °F)
Operating pressure (Maximum operating pressure depending on flange type)	Soft rubber: 0.01 bar_a ... 100 bar_g (0.15 psi_a ... 1450 psi_g) EPDM: 0.01 bar_a ... 40 bar_g (0.15 psi_a ... 580 psi_g) Linatex: 0.01 bar_a ... 40 bar_g (0.15 psi_a ... 580 psi_g) Ebonite: 0.01 bar_a ... 100 bar_g (0.15 psi_a ... 1450 psi_g) PTFE: DN ≤ 300 (≤ 12"): 0.3 bar_a ... 50 bar_g (4 psi_a ... 725 psi_g) PTFE: 350 ≤ DN ≤ 600 (14" ≤ DN ≤ 24"): 0.3 bar_a ... 40 bar_g (4 psi_a ... 580 psi_g) PFA: Vacuum 0.02 bar_a ... 50 bar_g (0.29 psi_a ... 725 psi_g)
Temperature of medium	
• Softrubber[5]	0 ... +70 °C (32 ... 158 °F)
• EPDM	-10 ... +70 °C (14 ... 158 °F)
• PTFE	-20 ... +100 °C (-4 ... +212 °F)
• PTFE & Option J30	-20 ... 150 °C (-4 ... +302 °F)
• PTFE & Option J31	-20 ... 180°C (-4 ... 356 °F) incl. type E protection rings and terminal box in stainless steel. Only for remote version
• Ebonite	0 ... 95 °C (32 ... 203 °F)
• Linatex	-40 ... +70 °C (-40 ... +158 °F)

SITRANS FMS300	
• PFA	-20 ... +100 °C (-4 ... +212 °F)
• PFA & Option J30	-20 ... 150 °C (-4 ... +302 °F)
Degree of protection	
• Standard	IP66/67, NEMA 4X/6
• Optional	IP68 and NEMA 6P (2 m, 10 days) for sensor in compact (integral mount) and remote design IP68 and NEMA 6P (10 m, continuously) for sensor in remote design
Mechanical load (vibration)	
• Integral mount / compact version	Vibration, sinusoidal according to IEC 60068-2-6: • 2 ... 8.4 Hz, 3.5 mm peak • 8.4 ... 500 Hz, 1 g peak Vibration broad-band random, according to IEC 60068-2-64: • 10 ... 200 Hz, 0.003 g^2/Hz • 200 ... 500 Hz, 0.001 g^2/Hz • Total: 0.93 g rms
• Remote Version	Vibration, sinusoidal according to IEC 60068-2-6: Sensor: • 2 ... 8.4 Hz, 7.5 mm peak • 8.4 ... 500 Hz, 2 g peak Transmitter: • 2 ... 8.4 Hz, 1.5 mm peak • 8.4 ... 500 Hz, 0.7 g peak Vibration broad-band random, according to IEC 60068-2 64: Sensor: • 10 ... 200 Hz, 0.01 g^2/-Hz • 200 ... 500 Hz, 0.003 g^2/Hz • Total: 1.67 g rms Transmitter: • 10 ... 200 Hz, 0.003 g^2/-Hz • 200 ... 500 Hz, 0.001 g^2/Hz • Total: 0.93 g rms
Pressure drop	Insignificant (as for straight pipe)
Test pressure	1.5 × PN (where applicable)
Design	
Dimensions	See dimensional drawings
Weight	See dimensional drawings
Material	
• Sensor housing and flanges	• Carbon steel ASTM A 105 with corrosion-resistant coating acc. to EN ISO 12944 class C4 or C5 (durability up to 15 years) • Stainless steel AISI 304 / 1.4301 flanges and carbon steel sensor housing with corrosion-resistant coating acc. to EN ISO 12944 class C4 or C5 (durability up to 15 years) • Stainless steel AISI 316L / 1.4404 flanges and sensor housing, polished
• Measuring electrode	• Stainless steel AISI 316Ti / 1.4571 • Hastelloy C276 / 2.4819 (PFA: Hastelloy C22 / 2.4602) • Platinum • Titanium • Tantalum • Ceramic coated stainless steel AISI 316Ti / 1.4571 • Ceramic coated Hastelloy C276 / 2.4819
• Grounding electrode	• Stainless steel AISI 316Ti / 1.4571 - Standard: Soft rubber[5], EPDM, Ebonite and Linatex - Optional: PTFE, PFA • Hastelloy C276 / 2.4819 - Standard: Soft rubber[5], EPDM, Ebonite and Linatex - Optional: PTFE, PFA (Hastelloy C22 / 2.4602) • Titanium - Optional: PTFE, PFA • Platinum - Optional: PTFE, PFA • Tantalum - Optional: PTFE, PFA
• Measuring tube	Stainless steel AISI 304 / 1.4301 (AISI 316Ti / 1.4571) [3]
• Terminal box	Polycarbonate
Cable entries	4 × metric thread (size M20 × 1.5)
Calibration	
• Standard	Zero-point, 2 × 25% and 2 × 90%
• Optional	5-point calibration: 20%, 40%, 60%, 80%, 100% of factory Q_{max}

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Technical specifications (continued)

SITRANS FMS300	
• Optional	10-point calibration: ascending and descending at 20%, 40%, 60%, 80%, 100% of factory Q_{max}
	Matched pair calibration: default, 5-point or 10-point
	ISO/IEC 17025 accredited, 5-point, matched-pair calibration
Certificates and approvals	
General purpose	CE (LVD, PED, EMC, RoHS), UKCA
Drinking water	EPDM: • WRAS (WRc, BS 6920 material approval for cold water, GB) • NSF/ANSI Standard 61 (Cold water, US) • ACS listed (France) • KTW-BWGL (Germany) • Belgaqua (Belgium) • AS/NZS 4020 (Australia / New Zealand) • GB/T 5750 (China) Ebonite: • WRAS (WRc, BS 6920 material approval for cold water, GB) • NSF/ANSI Standard 61/37[1)] (Cold Water, US) • GB/T5750 (CN) • AS/NZS4020 (Australia/New Zealand)
Custody transfer	• MI-001 cold water (EU): DN 25 ... 600, 1 ... 24 inch
Others	• Environmental Product Declaration (EPD) • CRN (Canadian Registration Number) • EAC (Kazakhstan)

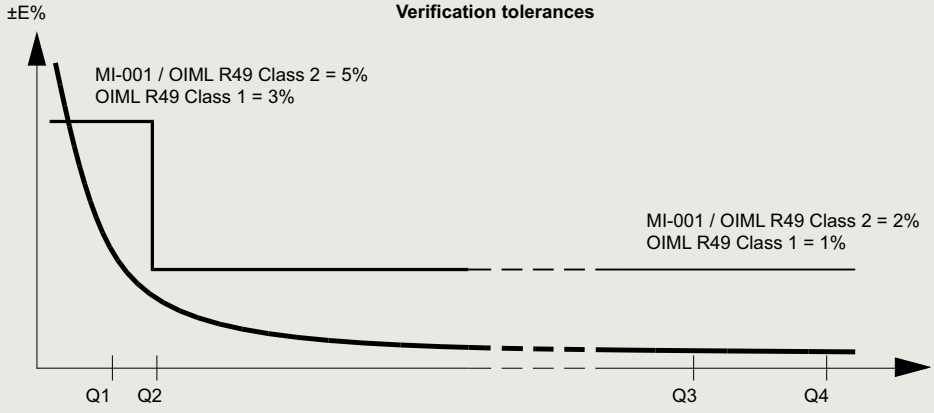
1) DN 750, DN 1050 and DN 1100 (30", 42" and 44") not available with EN 1092-1 and AS 4087 flanges.
2) PN 6-40: DN ≤ 600 type 01 (SORF); DN > 600 type 11 (WNRF); PN 63-100: type 11 (WNRF).
3) Only in combination with flanges and sensor housing in stainless steel AISI 304 / 1.4301.
4) The value applies for measurement between 15 µS/cm and 5000 µS/cm at a reference temperature of 25 °C (77 °F).
5) Devices made in France use Neoprene; Devices made in China use Butyl

FMS300 (7ME636) with FMT020 (7ME694)

The FM320 water meter, which combines the FMS300 sensor and FMT020 transmitter, is EU-type approved according to MID Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on Measuring Instruments (Annex III – Water Meters MI-001). It also meets OIML R49 recommendations for Class 1 and 2 (Water meters for cold potable water and hot water).

Extensive testing has ensured its superior measurement accuracy, even under challenging inlet and outlet conditions. This allows for flexible installation in tight spaces without the need for pipe re-routing, as the FMS300 functions as a 0D/0D device for both Class 1 and Class 2 accuracy, requiring no inlet or outlet sections.

Furthermore, while primarily a cold water meter, the FM320 has been rigorously tested and passed at temperatures up to 50 °C (122 °F), including 30 °C (86 °F). This robust performance means it can be used for custody transfer (CT) purposes up to 50 °C (122 °F).



G00 - Without custody transfer approval Order code: G10 Size	DN 25 (1")	DN 32 (1¼")	DN 40 (1½")	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN											
Orientation	All orientations											
Q3 [m³/h]	10	16	25	63	100	160	250	400	630	1000	1600	1600

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Technical specifications (continued)

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G11

Size	DN 25 (1")	DN 32 (1¼")	DN 40 (1½")	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	**0 × DN**											
Orientation	**All orientations**											
"R" Q3/Q1	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
Q4 [m³/h]	12.5	20	31.25	78.75	125	200	312.50	500	787.5	1250	2000	2000
Q3 [m³/h]	**10**	**16**	**25**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**
Q2 [m³/h]	0.4	0.64	1	2.52	4	6.4	10	16	25.2	40	64	64
Q1 [m³/h]	0.25	0.4	0.63	1.58	2.5	4	6.25	10	15.75	25	40	40

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G13

Size	DN 25 (1")	DN 32 (1¼")	DN 40 (1½")	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	**0 × DN**											
Orientation	**All orientations**											
"R" Q3/Q1	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**
Q4 [m³/h]	12.5	20	31.25	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	**10**	**16**	**25**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**
Q2 [m³/h]	0.2	0.32	0.5	1.26	2	3.2	5	8	12.60	20	32	32
Q1 [m³/h]	0.13	0.2	0.31	0.79	1.25	2	3.13	5	7.88	12.5	20	20

G01 - MI-001
G06 - OIML R49 Class 1
Order code: G15

Size	DN 25 (1")	DN 32 (1¼")	DN 40 (1½")
UxDx	**0 × DN**		
Orientation	**All orientations**		
"R" Q3/Q1	**125**	**125**	**125**
Q4 [m³/h]	12.5	20	31.25
Q3 [m³/h]	**10**	**16**	**25**
Q2 [m³/h]	0.13	0.2	0.32
Q1 [m³/h]	0.08	0.13	0.2

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1 (DN 50 ... 300)
Order code: G16

Size	DN 25 (1")	DN 32 (1¼")	DN 40 (1½")	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	**0 × DN**											
Orientation	**All orientations**											
"R" Q3/Q1	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**
Q4 [m³/h]	12.5	20	31.25	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	**10**	**16**	**25**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**
Q2 [m³/h]	0.1	0.16	0.25	0.63	1	1.60	2.50	4	6.30	10	16	16
Q1 [m³/h]	0.06	0.1	0.16	0.39	0.63	1	1.56	2.5	3.94	6.25	10	10

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Technical specifications (continued)

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1 (DN 50 ... 300)
Order code: G17

Size	DN 25 (1")	DN 32 (1¼")	DN 40 (1½")	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN											
Orientation	All orientations											
"R" Q3/Q1	200	200	200	200	200	200	200	200	200	200	200	200
Q4 [m³/h]	12.5	20	31.25	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	10	16	25	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	0.08	0.13	0.2	0.5	0.8	1.28	2	3.2	5.04	8	12.8	12.8
Q1 [m³/h]	0.05	0.08	0.13	0.32	0.5	0.8	1.25	2	3.15	5	8	8

G01 - MI-001
G05 - OIML R49 Class 2
Order code: G18

Size	DN 25 (1")	DN 32 (1¼")	DN 40 (1½")
UxDx	0 × DN		
Orientation	All orientations		
"R" Q3/Q1	250	250	250
Q4 [m³/h]	12.5	20	31.25
Q3 [m³/h]	10	16	25
Q2 [m³/h]	0.06	0.1	0.16
Q1 [m³/h]	0.04	0.06	0.1

G01 - MI-001
G05 - OIML R49 Class 2
Order code: G20

Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
UxDx	0 × DN								
Orientation	All orientations								
"R" Q3/Q1	400	400	400	400	400	400	400	400	400
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	0.25	0.4	0.64	1	1.6	2.52	4	6.4	6.4
Q1 [m³/h]	0.16	0.25	0.4	0.63	1	1.58	2.5	4	4

G00 - Without custody transfer approval
Order code: G30

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	0 × DN				
Orientation	Horizontal and vertical				
Q3 [m³/h]	2500	4000	4000	6300	6300

G01 - MI-001
G05 - OIML R49 Class 2
G06 - OIML R49 Class 1
Order code: G31

Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	0 × DN				
Orientation	Horizontal and vertical				
"R" Q3/Q1	40	40	40	40	40
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	2500	4000	4000	6300	6300
Q2 [m³/h]	100	160	160	252	252
Q1 [m³/h]	62.5	100	100	157.5	157.5

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Technical specifications (continued)

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G33 Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**80**	**80**	**80**	**80**	**80**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	50	80	80	126	126
Q1 [m³/h]	31.25	50	50	78.75	78.75

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G36 Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**160**	**160**	**160**	**160**	**160**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	25	40	40	63	63
Q1 [m³/h]	15.625	25	25	39.38	39.38

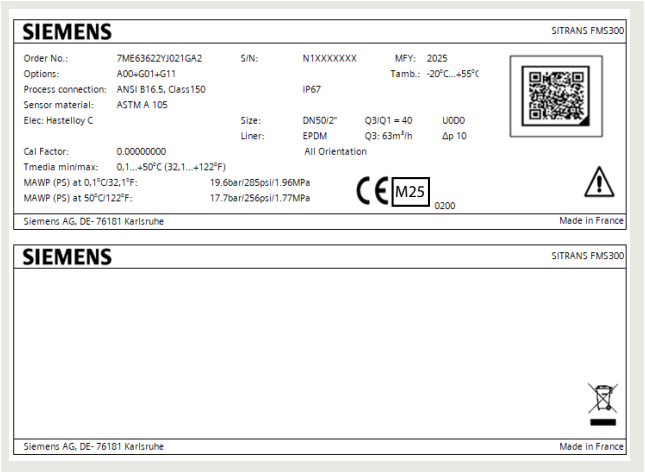
G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G37 Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**200**	**200**	**200**	**200**	**200**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	20	32	32	50.4	50.4
Q1 [m³/h]	12.5	20	20	31.5	31.5

G01 - MI-001 G05 - OIML R49 Class 2 G06 - OIML R49 Class 1 Order code: G40 Size	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
UxDx	**0 × DN**				
Orientation	**Horizontal and vertical**				
"R" Q3/Q1	**400**	**400**	**400**	**400**	**400**
Q4 [m³/h]	3125	5000	5000	7875	7875
Q3 [m³/h]	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	10	16	16	25.20	25.20
Q1 [m³/h]	6.25	10	10	15.75	15.75

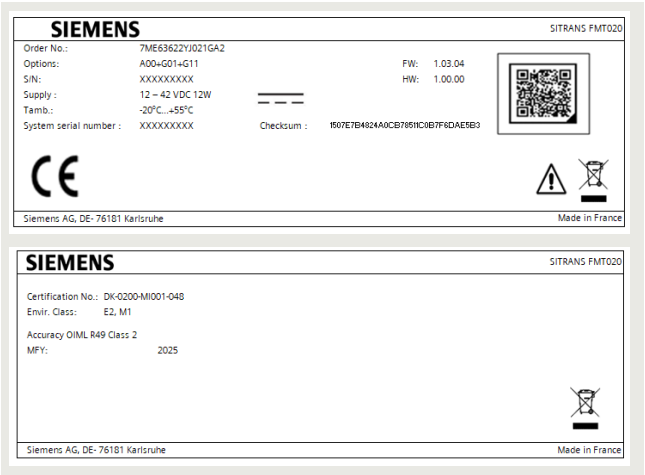
The following label is placed on the sensor terminal box and on the transmitter housing. An example of the product label is shown below:

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Technical specifications (continued)



Sensor label



Transmitter label

FM320 approvals are valid for:

Sizes	DN 50 ... 600 (2" ... 24")
Performance range	R400 Class 2 & Class 1
Installation	• All orientation for DN 25 ... 300 (1 ... 12") • Horizontal and vertical for DN 350 ... 600 (14 ... 24") • Compact or remote with max. 500 m cable • Approved for forward metering but also designed to be used in reverse
Sensitivity class	U0D0 (The meter requires 0xD straight pipe upstream and 0xD straight pipe downstream from the sensor)
Temperature class	• T30 (0.1 ... 30 °C) • T50 (0.1 ... 50 °C)
Pressure	MAWP 16 (Maximum Allowable Working Pressure)
Electromagnetic class	E2
Mechanical class	M1, Class B and O (building and outdoors)
Climatic class	-20 ... 55 °C (-4 ... 131 °F)
Power supply	• 12 ... 42 V DC, 12 W • 100 ... 240 V AC, 50 ... 60 Hz, 25 VA
Software	Designed according to WELMEC 7.2
Communication modules [1]	HART, PROFINET, MODBUS and EtherNet/IP have been certified and can only be used where national regulations permit it. The reading of ancillary devices may be used for testing and verification and for remote reading of the water meter.

[1] Communication module need to be ordered together with the system (FM320), a retrofit of the communication module is not possible since it would break the CT seals.

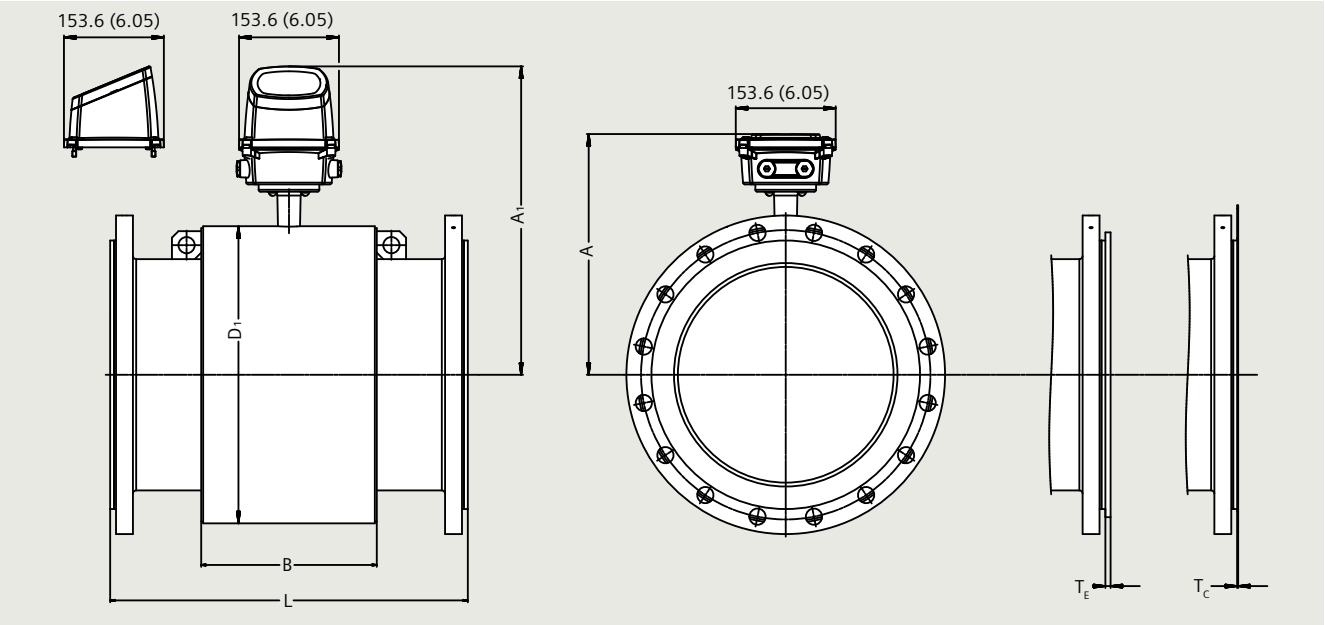
Special MI-001 settings:

- Unit: m^3
- Low flow cut-off: 9 mm/s
- Digital output: pulses

For other factory settings, see the operating instructions.

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Dimensional drawings



SITRANS FMS300 sensor in compact (integral-mount transmitter) and remote design. Dimensions in mm (inch)

Metric

DN	A	A_1	B	D1	L[1] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 length 1.0 × DN	PN 25	PN 40	PN 63	PN 100
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
15	180	284	59	104	-	-/-	-	200	-	-
25	180	284	59	104	-	-/-	-	200	-	260 [2]
32	190	294	86	114	-	-/-	-	200	-	280 [2]
40	190	294	82	124	-	-/-	-	200	-	280 [2]
50	198	302	72	139	-	-/-	-	200	276 [2]	300 [2]
65	205	309	72	154	200	200/-	-	200	320 [2]	350 [2]
80	215	319	72	174	200	200/-	-	272 [2]	323 [2]	340 [2]
100	235	339	85	214	250	250/-	-	250	380 [2]	400 [2]
125	248	352	85	239	250	250/-	-	250	420 [2]	450 [2]
150	269	373	85	282	300	300/-	-	300	415 [2]	450 [2]
200	297	401	137	338	350	350/-	350	350	480 [2]	530 [2]
250	325	429	157	393	450	450/-	450	450	550 [2]	620 [2]
300	350	454	157	444	500	500/-	500	500	600 [2]	680 [2]
350	355	459	270	451	550	550/-	550	550	-	-
400	380	484	270	502	600	600/-	600	600	-	-
450	411	515	310	563	600	600/-	600	600	-	-
500	436	540	350	614	600	600/-	625	680	-	-
600	487	591	320	715	600	600/-	750	800	-	-
700	537	641	450	816	700	875/700	800	-	-	-
750	564	668	556	869	-	-/-	-	-	-	-
800	599	703	560	927	800	1000/800	900	-	-	-
900	646	750	630	1032	900	1125/900	1000	-	-	-
1000	697	801	670	1136	1000	1250/1000	1100	-	-	-
1050	697	801	670	1136	-	-/-	-	-	-	-
1100	748	847	770	1238	-	-/-	-	-	-	-
1200	803	907	792	1348	1200	1500/1200	1300	-	-	-
1400	918	1022	1000	1574	1400	-/1400	-	-	-	-
1500	965	1069	1020	1672	1500	-/1500	-	-	-	-
1600	1018	1122	1130	1774	1600	-/1600	-	-	-	-
1800	1116	1220	1250	1974	1800	-/1800	-	-	-	-

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Dimensional drawings (continued)

DN	A	A_1	B	D1	L[1] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 length 1.0 × DN	PN 25	PN 40	PN 63	PN 100
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
2000	1216	1320	1375	2174	2000	-/2000	-	-	-	-
2200	1346	1450	1496	2400	2200	-/-	-	-	-	-

1) When grounding or protection rings are used, the thickness of the grounding or protection ring must be added to the sensor face-to-face length
2) Not according to ISO 20456

DN	A	A_1	B	D1	L[1] ANSI B16.5 Class 150	Class 300	Class 600	AWWA C-207 Class D	AS 4087 PN 16, PN 21, PN 35	AS 2129 Table E
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
15	180	284	59	104	200	200	-	-	-	200
25	180	284	59	104	200	200	280 [3]	-	-	200
32	190	294	86	114	200	200	300 [3]	-	-	200
40	190	294	82	124	200	200	320 [3]	-	-	200
50	198	302	72	139	200	200	330 [3]	-	200	200
65	205	309	72	154	200	272 [3]	370 [3]	-	200	200
80	215	319	72	174	272 [3]	272 [3]	350 [3]	-	272 [2][3]	272 [3]
100	235	339	85	214	250	310 [3]	460 [3]	-	250	250
125	248	352	85	239	250	335 [3]	480 [3]	-	-	250
150	269	373	85	282	300	300	500 [3]	-	300	300
200	297	401	137	338	350	350	600 [3]	-	350	350
250	325	429	157	393	450	450	600 [3]	-	450	450
300	350	454	157	444	500	500	700 [3]	-	500	500
350	355	459	270	451	550	550	800 [3]	-	550	550
400	380	484	270	502	600	600	820 [3]	-	600	600
450	411	515	310	563	600	640		-	600	600
500	436	540	350	614	600	730		-	600 [4]	600
600	487	591	320	715	600	860		-	600 [5]	600
700	537	641	450	816	800	-		700	700 [6]	700
750	564	668	556	869	950	-		750	-	750
800	599	703	560	927	900	-		800	800 [6]	800
900	646	750	630	1032	1100	-		900	900 [6]	900
1000	697	801	670	1136	1100	-		1000	1000 [6]	1000
1050	697	801	670	1136	-	-		1000	-	-
1100	748	847	770	1238	-	-		1100	-	-
1200	803	907	792	1348	1400	-		1200	1200 [6]	1200
1400	918	1022	1000	1574	-	-	-	1400	-	-
1500	965	1069	1020	1672	-	-	-	1500	-	-
1600	1018	1122	1130	1774	-	-	-	1600	-	-
1800	1116	1220	1250	1974	-	-	-	1800	-	-
2000	1216	1320	1375	2174	-	-	-	2000	-	-
2200	1346	1450	1496	2400	-	-	-	2200	-	-

1) When grounding or protection rings are used, the thickness of the grounding or protection ring must be added to the sensor face-to-face length
2) AS 4087, PN 35, DN 80 = 272 mm
3) Not according to ISO 20456
4) AS 4087, PN 35, DN 500 = 680 mm
5) AS 4087, PN 35, DN 600 = 750 mm
6) Not available for AS 4087, PN 21 or PN 35

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Dimensional drawings (continued)

DN	A	A_1	B	D1	L[1] JIS B 2220:2004 10K	L[1] JIS B 2220:2004 20K	T_C [2]	T_E [2]	T_F [2]	Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
15	180	284	59	104	200	200	-	6.0	2.0	4
25	180	284	59	104	200	200	1.2	6.0	2.0	5
32	190	294	86	114	200	240 [3]	1.2	6.0	2.0	7
40	190	294	82	124	200	240 [3]	1.2	6.0	2.0	8
50	198	302	72	139	200	240 [3]	1.2	6.0	2.0	9
65	205	309	72	154	200	272 [3]	1.2	6.0	2.0	11
80	215	319	72	174	200	272 [3]	1.2	6.0	2.0	12
100	235	339	85	214	250	310 [3]	1.2	6.0	2.0	16
125	248	352	85	239	250	335 [3]	1.2	6.0	2.0	19
150	269	373	85	282	300	300	1.2	6.0	2.0	27
200	297	401	137	338	350	350	1.2	8.0	2.0	40
250	325	429	157	393	450	450	1.2	8.0	2.0	60
300	350	454	157	444	500	500	1.6	8.0	2.0	80
350	355	459	270	451	550	550	1.6	8.0	-	110
400	380	484	270	502	600	600	1.6	10.0	-	125
450	411	515	310	563	600	640	1.6	10.0	-	175
500	436	540	350	614	600	680	1.6	10.0	-	200
600	487	591	320	715	600	800	1.6	10.0	-	287
700	537	641	450	816	-	-	2.0	-	-	330
750	564	668	556	869	-	-	2.0	-	-	360
800	599	703	560	927	-	-	2.0	-	-	450
900	646	750	630	1032	-	-	2.0	-	-	530
1000	697	801	670	1136	-	-	2.0	-	-	660
1050	697	801	670	1136	-	-	2.0	-	-	660
1100	748	847	770	1238	-	-	2.0	-	-	1140
1200	803	907	792	1348	-	-	2.0	-	-	1180
1400	918	1022	1000	1574	-	-	2.0	-	-	1600
1500	965	1069	1020	1672	-	-	3.0	-	-	2460
1600	1018	1122	1130	1774	-	-	3.0	-	-	2525
1800	1116	1220	1250	1974	-	-	3.0	-	-	2930
2000	1216	1320	1375	2174	-	-	3.0	-	-	3665
2200	1346	1450	1496	2400	-	-	-	-	-	5690

1) When grounding or protection rings are used, the thickness of the grounding or protection ring must be added to the sensor face-to-face length
2) T_C = Protection ring type C, T_E = Grounding ring type E, T_F = Grounding ring type Flat ring
3) Not according to ISO 20456

Imperial

DN	A	A_1	B	D1	L[1] [2] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 length 1.0 × DN	PN 25	PN 40	PN 63	PN 100
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
½"	7.36	13.31	2.32	4.09	-	-/-	-	7.87	-	-
1"	7.36	13.31	2.32	4.09	-	-/-	-	7.87	-	10.24 [2]
1¼"	7.6	13.6	3.4	4.5	-	-/-	-	7.87	-	11.02 [2]
1½"	7.76	13.7	3.23	4.88	-	-/-	-	7.87	-	11.02 [2]
2"	8.07	14.01	2.83	5.47	-	-/-	-	7.87	10.87 [2]	11.81 [2]
2½"	8.35	14.29	2.83	6.06	7.87	7.87/-	-	7.87	12.60 [2]	13.78 [2]
3"	8.74	14.69	2.83	6.85	7.87	7.87/-	-	10.71 [2]	12.72 [2]	13.39 [2]
4"	9.53	15.47	3.35	8.43	9.84	9.84/-	-	9.84	14.96 [2]	15.75 [2]
5"	10.04	15.98	3.35	9.41	9.84	9.84/-	-	9.84	16.54 [2]	17.72 [2]
6"	10.87	16.81	5.39	11.10	11.81	11.81/-	-	11.81	16.34 [2]	17.72 [2]
8"	11.97	17.91	5.39	13.31	13.78	13.78/-	13.78	13.78	18.90 [2]	20.87 [2]
10"	13.07	19.02	6.18	15.47	17.72	17.72/-	17.72	17.72	21.65 [2]	24.41 [2]
12"	14.05	20.00	6.18	17.48	19.69	19.69	19.69	19.69	23.62 [2]	26.77 [2]
14"	14.25	20.20	10.63	17.76	21.65	21.65/-	21.65	21.65	-	-
16"	15.24	21.18	10.63	19.76	23.62	23.62/-	23.62	23.62	-	-
18"	16.45	22.40	12.20	22.16	23.62	23.62/-	23.62	23.62	-	-
20"	17.44	23.39	13.78	24.17	23.62	23.62/-	24.61	26.77	-	-

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Dimensional drawings (continued)

DN	A	A_1	B	D1	L[1) 2)] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 length 1.0 × DN	PN 25	PN 40	PN 63	PN 100
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
24"	19.45	25.39	12.59	28.15	23.62	23.62/-	29.53	31.50	-	-
28"	21.42	27.36	17.72	32.13	27.56	34.45/27.56	31.50	-	-	-
30"	22.48	28.43	21.89	34.21	-	-/-	-	-	-	-
32"	23.86	29.80	22.05	36.50	31.50	39.37/31.50	35.43	-	-	-
36"	25.71	31.65	24.80	40.63	35.43	44.29/35.43	39.38	-	-	-
40"	27.72	33.85	26.38	44.72	39.37	49.21/39.37	43.32	-	-	-
42"	27.72	33.85	26.38	44.72	-	-/-	-	-	-	-
44"	29.72	35.67	30.31	48.74	-	-/-	-	-	-	-
48"	31.89	37.83	31.18	53.07	47.24	59.06/47.24	51.19	-	-	-
54"	36.42	42.36	39.37	61.97	55.12	-/55.12	-	-	-	-
60"	38.27	44.21	40.15	65.83	59.06	-/59.06	-	-	-	-
66"	40.35	46.30	44.49	69.84	62.99	-/62.99	-	-	-	-
72"	44.21	50.16	49.21	77.72	70.87	-/70.87	-	-	-	-
78"	48.15	54.09	54.13	85.59	78.74	-/78.74	-	-	-	-
88"	53.30	59.03	58.90	94.50	86.60	-/-	-	-	-	-

1) When grounding or protection rings are used, the thickness of the grounding or protection ring must be added to the sensor face-to-face length
2) Not according to ISO 20456

DN	A	A_1	B	D1	L[1)] ANSI B16.5 Class 150	AWWA C-207 Class 300	AWWA C-207 Class 600	Class D	AS 4087 PN 16, PN 21, PN 35	AS 2129 Table E
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
½"	7.36	13.31	2.32	4.09	7.87	7.87	-		7.87	7.87
1"	7.36	13.31	2.32	4.09	7.87	7.87	11.02 3)		7.87	7.87
1¼"	7.6	13.6	3.4	4.5	7.87	7.87	11.81 3)		7.87	7.87
1½"	7.76	13.7	3.23	4.88	7.87	7.87	12.60 3)		7.87	7.87
2"	8.07	14.01	2.83	5.47	7.87	7.87	12.99 3)		7.87	7.87
2½"	8.35	14.29	2.83	6.06	7.87	10.71 3)	14.57 3)		7.87	7.87
3"	8.74	14.69	2.83	6.85	10.71 3)	10.71 3)	13.78 3)		7.87 2)3)	7.87 3)
4"	9.53	15.47	3.35	8.43	9.84	12.20 3)	18.11 3)		9.84	9.84
5"	10.04	15.98	3.35	9.41	9.84	13.19 3)	18.90 3)		-	9.84
6"	10.87	16.81	5.39	11.10	11.81	11.81	19.68 3)		11.81	11.81
8"	11.97	17.91	5.39	13.31	13.78	13.78	23.62 3)		13.78	13.78
10"	13.07	19.02	6.18	15.47	17.72	17.72	23.62 3)		17.72	17.72
12"	14.05	20.00	6.18	17.48	19.69	16.69	27.56 3)		19.69	19.69
14"	14.25	20.20	10.63	17.76	21.65	21.65	31.50 3)		21.65	21.65
16"	15.24	21.18	10.63	19.76	23.62	23.62	32.28 3)		23.62	23.62
18"	16.45	22.40	12.20	22.16	23.62	25.20	-		23.62	23.62
20"	17.44	23.39	13.78	24.17	23.62	28.70	-		23.62 4)	23.62
24"	19.45	25.39	12.59	28.15	23.62	33.80	-		23.62 5)	23.62
28"	21.42	27.36	17.72	32.13	31.50	-	-	27.56	27.56 6)	27.56
30"	22.48	28.43	21.89	34.21	37.41	-	-	29.53	-	29.53
32"	23.86	29.80	22.05	36.50	35.43	-	-	31.50	31.50 6)	31.50
36"	25.71	31.65	24.80	40.63	43.32	-	-	35.43	35.43 6)	35.43
40"	27.72	33.85	26.38	44.72	43.32	-	-	39.37	39.37 6)	39.37
42"	27.72	33.85	26.38	44.72	-	-	-	39.37	-	-
44"	29.72	35.67	30.31	48.74	-	-	-	43.31	-	-
48"	31.89	37.83	31.18	53.07	55.12	-	-	47.24	47.24 6)	47.24
54"	36.42	42.36	39.37	61.97	-	-	-	55.12	-	-
60"	38.27	44.21	40.15	65.83	-	-	-	59.06	-	-
66"	40.35	46.30	44.49	69.84	-	-	-	62.99	-	-
72"	44.21	50.16	49.21	77.72	-	-	-	70.87	-	-
78"	48.15	54.09	54.13	85.59	-	-	-	78.74	-	-
88"	53.30	59.03	58.90	94.50	-	-	-	86.61	-	-

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Dimensional drawings (continued)

1) When grounding or protection rings are used, the thickness of the grounding or protection ring must be added to the sensor face-to-face length
2) AS 4087, PN 35, DN 80 (3") = 10.07 inch
3) Not according to ISO 20456
4) AS 4087, PN 35, DN 500 (20") = 26.77 inch
5) AS 4087, PN 35, DN 600 (24") = 29.53 inch
6) Not available for AS 4087, PN 21 or PN 35

DN	A	A_1	B	D1	L 1) JIS B 2220:2004		T_C 2)	T_E 2)	T_F 2)	Weight
					10K	20K				
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[lbs]
½"	7.36	13.31	2.32	4.09	7.87	7.87	-	0.24	0.08	9
1"	7.36	13.31	2.32	4.09	7.87	7.87	0.5	0.24	0.08	11
1¼"	7.6	13.6	3.4	4.5	7.87	9.44 3)	0.5	0.24	0.08	11
1½"	7.76	13.7	3.23	4.88	7.87	9.44 3)	0.5	0.24	0.08	17
2"	8.07	14.01	2.83	5.47	7.87	9.44 3)	0.5	0.24	0.08	20
2½"	8.35	14.29	2.83	6.06	7.87	10.71 3)	0.5	0.24	0.08	24
3"	8.74	14.69	2.83	6.85	7.87	10.71 3)	0.5	0.24	0.08	26
4"	9.53	15.47	3.35	8.43	9.84	12.20 3)	0.5	0.24	0.08	35
5"	10.04	15.98	3.35	9.41	9.84	13.19 3)	0.5	0.24	0.08	42
6"	10.87	16.81	5.39	11.10	11.81	11.81	0.5	0.24	0.08	60
8"	11.97	17.91	5.39	13.31	13.78	13.78	0.5	0.31	0.08	88
10"	13.07	19.02	6.18	15.47	17.72	17.72	0.5	0.31	0.08	132
12"	14.05	20.00	6.18	17.48	19.69	16.69	0.6	0.31	0.08	176
14"	14.25	20.20	10.63	17.76	21.65	21.65	0.6	0.31	-	242
16"	15.24	21.18	10.63	19.76	23.62	23.62	0.6	0.39	-	275
18"	16.45	22.40	12.20	22.16	23.62	25.20	0.6	0.39	-	385
20"	17.44	23.39	13.78	24.17	23.62	26.77	0.6	0.39	-	440
24"	19.45	25.39	12.59	28.15	23.62	31.49	0.6	0.39	-	633
28"	21.42	27.36	17.72	32.13	-	-	0.8	-	-	728
30"	22.48	28.43	21.89	34.21	-	-	0.8	-	-	794
32"	23.86	29.80	22.05	36.50	-	-	0.8	-	-	992
36"	25.71	31.65	24.80	40.63	-	-	0.8	-	-	1168
40"	27.72	33.85	26.38	44.72	-	-	0.8	-	-	1455
42"	27.72	33.85	26.38	44.72	-	-	0.8	-	-	1455
44"	29.72	35.67	30.31	48.74	-	-	0.8	-	-	2513
48"	31.89	37.83	31.18	53.07	-	-	0.8	-	-	2601
54"	36.42	42.36	39.37	61.97	-	-	0.12	-	-	3528
60"	38.27	44.21	40.15	65.83	-	-	0.12	-	-	5423
66"	40.35	46.30	44.49	69.84	-	-	0.12	-	-	5566
78"	44.21	50.16	49.21	77.72	-	-	0.12	-	-	6460
80"	48.15	54.09	54.13	85.59	-	-	0.12	-	-	8080
88"	53.30	59.03	58.90	94.50	-	-	-	-	-	12544

1) When grounding or protection rings are used, the thickness of the grounding or protection ring must be added to the sensor face-to-face length
2) T_C = Protection ring type C, T_E = Grounding ring type E, T_F = Grounding ring type Flat ring
3) Not according to ISO 20456

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Overview



The SITRANS FMS100 is a magnetic flow sensor suitable for volume flow measurement of liquids (conductive) with a large variety of product options to meet the demands of almost any flow application.

The sensor model provides a high level of flexibility and has a comprehensive set of product features. The FMS100 is deliverable in small sizes for precise dosing, with a high variety of flanges as standard and F&B approvals.

Combined with a flow meter transmitter it is a traditional externally powered electromagnetic flow meter system.

Benefits

- Sensor sizes: DN 2 to DN 100 ($^1/_{12}$" to 4")
- Compact wafer-type design matching for mating flange according to EN 1092-1 and ANSI B16.5 standard
- Unique mechanical design with a wide range of sanitary process connections for the F&B version
- Sanitary design for CIP/SIP cleaning for the F&B version
- Corrosion resistant AISI 316 stainless steel sensor housing
- Highly resistant liner and electrodes fitting most extreme process media
- High temperature version is available for applications with temperatures up to 200 °C (392 °F)
- Hose proof IP66/NEMA 4X enclosure rating
- Option for IP68/NEMA 6P protection class ex works or for upgrading on site
- No moving parts for maintenance-free operation over many years
- Smooth surface with minimal risk of build-up
- SENSORPROM™ Technology provides an automatic upload of start-up settings and calibration data for easy commissioning
- Designed to allow in-situ verification for easy performance check
- Meets PED, 2014/68/EU pressure directive

Application

The SITRANS FMS100 is designed to meet the most common specifications within the chemical and process as well as F&B industries. The field proven flow sensor with high temperature resistance is also the ideal solution for the toughest and challenging applications.

The main applications of the SITRANS FMS100 flow sensor can be found in the following fields:

- Process industry
- Chemical industry
- Water treatment
- Food industry
- Beverage industry
- Pharmaceutical industry

For a complete magnetic flowmeter, the FMS100 flow sensor can be combined with a FMT020 transmitter. The entire flowmeter system either mounted remotely or as a compact unit is operated under the product name SITRANS FM120.

SITRANS FM120: This versatile magnetic flowmeter finds its primary applications in the food and beverage industry as well as in the process, chemical and pharmaceutical industry.

Available sensor sizes from DN 2 to DN 100 ($^1/_{12}$ ... 4").

Measuring accuracy ±0.4% of flow rate, optional ±0.2% of flow rate available.

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Selection and ordering data

Sensor SITRANS FMS100	Article No. 7ME616 ● - ● ● ● ● ● - ● ● A ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Transmitter variant	
No transmitter (sensor only)	0
Transmitter SITRANS FMT020	2
Diameter	
DN 2, $^{1}/_{12}$ inch	1 D
DN 3, $^{1}/_{8}$ inch	1 H
DN 6, ¼ inch	1 M
DN 10, $^{3}/_{8}$ inch	1 R
DN 15, ½ inch	1 V
DN 25, 1 inch	2 D
DN 40, 1½ inch	2 R
DN 50, 2 inch	2 Y
DN 65, 2½ inch	3 F
DN 80, 3 inch	3 M
DN 100, 4 inch	3 T
Process connection	
No process connection	A
Pipe connection R ½", AISI 316L	B
Pipe connection ½" NPT, AISI 316L	C
Pipe connection R ½", Hastelloy C	D
Pipe connection ½" NPT, Hastelloy C	E
Pipe connection R ½", PVDF	F
Pipe connection ½" NPT, PVDF	G
Weld in, DIN 11850 / EN10357	H
Weld in, ISO 2037 / SMS 3008	J
Weld in, Tri-Weld / BS 4825-1	K
Clamp type, DIN 32676	M
Clamp type, ISO 2852 / SMS 3016	N
Clamp type, Tri-Clamp / BS 4825-3	P
Threaded type, DIN 11851	R
Threaded type, SMS 1145	S
Gasket material	
EPDM flat gasket	0
Graphite flat gasket	1
EPDM P gasket	3
PTFE flat gasket	4
Liner material	
PFA	1
Ceramic	2
Electrode material	
Hastelloy C22 / 2.4602 (only with PFA liner)	1
Platinum (only with ceramic liner, with gold brazing alloy ≥ DN 10)	2
Transmitter mounting & enclosure type	
No transmitter (sensor only)	A
Polycarbonate housing, compact design	G
Polycarbonate housing, remote design (wall-mounting unit and sensor terminal board included)	J
Terminal box, electrical connection	
Polycarbonate terminal box, M20 thread	B
Polycarbonate terminal box, M20 thread with ½" NPT adapter	C
Stainless steel terminal box, M20 thread	P
Stainless steel terminal box, M20 thread with ½" NPT adapter	Q

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Selection and ordering data (continued)

Sensor SITRANS FMS100	Article No. 7ME616 ● - ● ● ● ● ● - ● ● A ●
Power supply	
No transmitter (sensor only)	0
12 ... 42 V DC	2
100 ... 240 V AC, 50/60 Hz	3

	Order code
Additional information	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Cable glands	
Without cable glands (blind plugs)	**A00**
M20×1.5 cable glands, material Polyamide	**A02**
½ inch NPT cable glands, material Polyamide	**A05**
M20x1.5 cable glands, material Brass	**A12**
½ inch NPT cable glands, material Brass	**A15**
M20x1.5 cable glands, material Stainless steel	**A22**
½ inch NPT cable glands, material Stainless steel	**A25**
Certificates	
Test report 2.1 (EN 10204)	**C00**
Inspection certificate 3.1 (EN 10204) - Material of pressure-containing and wetted parts	**C12**
Test report 2.2 (EN 10204)	**C14**
Declaration of compliance with the order 2.1 (EN 10204)	**C18**
High accuracy calibration	
High accuracy factory calibration 0.2% of act. vol. flow	**D01**
5-point calibration	
5-point factory calibration	**D10**
10-point calibration	
10-point factory calibration	**D15**
General safety	
CSA General Purpose	**E06**
Country specific approvals	
CRN (Canada)	**E70**
Special certificates	
3A approval	**E85**
Country of origin	
France	**E90**
Communication	
HART with 4 ... 20 mA output, active or passive	**F01**
Modbus RTU / RS 485	**F04**
PROFIBUS PA	**F05**
PROFIBUS PA	**F06**
PROFINET	**F07**
EtherNet/IP	**F09**
MODBUS TCP/IP	**F10**
I/O Extension	
Digital input or output, passive	**F30**
Device options	
Sensor terminal board factory mounted	**J00**
Sensor cables factory mounted	**J01**
Factory preconfigured for transmitter mounting in compact design (integral mount)	**J02**
Display with protection cover	**J03**
Breathing vent M20 thread	**J04**

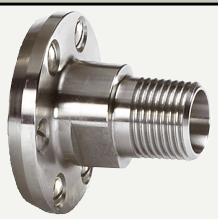
	Order code
Micro-SD memory card, 20 GB	**J06**
Special sensor design	
High temperature version 200 °C (ceramic liner only)	**J30**
Food grade Version	**J33**
Type of protection (IP)	
IP68 (NEMA 6P) protection type for transmitter and sensor, without potting (to 2 m depth, 10 days)	**L50**
IP68 (NEMA 6P) protection class for sensor in remote design, factory potted (to 10 m depth, continuously)	**L51**
Sensor cables	
Cable kit with coil and electrode cable, standard type (3 × 1.5 mm^2), PVC jacket	
• 5 m (16 ft)	**T00**
• 10 m (33 ft)	**T01**
• 20 m (65 ft)	**T03**
• 30 m (98 ft)	**T05**
• 40 m (131 ft)	**T06**
• 50 m (164 ft)	**T07**
Cable kit with coil cable standard type (3 × 1.5 mm^2) and electrode cable special type (3 × 0.25 mm^2), PVC jacket	
• 5 m (16 ft)	**T50**
• 10 m (33 ft)	**T51**
• 15 m (49 ft)	**T52**
• 20 m (65 ft)	**T53**
• 25 m (82 ft)	**T54**
• 30 m (98 ft)	**T55**
• 40 m (131 ft)	**T56**
• 50 m (164 ft)	**T57**
Device settings	
Measuring range: Upper range value for analog and frequency output (Q_{max}), unit, analog output is activated	**Y01**
Current output damping	**Y02**
Current output signal range	**Y03**
Flow direction (default setting: Positive)	**Y05**
Empty pipe detection (default setting: On)	**Y06**
Mains frequency (default setting: 50 Hz)	**Y07**
Operation language display (default setting English)	**Y24**
Device address (PROFIBUS 0 ... 125)	**Y25**
Device identification	
Stainless steel TAG shield for transmitter, line 1, max. 32 characters	**Y11**
Stainless steel TAG shield for transmitter, line 2, max. 32 characters	**Y12**
TAG adhesive label for transmitter, line 1, max. 32 characters	**Y13**
TAG adhesive label for transmitter, line 2, max. 32 characters	**Y14**
Stainless steel TAG shield for sensor, line 1, max. 32 characters	**Y15**
Stainless steel TAG shield for sensor, line 2, max. 32 characters	**Y16**
TAG adhesive label for sensor, line 1, max. 32 characters	**Y18**

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Selection and ordering data (continued)

	Order code
TAG adhesive label for sensor, line 2, max. 32 characters	**Y19**
Totalizer 1 settings	
Preset value	**Y30**
Unit (Default setting: m^3)	**Y31**
Direction (Default setting: Forward counting)	**Y32**
Failure mode (Default setting: Stop counting)	**Y33**
Decimal places (Default setting: 2)	**Y34**
Totalizer 2 settings	
Preset value	**Y35**
Unit (Default setting: m^3)	**Y36**
Direction (Default setting: Backward counting)	**Y37**
Failure mode (Default setting: Stop counting)	**Y38**
Decimal places (Default setting: 2)	**Y39**

	Order code
Totalizer 3 settings	
Preset value	**Y40**
Unit (Default setting: m^3)	**Y41**
Direction (Default setting: Forward / backward counting, net)	**Y42**
Failure mode (Default setting: Stop counting)	**Y43**
Decimal places (Default setting: 2)	**Y44**
Pulse output settings	
Volume per pulse	**Y50**
Pulse width	**Y51**

Description	Article No.	
Pipe connection ½" external thread		
For DN 2 ... 10 (1/12" ... 3/8") sensor Material: Stainless steel AISI 316L 2 pcs. pipe connections, 2 pcs. EPDM gaskets, 12 pcs. M4×14 screws		
• R½" ISO 7-1 tapered thread	**FDK:083G0080**	
• ½" NPT thread	**FDK:083G4330**	
For DN 2 ... 10 (1/12" ... 3/8") sensor Material: Hastelloy C, 2 pcs. pipe connections, 2 pcs. PTFE gaskets, 12 pcs. M4x14 screws		
• R½" ISO 7-1 tapered thread	**FDK:083G4332**	
• ½" NPT thread	**FDK:083G4331**	
For DN 2 ... 10 (1/12" ... 3/8") sensor Material PVDF (Kynar 1000) 2 pcs. pipe connections (Max. 70 °C, PN 8 bar/max 158 °F, 116 PSI), 1 pc. grounding ring made of C22[1)], 1 pc. grounding wire, 3 pcs. PTFE gaskets, 2 pcs. space rings, 6 pcs. M4×14 and M4×25		
• R½" ISO 7-1 tapered thread incl. grounding ring	**A5E01018395**	
• ½" NPT thread incl. grounding ring	**A5E01018400**	
EPDM gaskets Material: EPDM; each set includes: 2 pcs. EPDM gaskets, 1 pc. grounding wire, 1 pc. M6 screw, 1 pc. nut, 1 pc. washer, 1 pc. bolt grounding plate		
• DN 2 ... 10 (1/12" ... 3/8")	**FDK:083G3116**	
• DN 15 (½")	**FDK:083G3117**	
• DN 25 (1")	**FDK:083G3119**	
• DN 40 (1½")	**FDK:083G3121**	
• DN 50 (2")	**FDK:083G3122**	
• DN 65 (2½")	**FDK:083G3123**	
• DN 80 (3")	**FDK:083G3124**	
• DN 100 (4")	**FDK:083G3125**	
PTFE gaskets Material: PTFE; each set includes: 2 pcs. gaskets, 2 pcs. grounding wires, 3 pcs. M6 screws (DN 2 ... 10: 12 pcs. M4×14)		
• DN 2 ... 10 (1/12" ... 3/8")	**FDK:083G0156**	
• DN 15 (½")	**FDK:083G0157**	
• DN 25 (1")	**FDK:083G0159**	
• DN 40 (1½")	**FDK:083G0161**	
• DN 50 (2")	**FDK:083G0162**	
• DN 65 (2½")	**FDK:083G0163**	

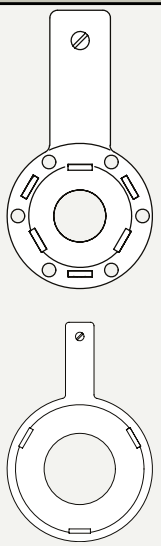
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Selection and ordering data (continued)

Description	Article No.	
• DN 80 (3")	FDK:083G0164	
• DN 100 (4")	FDK:083G0165	
Graphite gaskets Material: Graphite; conductive, each set includes: 2 pcs. gaskets (can also be used as grounding ring)		
• DN 2 ... 10 (1/12" ... 3/8")	FDK:083G0116	
• DN 15 (½")	FDK:083G0117	
• DN 25 (1")	FDK:083G0119	
• DN 40 (1½")	FDK:083G0121	
• DN 50 (2")	FDK:083G0122	
• DN 65 (2½")	FDK:083G0123	
• DN 80 (3")	FDK:083G0124	
• DN 100 (4")	FDK:083G0125	
Grounding ring (stainless steel) Material: AISI 316L/1.4404; each set includes: 1 pc. grounding ring[1)], 3 pcs. PTFE gaskets, 1 pc. earth wire, 1 pc. M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	FDK:083G0686	
• DN 15 (½")	FDK:083G0687	
• DN 25 (1")	FDK:083G0689	
• DN 40 (1½")	FDK:083G0691	
• DN 50 (2")	FDK:083G0692	
• DN 65 (2½")	FDK:083G0693	
• DN 80 (3")	FDK:083G0694	
• DN 100 (4")	FDK:083G0695	
Grounding ring (Hastelloy C) Material: Hastelloy C22/2.4602; each set includes: 1 pc. grounding ring[1)], 3 pcs. PTFE gaskets, 1 pc. earth wire, 1 pc. M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	FDK:083G3256	
• DN 15 (½")	FDK:083G3257	
• DN 25 (1")	FDK:083G3259	
• DN 40 (1½")	FDK:083G3261	
• DN 50 (2")	FDK:083G3262	
• DN 65 (2½")	FDK:083G3263	
• DN 80 (3")	FDK:083G3264	
• DN 100 (4")	FDK:083G3265	
Grounding ring (Tantalum) Material: Tantalum; each set includes: 1 pc. grounding ring[1)], 3 pcs. PTFE gaskets, 1 pc. earth wire, 1 pc. M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	A5E01181599	
• DN 15 (½")	A5E01181606	
• DN 25 (1")	A5E01181610	
• DN 40 (1½")	A5E01181613	
• DN 50 (2")	A5E01181615	

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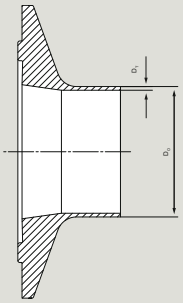
Selection and ordering data (continued)

Description	Article No.	
• DN 65 (2½")	**A5E01181616**	
• DN 80 (3")	**A5E01181619**	
• DN 100 (4")	**A5E01181622**	
Studs and nuts For DN 100 PN 25/40, 8 pcs. M20 studs, 16 pcs. M20 nuts Material: AISI 304/1.4305		
• DN 100 (4")	FDK:083G0226	

1) Thickness of grounding ring is 2 mm (0.08 inch)

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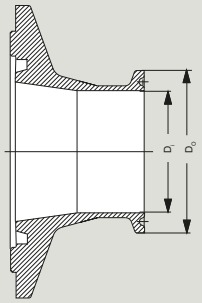
Selection and ordering data (continued)

Description				Article No.
Weld-in connection fittings for use with P gaskets (stainless steel) Material: AISI 316L (1.4404) Only for PFA liner 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), P gaskets not included				
DIN 11850[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
10	13	1.5	10	**A5E02054630**
15	19	1.5	15	**A5E02054633**
20	23	1.5	15	**A5E02054634**
25	29	1.5	25	**A5E02054635**
32	35	1.5	25	**A5E02054637**
40	41	1.5	40	**A5E02054638**
50	53	1.5	50	**A5E02054640**
65	70	2.0	65	**A5E02054643**
80	85	2.0	80	**A5E02054644**
100	104	2.0	100	**A5E02054646**
ISO 2037[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.0	10	**A5E03727946**
17.2	17.2	1.0	15	**A5E03728098**
25	25	1.6	25	**A5E02196073**
33	33.7	1.6	25	**A5E02196074**
38	38	1.6	40	**A5E02196075**
40	40	1.6	40	**A5E02196076**
51	51	1.6	50	**A5E02196077**
63.5	63.5	1.6	65	**A5E02196078**
76.1	76.1	1.6	80	**A5E02196080**
101.6	101.6	2.0	100	**A5E02196082**
Tri-Weld (BS 4825-1)[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.2	10	**A5E02199113**
19.05	19.05	1.2	15	**A5E02199114**
25.4	25.4	1.6	25	**A5E02199115**
38.1	38.1	1.6	40	**A5E02199116**
50.8	50.8	1.6	50	**A5E02199117**
63.5	63.5	1.6	65	**A5E02199118**
76.2	76.2	1.6	80	**A5E02199119**
101.6	101.6	2.0	100	**A5E02199120**

[1] Suitable for 3A

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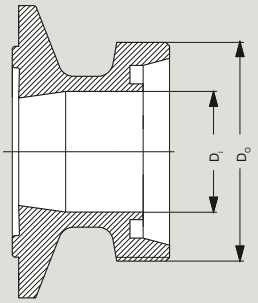
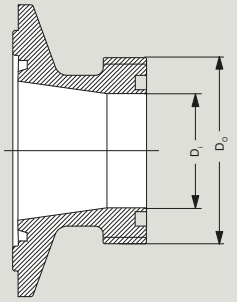
Selection and ordering data (continued)

Description				Article No.
Clamp-type connection fittings for use with P gaskets (stainless steel) Material: AISI 316L (1.4404) Only for liner PFA 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), P gaskets not included				
DIN 32676[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
10	34	10	10	**A5E02211143**
15	34	16	15	**A5E02211144**
25	50.5	22.6	25	**A5E02211146**
40	50.5	38	40	**A5E02211147**
50	64	50	50	**A5E02211148**
65	91	66	65	**A5E02211151**
80	106	81	80	**A5E02211152**
100	119	100	100	**A5E02211153**
ISO 2852[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	50.5	22.6	25	**A5E02213581**
33.7	50.5	31.3	25	**A5E02213582**
38	50.5	35.6	40	**A5E02213583**
51	64	48.6	50	**A5E02213584**
63.5	77.5	60.3	65	**A5E02213585**
76.1	91	72.9	80	**A5E02213586**
101.6	119	97.6	100	**A5E02213587**
Tri-Clamp (BS 4825-3)[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
12.7	25.4	9.5	10	**A5E02213596**
19.05	25.4	15.85	15	**A5E02213597**
25.4	50.5	22.2	25	**A5E02213598**
38.1	50.5	34.9	40	**A5E02213599**
50.8	64	47.6	50	**A5E02213600**
63.5	77.5	60.3	65	**A5E02213601**
76.2	91	73	80	**A5E02213602**
101.6	119	97.6	100	**A5E02213603**

D_o: Outer diameter
D_i: Inner diameter
1) Suitable for 3A

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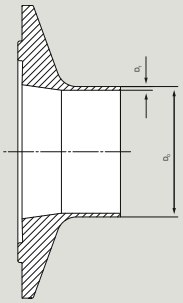
Selection and ordering data (continued)

Description				Article No.
Threaded type connection fittings for use with P gaskets (stainless steel) Material: AISI 316L (1.4404) Only for PFA liner 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), P gaskets not included				
DIN 11851[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
10	28	10	10	**A5E02218293**
15	34	16	15	**A5E02218294**
20	44	20	15	**A5E02218295**
25	52	26	25	**A5E02218296**
32	58	32	25	**A5E02218297**
40	65	38	40	**A5E02218298**
50	78	50	50	**A5E02218299**
65	95	66	65	**A5E02218300**
80	110	81	80	**A5E02218301**
100	130	100	100	**A5E02218302**
SMS 1145[2]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	40	22.6	25	**A5E02218310**
38	60	35.6	40	**A5E02218312**
51	70	48.6	50	**A5E02218313**
63.5	85	60.3	65	**A5E02218314**
76	98	72	65	**A5E02218315**

D_o: Outer diameter
D_i: Inner diameter
1) Suitable for 3A
2) Not suitable for 3A

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Selection and ordering data (continued)

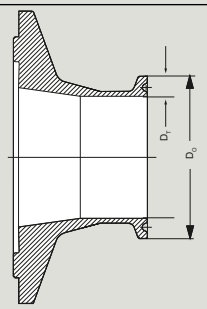
Description				Article No.
Weld-in connection fittings for use with flat gaskets (stainless steel) Material: AISI 316L (1.4404) For PFA liner and ceramic 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), Flat gaskets not included				
DIN 11850[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
10	13	1.5	10	**FDK:083G2116**
15	19	1.5	15	**FDK:083G2117**
20	23	1.5	15	**FDK:083G2118**
25	29	1.5	25	**FDK:083G2119**
32	35	1.5	25	**FDK:083G2120**
40	41	1.5	40	**FDK:083G2121**
50	53	1.5	50	**FDK:083G2122**
65	70	2.0	65	**FDK:083G2123**
80	85	2.0	80	**FDK:083G2124**
100	104	2.0	100	**FDK:083G2125**
ISO 2037[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.0	10	**A5E03720273**
17.2	17.2	1.0	15	**FDK:083G2107**
25	25.6	1.6	25	**FDK:083G2109**
33.7	33.7	1.6	25	**FDK:083G2100**
38	38	1.6	40	**FDK:083G2111**
40	40	1.6	40	**FDK:083G2101**
51	51	1.6	50	**FDK:083G2112**
63.5	63.5	1.6	65	**FDK:083G2113**
76.1	76.1	1.6	80	**FDK:083G2114**
101.6	101.6	2.0	100	**FDK:083G2115**
114.3	118.3	2.0	100	**FDK:083G2105**
Tri-Weld (BS 4825-1)[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.2	10	**FDK:083G2276**
19.05	19.05	1.2	15	**FDK:083G2277**
25.4	25.4	1.6	25	**FDK:083G2279**
38	38.1	1.6	40	**FDK:083G2281**
50.8	50.8	1.6	50	**FDK:083G2282**
63.5	63.5	1.6	65	**FDK:083G2283**
76.2	76.2	1.6	80	**FDK:083G2284**

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Selection and ordering data (continued)

Description				Article No.
101.6	101.6	2.0	100	**FDK:083G2285**

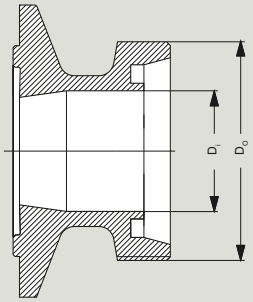
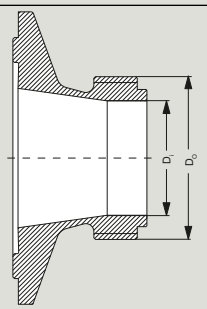
1) Suitable for 3A

Description				Article No.
Clamp-type connection fittings for use with flat gaskets (stainless steel) Material: AISI 316L (1.4404) For PFA liner and ceramic 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), Flat gaskets not included				
DIN 32676[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
10	34	10	10	**FDK:083G2186**
15	34	16	15	**FDK:083G2187**
25	50.5	26	25	**FDK:083G2179**
40	50.5	38	40	**FDK:083G2181**
50	64	50	50	**FDK:083G2182**
65	91	66	65	**FDK:083G2183**
80	106	81	80	**FDK:083G2184**
100	119	100	100	**FDK:083G2185**
ISO 2852[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
25	50.5	22.6	25	**FDK:083G2189**
33.7	50.5	31.3	25	**FDK:083G2190**
38	50.5	35.6	40	**FDK:083G2191**
51	64	48.6	50	**FDK:083G2192**
63.5	77.5	60.3	65	**FDK:083G2193**
76.1	91	72.9	80	**FDK:083G2194**
101.6	119	97.6	100	**FDK:083G2195**
Tri-Clamp (BS 4825-3)[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	25.4	9.5	10	**FDK:083G2286**
19.05	25.4	15.85	15	**FDK:083G2287**
25.4	50.5	22.2	25	**FDK:083G2289**
38.1	50.5	34.9	40	**FDK:083G2291**
50.8	64	47.6	50	**FDK:083G2292**
63.5	77.5	60.3	65	**FDK:083G2293**
76.2	91	73	80	**FDK:083G2294**
101.6	119	97.6	100	**FDK:083G2295**

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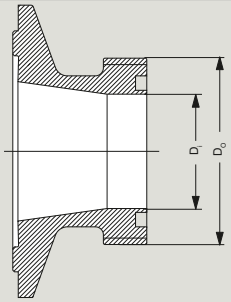
Selection and ordering data (continued)

D_o: Outer diameter
D_i: Inner diameter
1) Suitable for 3A

Description				Article No.
Threaded type connection fittings for use with flat gaskets (stainless steel) Material: AISI 316L (1.4404) For PFA liner and ceramic 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), Flat gaskets not included				
DIN 11851[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
10	28	10	10	**FDK:083G2156**
15	34	16	15	**FDK:083G2157**
20	44	20	15	**FDK:083G2158**
25	52	26	25	**FDK:083G2159**
32	58	32	25	**FDK:083G2160**
40	65	38	40	**FDK:083G2161**
50	78	50	50	**FDK:083G2162**
65	95	66	65	**FDK:083G2163**
80	110	81	80	**FDK:083G2164**
100	130	100	100	**FDK:083G2165**
ISO 2853[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	37	22.6	25	**FDK:083G2149**
38	51	35.6	40	**FDK:083G2151**
51	64	48.6	50	**FDK:083G2152**
63.5	78	60.3	65	**FDK:083G2153**
76.1	91	72.9	80	**FDK:083G2154**
BS 4825-4[2]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
101.6	126	97.6	100	**FDK:083G2145**
SMS 1145[2]				
Adapter			Sensor	

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Selection and ordering data (continued)

Description				Article No.
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	40	22.6	25	**FDK:083G2139**
38	60	35.6	40	**FDK:083G2141**
51	70	48.6	50	**FDK:083G2142**
63.5	85	60.3	65	**FDK:083G2143**
76	98	72	65	**FDK:083G2144**

D_o: Outer diameter
D_i: Inner diameter
1) Suitable for 3A
2) Not suitable for 3A

Description	Article No.
Gaskets (delivered in pairs, to be placed between flow sensor and adapter)	
FMS100 (PFA) - P gaskets	
Rubber: EPDM[1)]	
• DN 10	**A5E02055286**
• DN 15	**A5E02055287**
• DN 25	**A5E02055290**
• DN 40	**A5E02055291**
• DN 50	**A5E02055292**
• DN 65	**A5E02055293**
• DN 80	**A5E02055295**
• DN 100	**A5E02055297**

Description	Article No.
FMS100 (PFA, ceramic) - Flat gaskets	
Rubber: EPDM[1)]	
• DN 10	**FDK:083G2206**
• DN 15	**FDK:083G2207**
• DN 25	**FDK:083G2209**
• DN 40	**FDK:083G2211**
• DN 50	**FDK:083G2212**
• DN 65	**FDK:083G2213**
• DN 80	**FDK:083G2214**
• DN 100	**FDK:083G2215**

1) Suitable for 3A
2) Not suitable for 3A

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Technical specifications

SITRANS FMS100	
Product characteristic	Versatile product to meet the diverse demands of various industries such as process, chemical, Pharmaceutical, Beverage, Food, Water treatment.
Measurement of	Volume flow, flow velocity, electrical conductivity
Nominal diameter	Full bore sensor: DN 2 ... 100 (1/12" ... 4")
Mode of operation	
Measuring principle	Electromagnetic induction
Medium conductivity	Liquids with an electrical conductivity ≥ 5 µS/cm
Excitation frequency (Main supply: 50 Hz / 60 Hz)	DN 2 ... 65 (1/12" ... 2½"): 12.5 Hz / 15 Hz DN 80 ... 100 (3" ... 4"): 6.25 Hz / 7.5 Hz
Performance characteristics	
Electrical conductivity	Repeatability: Max. ±5% of measured value
Process connection	
Flanges	
• No process connection	PN 40 (580 psi) DN 2 ... 65 (1/12" ... 2½") PN 37.5 (540 psi) DN 80 (3") PN 30 (435 psi) DN 100 (4")
• Pipe connection R ½"	DN 2 ... 10 (1/12" ... 3/8")
• Pipe connection ½" NPT	DN 2 ... 10 (1/12" ... 3/8")
• Weld in, DIN 11850 (EN 10357)	PN 40 (600 psi) DN 10 ... 65 (3/8" ... 2½") PN 25 (350 psi) DN 80 ... 100 (3" ... 4")
• Weld in, ISO 2037 (SMS 3008)	PN 40 (600 psi) DN 10 ... 65 (3/8" ... 2½") PN 25 (350 psi) DN 80 ... 100 (3" ... 4")
• Weld in, Tri-Weld (BS 4825-1)	PN 40 (600 psi) DN 10 ... 65 (3/8" ... 2½") PN 25 (350 psi) DN 80 ... 100 (3" ... 4")
• Clamp type, DIN 32676	PN 16 (200 psi) DN 10 ... 50 (3/8" ... 2") PN 10 (150 psi) DN 65 ... 100 (2½" ... 4")
• Clamp type, ISO 2852 (SMS 3016)	PN 16 (200 psi) DN 10 ... 50 (3/8" ... 2") PN 10 (150 psi) DN 65 ... 100 (2½" ... 4")
• Clamp type, Tri-Clamp (BS 4825-3)	PN 16 (200 psi) DN 10 ... 50 (3/8" ... 2") PN 10 (150 psi) DN 65 ... 100 (2½" ... 4")
• Threaded type, DIN 11851	PN 40 (600 psi) DN 10 ... 40 (3/8" ... 1½") PN 25 (350 psi) DN 50 ... 100 (2" ... 4")
• Threaded type, SMS 1145	PN 6 (80 psi) DN 25 ... 65 (1" ... 2½")
Rated operating conditions	
Ambient temperature	
• Sensor	-40 ... +100 °C (-40 ... +212 °F)
• Compact with transmitter	-40 ... +65 °C (-40 ... +149 °F)
• Display	-20 ... +60 °C (-4 ... +140 °F)
Operating pressure (Maximum operating pressure depending on flange	
• Ceramic	DN 2 ... 65: 40 bar_g (1/12" ... 2 ½": 580 psi_g) DN 80: 37.5 bar_g (3": 540 psi_g) DN 100: 30 bar_g (4": 435 psi_g) Vacuum: 1 × 10^{-6} bar_{abs}(1.5 × 10^{-5} psi_{abs})
• Ceramic & Option J30	DN 15 ... 50: 40 bar_g (½" ... 2": 580 psi_g) DN 80: 37.5 bar_g (3": 540 psi_g) DN 100: 25 bar_g (4": 363 psi_g) Vacuum: 1 × 10^{-6} bar_{abs} (1.5 × 10^{-5} psi_{abs})
• Ceramic & Option J33	DN 10 ... 65: 40 bar_g (3/8" ... 2 ½": 580 psi_g) DN 80 ... 100: 25 bar_g (3" ... 4": 363 psi_g) Vacuum: 1 × 10^{-6} bar_{abs} (1.5 × 10^{-5} psi_{abs})
• PFA	20 bar_g (290 psi_g) Vacuum: 0.02 bar_{abs} (0.3 psi_{abs}) DN 80 ... 100: CO_2 pressure max. 7 bar_g (101.5 psi_g)
Temperature of medium	
• Ceramic	-20 ... +150 °C (-4 ... 302 °F) Suitable for steam sterilization
• Ceramic & Option J30	-20 ... +200 °C (-4 ... +392 °F)
• PFA	-30 ... +130 °C (-22 ... +266 °F) Suitable for steam sterilization at 150 °C (302°F)
Temperature shock	Duration ≤ 1 min, followed by 10 min rest
• Ceramic	DN 2, DN 3 (1/12", 1/8") No limitations DN 6, DN 10, DN 15, DN 25: Max. ΔT ≤ 80 °C/min (¼",3/8", ½", 1": Max. ΔT ≤ 144 °F/min) DN 40, DN 50, DN 65: Max. ΔT ≤ 70 °C/min (1½",2", 2½": Max. ΔT ≤ 126 °F/min) DN 80, DN 100: Max. ΔT ≤ 60 °C/min (3",4": Max. ΔT ≤ 108 °F/min)

Technical specifications (continued)

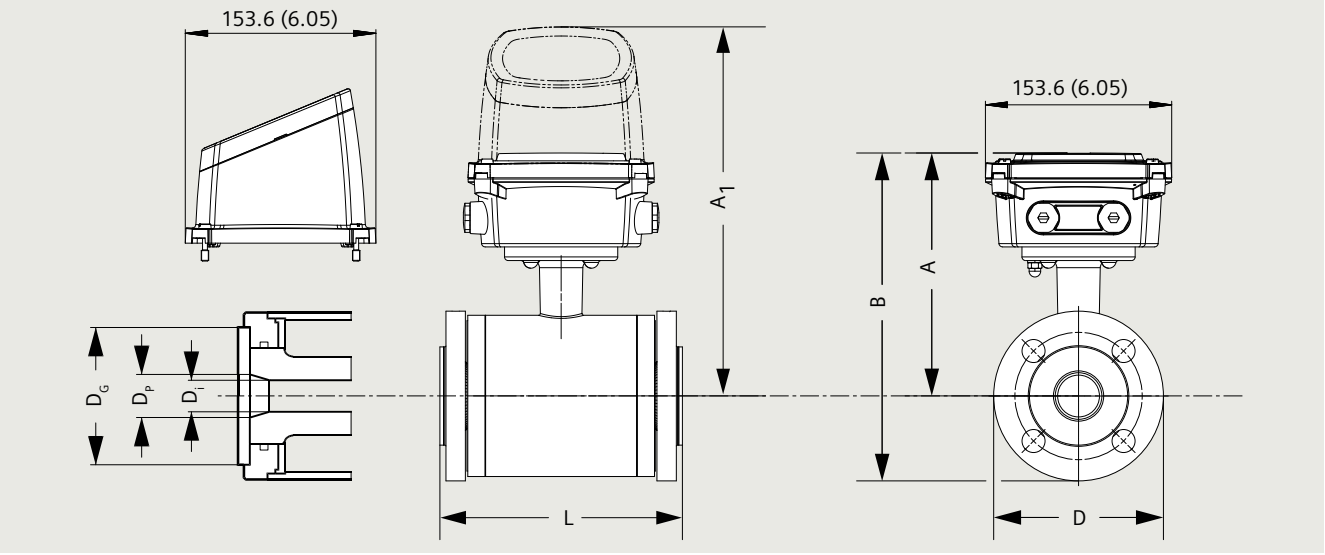
SITRANS FMS100	
• Ceramic & Option J30	DN 10, DN 15, DN 25: Max. ΔT ≤ 80 °C/min (3/8", ½", 1": Max. ΔT ≤ 144 °F/min) DN 40, DN 50, DN 65: Max. ΔT ≤ 70 °C/min (1½", 2", 2½": Max. ΔT ≤ 126 °F/min) DN 80, DN 100: Max. ΔT ≤ 60 °C/min (3", 4": Max. ΔT ≤ 108 °F/min)
• Ceramic & Option J33	DN 15, DN 25:Max. ΔT ≤ 80 °C/min (½", 1": Max. ΔT ≤ 144 °F/min) DN 40, DN 50:Max. ΔT ≤ 70 °C/min (1½", 2": Max. ΔT ≤ 126 °F/min) DN 80, DN 100:Max. ΔT ≤ 60 °C/min (3", 4": Max. ΔT ≤ 108 °F/min)
• PFA	DN 15, 25, 40, 50, 65: Max. ΔT 120 °C/min (½", 1", 1½", 2", 2½": Max. ΔT 248 °F/min) DN 80, DN 100: Max. ΔT 110 °C/min (3", 4": Max. ΔT 230 °F/min)
Degree of protection	
• Standard	IP66/67, NEMA 4X/6
• Optional	IP68 and NEMA 6P (2 m, 10 days) IP68 and NEMA 6P (10 m, continuously) (only in remote design)
Mechanical load (vibration)	
Integral mount / compact version	• 2 ... 8.4 Hz, 3.5 mm peak • 8.4 ... 500 Hz, 1 g peak Vibration broad-band random, according to IEC 60068-2-64 • 10 ... 200 Hz, 0.003 g2/Hz • 200 ... 500 Hz, 0.001 g2/Hz • Total: 0.93 g rms
• Remote version	Vibration, sinusoidal according to IEC 60068-2-6 **Sensor** • 2 ... 8.4 Hz, 7.5 mm peak • 8.4 ... 500 Hz, 2 g peak **Transmitter** • 2 ... 8.4 Hz, 1.5 mm peak • 8.4 ... 500 Hz, 0.7 g peak Vibration broad-band random, according to IEC 60068-2 64 **Sensor** • 10 ... 200 Hz, 0.01 g^2/-Hz • 200 ... 500 Hz, 0.003 g^2/Hz • Total: 1.67 g rms **Transmitter** • 10 ... 200 Hz, 0.003 g^2/-Hz • 200 ... 500 Hz, 0.001 g^2/Hz • Total: 0.93 g rms
Pressure drop	insignificant
Test pressure	1.5 × PN (where applicable)
Design	
Dimensions	See dimensional drawings
Weight	See dimensional drawings
Material	
• Housing and flanges	Stainless steel AISI 316L / 1.4404 flanges and housing, polished
• Measuring electrode	Hastelloy C22 / 2.4602 Platinum
• Measuring tube	Stainless steel AISI 316L / 1.4404
• Terminal box	Polycarbonate Optional Stainless steel AISI 316 / 1.4436
Cable entries	4 × metric thread (size M20 × 1.5)
Pressure equipment	Conforming with PED 2014/68/EU
Electromagnetic compatibility	Conforming with EMC 2014/30/EU
Calibration	
• Standard	Zero-point, 2 × 25% and 2 × 90%
• Optional	5-point calibration: 20%, 40%, 60%, 80%, 100% of factory Q_{max} 10-point calibration: ascending and descending at 20%, 40%, 60%, 80%, 100% of factory Qmax
Certificates and approvals	
General purpose	CE (LVD, PED, EMC, RoHS), UKCA
Hygienic	
• Ceramic & Option J33 & E85	3A certificate (Hygienic – US)
• PFA & Option J33 [& E85]	FDA declaration of conformity (food contact - US) EC/1935/2004 Food contact declaration of conformity (food contact - EU) [3A certificate (Hygienic – US)]

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Technical specifications (continued)

SITRANS FMS100	
Others	Environmental Product Declaration (EPD) CRN (Canadian Registration Number) UL 61010 (ordinary locations US/C) RCM (Australia) EAC (KZ) KC (Ko)

Dimensional drawings



SITRANS FMS100 in compact (integral-mount transmitter) and remote design. Dimensions in mm (inch)

Metric

DN [mm]	A[1] [mm]	B[1] [mm]	A_1 [mm]	D [mm]	D_i [mm]	D_i (PFA) [mm]	D_p [mm]	D_G [mm]	Weight[2] [kg]
2	154	179	258	48.7	2		17.3	34	2.2
3	154	179	258	48.7	3		17.3	34	2.2
6	154	179	258	48.7	6		17.3	34	2.2
10	154	179	258	48.7	10	10	13.6	34	2.2
15	154	179	258	48.7	15	16	17.3	40	2.2
25	162	194	266	63.5	25	26	28.5	56	2.7
40	172	214	276	84.0	40	38	43.4	75	3.4
50	181	232	285	101.6	50	50	54.5	90	4.2
65	191	251	294	120.9	65	66	68.0	112	5.5
80	197	263	300	133.0	80	81	82.5	124	7.0
100	210	289	313	159.0	100	100	107.1	150	10.0

1) 7.5 mm shorter when the stainless steel terminal box is used (High temperature 200 °C (392 °F) version).
2) With transmitter FMT020 installed, weight is increased by approximately 1 kg.

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Dimensional drawings (continued)

Imperial

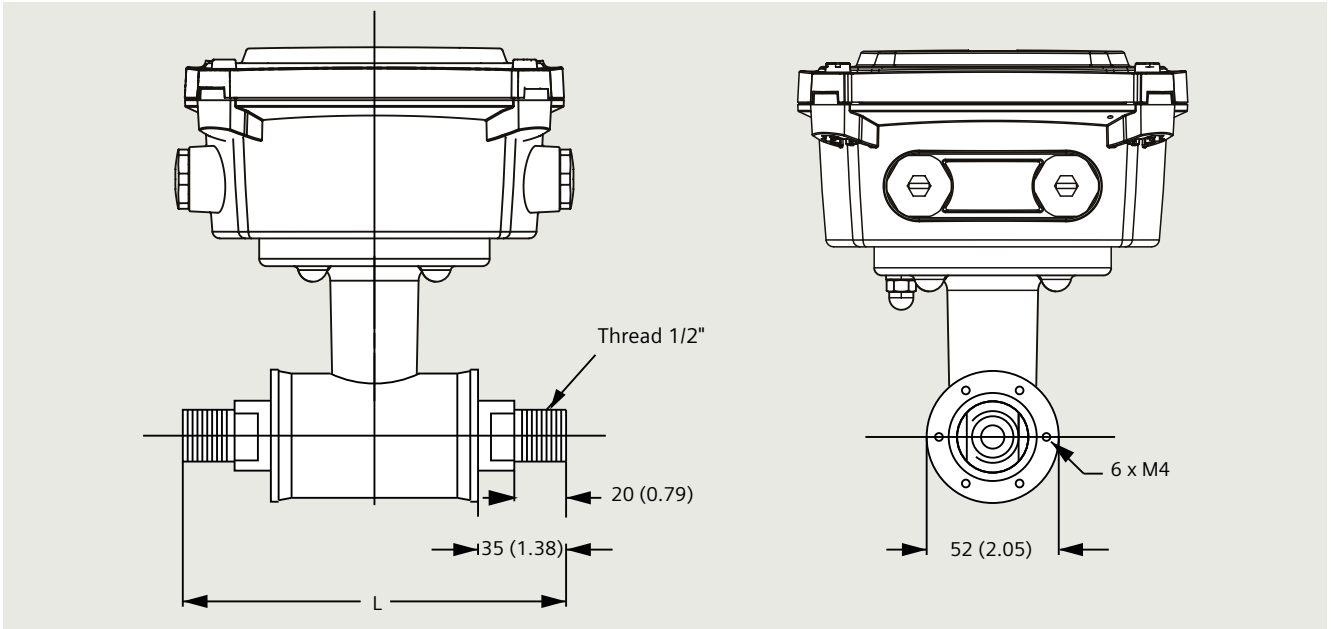
DN [inch]	A[1] [inch]	B[1] [inch]	A_1 [inch]	D [inch]	D_i [inch]	D_i (PFA) [inch]	D_p [inch]	D_G [inch]	Weight[2] [lb]
1/12	6.1	7.05	10.2	1.92	0.08		0.68	1.34	4.8
1/8	6.1	7.05	10.2	1.92	0.12		0.68	1.34	4.8
¼	6.1	7.05	10.2	1.92	0.24		0.68	1.34	4.8
3/8	6.1	7.05	10.2	1.92	0.39	0.39	0.53	1.34	4.8
½	6.1	7.05	10.2	1.92	0.59	0.63	0.68	1.57	4.8
1	6.4	7.64	10.5	2.50	0.98	1.02	1.12	2.20	5.9
1½	6.8	8.42	10.9	3.31	1.57	1.50	1.71	2.95	7.5
2	7.1	9.13	11.2	4.00	1.97	1.97	2.15	3.54	9.2
2½	7.5	9.88	11.6	4.76	2.56	2.60	2.68	4.41	12
3	7.8	10.35	11.8	5.24	3.15	3.19	3.25	4.88	15
4	8.3	11.37	12.3	6.26	3.94	3.94	4.22	5.91	22

1) 0.29 inch shorter when the stainless steel terminal box is used (High temperature 200 °C (392 °F) version).
2) With transmitter FMT020 installed, weight is increased by approximately 2.2 lb.

SITRANS FMS100 built-in length without flanges (sandwich version)

Nominal size		L[1] EN 1092-1-201									
		EPDM		Graphite		PTFE (Teflon)		Without gasket		Grounding ring	
DN	inch	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
2 ... 10[1]	1/12 ... 3/8[1]	64	2.52	66	2.60	70	2.75	64	2.52	77	3.03
15	½	65	2.56	66	2.60	70	2.75	64	2.52	77	3.03
25	1	80	3.15	81	3.19	85	3.35	79	3.10	92	3.62
40	1½	95	3.74	96	3.78	100	3.94	94	3.70	107	4.21
50	2	105	4.13	106	4.17	110	4.33	104	4.05	117	4.61
65	2½	130	5.12	131	5.15	135	5.31	129	5.05	142	5.60
80	3	155	6.10	156	6.14	160	6.30	154	6.00	167	6.57
100	4	185	7.28	186	7.31	190	7.48	184	7.20	197	7.76

1) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length.

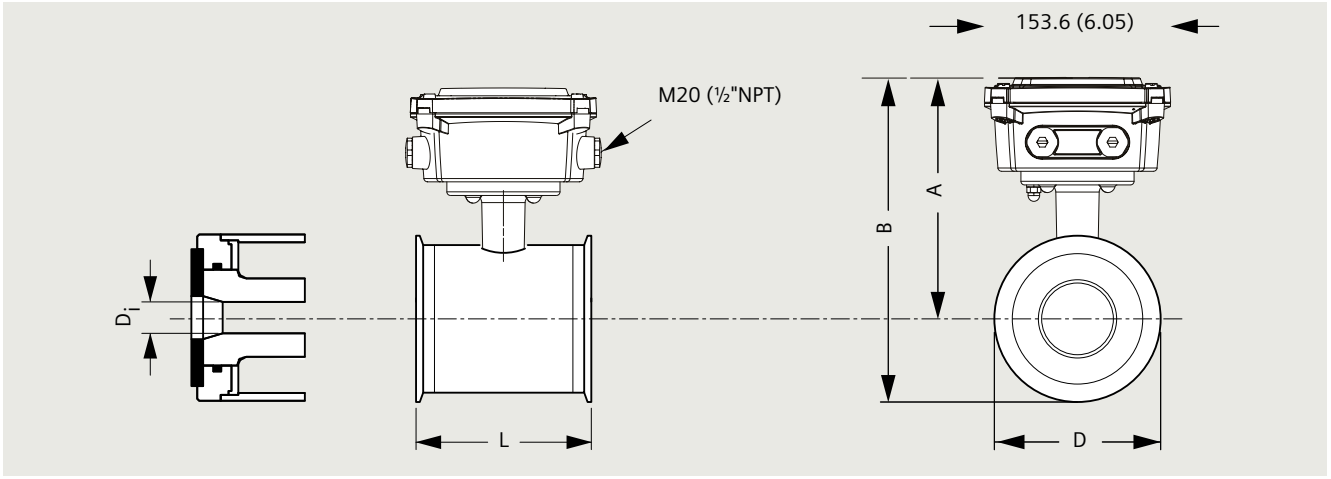


SITRANS FMS100 built-in length DN 2 ... 10 (1/12" ... 3/8") with adapters

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Dimensional drawings (continued)

Stainless steel and Hastelloy pipe connections								PVDF pipe connections	
Without gasket		EPDM		Graphite		PTFE		PTFE	
DN	inch	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
150	5.9	150	5.9	152	6.0	156	6.1	133	5.2



SITRANS FMS100 Food grade version remote design

Metric

DN [mm]	L [mm]	A [mm]	B [mm]	D [mm]	D_i (Al_2O_3) [mm]	Di (PFA) [mm]	Weight[1] [kg]
10	64	161	193.7	64.0	10	10	2.2
15	64	161	193.7	64.0	15	16	2.2
25	79	169	207.5	77.5	25	26	2.7
40	94	179	228.0	91.0	40	38	3.4
50	104	188	247.7	119.0	50	50	4.2
65	131	197.5	262.6	130.0	65	66	5.5
80	156	204	281.0	155.0	80	81	7.0
100	186	217	308.0	183.0	100	100	10.0

1) With transmitter FMT020 installed, weight is increased by approximately 1 kg.

Imperial

DN [inch]	L [inch]	A [inch]	B [inch]	D [inch]	D_i (Al_2O_3) [inch]	Di (PFA) [inch]	Weight[1] lb
3/8	2.52	6.34	7.62	2.52	0.39	0.39	4.8
½	2.52	6.34	7.62	2.52	0.59	0.63	4.8
1	3.11	6.66	8.17	3.05	0.98	1.02	5.9
1½	3.70	7.05	8.98	3.58	1.57	1.50	7.5
2	4.09	7.40	9.75	4.68	1.97	1.97	9.2
2½	5.16	7.78	10.34	5.12	2.56	2.60	12.0
3	6.14	8.03	11.06	6.10	3.15	3.19	15.0
4	7.32	8.54	12.13	7.20	3.94	3.94	22.0

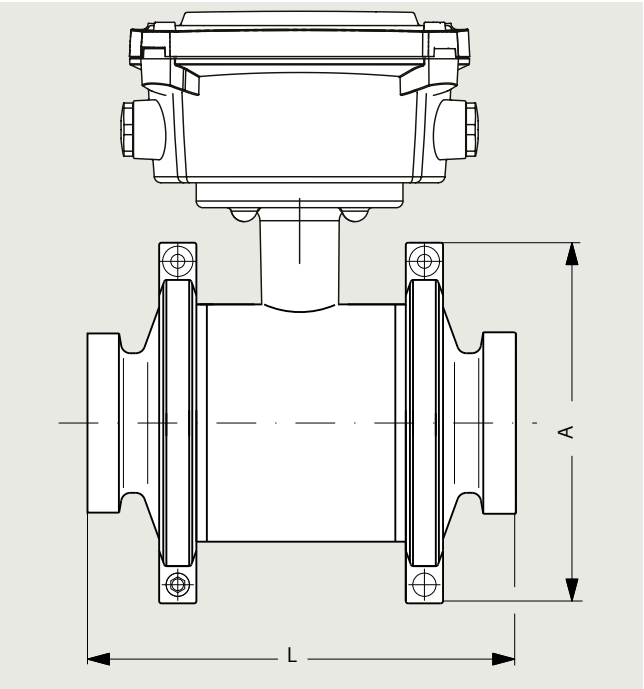
1) With transmitter FMT020 installed, weight is increased by approximately 2.2 lb.

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Dimensional drawings (continued)

DN [inch]	A[1] [inch]	B[1] [inch]	A_1 [inch]	D [inch]	D_i [inch]	Di (PFA) [inch]	D_p [inch]	D_G [inch]	Weight[2] [lb]
1/12	6.1	7.05	10.2	1.92	0.08		0.68	1.34	4.8
1/8	6.1	7.05	10.2	1.92	0.12		0.68	1.34	4.8
¼	6.1	7.05	10.2	1.92	0.24		0.68	1.34	4.8
3/8	6.1	7.05	10.2	1.92	0.39	0.39	0.53	1.34	4.8
½	6.1	7.05	10.2	1.92	0.59	0.63	0.68	1.57	4.8
1	6.4	7.64	10.5	2.50	0.98	1.02	1.12	2.20	5.9
1½	6.8	8.42	10.9	3.31	1.57	1.50	1.71	2.95	7.5
2	7.1	9.13	11.2	4.00	1.97	1.97	2.15	3.54	9.2
2½	7.5	9.88	11.6	4.76	2.56	2.60	2.68	4.41	12
3	7.8	10.35	11.8	5.24	3.15	3.19	3.25	4.88	15
4	8.3	11.37	12.3	6.26	3.94	3.94	4.22	5.91	22

1) 0.29 inch shorter when the stainless steel terminal box is used (High temperature 200 °C (392 °F) version).
2) With transmitter FMT020 installed, weight is increased by approximately 2.2 lb.



SITRANS FMS100 Food grade version built-in length with flanges

DN [mm]	[inch]	A [mm]	[inch]	L[1] [mm]	[inch]
10	3/8	99	3.90	146	5.75
15	½	99	3.90	146	5.75
25	1	113	4.45	161	6.34
40	1½	126	4.96	176	6.93
50	2	154	6.06	186	7.32
65	2½	165	6.50	223	8.78
80	3	200	7.87	258	10.16
100	4	225	8.86	288	11.34

1) The total built-in length "L" is independent of the adapter type selected.

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Overview



The SITRANS FM MAG 1100 is an electromagnetic flow sensor in a compact wafer design designed for flow applications in the process industry.

Benefits

- Sensor sizes: DN 2 to DN 100 ($^1/_{12}$" to 4")
- Compact wafer-type design matching for mating flange according to EN 1092-1 and ANSI B16.5 standard
- Corrosion resistant AISI 316 stainless steel sensor housing
- Highly resistant liner and electrodes fitting most extreme process media
- Hose proof IP67/NEMA 6 enclosure rating
- Option for IP68 / NEMA 6P protection class ex works or for upgrading on site
- High temperature sensor for applications with temperatures up to 200 °C (392 °F)
- Approved for hazardous areas for maximum safety and reliability
- Designed to allow in-situ verification for easy performance check

Application

The main applications of the SITRANS FM electromagnetic flow sensors can be found in the following fields:

- Process industry
- Chemical industry
- Pharmaceutical industry
- Water treatment like e.g. chemical dosing

Integration

The complete flowmeter consists of a flow sensor and an associated transmitter SITRANS FM MAG 5000, 6000 or 6000 I. The flexible communication concept simplifies integration and update to a variety of fieldbus systems such as HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS DP and PA, Modbus RTU/RS 485.

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Selection and ordering data

Sensor SITRANS FM MAG 1100 EPDM gaskets included	Article No. 7ME6110-									
	●	●	A	●	0	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Diameter										
DN 2, 1/12 inch	1	D								
DN 3, 1/8 inch	1	H								
DN 6, ¼ inch	1	M								
DN 10, 3/8 inch	1	R								
DN 15, ½ inch	1	V								
DN 25, 1 inch	2	D								
DN 40, 1½ inch	2	R								
DN 50, 2 inch	2	Y								
DN 65, 2½ inch	3	F								
DN 80, 3 inch	3	M								
DN 100, 4 inch	3	T								
Liner material										
PFA (no ATEX)				1						
Ceramic				2						
Electrode material										
Hastelloy C22 / 2.4602 (only with PFA liner)							1			
Platinum (only with ceramic liner, with gold brazing alloy ≥ DN 10)							2			
Transmitter										
Standard sensor for remote transmitter (order transmitter separately)								A		
Ex sensor for remote transmitter (order transmitter separately)								B		
MAG 6000 I, Aluminum 18 ... 90 V DC, 115 ... 230 V AC, FM / CSA Class I Div. 2								C		
MAG 6000 I, Aluminum 18 ... 30 V DC, Ex								D		
MAG 6000 I, Aluminum, 18 ... 90 V DC,115 ... 230 V AC (non-Ex)								F		
MAG 6000 I, Aluminum 115 ... 230 V AC, Ex								E		
MAG 6000 Polyamide, 11 ... 30 V DC/11 ... 24 V AC								H		
MAG 6000, Polyamide, 115 ... 230 V AC								J		
MAG 5000, Polyamide, 11 ... 30 V DC/11 ... 24 V AC								K		
MAG 5000, Polyamide, 115 ... 230 V AC								L		
Communication										
No communication, add-on possible									A	
HART									B	
PROFIBUS PA Profile 3									F	
PROFIBUS DP Profile 3 (not for Ex)									G	
Modbus RTU/RS 485 (not for Ex)									E	
FOUNDATION Fieldbus H1									J	
Cable glands/terminal box										
Metric: Polyamide terminal box or MAG 6000 I compact										1
½" NPT: Polyamide terminal box or MAG 6000 I compact										2
Metric: Stainless steel terminal box										3
½" NPT: Stainless steel terminal box										4

[1] Quick ship only in combination with ceramic liner

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Selection and ordering data (continued)

	Order code
Additional information	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates	
Material certificate according to EN 10204-3.1	**C12**
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Special calibration	
5-point calibration[1)]	**D01**
10-point calibration[2)]	**D06**
Default (2 × 25 % and 2 × 90 %) matched-pair calibration	**D11**
5-point, matched-pair calibration[1)]	**D15**
10-point, matched-pair calibration[2)]	**D18**
Terminal blocks	
Factory mounted terminal blocks	**N02**
Country specific label	
CRN (Canadian Registration Number)	**H25**
Device identification	
Tag name, stainless steel plate for transmitter (specify in plain text)	**Y16**
Tag name, stainless steel plate (specify in plain text)	**Y17**
Tag name, adhesive label (specify in plain text)	**Y18**
Device settings	
Customer-specific transmitter setting	**Y20**
Sensor cables	
Factory mounted sensor cables wired	**Y40**
Factory mounted and potted sensor cables, IP68 protection class for sensor	**Y41**
Additional calibrations	
Accredited matched-pair calibration acc. to ISO/IEC 17025: 2005	**On request** [3)]
Customer-specified calibration up to 10 points	**On request** [3)]
Customer-witnessed calibration (any of above calibration)	**On request** [3)]

1) 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}
2) Ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}
3) Product Variation Request (PVR)

Sensor SITRANS FM MAG 1100 HT High Temperature Ceramic liner, Platinum electrode, Graphite gaskets included	**Article No. 7ME6120-**								
	●	●	A	2	0	-	2	●	A	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Diameter										
DN 15, ½ inch	**1**	**V**								
DN 25, 1 inch	**2**	**D**								
DN 40, 1½ inch	**2**	**R**								
DN 50, 2 inch	**2**	**Y**								
DN 80, 3 inch	**3**	**M**								
DN 100, 4 inch	**3**	**T**								
Transmitter										
Standard sensor for remote transmitter (order transmitter separately)								**A**		
Ex sensor for remote transmitter (order transmitter separately)								**B**		
Cable glands/terminal box										
Metric: Stainless steel terminal box										**3**
½" NPT: Stainless steel terminal box										**4**

	Order code
Additional information	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates	
Material certificate according to EN 10204-3.1	**C12**
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Special calibration	
5-point calibration[1)]	**D01**
10-point calibration[2)]	**D06**
Default (2 × 25 % and 2 × 90 %) matched-pair calibration	**D11**
5-point, matched-pair calibration[1)]	**D15**
10-point, matched-pair calibration[2)]	**D18**

	Order code
Terminal blocks	
Factory mounted terminal blocks	**N02**
Device identification	
Tag name, stainless steel plate (specify in plain text)	**Y17**
Tag name, adhesive label (specify in plain text)	**Y18**
Device settings	
Customer-specific transmitter setting	**Y20**
Sensor cables	
Factory mounted sensor cables	**Y40**
Factory mounted and potted sensor cables, IP68 protection class for sensor	**Y41**
Additional calibrations	
Accredited matched-pair calibration acc. to ISO/IEC 17025: 2005	**On request** [3)]
Customer-specified calibration up to 10 points	**On request** [3)]

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Selection and ordering data (continued)

	Order code
Customer-witnessed calibration (any of above calibration)	**On request** [3]

Description	Article No.
• English	**A5E02435647**

1) 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}
2) Ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}
3) Product Variation Request (PVR)

All literature is available to download for free, in a range of languages, at
www.siemens.com/processinstrumentation/documentation

Accessories

Description	Article No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[1]	**FDK:085U0220**	

1) Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging

Accessories for MAG 1100 sensor

Description	Article No.	
Pipe connection ½" external thread		
For DN 2 ... 10 (1/12" ... 3/8") sensor Material: Stainless steel AISI 316L 2 pcs. pipe connections, 2 pcs. EPDM gaskets, 12 pcs. M4×12 screws		
• R½" ISO 7-1 tapered thread	**FDK:083G0080**	
• ½" NPT thread	**FDK:083G4330**	
For DN 2 ... 10 (1/12" ... 3/8") sensor Material: Hastelloy C, 2 pcs. pipe connections, 2 pcs. PTFE gaskets, 12 pcs. M4x12 screws		
• R½" ISO 7-1 tapered thread	**FDK:083G4332**	
• ½" NPT thread	**FDK:083G4331**	
For DN 2 ... 10 (1/12" ... 3/8") sensor Material PVDF (Kynar 1000) 2 pcs. pipe connections (Max. 70 °C, PN 8 bar/max 158 °F, 116 PSI), 1 pc. grounding ring [1], 1 pc. grounding wire, 3 pcs. PTFE gaskets, 2 pcs. space rings, 6 pcs. M4×16 and M4×25		
• R½" ISO 7-1 tapered thread incl. grounding ring	**A5E01018395**	
• ½" NPT thread incl. grounding ring	**A5E01018400**	
EPDM gaskets Material: EPDM; each set includes: 2 pcs. EPDM gaskets, 1 pc. grounding wire, 1 pc. M6 screw, 1 pc. nut, 1 pc. washer, 1 pc. bolt grounding plate		
• DN 2 ... 10 (1/12" ... 3/8")	**FDK:083G3116**	
• DN 15 (½")	**FDK:083G3117**	
• DN 25 (1")	**FDK:083G3119**	
• DN 40 (1½")	**FDK:083G3121**	
• DN 50 (2")	**FDK:083G3122**	
• DN 65 (2½")	**FDK:083G3123**	
• DN 80 (3")	**FDK:083G3124**	
• DN 100 (4")	**FDK:083G3125**	

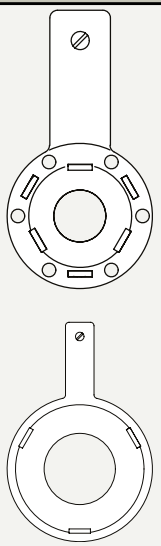
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Selection and ordering data (continued)

Description	Article No.	
PTFE gaskets Material: PTFE; each set includes: 2 pcs. gaskets, 2 pcs. grounding wires, 3 pcs. M6 screws (DN 2 ... 10: 12 pcs. M4×14)		
• DN 2 ... 10 (1/12" ... 3/8")	**FDK:083G0156**	
• DN 15 (½")	**FDK:083G0157**	
• DN 25 (1")	**FDK:083G0159**	
• DN 40 (1½")	**FDK:083G0161**	
• DN 50 (2")	**FDK:083G0162**	
• DN 65 (2½")	**FDK:083G0163**	
• DN 80 (3")	**FDK:083G0164**	
• DN 100 (4")	**FDK:083G0165**	
Graphite gaskets Material: Graphite; conductive, each set includes: 2 pcs. gaskets (can also be used as grounding ring)		
• DN 2 ... 10 (1/12" ... 3/8")	**FDK:083G0116**	
• DN 15 (½")	**FDK:083G0117**	
• DN 25 (1")	**FDK:083G0119**	
• DN 40 (1½")	**FDK:083G0121**	
• DN 50 (2")	**FDK:083G0122**	
• DN 65 (2½")	**FDK:083G0123**	
• DN 80 (3")	**FDK:083G0124**	
• DN 100 (4")	**FDK:083G0125**	
Grounding ring (stainless steel) Material: AISI 316L/1.4404; each set includes: 1 pc. grounding ring[1)], 3 pcs. PTFE gaskets, 1 pc. earth wire, 1 pc. M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	**FDK:083G0686**	
• DN 15 (½")	**FDK:083G0687**	
• DN 25 (1")	**FDK:083G0689**	
• DN 40 (1½")	**FDK:083G0691**	
• DN 50 (2")	**FDK:083G0692**	
• DN 65 (2½")	**FDK:083G0693**	
• DN 80 (3")	**FDK:083G0694**	
• DN 100 (4")	**FDK:083G0695**	
Grounding ring (Hastelloy C) Material: Hastelloy C22/2.4602; each set includes: 1 pc. grounding ring[1)], 3 pcs. PTFE gaskets, 1 pc. earth wire, 1 pc. M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	**FDK:083G3256**	
• DN 15 (½")	**FDK:083G3257**	
• DN 25 (1")	**FDK:083G3259**	
• DN 40 (1½")	**FDK:083G3261**	
• DN 50 (2")	**FDK:083G3262**	
• DN 65 (2½")	**FDK:083G3263**	
• DN 80 (3")	**FDK:083G3264**	
• DN 100 (4")	**FDK:083G3265**	
Grounding ring (Tantalum) Material: Tantalum; each set includes: 1 pc. grounding ring[1)], 3 pcs. PTFE gaskets, 1 pc. earth wire, 1 pc. M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	**A5E01181599**	
• DN 15 (½")	**A5E01181606**	
• DN 25 (1")	**A5E01181610**	
• DN 40 (1½")	**A5E01181613**	

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Selection and ordering data (continued)

Description	Article No.	
• DN 50 (2")	**A5E01181615**	
• DN 65 (2½")	**A5E01181616**	
• DN 80 (3")	**A5E01181619**	
• DN 100 (4")	**A5E01181622**	
Studs and nuts For DN 100 PN 25/40, 8 pcs. M20 studs, 16 pcs. M20 nuts Material: AISI 304/1.4305 • DN 100 (4")	FDK:083G0226	

1) Thickness of grounding ring is 2 mm (0.08 inch)

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Technical specifications

Version	MAG 1100	MAG 1100 HT (High Temperature)
Measuring principle	Electromagnetic induction	Electromagnetic induction
Excitation frequency (mains supply: 50 Hz/60 Hz)	DN 2 ... 65 (1/12" ... 2½"): 12.5 Hz/15 Hz DN 80, 100 (3", 4"): 6.25 Hz/7.5 Hz	DN 15 ... 50 (½" ... 2"): 12.5 Hz/15 Hz DN 80, 100 (3", 4"): 6.25 Hz/7.5 Hz
Process connection		
Nominal size		
• MAG 1100 (Ceramic)	DN 2 ... 100 (1/12" ... 4")	DN 15 ... 100 (½" ... 4")
• MAG 1100 (PFA)	DN 10 ... 100 (3/8" ... 4")	
Mating flanges	EN 1092-1 (DIN 2501), ANSI B16.5 class 150 and 300 or equivalent	EN 1092-1 (DIN 2501), ANSI B16.5 class 150 and 300 or equivalent
	Option: DN 2 ... 10 (1/12" ... 3/8"): G½"/1/2" NPT pipe connection adapters	
Rated operating conditions		
Ambient temperature		
• Standard sensor	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)
• Ex sensor	-20 ... +60 °C (-4 ... +140 °F)	-20 ... +60 °C (-4 ... +140 °F)
• Compact with transmitter MAG 5000/6000	-20 ... +60 °C (-4 ... +140 °F)	
• Compact with transmitter MAG 6000 I [1)]	-20 ... +60 °C (-4 ... +140 °F)	
• Compact with transmitter MAG 6000 I Ex [1)]	-20 ... +60 °C (-4 ... 140 °F)	
Temperature of medium		
• MAG 1100 (Ceramic)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +200 °C (-4 ... +392 °F)
• MAG 1100 Ex (Ceramic)	-20 ... +150 °C (-4 ... +302 °F)	-20 ... +180 °C (-4 ... +356 °F)
• MAG 1100 (PFA)	-30 ... +130 °C (-22 ... +266 °F) Suitable for steam sterilization at 150 °C (302 °F)	
Temperature shock	Duration ≤ 1 min, followed by 10 min rest	
• MAG 1100 (Ceramic)	• DN 2, 3 (1/12", 1/8") No limitations	• DN 15, 25: Max. ΔT ≤ 80 °C/min (½", 1": Max. ΔT ≤ 144 °F/min)
	• DN 6, 10, 15, 25: Max. ΔT ≤ 80 °C/min (¼", 3/8", ½", 1": Max. ΔT ≤ 144 °F/min)	• DN 40, 50: Max. ΔT ≤ 70 °C/min (1½", 2": Max. ΔT ≤ 126 °F/min)
	• DN 40, 50, 65: Max. ΔT ≤ 70 °C/min (1½", 2", 2½": Max. ΔT ≤ 126 °F/min)	• DN 80, 100: Max. ΔT ≤ 60 °C/min (3", 4": Max. ΔT ≤ 108 °F/min)
	• DN 80, 100: Max. ΔT ≤ 60 °C/min (3", 4": Max. ΔT ≤ 108 °F/min)	
• MAG 1100 (PFA)	• DN 15, 25, 40, 50, 65: Max. ΔT 120°C/min (1/2", 1", 1 1/2", 2", 2 1/2": Max. ΔT 248 °F/min)	
	• DN 80, 100: Max. ΔT 110 °C/min (3", 4": Max. ΔT 230 °F/min)	
Operating pressure		
• MAG 1100 (Ceramic)	• DN 2 ... 65: 40 barg (1/12" ... 2½": 580 psig)	• DN 15 ... 50: 40 barg (½" ... 2": 580 psig)
	• DN 80: 37.5 barg (3": 540 psig)	• DN 80: 37.5 barg (3": 540 psig)
	• DN 100: 30 barg (4": 435 psig)	• DN 100: 30 barg (4": 435 psig)
	Vacuum: 1×10^{-6} bar_{abs} (1.5×10^{-5} psi_{abs})	Vacuum: 1×10^{-6} bar_{abs} (1.5×10^{-5} psi_{abs})
• MAG 1100 (PFA)	20 barg (290 psig)	
	Vacuum: 0.02 bar_{abs} (0.3 psi_{abs})	

Technical specifications (continued)

Version	MAG 1100	MAG 1100 HT (High Temperature)
• MAG 1100 (PFA)	DN 80 ... 100: CO_2 pressure max. 7 barg (101.5 psig)	
Mechanical load (vibration)	• 18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36	• 18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36
	• Sensor: 3.17 g RMS	• Sensor: 3.17 g RMS
	• Sensor with compact MAG 5000/6000 mounted transmitter: 3.17 g RMS	
	• Sensor with compact MAG 6000 I/6000 I Ex mounted transmitter: 1.14 g RMS	
	• For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.	
Protection class	IP67, NEMA 6	IP67, NEMA 6
EMC	2014/30/EU	2014/30/EU
Design		
Weight	See Dimensional drawings	See Dimensional drawings
Material		
• Enclosure	Stainless steel AISI 316L/1.4404	Stainless steel AISI 316L/1.4404
• Terminal box		
- Standard	Fibre glass reinforced polyamide (not for Ex)	Stainless steel AISI 316/1.4436
- Option	Stainless steel AISI 316/1.4436	
• Fixing studs	Stainless steel AISI 304/1.4301 Number and size to EN 1092-1:2001	Stainless steel AISI 304/1.4301 Number and size to EN 1092-1:2001
• Gaskets		
- Standard	EPDM (max. 150 °C, PN 40 (max. 302 °F, 600 psi))	Graphite (max. 200 °C, PN 40 (max. 392 °F, 600 psi))
- Option	• Graphite (max. 200 °C, PN 40 (max. 392 °F, 600 psi))	
	• PTFE (max. 130 °C, PN 25 (max. 266 °F, 300 psi))	
• Pipe connection adapters: DN 2, 3, 6 and 10 (1/12", 1/8", ¼" and 3/8")	• Stainless steel, AISI 316 /1.4436	
	• Hastelloy C22/2.4602	
	• PVDF	
• Liner		
- MAG 1100 (Ceramic)	• DN 2, 3 (1/12", 1/8"): Zirconium oxide (ZrO_2)	DN 15 ... 100 (½", 4"): Aluminum oxide Al_2O_3
	• DN 6 ... 100 (¼" ... 4"): Aluminum oxide (Al_2O_3)	
- MAG 1100 (PFA)	Reinforced PFA (not for Ex)	
• Electrodes		
- MAG 1100 (Ceramic)	• DN 10 ... 100 (3/8" ... 4"): Platinum with Gold / Titanium brazing alloy	Platinum with Gold / Titanium brazing alloy
	• DN 2 ... 6 (1/12" ... ¼"): Platinum	
- MAG 1100 (PFA)	• DN 10 ... 100 (3/8" ... 4"): Hastelloy C22/2.4602	
Cable entries	• Remote installation 2 × M20 or 2 × ½" NPT	Remote installation 2 × M20 or 2 × ½" NPT
	• Compact installation	
	- MAG 5000/MAG 6000: 4 × M20 or 4 × ½" NPT	
	- MAG 6000 I : 2 × M20 (M25 for PROFIBUS) or 2 × ½" NPT	

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Technical specifications (continued)

Version	MAG 1100	MAG 1100 HT (High Temperature)
Certificates and approvals		
Calibration		
• Default calibration	Zero-point, 2 × 25 %, 2 × 90 %	Zero-point, 2 × 25 %, 2 × 90 %
• Special calibration	5-point calibration: 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max} 10-point calibration: ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max} Matched-pair calibration: default, 5-point or 10-point	
Hazardous areas		
• MAG 1100 F (Ceramic)		
- Ex-sensor in compact or remote version with MAG 6000 I Ex	• ATEX, EAC Ex - Zone 1 Ex d e ia IIB T6 Gb • ATEX - Zone 21 Ex tD A21 IP67	• ATEX, EAC Ex - Zone 1 Ex d e ia IIB T6 Gb • ATEX - Zone 21 Ex tD A21 IP67
- Standard sensor in compact or remote version with MAG 5000/6000/6000 I	• FM - NI Class I Div. 2 Groups A, B, C, D	• FM - NI Class I Div. 2 Groups A, B, C, D
• MAG 1100 F (PFA)		
- Standard sensor in compact or remote version with MAG 5000/6000/6000 I	• FM - NI Class I Div. 2 Groups A, B, C, D	
General purpose	• CE (LVD, PED, EMC, RoHS), UKCA • CRN (only PFA)	• CE (LVD, PED, EMC, RoHS), UKCA
Others	• EAC (Kazakhstan)	• EAC (Kazakhstan)

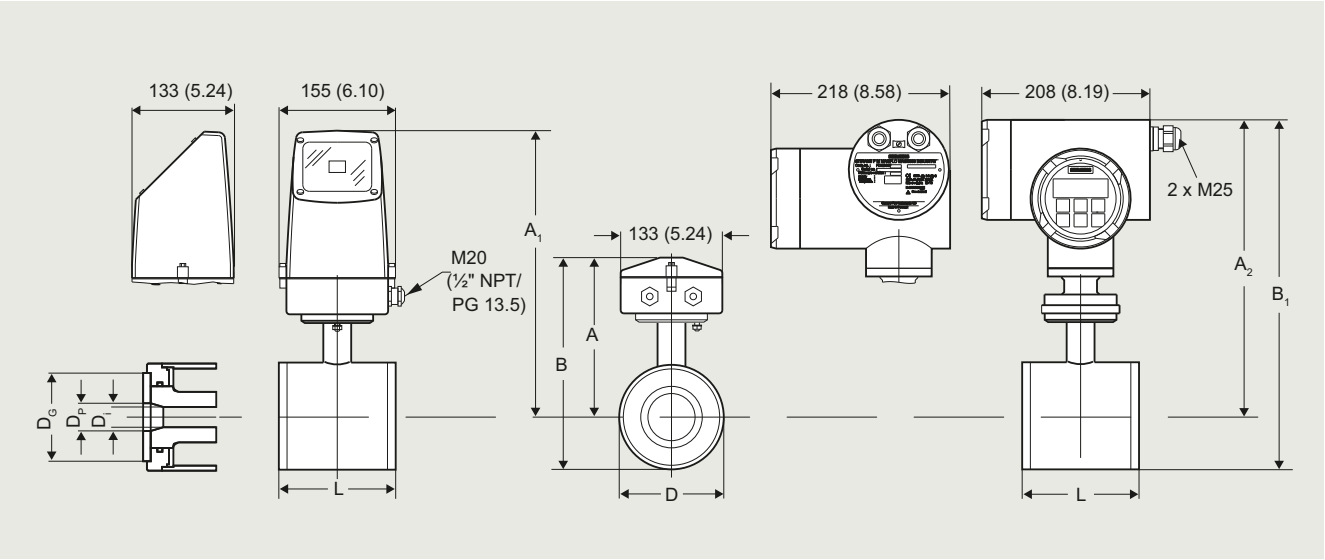
1) With HART communication max. ambient temperature 50 °C (122 °F).

For technical specification for transmitter - please see section about transmitters.

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Dimensional drawings

Sensor MAG 1100, compact/remote



Dimensions in mm (inch)

Important note: For compact installation with MAG 6000 I/Ex - transmitter to be supported to avoid tension on the sensor part

Size DN	A[1] [mm]	B[1] [mm]	A_1/A_2 [3] [mm]	B_1 [mm]	D [mm]	D_i [mm]	D_i (PFA) [mm]	D_P [mm]	D_G [mm]	Weight[2] [kg]
2	161	186	315	340	48.7	2		17.3	34	2.2
3	161	186	315	340	48.7	3		17.3	34	2.2
6	161	186	315	340	48.7	6		17.3	34	2.2
10	161	186	315	340	48.7	10	10	13.6	34	2.2
15	161	186	315	340	48.7	15	16	17.3	40	2.2
25	169	201	323	354	63.5	25	26	28.5	56	2.7
40	179	221	333	375	84.0	40	38	43.4	75	3.4
50	188	239	342	393	101.6	50	50	54.5	90	4.2
65	198	258	351	412	120.9	65	66	68.0	112	5.5
80	204	270	357	424	133.0	80	81	82.5	124	7.0
100	217	296	370	450	159.0	100	100	107.1	150	10.0

Size [inch]	A[1] [inch]	B[1] [inch]	A_1/A_2 [3] [inch]	B_1 [inch]	D [inch]	D_i [inch]	D_i (PFA) [inch]	D_P [inch]	D_G [inch]	Weight[2] [lbs]
1/12	6.34	7.33	12.40	13.39	1.92	0.08		0.68	1.34	4.8
1/8	6.34	7.33	12.40	13.39	1.92	0.12		0.68	1.34	4.8
¼	6.34	7.33	12.40	13.39	1.92	0.24		0.68	1.34	4.8
3/8	6.34	7.33	12.40	13.39	1.92	0.39	0.39	0.53	1.34	4.8
½	6.34	7.33	12.40	13.39	1.92	0.59	0.63	0.68	1.57	4.8
1	6.66	7.92	12.72	13.94	2.50	0.98	1.02	1.12	2.20	5.9
1½	7.05	8.70	13.11	14.76	3.31	1.57	1.50	1.71	2.95	7.5
2	7.40	9.41	13.47	15.47	4.00	1.97	1.97	2.15	3.54	9.2
2½	7.80	10.16	13.82	16.22	4.76	2.56	2.60	2.68	4.41	12
3	8.03	10.63	14.06	16.70	5.24	3.15	3.19	3.25	4.88	15
4	8.54	11.65	14.57	17.72	6.26	3.94	3.94	4.22	5.91	22

[1] 14.5 mm (0.571") shorter when the stainless steel terminal box is used (Ex or high temperature 200 °C (392 °F) version).

[2] With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approximately 0.8 kg (1.8 lb). With MAG 6000 I weight is increased with 5.5 kg (12.1 lbs).

[3] A_2 is 3 mm (0.12") shorter than A_1

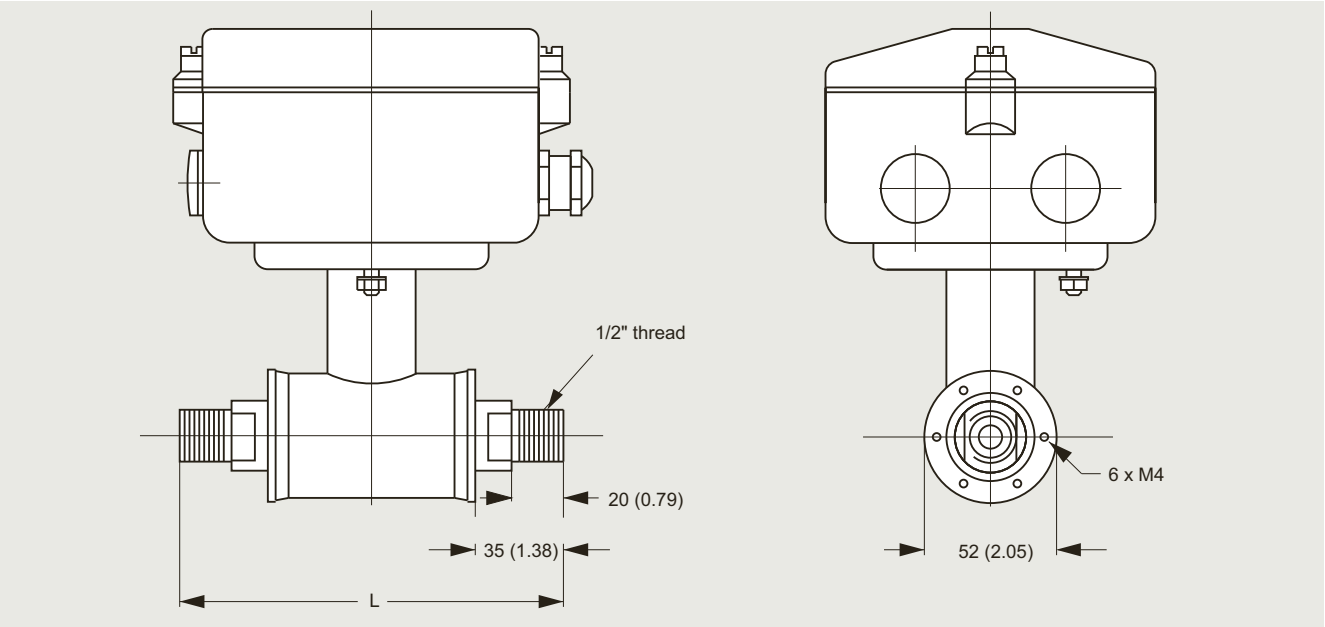
The total built-in length "L" [mm]/[inch] before assembling depends on the gasket selected.

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Dimensional drawings (continued)

Size		EPDM		Graphite		PTFE (Teflon)		Without gasket		Grounding ring	
DN	Inch	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
2 ... 10 [1]	1/12 ... 3/8	64	2.52	66	2.60	70	2.75	64	2.52	77	3.03
15	½	65	2.56	66	2.60	70	2.75	64	2.52	77	3.03
25	1	80	3.15	81	3.19	85	3.35	79	3.10	92	3.62
40	1½	95	3.74	96	3.78	100	3.94	94	3.70	107	4.21
50	2	105	4.13	106	4.17	110	4.33	104	4.05	117	4.61
65	2½	130	5.12	131	5.15	135	5.31	129	5.05	142	5.60
80	3	155	6.10	156	6.14	160	6.30	154	6.00	167	6.57
100	4	185	7.28	186	7.31	190	7.48	184	7.20	197	7.76

[1] Mounting between two flanges
Sensor MAG 1100 DN 2 ... 10 (1/12" ... 3/8") with adapters



The MAG 1100 DN 2, 3, 6 and 10 (1/12", 1/8", ¼" and 3/8") are prepared for assembly with the ½" pipe connections. Dimensions in mm (inch)

The length "L" varies dependent on the gasket choice.

Stainless steel and Hastelloy pipe connections								PVDF pipe connections	
Without gasket		EPDM		Graphite		PTFE		PTFE	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
150	5.9	150	5.9	152	6.0	156	6.1	133	5.2

Important note:
For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.

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Overview



The electromagnetic sensor SITRANS FM MAG 1100 F is designed to meet applications in the food and beverage industry.

Benefits

- Unique mechanical design with a wide range of sanitary process connections
- Sensor sizes: DN 10 to DN 100 (3/8" to 4")
- AISI 316 stainless steel sensor housing
- Sanitary design for CIP/SIP cleaning
- Hose proof IP67/NEMA 6 enclosure rating
- SENSORPROM Technology provides an automatic upload of startup settings and calibration data for easy commissioning
- Designed to allow in situ verification for easy performance check
- Approved for hazardous areas for maximum safety and reliability
- Option for IP68 / NEMA 6P protection class ex works or for upgrading on site

Application

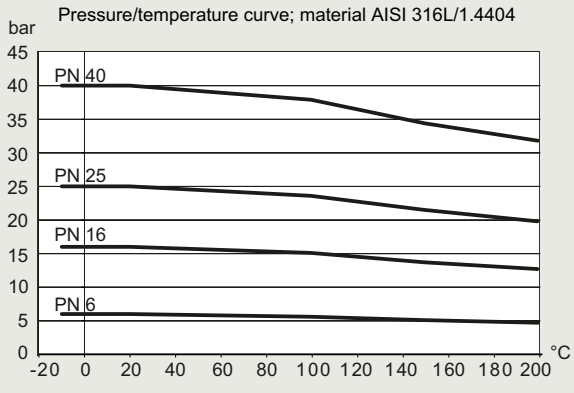
The main applications of the SITRANS FM electromagnetic sensors can be found in the following fields:

- Food industry
- Beverage industry
- Pharmaceutical industry

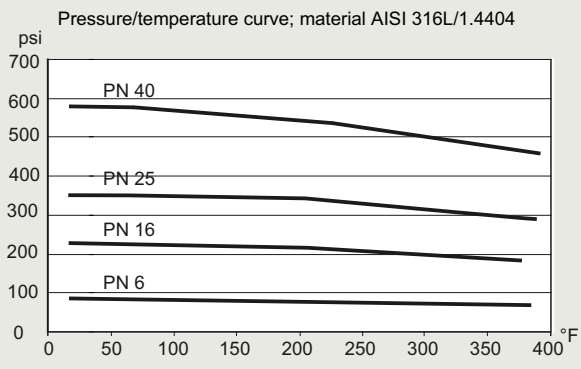
Integration

The complete flowmeter consists of a sensor and an associated transmitter SITRANS FM MAG 5000, 6000 and 6000 I. The flexible communication concept simplifies integration and update to a variety of fieldbus systems such as PROFIBUS DP and PA, Modbus RTU/RS 485, HART, FOUNDATION Fieldbus H1, DeviceNet.

Pressure/temperature curve; material AISI 316L/1.4404



Pressure/temperature curve; material AISI 316L/1.4404



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Selection and ordering data

Sensor SITRANS FM MAG 1100 F	Article No. 7ME6140-									
	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Diameter										
DN 10, 3/8 inch	1	R								
DN 15, ½ inch	1	V								
DN 25, 1 inch	2	D								
DN 40, 1½ inch	2	R								
DN 50, 2 inch	2	Y								
DN 65, 2½ inch	3	F								
DN 80, 3 inch	3	M								
DN 100, 4 inch	3	T								
Process connections										
None (not suitable for 3A approval)			A							
Weld in										
DIN 11850			B							
ISO 2037 (SMS 3008)			C							
Tri-Weld/BS 4825-1			D							
Clamp type										
DIN 32676			G							
ISO 2852 (SMS 3016)			H							
Tri-Clamp/BS 4825-3			J							
Threaded type										
DIN 11851			M							
SMS 1145[1)]			N							
Liner material										
PFA (no ATEX)				1						
Ceramic				2						
Gasket material[1)]										
EPDM flat gasket (FDA)					0					
FPM/FKM flat gasket (FDA) (only with ceramic liner)					2					
EPDM P gasket (FDA) (only with PFA liner)					3					
Electrode material										
Hastelloy C22 / 2.4602 (only with PFA liner)							1			
Platinum (only with ceramic liner, with gold brazing alloy ≥ DN 10)							2			
Transmitter										
Standard sensor for remote transmitter (order transmitter separately), 3A approved								A		
Ex sensor for remote transmitter (order transmitter separately), 3A approved								B		
MAG 6000 I, Aluminum, 18 ... 90 V DC, 115 ... 230 V AC, FM / CSA Class I Div. 2								C		
MAG 6000 I, Aluminum, 18 ... 30 V DC, Ex								D		
MAG 6000 I, Aluminum, 115 ... 230 V AC, Ex								E		
MAG 6000 I, Aluminum, 18 ... 90 V DC, 115 ... 230 V AC (non-Ex)								F		
MAG 6000, Polyamide, 11 ... 30 V DC/11 ... 24 V AC								H		
MAG 6000, Polyamide, 115 ... 230 V AC								J		
MAG 5000, Polyamide, 11 ... 30 V DC/11 ... 24 V AC								K		
MAG 5000, Polyamide, 115 ... 230 V AC								L		
Communication										
No communication, add-on possible									A	
HART									B	
PROFIBUS PA Profile 3									F	
PROFIBUS DP Profile 3 (not for Ex)									G	
Modbus RTU/RS 485 (not for Ex)									E	
FOUNDATION Fieldbus H1									J	
Cable glands/terminal box										
Metric: Polyamide terminal box or MAG 6000 I compact										1

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Selection and ordering data (continued)

Sensor SITRANS FM MAG 1100 F	Article No. 7ME6140- ● ● ● ● ● - ● ● ● ●
½" NPT: Polyamide terminal box or MAG 6000 I compact	2
Metric: Stainless steel terminal box	3
½" NPT: Stainless steel terminal box	4

1) SMS 1145 standard is not approved by 3A.

Additional information	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates	
Pressure test certificate according to EN 10204-3.1	**C01**
Material certificate according to EN 10204-3.1	**C12**
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Country specific label	
CRN (Canadian Registration Number)	**H25**
Terminal blocks	
Factory mounted terminal blocks	**N02**
Device identification	
Tag name, stainless steel plate for transmitter (specify in plain text)	**Y16**
Tag name, stainless steel plate (specify in plain text)	**Y17**
Tag name, adhesive label (specify in plain text)	**Y18**
Device settings	
Customer-specific transmitter setting	**Y20**

Additional information	Order code
Sensor cables	
Factory mounted sensor cables	**Y40**
Factory mounted and potted sensor cables, IP68 protection class for sensor	**Y41**
Additional calibrations	
Matched-pair calibration	**On request** 1)
Accredited matched-pair calibration acc. to ISO/IEC 17025: 2005	**On request** 1)
Customer-specified calibration up to 10 points	**On request** 1)
Customer-witnessed calibration (any of above calibration)	**On request** 1)

1) Product Variation Request (PVR).

Description	Article No.
• English	**A5E02435647**

All literature is available to download for free, in a range of languages, at
www.siemens.com/processinstrumentation/documentation

Accessories

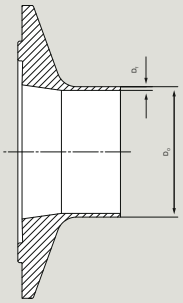
Description	Article No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P1)	**FDK:085U0220**	

1) Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging

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Selection and ordering data (continued)

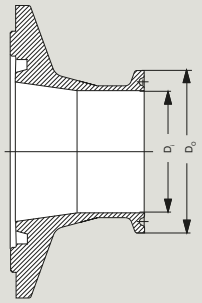
Spare parts for MAG 1100 F sensor

Description				Article No.
Weld-in connection fittings for use with P gaskets (stainless steel) Material: AISI 316L (1.4404) Only for PFA liner 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), P gaskets not included				
DIN 11850				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
10	13	1.5	10	**A5E02054630**
15	19	1.5	15	**A5E02054633**
20	23	1.5	15	**A5E02054634**
25	29	1.5	25	**A5E02054635**
32	35	1.5	25	**A5E02054637**
40	41	1.5	40	**A5E02054638**
50	53	1.5	50	**A5E02054640**
65	70	2.0	65	**A5E02054643**
80	85	2.0	80	**A5E02054644**
100	104	2.0	100	**A5E02054646**
ISO 2037				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.0	10	**A5E03727946**
17.2	17.2	1.0	15	**A5E03728098**
25	25	1.6	25	**A5E02196073**
33	33.7	1.6	25	**A5E02196074**
38	38	1.6	40	**A5E02196075**
40	40	1.6	40	**A5E02196076**
51	51	1.6	50	**A5E02196077**
63.5	63.5	1.6	65	**A5E02196078**
76.1	76.1	1.6	80	**A5E02196080**
101.6	101.6	2.0	100	**A5E02196082**
Tri-Weld (BS 4825-1)				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.2	10	**A5E02199113**
19.05	19.05	1.2	15	**A5E02199114**
25.4	25.4	1.6	25	**A5E02199115**
38.1	38.1	1.6	40	**A5E02199116**
50.8	50.8	1.6	50	**A5E02199117**
63.5	63.5	1.6	65	**A5E02199118**

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Selection and ordering data (continued)

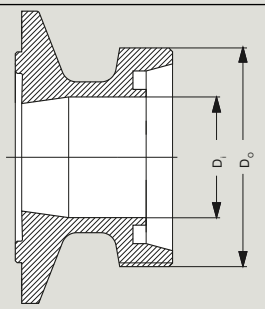
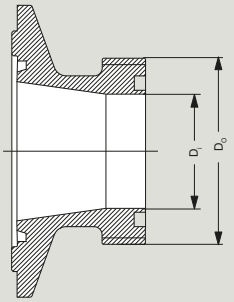
Description				Article No.
76.2	76.2	1.6	80	**A5E02199119**
101.6	101.6	2.0	100	**A5E02199120**

Description				Article No.
Clamp-type connection fittings for use with P gaskets (stainless steel) Material: AISI 316L (1.4404) Only for liner PFA 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), P gaskets not included				
DIN 32676				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
10	34	10	10	**A5E02211143**
15	34	16	15	**A5E02211144**
25	50.5	22.6	25	**A5E02211146**
40	50.5	38	40	**A5E02211147**
50	64	50	50	**A5E02211148**
65	91	66	65	**A5E02211151**
80	106	81	80	**A5E02211152**
100	119	100	100	**A5E02211153**
ISO 2852				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	50.5	22.6	25	**A5E02213581**
33.7	50.5	31.3	25	**A5E02213582**
38	50.5	35.6	40	**A5E02213583**
51	64	48.6	50	**A5E02213584**
63.5	77.5	60.3	65	**A5E02213585**
76.1	91	72.9	80	**A5E02213586**
101.6	119	97.6	100	**A5E02213587**
Tri-Clamp (BS 4825-3)				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
12.7	25.4	9.5	10	**A5E02213596**
19.05	25.4	15.85	15	**A5E02213597**
25.4	50.5	22.2	25	**A5E02213598**
38.1	50.5	34.9	40	**A5E02213599**
50.8	64	47.6	50	**A5E02213600**
63.5	77.5	60.3	65	**A5E02213601**
76.2	91	73	80	**A5E02213602**
101.6	119	97.6	100	**A5E02213603**

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Selection and ordering data (continued)

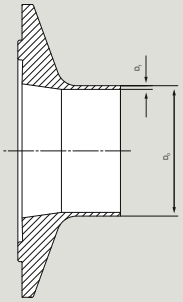
D_o: Outer diameter
D_i: Inner diameter

Description				Article No.
Threaded type connection fittings for use with P gaskets (stainless steel) Material: AISI 316L (1.4404) Only for PFA liner 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), P gaskets not included				
DIN 11851				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
10	28	10	10	**A5E02218293**
15	34	16	15	**A5E02218294**
20	44	20	15	**A5E02218295**
25	52	26	25	**A5E02218296**
32	58	32	25	**A5E02218297**
40	65	38	40	**A5E02218298**
50	78	50	50	**A5E02218299**
65	95	66	65	**A5E02218300**
80	110	81	80	**A5E02218301**
100	130	100	100	**A5E02218302**
SMS 1145				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	40	22.6	25	**A5E02218310**
38	60	35.6	40	**A5E02218312**
51	70	48.6	50	**A5E02218313**
63.5	85	60.3	65	**A5E02218314**
76	98	72	65	**A5E02218315**

D_o: Outer diameter
D_i: Inner diameter

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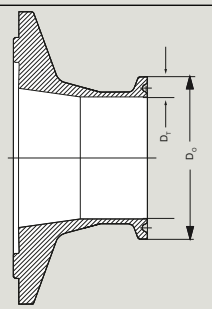
Selection and ordering data (continued)

Description				Article No.
Weld-in connection fittings for use with flat gaskets (stainless steel) Material: AISI 316L (1.4404) For PFA liner and ceramic 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), Flat gaskets not included				
DIN 11850[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
10	13	1.5	10	**FDK:083G2116**
15	19	1.5	15	**FDK:083G2117**
20	23	1.5	15	**FDK:083G2118**
25	29	1.5	25	**FDK:083G2119**
32	35	1.5	25	**FDK:083G2120**
40	41	1.5	40	**FDK:083G2121**
50	53	1.5	50	**FDK:083G2122**
65	70	2.0	65	**FDK:083G2123**
80	85	2.0	80	**FDK:083G2124**
100	104	2.0	100	**FDK:083G2125**
ISO 2037[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.0	10	**A5E03720273**
17.2	17.2	1.0	15	**FDK:083G2107**
25	25.6	1.6	25	**FDK:083G2109**
33.7	33.7	1.6	25	**FDK:083G2100**
38	38	1.6	40	**FDK:083G2111**
40	40	1.6	40	**FDK:083G2101**
51	51	1.6	50	**FDK:083G2112**
63.5	63.5	1.6	65	**FDK:083G2113**
76.1	76.1	1.6	80	**FDK:083G2114**
101.6	101.6	2.0	100	**FDK:083G2115**
114.3	118.3	2.0	100	**FDK:083G2105**
Tri-Weld (BS 4825-1)[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	12.7	1.2	10	**FDK:083G2276**
19.05	19.05	1.2	15	**FDK:083G2277**
25.4	25.4	1.6	25	**FDK:083G2279**
38	38.1	1.6	40	**FDK:083G2281**
50.8	50.8	1.6	50	**FDK:083G2282**
63.5	63.5	1.6	65	**FDK:083G2283**
76.2	76.2	1.6	80	**FDK:083G2284**

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Selection and ordering data (continued)

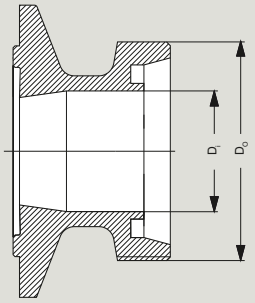
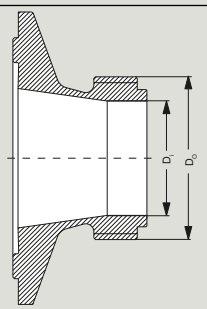
Description				Article No.
101.6	101.6	2.0	100	**FDK:083G2285**

Description				Article No.
Clamp-type connection fittings for use with flat gaskets (stainless steel) Material: AISI 316L (1.4404) For PFA liner and ceramic 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), Flat gaskets not included				
DIN 32676[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
10	34	10	10	**FDK:083G2186**
15	34	16	15	**FDK:083G2187**
25	50.5	26	25	**FDK:083G2179**
40	50.5	38	40	**FDK:083G2181**
50	64	50	50	**FDK:083G2182**
65	91	66	65	**FDK:083G2183**
80	106	81	80	**FDK:083G2184**
100	119	100	100	**FDK:083G2185**
ISO 2852[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
25	50.5	22.6	25	**FDK:083G2189**
33.7	50.5	31.3	25	**FDK:083G2190**
38	50.5	35.6	40	**FDK:083G2191**
51	64	48.6	50	**FDK:083G2192**
63.5	77.5	60.3	65	**FDK:083G2193**
76.1	91	72.9	80	**FDK:083G2194**
101.6	119	97.6	100	**FDK:083G2195**
Tri-Clamp (BS 4825-3)[1)]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_T (mm)	DN (mm)	
12.7	25.4	9.5	10	**FDK:083G2286**
19.05	25.4	15.85	15	**FDK:083G2287**
25.4	50.5	22.2	25	**FDK:083G2289**
38.1	50.5	34.9	40	**FDK:083G2291**
50.8	64	47.6	50	**FDK:083G2292**
63.5	77.5	60.3	65	**FDK:083G2293**
76.2	91	73	80	**FDK:083G2294**
101.6	119	97.6	100	**FDK:083G2295**

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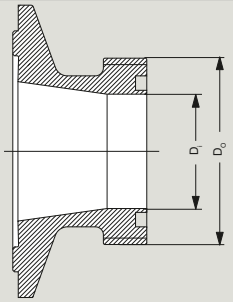
Selection and ordering data (continued)

D_o: Outer diameter
D_i: Inner diameter
1) Suitable for 3A

Description				Article No.
Threaded type connection fittings for use with flat gaskets (stainless steel) Material: AISI 316L (1.4404) For PFA liner and ceramic 2 pcs. fittings 2 pcs. clamps (to join flow sensor and fitting), Flat gaskets not included				
DIN 11851[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
10	28	10	10	**FDK:083G2156**
15	34	16	15	**FDK:083G2157**
20	44	20	15	**FDK:083G2158**
25	52	26	25	**FDK:083G2159**
32	58	32	25	**FDK:083G2160**
40	65	38	40	**FDK:083G2161**
50	78	50	50	**FDK:083G2162**
65	95	66	65	**FDK:083G2163**
80	110	81	80	**FDK:083G2164**
100	130	100	100	**FDK:083G2165**
ISO 2853[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	37	22.6	25	**FDK:083G2149**
38	51	35.6	40	**FDK:083G2151**
51	64	48.6	50	**FDK:083G2152**
63.5	78	60.3	65	**FDK:083G2153**
76.1	91	72.9	80	**FDK:083G2154**
BS 4825-4[1]				
Adapter			Sensor	
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
101.6	126	97.6	100	**FDK:083G2145**
SMS 1145[2]				
Adapter			Sensor	

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Selection and ordering data (continued)

Description				Article No.
DN (mm)	D_o (mm)	D_i (mm)	DN (mm)	
25	40	22.6	25	**FDK:083G2139**
38	60	35.6	40	**FDK:083G2141**
51	70	48.6	50	**FDK:083G2142**
63.5	85	60.3	65	**FDK:083G2143**
76	98	72	65	**FDK:083G2144**

D_o: Outer diameter
D_i: Inner diameter
1) Suitable for 3A
2) Not suitable for 3A

Accessories for MAG 1100 F sensor

Description	Article No.
Gaskets (delivered in pairs, to be placed between flow sensor and adapter)	
MAG 1100 F (PFA) - P gaskets	
Rubber: EPDM[1)]	
• DN 10	**A5E02055286**
• DN 15	**A5E02055287**
• DN 25	**A5E02055290**
• DN 40	**A5E02055291**
• DN 50	**A5E02055292**
• DN 65	**A5E02055293**
• DN 80	**A5E02055295**
• DN 100	**A5E02055297**
MAG 1100 F (ceramic) - Flat gaskets	
Rubber: FKM/FPM	
• DN 10	**A5E00915707**
• DN 15	**A5E00915764**
• DN 25	**A5E00915771**
• DN 40	**A5E00915773**
• DN 50	**A5E00915775**
• DN 65	**A5E00915780**
• DN 80	**A5E00915782**
• DN 100	**A5E00915784**

Description	Article No.
MAG 1100 F (PFA, ceramic) - Flat gaskets	
Rubber: EPDM	
• DN 10	**FDK:083G2206**
• DN 15	**FDK:083G2207**
• DN 25	**FDK:083G2209**
• DN 40	**FDK:083G2211**
• DN 50	**FDK:083G2212**
• DN 65	**FDK:083G2213**
• DN 80	**FDK:083G2214**
• DN 100	**FDK:083G2215**
Rubber: NBR	
• DN 10	**FDK:083G2216**
• DN 15	**FDK:083G2217**
• DN 25	**FDK:083G2219**
• DN 40	**FDK:083G2221**
• DN 50	**FDK:083G2222**
• DN 65	**FDK:083G2223**
• DN 80	**FDK:083G2224**
• DN 100	**FDK:083G2225**

1) Suitable for 3A

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Technical specifications

MAG 1100 F	
Measuring principle	Electromagnetic induction
Excitation frequency (Mains supply: 50 Hz/60 Hz)	DN 10 ... 65 (¼" ... 2½"): 12.5 Hz/15 Hz DN 80 ... 100 (3", 4"): 6.25 Hz/7.5 Hz
Process connection	
Nominal size	DN 10 ... 100 (3/8" ... 4")
Process connection	Hygienic adapters available for: • Direct welding onto pipe • Clamp fitting • Threaded fitting
Rated operating conditions	
Ambient temperature	
• Sensor	-40 ... +100 °C (-40 ... +212 °F)
• Ex sensor	-20 ... +60 °C (-4 ... +140 °F)
• Compact with transmitter MAG 5000/6000	-20 ... +60 °C (-4 ... +140 °F)
• Compact with transmitter MAG 6000 I [1]	-20 ... +60 °C (-4 ... +140 °F)
• Compact with transmitter MAG 6000 I Ex [1]	-10 ... +60 °C (14 ... 140 °F)
Temperature of medium	
• MAG 1100 F (Ceramic)	-20 ... +150 °C (-4 ... +302 °F) Suitable for steam sterilization
• MAG 1100 F (PFA)	-30 ... +130 °C (-22 ... +266 °F) Suitable for steam sterilization at 150 °C (302 °F)
Temperature shock	Duration ≤ 1 min, followed by 10 min rest
• MAG 1100 F	• DN 10, 15, 25: Max. ΔT ≤ 80 °C/min (3/8", ½", 1": Max. ΔT ≤ 144 °F/min) • DN 40, 50, 65: Max. ΔT ≤ 70 °C/min (1½", 2", 2½": Max. ΔT ≤ 126 °F/min) • DN 80, 100: Max. ΔT ≤ 60 °C/min (3", 4": Max. ΔT ≤ 108 °F/min)
• MAG 1100 F (PFA)	• DN 15, 25, 40, 50, 65: Max. ΔT 120 °C/min (½", 1", 1½", 2", 2½": Max. ΔT 248 °F/min) • DN 80, 100: Max. ΔT 110 °C/min (3", 4": Max. ΔT 230 °F/min)
Operating pressure	
• MAG 1100 F (Ceramic)	• DN 10 ... 65: 40 barg (3/8" ... 2½": 580 psig) • DN 80: 25 barg (3": 363 psig) • DN 100: 25 barg (4": 363 psig) Vacuum: 1×10^{-6} bar_{abs} (1.5×10^{-5} psi_{abs})
• MAG 1100 F (PFA)	20 barg (290 psig) Vacuum: 0.02 bar_{abs} (0.3 psi_{abs}) DN 80 ... 100: CO_2 pressure max. 7 barg (101.5 psig)
Mechanical load (vibration)	• 18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 • Sensor: 3.17 g RMS • Sensor with compact MAG 5000/6000 mounted transmitter: 3.17 grms • Sensor with compact MAG 6000 I/MAG 6000 I Ex mounted transmitter: 1.14 grms • For compact installation with the MAG 6000 I/MAG 6000 I Ex, transmitter to be supported to avoid tension on sensor part.
Protection class	IP67, NEMA 6
EMC	2014/30/EU
Design	
Weight	See Dimensional drawings
• Enclosure	Stainless steel AISI 316L/1.4404
• Terminal box (remote version only)	
- Standard	Fibre glass reinforced polyamide
- Option	Stainless steel AISI 316/1.4436
• Liner	Aluminum oxide (Al_2O_3) Reinforced PFA (not for Ex)
• Electrodes	
- MAG 1100 F (Ceramic)	Platinum with Gold / Titanium brazing alloy
- MAG 1100 F (PFA)	Hastelloy C22/2.4602

Technical specifications (continued)

MAG 1100 F	
Cable entries	• Remote installation 2 × M20 or 2 × ½" NPT • Compact installation - MAG 5000/MAG 6000: 4 × M20 or 4 × ½" NPT - MAG 6000 I : 2 × M20 (M25 for PROFIBUS) or 2 × ½" NPT
Certificates and approvals	
Calibration	
• Default calibration	Zero-point, 2 × 25 %, 2 × 90 %
Hazardous areas	
• MAG 1100 F (Ceramic)	
- Ex-sensor in compact or remote version with MAG 6000 I Ex	• ATEX, EAC Ex - Zone 1 Ex d e ia IIB T6 Gb • ATEX - Zone 21 Ex tD A21 IP67
- Standard sensor in compact or remote version with MAG MAG 5000/6000/6000 I Ex	• FM - NI Class I Div. 2 Groups A, B, C, D
• MAG 1100 F (PFA)	
- Standard sensor in compact or remote version with MAG MAG 5000/6000/6000 I Ex	• FM - NI Class I Div. 2 Groups A, B, C, D
Hygienic	
• MAG 1100 F (Ceramic)	• 3A (remote version with Polyamide terminal box)
• MAG 1100 F (PFA)	• 3A (remote version with Polyamide terminal box) • Hygienic EC 1935:2004 European food contact material
General purpose	• CE (LVD, PED, EMC, RoHS), UKCA
Others	• EAC (Kazakhstan)

Accessories for MAG 1100 F	
Weld-in adapter	
Adapter for welding onto dairy pipe, stainless steel 1.4404	Tri-Weld ISO 2037, DIN 11850, SMS 3008, BS 4825-1
• DN 10, 15, 25, 40, 50 and 65 (3/8", ½", 1", 1½", 2" and 2½")	PN 40 (600 psi)
• DN 8 and DN 100 (3" and 4")	PN 25 (350 psi)
Clamp adapter	Tri-Clamp, ISO 2852, DIN 32676, SMS 3016, BS 4825-3
DN 10, 15, 25, 40 and 50 (3/8", ½", 1", 1½" and 2")	PN 16 (200 psi)
DN 65, 80 and 100 (2½", 3" and 4")	PN 10 (150 psi)
Thread adapter	
DIN 11851	
• DN 10, 15, 25, and 40 (3/8", ½", 1", and 1½")	PN 40 (600 psi)
• DN 50, 65, 80 and 100 (2", 2½", 3" and 4")	PN 25 (350 psi)
ISO 2853, BS 4825-4	
• DN 10, 15, 25, 40, 50, 65 and 80 (3/8", ½", 1", 1½", 2", 2½" and 3")	PN 16 (200 psi)
SMS 1145	
• DN 25, 40, 50, 65 and 80 (1", 1½", 2", 2½" and 3")	PN 6 (80 psi)
Design	
Material	
Adapter	Stainless steel AISI 316/1.4436
Gasket	
• MAG 1100 F (Ceramic)	FKM/FPM with stainless steel insert (AISI 304/1.4301) (-20 ... +150 °C (-4 ... +302 °F)) EPDM (-20 ... +150 °C (-4 ... +302 °F))
• MAG 1100 F (PFA)	EPDM (-20 ... +150 °C (-4 ... +302 °F)) NBR (-20 ... +100 °C (-4 ... +212 °F))

[1] With HART communication max. ambient temperature 50 °C (122 °F).

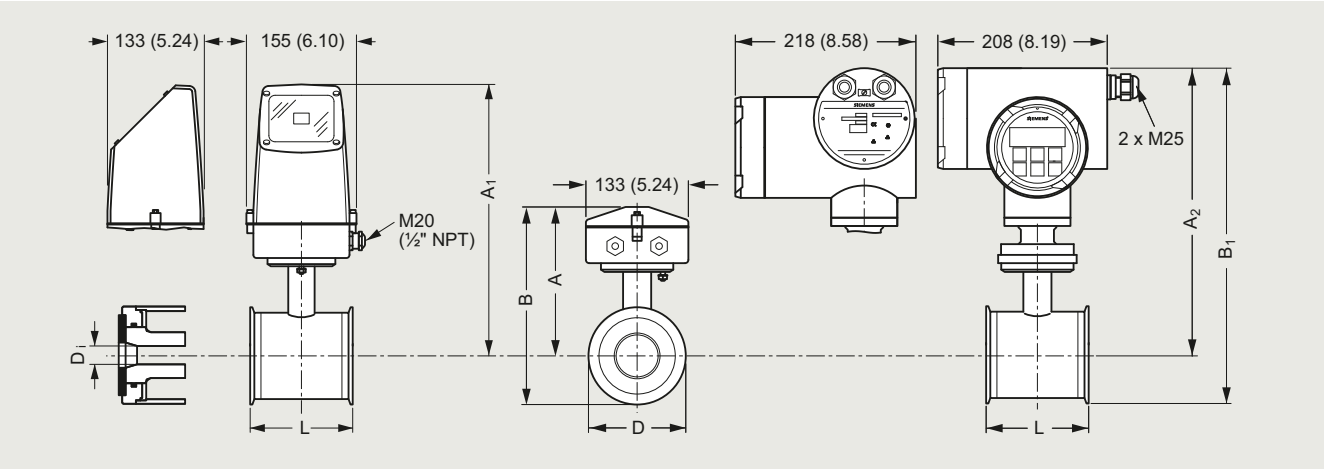
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Technical specifications (continued)

Note:
When combined sensor and adapter, the operating pressure is the lower rated of the pair.

Dimensional drawings

Sensor MAG 1100 F compact/remote



Dimensions in mm (inch)

Important note: For compact installation with MAG 6000 I/Ex - Supports the transmitter to avoid tension on the sensor part.

Size DN	L [mm]	A [mm]	A_1 3) [mm]	B 2) [mm]	B_1 [mm]	D [mm]	D_i (Al_2O_3) [mm]	D_i PFA [mm]	Weight 1) [kg]
10	64	161	315	193.7	344.7	64.0	10	10	2.2
15	64	161	315	193.7	344.7	64.0	15	16	2.2
25	79	169	323	207.5	359.0	77.5	25	26	2.7
40	94	179	333	228.0	379.0	91.0	40	38	3.4
50	104	188	342	247.7	398.7	119.0	50	50	4.2
65	131	197.5	351	262.6	413.6	130.0	65	66	5.5
80	156	204	357	281.0	432.0	155.0	80	81	7.0
100	186	217	370	308.0	459.0	183.0	100	100	10.0

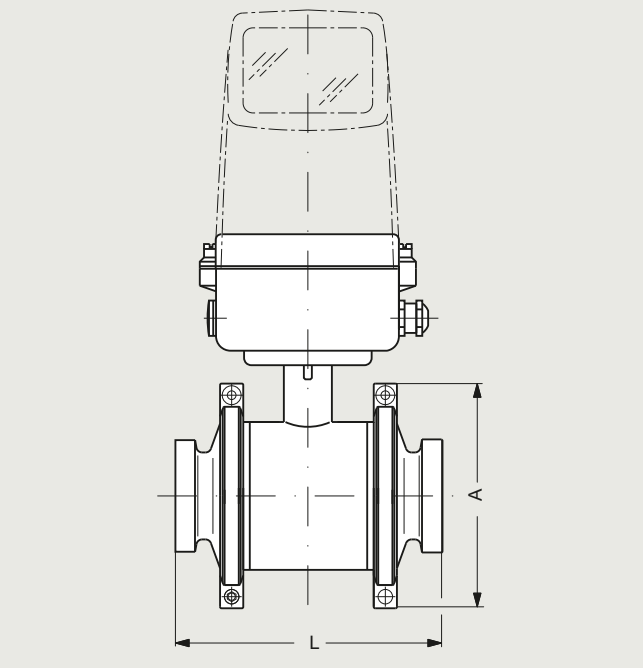
Size [inch]	L [inch]	A [inch]	A_1 3) [inch]	B 2) [inch]	B_1 [inch]	D [inch]	D_i (Al_2O_3) [inch]	D_i PFA [inch]	Weight 1) [lb]
3/8	2.52	6.34	12.40	7.62	13.57	2.52	0.39	0.39	4.8
½	2.52	6.34	12.40	7.62	13.57	2.52	0.59	0.63	4.8
1	3.11	6.66	12.72	8.17	14.13	3.05	0.98	1.02	4.9
1½	3.70	7.05	13.11	8.98	14.92	3.58	1.57	1.50	7.5
2	4.09	7.40	13.47	9.75	15.70	4.68	1.97	1.97	9.2
2½	5.16	7.78	13.82	10.34	16.28	5.12	2.56	2.60	12.0
3	6.14	8.03	14.06	11.06	17.01	6.10	3.15	3.19	15.0
4	7.32	8.54	14.57	12.13	18.07	7.20	3.94	3.94	22.0

1) With transmitter MAG 5000 or MAG 6000 compact, weight is increased by approximately 0.8 kg (1.8 lb). With MAG 6000 I weight is increased with 5.5 kg (12.1 lbs).
2) 14.5 mm (0.571") shorter when the stainless steel terminal box is used (always Ex version).
3) A_2 is 3 mm (0.12") shorter than A_1.

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Dimensional drawings (continued)

Sensor MAG 1100 F compact/separate – built-in length



Size DN	[Inch]	A [mm]	[inch]	L [1] [mm]	[inch]
10	3/8	99	3.90	146	5.75
15	½	99	3.90	146	5.75
25	1	113	4.45	161	6.34
40	1½	126	4.96	176	6.93
50	2	154	6.06	186	7.32
65	2½	165	6.50	223	8.78
80	3	200	7.87	258	10.16
100	4	225	8.86	288	11.34

[1] The total built-in length "L" is independent of the adapter type selected.

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Overview



The SITRANS FM MAG 3100 is an electromagnetic flow sensor in a large variety that meets the demands of almost every flow application.

Benefits

- Wide range of sizes: DN 15 to DN 2200 (½" to 88")
- Wide range of electrode and liner materials to fit even the most extreme process media
- Excellent chemical resistance also during high process temperature
- Reinforced PFA liner to perform extremely well under vacuum conditions
- Fully welded construction with no moving parts for maintenancefree operation over many years
- Smooth surface with minimal risk of build-up
- Sensor face-to-face length according to ISO 20456 (up to DN 400 mm)
- SENSORPROM™ Technology provides an automatic upload of startup settings and calibration data for easy commissioning
- Option for IP68 / NEMA 6P protection class ex works or for upgrading on site
- Designed to allow in-situ verification for easy performance check
- Approved for hazardous areas for maximum safety and reliability
- Meets EMC requirements acc. to NAMUR recommendation
- Meets EEC directive PED 2014/68/EU

Application

The main applications of the SITRANS FM electromagnetic flow sensors can be found in the following fields:

- Process industry
- Chemical industry
- Steel industry
- Mining
- Utility
- Power generation and distribution
- Oil and gas/HPI
- Water and waste water

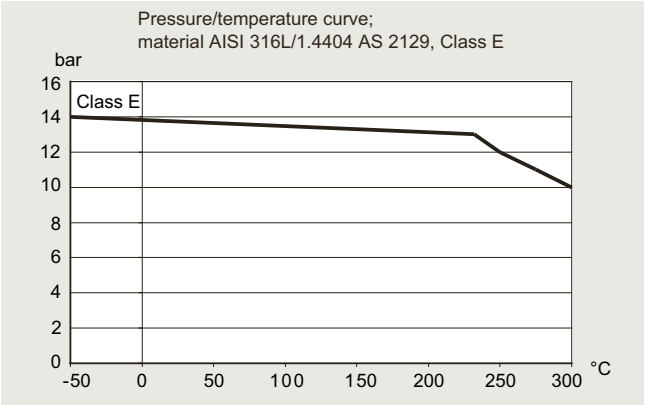
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Integration

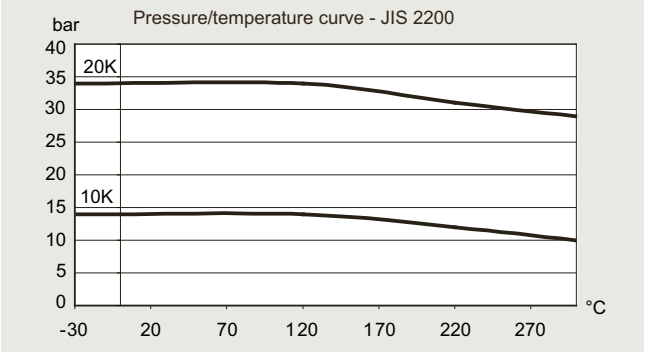
The complete flowmeter consists of a flow sensor and an associated transmitter MAG 5000, 6000 and 6000 I.

The flexible communication concept simplifies integration and update to a variety of fieldbus systems such as HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS DP and PA, Modbus RTU/RS 485.

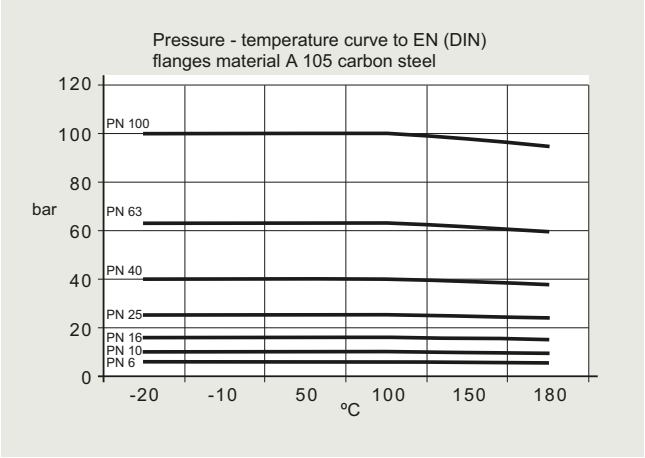
Pressure/temperature curve; material AISI 316L/1.4404 AS 2129, Class E



Pressure/temperature curve - JIS 2200

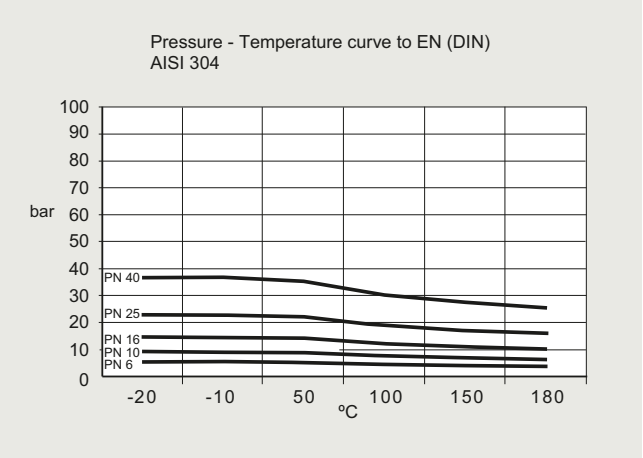


Pressure/temperature curve to EN (DIN) flanges, material A 105 carbon steel

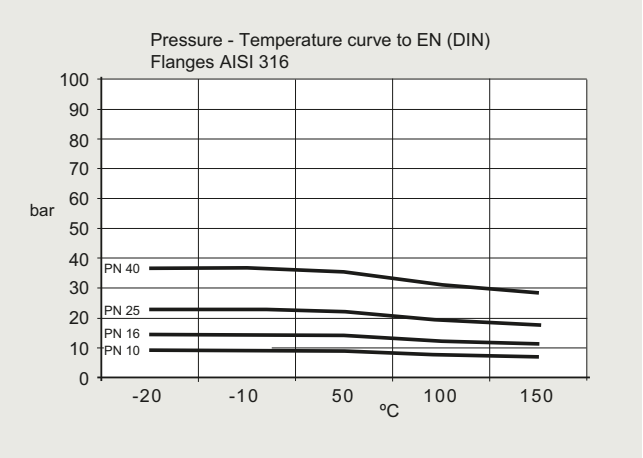


Integration (continued)

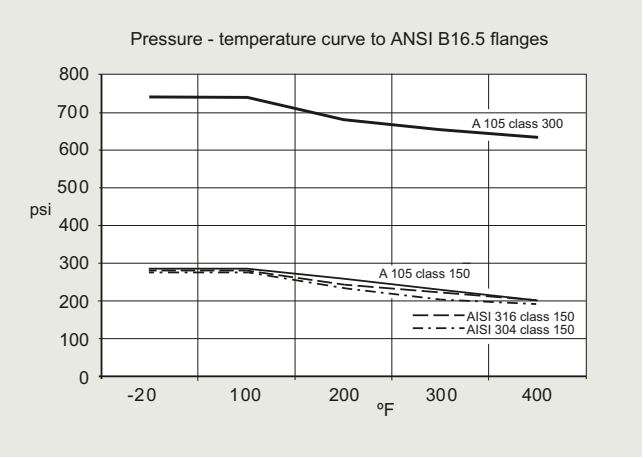
Pressure/temperature curve to EN (DIN) flanges AISI 304



Pressure/temperature curve to EN (DIN) flanges AISI 316



Pressure/temperature curve to ANSI B16.5 flanges



Note: The pressure-temperature curves only assist in the selection of a system. No responsibility is taken for the correctness of the

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Integration (continued)

information. For further information on PED standard see the section about Pressure Equipment Directive.

Selection and ordering data

Sensor SITRANS FM MAG 3100	Article No. 7ME6310- ● ● ● ● ● - ● ● ● ● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Diameter	
DN 15, ½ inch (PTFE and PFA liner)	1 V
DN 25, 1 inch	2 D
DN 32, 1¼ inch	2 H
DN 40, 1½ inch	2 R
DN 50, 2 inch	2 Y
DN 65, 2½ inch	3 F
DN 80, 3 inch	3 M
DN 100, 4 inch	3 T
DN 125, 5 inch	4 B
DN 150, 6 inch	4 H
DN 200, 8 inch	4 P
DN 250, 10 inch	4 V
DN 300, 12 inch	5 D
DN 350, 14 inch	5 K
DN 400, 16 inch	5 R
DN 450, 18 inch	5 Y
DN 500, 20 inch	6 F
DN 600, 24 inch	6 P
DN 700, 28 inch	6 Y
DN 750, 30 inch	7 D
DN 800, 32 inch	7 H
DN 900, 36 inch	7 M
DN 1000, 40 inch	7 R
DN 1050, 42 inch	7 U
DN 1100, 44 inch	7 V
DN 1200, 48 inch	8 B
DN 1400, 54 inch	8 F
DN 1500, 60 inch	8 K
DN 1600, 66 inch	8 P
DN 1800, 72 inch	8 T
DN 2000, 78 inch	8 Y
DN 2200, 88 inch	8 V
Flange norm and pressure rating	
EN 1092-1 PN 6 flanges	A
EN 1092-1 PN 10 flanges	B
EN 1092-1 PN 16 flanges, standard face-to-face length for sensor (1.25 × DN, PED compliant)	C
EN 1092-1 PN 16 flanges, short face-to-face length for sensor (1.0 × DN, not PED compliant)	D
EN 1092-1 PN 25 flanges	E
EN 1092-1 PN 40 flanges	F
EN 1092-1 PN 63 flanges	G
EN 1092-1 PN 100 flanges	H
ANSI B16.5 Class 150 flanges	J
ANSI B16.5 Class 300 flanges	K
ANSI B16.5 Class 600 flanges	U

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Selection and ordering data (continued)

Sensor SITRANS FM MAG 3100	Article No. 7ME6310- ● ● ● ● ● - ● ● ● ● ● ● ●
AWWA C-207 Class D flanges	L
AS 2129 table E flanges	M
AS 4087 PN 16 flanges	N
AS 4087 PN 21 flanges	P
AS 4087 PN 35 flanges	Q
JIS B 2220:2004 10K flanges	R
JIS B 2220:2004 20K flanges	S
Flange material	
Carbon steel flanges ASTM A 105, corrosion-resistant coating of category C4	1
Stainless steel flanges, AISI 304/1.4301, corrosion-resistant coating of category C4	2
Stainless steel flanges and sensor body, AISI 316L/1.4404, polished	3
Carbon steel ASTM A 105 with corrosion-resistant coating acc. to EN ISO 12944 grade C5 (300 µm)	4
Stainless steel flanges, AISI 304/1.4301, with corrosion-resistant coating acc. to EN ISO 12944 grade C5 (300 µm)	5
Liner material	
Soft rubber[1)]	1
EPDM	2
PTFE	3
Ebonite	4
Linatex	5
PFA	7
Electrode material (Grounding electrodes not for pressure rating PN 100)	
AISI 316Ti/1.4571 (not for PFA)	1
Hastelloy C276/2.4819 (PFA liner: Hastelloy C22/2.4602)	2
Platinum (DN ≤ 300 (12")) (not for Ebonite)	3
Titanium (not for PFA)	4
Tantalum (not for Ebonite)	5
Hastelloy C incl. grounding electrodes (only PFA and PTFE)	6
Platinum incl. grounding electrodes (only PFA and PTFE)	7
Tantalum incl. grounding electrodes (only PFA and PTFE)	8
Ceramic coated stainless steel	9 N 0 A
Ceramic coated Hastelloy C	9 N 0 B
AISI 316Ti incl. grounding electrodes (only PTFE)	9 N 0 C
Titanium incl. grounding electrodes (only PTFE)	9 N 0 D
Transmitter	
Standard sensor for remote transmitter (order transmitter separately)	A
Ex sensor for remote transmitter (order transmitter separately)	B
MAG 6000 I, Aluminum 18 ... 90 V DC, 115 ... 230 V AC, FM / CSA Class I Div. 2	C
MAG 6000 I, Aluminum 18 ... 30 V DC, Ex	D
MAG 6000 I, Aluminum 115 ... 230 V, Ex	E
MAG 6000 I, Aluminum 18 ... 90 V DC, 115 ... 230 V AC (non-Ex)	F
MAG 6000 Polyamide, 11... 30 V DC / 11...24 V AC	H
MAG 6000, Polyamide, 115 ... 230 V AC	J
MAG 5000, Polyamide, 11 ... 30 V DC / 11 ... 24 V AC	K
MAG 5000, Polyamide, 115 ... 230 V AC	L
Communication	
No communication, add-on possible	A
HART / Blocked for any TRN except MAG 6000I. Please consider to order the FM320	B
PROFIBUS PA Profile 3	F
PROFIBUS DP Profile 3 (not for Ex)	G
Modbus RTU/RS 485 (not for Ex)	E
FOUNDATION Fieldbus H1	J

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Selection and ordering data (continued)

Sensor SITRANS FM MAG 3100	Article No. 7ME6310- ● ● ● ● ● - ● ● ● ● ● ● ●
Cable glands/terminal box	
Metric: Polyamide terminal box or MAG 6000 I compact	1
½" NPT: Polyamide terminal box or MAG 6000 I compact	2
Metric: Stainless steel terminal box	3
½" NPT: Stainless steel terminal box	4

1) Devices made in France use Neoprene; devices made in China use Butyl

	Order code
Additional information	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates	
Pressure test certificate according to EN 10204-3.1	**C01**
Material certificate according to EN 10204-3.1	**C12**
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Special calibration	
5-point calibration for DN 15 ... 200[2)]	**D01**
5-point calibration for DN 250 ... 600[2)]	**D02**
5-point calibration for DN 700 ... 1200[2)]	**D03**
10-point calibration for DN 15 ... 200[3)]	**D06**
10-point calibration for DN 250 ... 600[3)]	**D07**
10-point calibration for DN 700 ... 1200[3)]	**D08**
Default (2 × 25 % and 2 × 90 %) match-pair calibration for DN 15 ... 200	**D11**
Default (2 × 25 % and 2 × 90 %) match-pair calibration for DN 250 ... 600	**D12**
Default (2 × 25 % and 2 × 90 %) match-pair calibration for DN 700 ... 1200	**D13**
5-point, matched-pair calibration for DN 15 ... 200[2)]	**D15**
5-point, matched-pair calibration for DN 250 ... 600[2)]	**D16**
5-point, matched-pair calibration for DN 700 ... 1200[2)]	**D17**
10-point, matched-pair calibration for DN 15 ... 200[3)]	**D18**
10-point, matched-pair calibration for DN 250 ... 600[3)]	**D19**
10-point, matched-pair calibration for DN 700 ... 1200[3)]	**D20**
Country of origin	
France	**F55**
Sensor cables	
Standard coil and electrode cable, PVC jacket	
• 5 m (16 ft)	**K01**
• 10 m (33 ft)	**K02**
• 20 m (65 ft)	**K04**
• 30 m (98 ft)	**K06**
• 40 m (131 ft)	**K07**
• 50 m (164 ft)	**K08**
• 60 m (197 ft)	**K09**
• 100 m (328 ft)	**K10**
• 150 m (492 ft)	**K11**
• 200 m (656 ft)	**K12**
• 500 m (1640 ft)	**K13**
Standard coil and special electrode cable, PVC jacket	
• 5 m (16 ft)	**K51**
• 10 m (33 ft)	**K52**
• 15 m (49 ft)	**K53**
• 20 m (65 ft)	**K54**
• 25 m (82 ft)	**K55**
• 30 m (98 ft)	**K56**
• 40 m (131 ft)	**K57**
• 50 m (164 ft)	**K58**
• 60 m (197 ft)	**K59**
• 100 m (328 ft)	**K60**
• 150 m (492 ft)	**K61**
• 200 m (656 ft)	**K62**
• 500 m (1640 ft)	**K63**
Terminal blocks	
Factory mounted terminal blocks	**N02**
PED options	
Not compliant to PED Cat I/II/III, approved for use under 2014/68/EU Art. 1 §2	**P30**
Device identification	
Tag name, stainless steel plate for transmitter (specify in plain text)	**Y16**
Tag name, stainless steel plate (specify in plain text)	**Y17**
Tag name, adhesive label (specify in plain text)	**Y18**
Device settings	
Customer-specific transmitter setting	**Y20**
Sensor cables	
Factory mounted sensor cables	**Y40**
Factory mounted and potted sensor cables, IP68 protection class for sensor	**Y41**
Additional calibrations	
Accredited matched-pair calibration acc. to ISO/IEC 17025: 2005	**On request** [4)]
Customer-specified calibration up to 10 points	**On request** [4)]
Customer-witnessed calibration (any of above calibration)	**On request** [4)]

1) Not concerned by PED
2) 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}
3) Ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}
4) Product Variation Request (PVR)

Description	Article No.
• English	**A5E03005599**
• German	**A5E03086288**

All literature is available to download for free, in a range of languages, at
http://www.siemens.com/processinstrumentation/documentation

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Selection and ordering data (continued)

Accessories

Description	Article No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[1)]	**FDK-085U0220**	

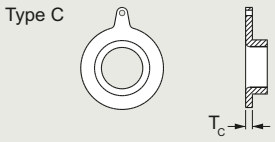
[1)] Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging

Please use online Product selector to get latest updates.

Product selector link:
http://www.pia-portal.automation.siemens.com

Accessories for MAG 3100

Grounding and protection ring - Type C (Stainless steel)[1)]



- Material AISI 304
- For all liners except PTFE and PFA
- 1 pc.

Size DN	EN 1092-1 PN 6	PN 10	PN 16	PN 25	PN 40	AS 2129 Table E
	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.
DN 25					**FDK:083N8361**	**FDK:083N8361**
DN 40					**FDK:083N8362**	**FDK:083N8362**
DN 50					**FDK:083N8344**	**FDK:083N8344**
DN 65	**FDK:083N8345**		**FDK:083N8345**		**FDK:083N8345**	**FDK:083N8346**
DN 80	**FDK:083N8347**		**FDK:083N8347**		**FDK:083N8347**	**FDK:083N8347**
DN 100	**FDK:083N8070**		**FDK:083N8025**		**FDK:083N8025**	**FDK:083N8025**
DN 125	**FDK:083N8071**		**FDK:083N8071**		**FDK:083N8071**	**FDK:083N8071**
DN 150	**FDK:083N8072**		**FDK:083N8008**		**FDK:083N8073**	**FDK:083N8008**
DN 200	**FDK:083N8074**	**FDK:083N8011**	**FDK:083N8011**	**FDK:083N8011**	**FDK:083N8075**	**FDK:083N8011**
DN 250	**FDK:083N8078**	**FDK:083N8013**	**FDK:083N8013**	**FDK:083N8013**	**FDK:083N8079**	**FDK:083N8013**
DN 300	**FDK:083N8080**	**FDK:083N8012**	**FDK:083N8012**	**FDK:083N8081**	**FDK:083N8082**	**FDK:083N8012**
DN 350	**FDK:083N8083**	**FDK:083N8039**	**FDK:083N8039**	**FDK:083N8084**	**FDK:083N8085**	**FDK:083N8039**
DN 400	**FDK:083N8099**	**FDK:083N8100**	**FDK:083N8100**	**FDK:083N8101**	**FDK:083N8102**	**FDK:083N8100**
DN 450	**FDK:083N8103**	**FDK:083N8103**	**FDK:083N8104**	**FDK:083N8104**	**FDK:083N8105**	**FDK:083N8104**
DN 500	**FDK:083N8107**	**FDK:083N8107**	**FDK:083N8108**	**FDK:083N8108**	**FDK:083N8109**	**FDK:083N8108**
DN 600	**FDK:083N8111**	**FDK:083N8111**	**FDK:083N8112**	**FDK:083N8112**		**FDK:083N8113**
DN 700	**FDK:083N8300**	**FDK:083N8294**	**FDK:083N8294**			**FDK:083N8372**
DN 750						
DN 800	**FDK:083N8303**	**FDK:083N8304**	**FDK:083N8304**			**FDK:083N8373**

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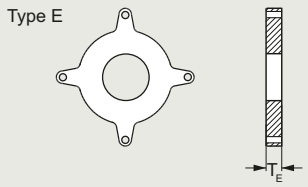
Selection and ordering data (continued)

Size DN	EN 1092-1 PN 6	PN 10	PN 16	PN 25	PN 40	AS 2129 Table E
DN 900	**FDK:083N8306**	**FDK:083N8307**	**FDK:083N8307**			**FDK:083N8396**
DN 1000	**FDK:083N8309**	**FDK:083N8310**	**FDK:083N8310**			**FDK:083N8397**
DN 1100		**FDK:083N8367**	**FDK:083N8367**			**FDK:083N8367**
DN 1200	**FDK:083N8312**	**FDK:083N8313**	**FDK:083N8313**			**FDK:083N8398**
DN 1400	**FDK:083N8467**	**FDK:083N8468**	**FDK:083N8469**			
DN 1500	**FDK:083N8471**	**FDK:083N8472**	**FDK:083N8473**			
DN 1600	**FDK:083N8475**	**FDK:083N8476**	**FDK:083N8477**			
DN 1800	**FDK:083N8479**	**FDK:083N8480**	**FDK:083N8481**			
DN 2000	**FDK:083N8483**	**FDK:083N8484**	**FDK:083N8485**			

Size Inch	ANSI B16.5 Class 150	Class 300	JIS B 2220:2004 10K	20K
	Article No.	Article No.	Article No.	Article No.
1"	**FDK:083N8361**	**FDK:083N8361**	**FDK:083N8361**	**FDK:083N8361**
1½"	**FDK:083N8362**	**FDK:083N8362**	**FDK:083N8362**	**FDK:083N8362**
2"	**FDK:083N8344**	**FDK:083N8344**	**FDK:083N8344**	**FDK:083N8344**
2½"	**FDK:083N8345**	**FDK:083N8345**	**FDK:083N8345**	**FDK:083N8345**
3"	**FDK:083N8347**	**FDK:083N8347**	**FDK:083N8347**	**FDK:083N8347**
4"	**FDK:083N8025**	**FDK:083N8025**	**FDK:083N8070**	**FDK:083N8025**
5"	**FDK:083N8071**	**FDK:083N8071**	**FDK:083N8071**	**FDK:083N8071**
6"	**FDK:083N8008**	**FDK:083N8073**	**FDK:083N8008**	**FDK:083N8008**
8"	**FDK:083N8011**	**FDK:083N8076**	**FDK:083N8011**	**FDK:083N8011**
10"	**FDK:083N8013**	**FDK:083N8079**	**FDK:083N8013**	**FDK:083N8079**
12"	**FDK:083N8012**	**FDK:083N8082**	**FDK:083N8012**	**FDK:083N8081**
14"	**FDK:083N8039**	**FDK:083N8085**	**FDK:083N8083**	**FDK:083N8039**
16"	**FDK:083N8100**	**FDK:083N8102**	**FDK:083N8100**	**FDK:083N8101**
18"	**FDK:083N8104**	**FDK:083N8106**	**FDK:083N8103**	**FDK:083N8104**
20"	**FDK:083N8107**	**FDK:083N8110**	**FDK:083N8107**	**FDK:083N8108**
24"	**FDK:083N8113**	**FDK:083N8114**	**FDK:083N8111**	**FDK:083N8112**

Size Inch	AWWA C-207 Class D
	Article No.
28"	**FDK:083N8302**
30"	**FDK:083N8366**
32"	**FDK:083N8305**
36"	**FDK:083N8308**
40"	**FDK:083N8311**
42"	**FDK:083N8394**
44"	**FDK:083N8395**
48"	**FDK:083N8314**
54"	**FDK:083N8470**
60"	**FDK:083N8474**
66"	**FDK:083N8478**
72"	**FDK:083N8482**
78"	**FDK:083N8486**

Grounding and protection ring - Type E (Stainless steel)



- Material: AISI 316
- For all PTFE liners
- 1 pc. incl. straps and screws

[1] Also for MAG 5100 W (7ME6520 > DN 300/12 inch).

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Selection and ordering data (continued)

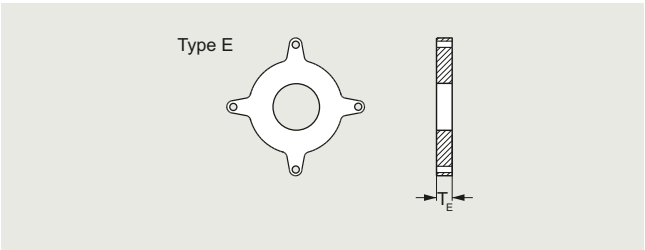
Size DN	EN 1092-1 PN 6	PN 10	PN 16	PN 25	PN 40	AS 2129 Table E
	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.
DN 15					**FDK:083N8365**	**FDK:083N8365**
DN 25					**FDK:083N8271**	**FDK:083N8272**
DN 32					**FDK:083N8274**	
DN 40					**FDK:083N8278**	**FDK:083N8280**
DN 50					**FDK:083N8282**	**FDK:083N8281**
DN 65	**FDK:083N8284**		**FDK:083N8285**		**FDK:083N8286**	**FDK:083N8284**
DN 80	**FDK:083N8288**		**FDK:083N8289**		**FDK:083N8290**	**FDK:083N8293**
DN 100	**FDK:083N8116**		**FDK:083N8117**		**FDK:083N8118**	**FDK:083N8117**
DN 125	**FDK:083N8120**		**FDK:083N8121**		**FDK:083N8122**	**FDK:083N8121**
DN 150	**FDK:083N8124**		**FDK:083N8125**		**FDK:083N8126**	**FDK:083N8128**
DN 200	**FDK:083N8129**	**FDK:083N8130**	**FDK:083N8130**	**FDK:083N8131**	**FDK:083N8132**	**FDK:083N8134**
DN 250	**FDK:083N8135**	**FDK:083N8136**	**FDK:083N8137**	**FDK:083N8138**	**FDK:083N8139**	**FDK:083N8143**
DN 300	**FDK:083N8144**	**FDK:083N8144**	**FDK:083N8145**	**FDK:083N8146**	**FDK:083N8147**	**FDK:083N8151**
DN 350	**FDK:083N8152**	**FDK:083N8153**	**FDK:083N8154**	**FDK:083N8155**	**FDK:083N8156**	**FDK:083N8153**
DN 400	**FDK:083N8160**	**FDK:083N8161**	**FDK:083N8162**	**FDK:083N8163**	**FDK:083N8164**	**FDK:083N8161**
DN 450	**FDK:083N8168**	**FDK:083N8169**	**FDK:083N8170**	**FDK:083N8171**	**FDK:083N8172**	**FDK:083N8176**
DN 500	**FDK:083N8177**	**FDK:083N8178**	**FDK:083N8179**	**FDK:083N8180**	**FDK:083N8181**	**FDK:083N8185**
DN 600	**FDK:083N8186**	**FDK:083N8187**	**FDK:083N8188**	**FDK:083N8189**		**A5E32710253**

Size Inch	ANSI B16.5 Class 150	Class 300	JIS B 2220:2004 10K	20K
	Article No.	Article No.	Article No.	Article No.
½"	**FDK:083N8365**	**FDK:083N8365**		
1"	**FDK:083N8272**	**FDK:083N8272**	**FDK:083N8271**	**FDK:083N8271**
1½"	**FDK:083N8279**	**FDK:083N8279**	**FDK:083N8278**	**FDK:083N8278**
2"	**FDK:083N8283**	**FDK:083N8283**	**FDK:083N8282**	**FDK:083N8282**
2½"	**FDK:083N8287**	**FDK:083N8287**	**FDK:083N8285**	**FDK:083N8285**
3"	**FDK:083N8291**	**FDK:083N8292**	**FDK:083N8288**	**FDK:083N8289**
4"	**FDK:083N8118**	**FDK:083N8119**	**FDK:083N8116**	**FDK:083N8117**
5"	**FDK:083N8122**	**FDK:083N8123**	**FDK:083N8121**	**FDK:083N8122**
6"	**FDK:083N8126**	**FDK:083N8127**	**FDK:083N8125**	**FDK:083N8126**
8"	**FDK:083N8370**	**FDK:083N8133**	**FDK:083N8130**	**FDK:083N8370**
10"	**FDK:083N8140**	**FDK:083N8141**	**FDK:083N8137**	**FDK:083N8139**
12"	**FDK:083N8148**	**FDK:083N8149**	**FDK:083N8144**	**FDK:083N8146**
14"	**FDK:083N8157**	**FDK:083N8158**	**FDK:083N8152**	**FDK:083N8154**
16"	**FDK:083N8165**	**FDK:083N8166**	**FDK:083N8160**	**FDK:083N8165**
18"	**FDK:083N8173**	**FDK:083N8174**	**FDK:083N8169**	**FDK:083N8171**
20"	**FDK:083N8182**	**FDK:083N8183**	**FDK:083N8178**	**FDK:083N8180**
24"	**FDK:083N8190**	**FDK:083N8191**	**A5E32709738**	**A5E32710253**

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Selection and ordering data (continued)

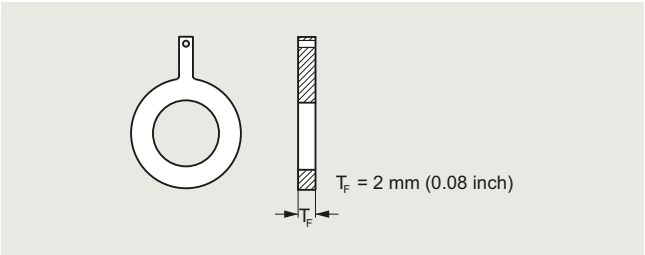
Grounding and protecting ring - Type E (Hastelloy)



- Material: Hastelloy C276
- For all PTFE liners
- 1 pc. incl. straps and screws

Size DN	EN 1092-1 PN 6	PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.	Article No.		Article No.	Article No.
DN 15			**FDK:083N8487**	½"	**FDK:083N8487**	**FDK:083N8487**
DN 25			**FDK:083N8488**	1"	**FDK:083N8489**	**FDK:083N8489**
DN 40			**FDK:083N8490**	1½"	**FDK:083N8491**	**FDK:083N8491**
DN 50			**FDK:083N8492**	2"	**FDK:083N8493**	**FDK:083N8493**
DN 65	**FDK:083N8494**	**FDK:083N8495**	**FDK:083N8496**	2½"	**FDK:083N8497**	**FDK:083N8497**
DN 80	**FDK:083N8498**	**FDK:083N8499**	**FDK:083N8500**	3"	**FDK:083N8501**	**FDK:083N8502**
DN 100	**FDK:083N8503**	**FDK:083N8504**	**FDK:083N8505**	4"	**FDK:083N8506**	**FDK:083N8507**

Grounding ring - Type Flat ring (Stainless steel)



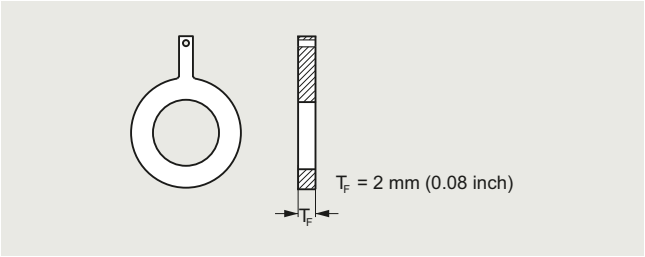
- Material: AISI 316
- For all liners (PTFE max. 150 °C (302 °F))
- 1 pc.

Size DN	EN 1092-1 PN 10	PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.	Article No.		Article No.	Article No.
DN 15			**A5E01191968**	½"	**A5E01191969**	
DN 25			**A5E01150880**	1"	**A5E01150022**	**A5E01150378**
DN 32			**A5E50640502**	1¼"	**A5E50640507**	**A5E50640516**
DN 40			**A5E01191952**	1½"	**A5E01191961**	
DN 50			**A5E01150918**	2"	**A5E01151121**	**A5E01151194**
DN 65		**A5E01191940**	**A5E01191954**	2½"	**A5E01191962**	
DN 80		**A5E01152876**	**A5E01152876**	3"	**A5E01152910**	**A5E01153422**
DN 100		**A5E01158875**	**A5E01159072**	4"	**A5E01159146**	**A5E01159628**
DN 125		**A5E01191941**	**A5E01191956**	5"	**A5E01191963**	
DN 150		**A5E01191943**	**A5E01191957**	6"	**A5E01191964**	
DN 200	**A5E01191951**	**A5E01191944**	**A5E01191958**	8"	**A5E01191965**	
DN 250	**A5E01191950**	**A5E01191946**	**A5E01191959**	10"	**A5E01191966**	
DN 300	**A5E01191949**	**A5E01191947**	**A5E01191960**	12"	**A5E01191967**	

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Selection and ordering data (continued)

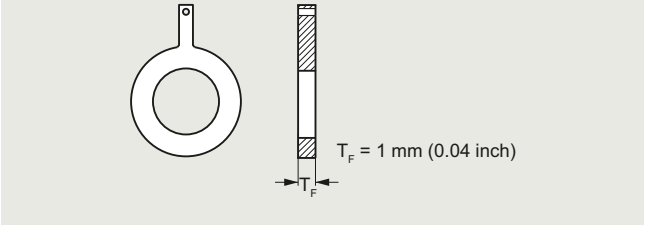
Grounding ring - Type Flat ring (Hastelloy)



- Material: Hastelloy C276
- For all liners (PTFE max. 150 °C (302 °F))
- 1 pc.

Size DN	EN 1092-1 PN 6	PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.	Article No.		Article No.	Article No.
DN 15			**A5E01191981**	½"	**A5E01191989**	
DN 25			**A5E01150882**	1"	**A5E01150028**	**A5E01150379**
DN 40			**A5E01191982**	1½"	**A5E01191990**	
DN 50			**A5E01150922**	2"	**A5E01151124**	**A5E01151197**
DN 65		**A5E01191971**	**A5E01191983**	2½"	**A5E01191991**	
DN 80		**A5E01152889**	**A5E01152889**	3"	**A5E01152913**	**A5E01153424**
DN 100		**A5E01158886**	**A5E01159074**	4"	**A5E01159150**	**A5E01159629**
DN 125		**A5E01191973**	**A5E01191984**	5"	**A5E01191992**	
DN 150		**A5E01191974**	**A5E01191985**	6"	**A5E01191993**	
DN 200	**A5E01191978**	**A5E01191975**	**A5E01191986**	8"	**A5E01191994**	
DN 250	**A5E01191979**	**A5E01191976**	**A5E01191987**	10"	**A5E01191995**	
DN 300	**A5E01191980**	**A5E01191977**	**A5E01191988**	12"	**A5E01191996**	

Grounding ring - Type Flat ring (Tantalum)



- Material: Tantalum
- For all liners (PTFE max. 150 °C (302 °F))
- 1 pc.

Size DN	EN 1092-1 PN 16	PN 40	Size Inch	ANSI B16.5 Class 150	Class 300
	Article No.	Article No.		Article No.	Article No.
DN 15		**A5E01192007**	½"	**A5E01192010**	
DN 25		**A5E01150883**	1"	**A5E01150030**	**A5E01150381**
DN 40		**A5E01192008**	1½"	**A5E01192011**	
DN 50		**A5E01150926**	2"	**A5E01151129**	**A5E01151199**
DN 65	**A5E01192005**	**A5E01192009**	2½"	**A5E01192012**	
DN 80	**A5E01152890**	**A5E01152890**	3"	**A5E01152916**	**A5E01153427**
DN 100	**A5E01158891**	**A5E01159076**	4"	**A5E01159156**	**A5E01159631**

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Technical specifications

Version	MAG 3100
Product characteristic	Flexible product program
Nominal size	DN 15 ... 2000 (½" ... 80")
Measuring principle	Electromagnetic induction
Excitation frequency (Mains supply: 50 Hz/60 Hz)	• DN 15 ... 65 (½" ... 2½"): 12.5 Hz/15 Hz • DN 80 ... 150 (3" ... 6"): 6.25 Hz/7.5 Hz • DN 200 ... 1200 (8" ... 48"): 3.125 Hz/3.75 Hz • DN 1400 ... 2200 (54" ... 88"): 1.5625 Hz/1.875 Hz
Process connection	
Flanges	EN 1092-1, raised face[1)2)] • DN 65 ... 2200 (2½" ... 88"): PN 6 (87 psi) • DN 200 ... 2200 (8" ... 88"): PN 10 (145 psi) • DN 65 ... 2000 (2½" ... 78"): PN 16 (232 psi) • DN 200 ... 600 (8" ... 24"): PN 25 (362 psi) • DN 15 ... 600 (½" ... 24"): PN 40 (580 psi) • DN 50 ... 300 (2" ... 12"): PN 63 (913 psi) • DN 25 ... 300 (1" ... 12"): PN 100 (1450 psi) ANSI B16.5, raised face • ½" ... 24": Class 150 (20 bar (290 psi)) • ½" ... 24": Class 300 (50 bar (725 psi)) • ½" ... 16": Class 600 (100 bar (1450 psi)) AWWA C-207, flat face 28" ... 88": Class D (10 bar) AS 2129, raised face ½" ... 48": Table E AS 4087, raised face[2)] • PN 16 (DN 50 ... 1200, 16 bar (232 psi)) • PN 21 (DN 50 ... 600, 21 bar (304 psi)) • PN 35 (DN 50 ... 600, 35 bar (508 psi)) JIS B 2220:2004 • K10 (1" ... 24") • K20 (1" ... 24") Other flanges and pressure ratings on request
Rated operating conditions	
Ambient temperature	
(conditions also dependent on liner characteristics)	
• Standard sensor	-40 ... +100 °C (-40 ... +212 °F)
• Ex sensor	-20 ... +60 °C (-4 ... +140 °F)
• Compact with transmitter	
- MAG 5000/6000	-20 ... +60 °C (-4 ... +140 °F)
- MAG 6000 I [8)]	-20 ... +60 °C (-4 ... +140 °F)
- MAG 6000 I Ex [7)]	-20 ... +60 °C (-4 ... +140 °F)
Operating pressure	
	• Softrubber[8)] 0.01 bara ... 100 barg (0.15 psia ... 1450 psig) • EPDM 0.01 bara ... 40 barg (0.15 psia ... 580 psig) • Linatex 0.01 bara ... 40 barg (0.15 psia ... 580 psig) • Ebonite 0.01 bara ... 100 barg (0.15 psia ... 1450 psig) • PTFE - DN ≤ 300 (≤ 12"): 0.3 bara ... 50 barg (4 psia ... 725 psig) - 350 ≤ DN ≤ 600 (14"≤ DN ≤ 24"): 0.3 bara ... 40 barg (4 psia ... 580 psig) • PFA - DN 15 ... 150 (½" ... 6"): Vacuum 0.02 bara ... 50 barg (0.29 psia ... 725 psig)
Temperature of medium	• Soft rubber[8)] 0 ... +70 °C (32 ... 158 °F) • EPDM -10 ... +70 °C (14 ... 158 °F) • Linatex (rubber) -40 ... +70 °C (-40 ... +158 °F) (for temperatures below -20 °C (-4 °F) AISI 304 or 316 flanges must be used) • Ebonite 0 ... 95 °C (32 ... 203 °F) • PTFE -20 ... +100 °C (-4 ... +212 °F) • PFA -20 ... +100 °C (-4 ... +212 °F)

Technical specifications (continued)

Version	MAG 3100
Mechanical load (vibration)	• 18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 • Sensor: 3.17 g RMS • Sensor with compact MAG 5000/6000 mounted transmitter: 3.17 g RMS • Sensor with compact MAG 6000 I/6000 I Ex mounted transmitter: 1.14 g RMS • For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.
Pressure drop at 3 m/s	As straight pipe
Test pressure	1.5 × PN (where applicable)
Protection class	IP67, NEMA 6 Optional: IP68 and NEMA 6P (10m, continuously) for sensor in remote design
EMC	2014/30/EU
Design	
Weight	See dimensional drawings
Material	
• Flange and sensor housing	Carbon steel ASTM A 105 with corrosion protection EN ISO 12944 grade C4 or grade C5 (medium durability ≤15 years) or Stainless steel AISI 304/1.4301 flanges and carbon steel housing with corrosion protection EN ISO 12944 grade C4 or grade C5 (durability up to 15 years) or Stainless steel AISI 316L/1.4404 flanges and housing, polished
• Measuring tube	Stainless steel AISI 304/1.4301
• Electrode	• Stainless steel AISI 316Ti/1.4571 • Hastelloy C276/2.4819 (PFA: Hastelloy C22/2.4602) • Platinum • Titanium • Tantalum • Ceramic coated stainless steel • Ceramic coated Hastelloy C
• Grounding electrode	• Soft rubber[8)], EPDM, Linatex, Ebonite: grounding electrodes built-in by default for stainless steel and Hastelloy C • PTFE: optional in Stainless steel, Hastelloy C, Titanium, Platinum or Tantalum • PFA: optional in Hastelloy, Tantalum or Platinum • Ceramic coated stainless steel and Hastelloy C276: grounding electrodes built-in by default
• Terminal box	
- Standard	Fibre glass reinforced polyamide
- Option	Stainless steel AISI 316/1.4436
Cable entries	• Remote installation 2 × M20 or 2 × ½" NPT • Compact installation - MAG 5000/MAG 6000: 4 × M20 or 4 × ½" NPT - MAG 6000 I: 2 × M20 (M25 for PROFIBUS) or 2 × ½" NPT
Certificates and approvals	
Calibration	
• Default calibration	Zero-point, 2 × 25 % and 2 × 90 % (default)
• Special calibration	5-point calibration: 20%, 40%, 60%, 80%, 100% of factory Q_{max} 10-point calibration: ascending and descending at 20%, 40%, 60%, 80%, 100% of factory Q_{max} Matched pair calibration: default, 5-point or 10-point
Hazardous areas[2)3)]	

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Technical specifications (continued)

Version	MAG 3100
• Ex-sensor in compact or remote version with MAG 6000 I Ex	• ATEX, FM, CSA, IECEx, EAC Ex, NEPSI - Zone 1 Ex d e ia IIC T6 Gb [4] - Zone 1 Ex e ia IIC T6 Gb [5] • ATEX, FM, CSA, IECEx - Zone 21 Ex tD A21 IP67 • FM - XP IS Class I Div. 1 Groups A, B, C, D[6] - DIP Class II+III Div. 1 Groups E, F, G[6] • KCs - Zone 1 Ex d e ia IIC T6 [4] - Zone 1 Ex e ia IIC T6 [5]
• Standard sensor with/without MAG 5000/6000/6000 I	• FM - NI Class I Div. 2 Groups A, B, C, D - NI Class I Zone 2 Groups IIC
Drinking water	EPDM liner: • WRAS (WRc, BS6920 material approval for cold water, GB) • NSF/ANSI Standard 61 (Cold water, US) • ACS listed (F) • KTW-BWGL (Germany) • KIWA (NL) • Belgaqua (B) • AS/NZS4020 (Australia/New Zealand) • MCERTS (GB) (EPDM or PTFE lining with AISI 316 or Hastelloy electrodes) Ebonite liner • NSF/ANSI Standard 61/37 [2] (Cold water, US) • GB/T5750 (CN) • AS/NZS4020 (Australia/New Zealand)
General purpose	CE (LVD, PED, EMC, RoHS), UKCA
Others	• CRN (Canadian Registration Number) • CPA (China) • EAC (Kazakhstan)

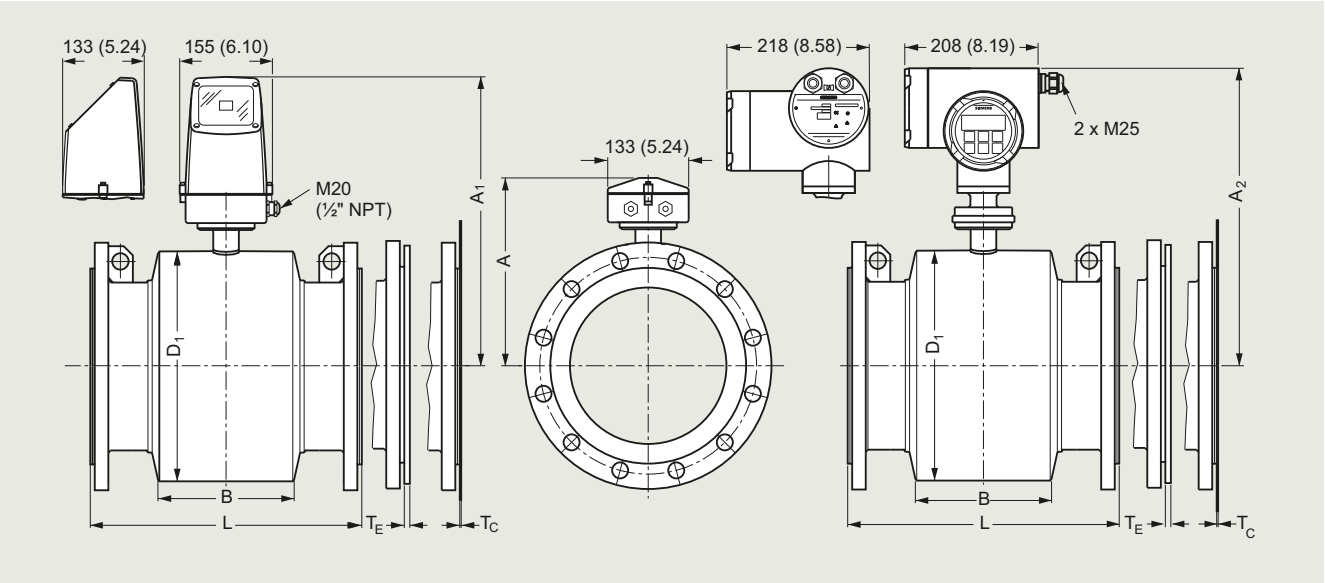
Technical specification for transmitter - please see section about transmitters.

1) PN 6-40: DN ≤ 600 type 01 (SORF); DN > 600 type 11 (WNRF); PN 63-100: type 11 (WNRF).
2) DN 750, DN 1050 and DN 1100 (30", 42" and 44") not available with EN 1092-1 and AS 4087 flanges.
3) Not available for sensors with C5 (300 µm) coating.
4) In remote design for sensor size DN 15 ... 300 (½" ... 12").
5) In remote design for sensor size DN 350 ... 2000 (14" ... 78").
6) In compact design for sensor size DN 15 ... 300 (½" ... 12").
7) With HART communication max. ambient temperature 50 °C (122 °F).
8) Devices made in France use Neoprene; devices made in China use Butyl

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Dimensional drawings

MAG 3100 and MAG 3100 HT sensor with compact or remote transmitter



Dimensions in mm (inch)

Metric

DN	A[1)]	A1	A2	B	D1	L[2)] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 face-to-face length 1.0×DN	PN 25	PN 40	PN 63	PN 100
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
15	187	341	338	59	104	-	-/-	-	200	-	-
25	187	341	338	59	104	-	-/-	-	200	-	260[3)]
32	193	346	336	86	114	-	-/-	-	200	-	280[3)]
40	197	351	348	82	124	-	-/-	-	200	-	280[3)]
50	205	359	356	72	139	-	-/-	-	200	276[3)]	300[3)]
65	212	366	363	72	154	200	200/-	-	200	320[3)]	350[3)]
80	222	376	373	72	174	200	200/-	-	272[3)]	323[3)]	340[3)]
100	242	396	393	85	214	250	250/-	-	250	380[3)]	400[3)]
125	255	409	406	85	239	250	250/-	-	250	420[3)]	450[3)]
150	276	430	427	85	282	300	300/-	-	300	415[3)]	450[3)]
200	304	458	455	137	338	350	350/-	350	350	480[3)]	530[3)]
250	332	486	483	157	393	450	450/-	450	450	550[3)]	620[3)]
300	357	511	508	157	444	500	500/-	500	500	600[3)]	680[3)]
350	362	516	513	270	451	550	550/-	550	550	-	-
400	387	541	538	270	502	600	600/-	600	600	-	-
450	418	572	569	310	563	600	600/-	600	600	-	-
500	443	597	594	350	614	600	600/-	625	680	-	-
600	494	648	645	320	715	600	600/-	750	800	-	-
700	544	698	695	450	816	700	875/700	-	-	-	-
750	571	725	722	556	869	-	-/-	-	-	-	-
800	606	760	757	560	927	800	1000/800	-	-	-	-
900	653	807	804	630	1032	900	1125/900	-	-	-	-
1000	704	858	855	670	1136	1000	1250/1000	-	-	-	-
1050	704	858	855	670	1136	-	-/-	-	-	-	-
1100	755	904	901	770	1238	-	-/-	-	-	-	-
1200	810	964	961	792	1348	1200	1500/1200	1300	-	-	-
1400	925	1079	1076	1000	1574	1400	-/1400	-	-	-	-
1500	972	1126	1123	1020	1672	1500	-/1500	-	-	-	-

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Dimensional drawings (continued)

DN	A[1]	A_1	A_2	B	D_1	L[2] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 face-to-face length 1.0×DN	PN 25	PN 40	PN 63	PN 100
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
1600	1025	1179	1176	1130	1774	1600	-/1600	-	-	-	-
1800	1123	1277	1274	1250	1974	1800	-/1800	-	-	-	-
2000	1223	1377	1374	1375	2174	2000	-/2000	-	-	-	-
2200	1353	1507	-	1496	2400	2200	-/-	-	-	-	-

1) 14.5 mm shorter with stainless steel terminal box
2) When grounding rings are used, the thickness of the grounding ring must be added to the sensor face-to-face length
3) Not according to ISO 20456

DN	A[1]	A_1	A_2	B	D_1	L[1][2] ANSI 16.5 Class 150	ANSI 16.5 Class 300	ANSI 16.5 Class 600	AWWA C-207 Class D	AS 4087 PN 16 PN 21 PN 35	AS 2129 Table E
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
15	187	341	338	59	104	200	200	-	-	-	200
25	187	341	338	59	104	200	200	280[4]	-	-	200
32	193	346	336	86	114	200	200	300[4]	-	-	200
40	197	351	348	82	124	200	200	320[4]	-	-	200
50	205	359	356	72	139	200	200	330[4]	-	200	200
65	212	366	363	72	154	200	272	370[4]	-	200	200
80	222	376	373	72	174	272[4]	272[4]	350	-	200[4]	200[4]
100	242	396	393	85	214	250	310	460[4]	-	250	250
125	255	409	406	85	239	250	335	480[4]	-	250	250
150	276	430	427	85	282	300	300	500[4]	-	300	300
200	304	458	455	137	338	350	350	600[4]	-	350	350
250	332	486	483	157	393	450	450	600[4]	-	450	450
300	357	511	508	157	444	500	500	700[4]	-	500	500
350	362	516	513	270	451	550	550	800[4]	-	550	550
400	387	541	538	270	502	600	600	820[4]	-	600	600
450	418	572	569	310	563	600	640	-	-	600	600
500	443	597	594	350	614	600	730	-	-	600[6]	600
600	494	648	645	320	715	600	860	-	-	600[7]	600
700	544	698	695	450	816	800	-	-	700	700[3]	700
750	571	725	722	556	869	950	-	-	750	750[3]	750
800	606	760	757	560	927	900	-	-	800	800[3]	800
900	653	807	804	630	1032	1100	-	-	900	900[3]	900
1000	704	858	855	670	1136	1100	-	-	1000	1000[3]	1000
1050	704	858	855	670	1136	-	-	-	1000	-	-
1100	755	904	901	770	1238	-	-	-	1100	-	-
1200	810	964	961	792	1348	1400	-	-	1200	1200[6]	1200
1400	925	1079	1076	1000	1574	-	-	-	1400	-	-
1500	972	1126	1123	1020	1672	-	-	-	1500	-	-
1600	1025	1179	1176	1130	1774	-	-	-	1600	-	-
1800	1123	1277	1274	1250	1974	-	-	-	1800	-	-
2000	1223	1377	1374	1375	2174	-	-	-	2000	-	-
2200	1353	1507	-	1496	2400	-	-	-	2200	-	-

1) 14.5 mm shorter with stainless steel terminal box
2) When grounding rings are used, the thickness of the grounding ring must be added to the sensor face-to-face length
3) Not available for AS 4087 PN 21, PN 35
4) Not according to ISO 20456
5) PN 35 DN 80 = 272 mm
6) PN 35 DN 500 = 680 mm
7) PN 35 DN 600 = 750 mm

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Dimensional drawings (continued)

DN	A[1]	A_1	A_2	B	D_1	L[2] JIS B 2220:2004 10K	L[2] JIS B 2220:2004 20K	T_C[3]	T_E[3]	T_F[3]	Weight[4]
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
15	187	341	338	59	104	200	200	-	6	2	4
25	187	341	338	59	104	200	200	1.2	6	2	5
32	193	346	336	86	114	200	240[9]	1.2	6	2	5
40	197	351	348	82	124	200	240[9]	1.2	6	2	7
50	205	359	356	72	139	200	240[9]	1.2	6	2	9
65	212	366	363	72	154	200	272[9]	1.2	6	2	11
80	222	376	373	72	174	200[9]	272[9]	1.2	6	2	12
100	242	396	393	85	214	250	310	1.2	6	2	16
125	255	409	406	85	239	250	335	1.2	6	2	19
150	276	430	427	85	282	300	300	1.2	6	2	27
200	304	458	455	137	338	350	350	1.2	8	2	40
250	332	486	483	157	393	450	450	1.2	8	2	60
300	357	511	508	157	444	500	500	1.6	8	2	80
350	362	516	513	270	451	550	550	1.6	8	-	110
400	387	541	538	270	502	600	600	1.6	10	-	125
450	418	572	569	310	563	600	640	1.6	10	-	175
500	443	597	594	350	614	600	680	1.6	10	-	200
600	494	648	645	320	715	600	800	1.6	10	-	287
700	544	698	695	450	816	-	-	2.0	-	-	330
750	571	725	722	556	869	-	-	2.0	-	-	360
800	606	760	757	560	927	-	-	2.0	-	-	450
900	653	807	804	630	1032	-	-	2.0	-	-	530
1000	704	858	855	670	1136	-	-	2.0	-	-	660
1050	704	858	855	670	1136	-	-	2.0	-	-	660
1100	755	904	901	770	1238	-	-	2.0	-	-	1140
1200	810	964	961	792	1348	-	-	2.0	-	-	1180
1400	925	1079	1076	1000	1574	-	-	2.0	-	-	1600
1500	972	1126	1123	1020	1672	-	-	3.0	-	-	2460
1600	1025	1179	1176	1130	1774	-	-	3.0	-	-	2525
1800	1123	1277	1274	1250	1974	-	-	3.0	-	-	2930
2000	1223	1377	1374	1375	2174	-	-	3.0	-	-	3665
2200	1353	1507	-	1496	2400	-	-	-	-	-	5690

1) 14.5 mm shorter with stainless steel terminal box
2) When grounding rings are used, the thickness of the grounding ring must be added to the sensor face-to-face length
3) TC = Protection ring type C, TE = Grounding ring type E (included and factory mounted for 180 °C PTFE liner), TF = Grounding ring type Flat ring
4) Weights are approx. for sensor with EN 1092-1 PN 16 (standard face-to-face length) flanges without transmitter
5) Not according to ISO 20456

MAG 3100 and MAG 3100 HT sensor with compact or remote transmitter

Imperial

DN	A[1]	A_1	A_2	B	D_1	L[2] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 face-to-face length 1.0×DN	PN 25	PN 40	PN 63	PN 100
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
½	7.36	13.31	13.25	2.32	4.09	-	-	-	7.87	-	-
1	7.36	13.31	13.25	2.32	4.09	-	-	-	7.87	-	10.24[3]
1¼	7.6	13.6	13.6	3.4	4.5	-	-	-	7.87	-	11.02[3]
1½	7.76	13.70	13.64	3.23	4.88	-	-	-	7.87	-	11.02[3]
2	8.07	14.01	13.95	2.83	5.47	-	-	-	7.87	10.87[3]	11.81[3]
2½	8.35	14.29	14.23	2.83	6.06	7.87	7.87/-	-	7.87	12.60[3]	13.78[3]
3	8.74	14.69	14.63	2.83	6.85	7.87	7.87/-	-	10.71[3]	12.72[3]	13.39[3]
4	9.53	15.47	15.41	3.35	8.43	9.84	9.84/-	-	9.84	14.96[5]	15.75[3]
5	10.04	15.98	15.92	3.35	9.41	9.84	9.84/-	-	9.84	16.54[3]	17.72[3]
6	10.87	16.81	16.75	5.39	11.10	11.81	11.81/-	-	11.81	16.34[3]	17.72[3]
8	11.97	17.91	17.85	5.39	13.31	13.78	13.78/-	13.78	13.78	18.90[3]	20.87[3]
10	13.07	19.02	18.96	6.18	15.47	17.72	17.72/-	17.72	17.72	21.65[3]	24.41[3]

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Dimensional drawings (continued)

DN	A[1]	A_1	A_2	B	D_1	L[2] EN 1092-1 PN 6, PN 10	PN 16 std./ PN 16 face-to-face length 1.0×DN	PN 25	PN 40	PN 63	PN 100
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
12	14.05	20.00	19.94	6.18	17.48	19.69	19.69/-	19.69	19.69	23.62[3]	26.77[3]
14	14.25	20.20	20.14	10.63	17.76	21.65	21.65/-	21.65	21.65	-	-
16	15.24	21.18	21.12	10.63	19.76	23.62	23.62/-	23.62	23.62	-	-
18	16.45	22.40	22.34	12.20	22.16	23.62	23.62/-	23.62	23.62	-	-
20	17.44	23.39	23.33	13.78	24.17	23.62	23.62/-	24.61	26.77	-	-
24	19.45	25.39	25.33	12.59	28.15	23.62	23.62/-	29.53	31.50	-	-
28	21.42	27.36	27.30	17.72	32.13	27.56	34.45/27.56	-	-	-	-
30	22.48	28.43	28.37	21.89	34.21	-	-/-	-	-	-	-
32	23.86	29.80	29.74	22.05	36.50	31.50	39.37/31.50	-	-	-	-
36	25.71	31.65	31.59	24.80	40.63	35.43	44.29/35.43	-	-	-	-
40	27.72	33.85	33.79	26.38	44.72	39.37	49.21/39.37	-	-	-	-
42	27.72	33.85	33.79	26.38	44.72	-	-/-	-	-	-	-
44	29.72	35.67	35.61	30.31	48.74	-	-/-	-	-	-	-
48	31.89	37.83	37.77	31.18	53.07	47.24	59.06/47.24	-	-	-	-
54	36.42	42.36	42.30	39.37	61.97	55.12	-/55.12	-	-	-	-
60	38.27	44.21	44.15	40.15	65.83	59.06	-/59.06	-	-	-	-
66	40.35	46.30	46.24	44.49	69.84	62.99	-/62.99	-	-	-	-
72	44.21	50.16	50.10	49.21	77.72	70.87	-/70.87	-	-	-	-
78	48.15	54.09	54.03	54.13	85.59	78.74	-/78.74	-	-	-	-
88	53.30	59.03	-	58.90	94.50	86.60	-	-	-	-	-

1) 0.571 inch shorter with stainless steel terminal box
2) When grounding rings are used, the thickness of the grounding ring must be added to the sensor face-to-face length
3) Not according to ISO 20456

DN	A[1]	A_1	A_2	B	D_1	L[1][2] ANSI B16.5 Class 150	ANSI B16.5 Class 300	ANSI B16.5 Class 600	AWWA C-207 Class D	AS 4087 PN 16 PN 21 PN 35	AS 2129 Table E
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
½	7.36	13.31	13.25	2.32	4.09	7.87	7.87	-	-	7.87	7.87
1	7.36	13.31	13.25	2.32	4.09	7.87	7.87	11.02[3]	-	7.87	7.87
1¼	7.6	13.6	13.6	3.4	4.5	7.87	7.87	11.81[3]	-	7.87	7.87
1½	7.76	13.70	13.64	3.23	4.88	7.87	7.87	12.60[3]	-	7.87	7.87
2	8.07	14.01	13.95	2.83	5.47	7.87	7.87	12.99[3]	-	7.87	7.87
2½	8.35	14.29	14.23	2.83	6.06	7.87	10.71[3]	14.57[3]	-	7.87	7.87
3	8.74	14.69	14.63	2.83	6.85	10.71[3]	10.71[3]	13.78[3]	-	7.87[3][5]	7.87
4	9.53	15.47	15.41	3.35	8.43	9.84	12.20[3]	18.11[3]	-	-	9.84
5	10.04	15.98	15.92	3.35	9.41	9.84	13.10[3]	18.90[3]	-	9.84	9.84
6	10.87	16.81	16.75	5.39	11.10	11.81	11.81	19.68[3]	-	11.81	11.81
8	11.97	17.91	17.85	5.39	13.31	13.78	13.78	23.62[3]	-	13.78	13.78
10	13.07	19.02	18.96	6.18	15.47	17.72	17.72	23.62[3]	-	17.72	17.72
12	14.05	20.00	19.94	6.18	17.48	19.69	19.69	27.56[3]	-	19.69	19.69
14	14.25	20.20	20.14	10.63	17.76	21.65	21.65	31.50[3]	-	21.65	21.65
16	15.24	21.18	21.12	10.63	19.76	23.62	23.62	32.28[3]	-	23.62	23.62
18	16.45	22.40	22.34	12.20	22.16	23.62	25.20	-	-	23.62	23.62
20	17.44	23.39	23.33	13.78	24.17	23.62	28.70	-	-	23.62[6]	23.62
24	19.45	25.39	25.33	12.59	28.15	23.62	33.80	-	-	23.62[7]	23.62
28	21.42	27.36	27.30	17.72	32.13	31.50	-	-	27.56[4]	27.56[4]	27.56
30	22.48	28.43	28.37	21.89	34.21	37.41	-	-	29.52[4]	-	29.53
32	23.86	29.80	29.74	22.05	36.50	35.44	-	-	31.50[4]	31.80[4]	31.80
36	25.71	31.65	31.59	24.80	40.63	43.32	-	-	35.43	35.43[4]	35.43
40	27.72	33.85	33.79	26.38	44.72	43.32	-	-	39.37	39.37[4]	39.37
42	27.72	33.85	33.79	26.38	44.72	-	-	-	39.37	-	
44	29.72	35.67	35.61	30.31	48.74	-	-	-	43.31	-	
48	31.89	37.83	37.77	31.18	53.07	55.12	-	-	47.24	47.24[4]	47.24

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Dimensional drawings (continued)

DN	A[1)]	A_1	A_2	B	D_1	L[1)2)] ANSI B16.5			AWWA C-207	AS 4087	AS 2129
						Class 150	Class 300	Class 600	Class D	PN 16 PN 21 PN 35	Table E
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
54	36.42	42.36	42.30	39.37	61.97	-	-	-	55.12	-	-
60	38.27	44.21	44.15	40.15	65.83	-	-	-	59.06	-	-
66	40.35	46.30	46.24	44.49	69.84	-	-	-	63.00	-	-
72	44.21	50.16	50.10	49.21	77.72	-	-	-	70.87	-	-
78	48.15	54.09	54.03	54.13	85.59	-	-	-	78.74	-	-
88	53.30	59.03	-	58.90	94.50	-	-	-	86.61	-	-

1) 0.571 inch shorter with stainless steel terminal box (Ex and high temperature version)
2) When grounding rings are used, the thickness of the grounding ring must be added to the sensor face-to-face length
3) Not according to ISO 20456
4) Not available for AS 4087 PN 21, PN 35
5) AS 4087, PN 35, DN 80 (3") = 10.07 inch
6) AS 4087, PN 35, DN 500 (20") = 26.77 inch
7) AS 4087, PN 35, DN 600 (24") = 29.53 inch
8) AS 4087, PN 35, DN 500 (20") = 26.77 inch

DN	A[1)]	A_1	A_2	B	D_1	L[2)] JIS B 2220:2004		T_{C3}[3)]	T_E[3)]	T_F[3)]	Weight[4)]
						10K	20K				
[inch]						[inch]	[inch]	[inch]	[inch]	[inch]	[lbs]
½	7.36	13.31	13.25	2.32	4.09	7.87	7.87	-	0.24	0.08	9
1	7.36	13.31	13.25	2.32	4.09	7.87	7.87	0.05	0.24	0.08	11
1¼	7.6	13.6	13.6	3.4	4.5	7.87	9.44[5)]	0.05	0.24	0.08	11
1½	7.76	13.70	13.64	3.23	4.88	7.87	9.44[5)]	0.05	0.24	0.08	17
2	8.07	14.01	13.95	2.83	5.47	7.87	9.44[5)]	0.05	0.24	0.08	20
2½	8.35	14.29	14.23	2.83	6.06	7.87	10.70[5)]	0.05	0.24	0.08	24
3	8.74	14.69	14.63	2.83	6.85	7.87[8)]	10.70[5)]	0.05	0.24	0.08	26
4	9.53	15.47	15.41	3.35	8.43	9.84	12.20[5)]	0.05	0.24	0.08	35
5	10.04	15.98	15.92	3.35	9.41	9.84	13.18[5)]	0.05	0.24	0.08	42
6	10.87	16.81	16.75	5.39	11.10	11.81	11.81	0.05	0.24	0.08	60
8	11.97	17.91	17.85	5.39	13.31	13.77	13.77	0.05	0.31	0.08	88
10	13.07	19.02	18.96	6.18	15.47	17.71	17.71	0.05	0.31	0.08	132
12	14.05	20.00	19.94	6.18	17.48	19.68	19.68	0.06	0.31	0.08	176
14	14.25	20.20	20.14	10.63	17.76	21.65	21.65	0.06	0.31	-	242
16	15.24	21.18	21.12	10.63	19.76	23.62	23.62	0.06	0.39	-	275
18	16.45	22.40	22.34	12.20	22.16	23.62	25.19	0.06	0.39	-	385
20	17.44	23.39	23.33	13.78	24.17	23.62	26.77	0.06	0.39	-	440
24	19.45	25.39	25.33	12.59	28.15	23.62	31.49	0.06	0.39	-	633
28	21.42	27.36	27.30	17.72	32.13	-	-	0.08	-	-	728
30	22.48	28.43	28.37	21.89	34.21	-	-	0.08	-	-	794
32	23.86	29.80	29.74	22.05	36.50	-	-	0.08	-	-	992
36	25.71	31.65	31.59	24.80	40.63	-	-	0.08	-	-	1168
40	27.72	33.85	33.79	26.38	44.72	-	-	0.08	-	-	1455
42	27.72	33.85	33.79	26.38	44.72	-	-	0.08	-	-	1455
44	29.72	35.67	35.61	30.31	48.74	-	-	0.08	-	-	2513
48	31.89	37.83	37.77	31.18	53.07	-	-	0.08	-	-	2601
54	36.42	42.36	42.30	39.37	61.97	-	-	0.12	-	-	3528
60	38.27	44.21	44.15	40.15	65.83	-	-	0.12	-	-	5423
66	40.35	46.30	46.24	44.49	69.84	-	-	0.12	-	-	5566
72	44.21	50.16	50.10	49.21	77.72	-	-	0.12	-	-	6460
78	48.15	54.09	54.03	54.13	85.59	-	-	0.12	-	-	8080
88	53.30	59.03	-	58.90	94.50	-	-	-	-	-	12544

1) 0.571 inch shorter with stainless steel terminal box (Ex and high temperature version)
2) When grounding rings are used, the thickness of the grounding ring must be added to the sensor face-to-face length
3) TC = Protection ring type C, TE = Grounding ring type E (included and factory mounted for 356 °F PTFE liner), TF = Grounding ring type Flat ring
4) Weights are appr. for sensor with ANSI B16.5 class 150 flanges without transmitter
5) Not according to ISO 20456

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Overview



Magnetic flowmeter transmitter SITRANS FMT020

The new magnetic flow meter transmitter model SITRANS FMT020 is a high performance, robust and intelligent product, designed to fit perfectly for a wide area of process applications that require accurate, and reliable flow measurement of conductive fluids.

The SITRANS FMT020 is the next generation successor for the well-proven MAG 5000 and MAG 6000 transmitter series. The FMT020 retains all the unique features of this transmitter series such as the flexible installation concept with common housing for compact and remote mounting. It also maintains the modular design supporting easy exchangeability of the transmitter as well as the add-on communication modules, or the Sensorprom memory unit for fast commissioning, instant measurement, and data storage.

In addition, the FMT020 features the ability to simultaneously measure volumetric flow, flow velocity and electrical conductivity. It also offers enhanced diagnostics like empty pipe monitoring and device self-check, and comes with multi-functional input/output channels for process control, a unified operating concept and much more:

- High accuracy up to 0.2% of rate
- 3 totalizers for forward, reverse, and net flow
- Multi language, menu-guided operation
- Field bus: HART, PROFINET, EtherNet/IP, MODBUS RTU, MODBUS TCP/IP
- Integrated self-verification via local display, SIMATIC PDM, Webserver and SITRANS mobile IQ

The transmitter can be configured locally via display and remotely over Fieldbus or Webserver. EDDs are available for SIMATIC PDM, AMS Device Manager, and AMS Trex Device Communicator, plus DTMs for FDTs (Field Device Tools).

Benefits

- Backwards compatible with older (up to 15 years) flow meter sensors (MAG 5100 W)
- Fast start-up without zero-point adjustments
- Variety of functions for comprehensive device check, self-diagnosis, and onboard verification
- Verificator compatible: Independently verifies performance of sensor, transmitter, and installation (including cable) without process interruption
- Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- Multi-functional outputs for process control, minimum configuration with analog, digital (pulse, frequency, status), and relay output
- SD memory card for data logging, configuration backup, and firmware update
- Seamless field device integration in host systems

Application

The SITRANS FMT020 transmitter is engineered for high performance, easy installation, commissioning, and reduced maintenance.

The device is a truly robust solution and suitable for all-around applications but is also the ideal choice for demanding applications where higher diagnostics capability and functionality are important.

The transmitter can be combined with magnetic flow sensors of type SITRANS FMS500.

SITRANS FMS500

A flow meter sensor for all water and wastewater applications. With its coned design, increased low-flow accuracy is achieved making it especially useful for leak detection. It is suitable for direct burial and constant flooding. The SITRANS FMS500 complies with drinking water approvals.

Accuracy: 0.4% of rate, option for: 0.2% of rate

Range: DN 15 ... 2200 (½ ... 88")

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Design

The transmitter is housed in a IP66/67, NEMA 4X/6 enclosure made of durable polycarbonate and creates together with a flow sensor a complete measurement system providing the measured flow values via a local display, multiple signal outputs or a fieldbus interface.

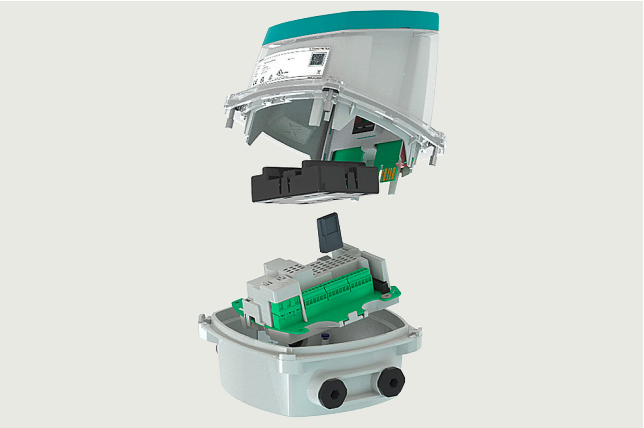
The modular design concept of the FMT020 makes it flexible to be remote connected or integral mounted with magnetic flow sensors of type SITRANS FMS500.

Integral-mount design

For devices with an integral-mount design, the transmitter and the sensor form a single mechanical unit.

Remote mount design

For devices with a remote mount design, the transmitter and sensor are mounted in separate locations. The electrical connection between the transmitter and the sensor is provided by sensor cables.



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Selection and ordering data

Transmitter SITRANS FMT020	Article No. 7ME6942-									
	0	A	A	0	0	-	0	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Transmitter mounting and enclosure type										
Polycarbonate enclosure								A		
Remote design. polycarbonate housing (wall-mounting unit and sensor terminal board included)								J		
Terminal box, electrical connection										
Without terminal box									A	
Polycarbonate terminal box with M20 threads (incl. 4 pcs M20 cable glands)									B	
Polycarbonate terminal box with M20 threads and ½" NPT adaptors (incl. 4 pcs ½" NPT cable glands)									C	
Power supply										
12 ... 42 V DC										2
100 ... 240 V AC, 50/60 Hz										3

Additional information	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
General safety	
CSA General Purpose	**E06**
Explosion protection	
ATEX (Europe) & IECEx (World)	**E20**
FM (USA & Canada)	**E22**
IECEx (World)	**E23**
Country specific approvals	
CPA (China)	**E75**
Communication	
HART with 4 ... 20 mA output, active or passive	**F01**
Modbus RTU / RS485	**F04**
PROFIBUS PA	**F05**
PROFIBUS DP	**F06**

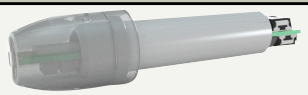
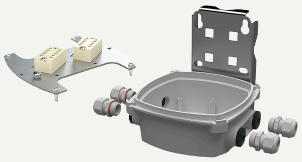
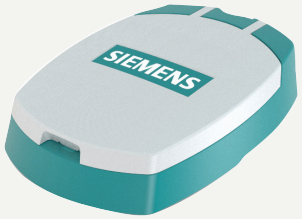
Additional information	Order code
PROFINET	**F07**
EtherNet/IP	**F09**
MODBUS TCP/IP	**F10**
I/O extension	
Digital input / output, passive	**F30**
Device options	
Industrial micro SD memory card, 20 GB storage capacity	**J06**
Name plate in Chinese language	**J20**
Type of Ex protection	
Increased safety (Ex e) Zone 2	**L12**
Non-incendive (NI) Class I, Division 2	**L15**

Accessories FMT020

Description	Article No.	
Communication add-on modules		
HART with 4 ... 20 mA output, active or passive	**7ME6940-1CM10**	
PROFINET	**7ME6940-1CM20**	
EtherNet/IP	**7ME6940-1CM30**	
Modbus RTU/RS485	**7ME6940-1CM40**	
PROFIBUS DP	**7ME6940-1CM50**	
PROFIBUS PA	**7ME6940-1CM60**	
MODBUS TCP/IP	**7ME6940-1CM70**	
I/O add-on modules Digital input / output	**7ME6940-1DM10**	

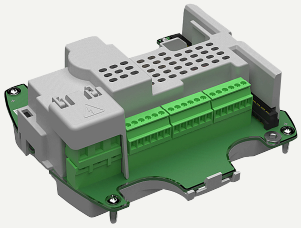
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Selection and ordering data (continued)

Description	Article No.	
Bluetooth adapter SITRANS AW050[2)] (including connection cable)	**7ME6940-1BT10**	
SENSORPROM programmer (MAG 5000/6000 SENSORPROM compatible)	**7ME6940-1SP10**	
Wall-mounting unit (including sensor terminal board), terminal box material polycarbonate		
• M20 × 1.5 cable glands (4 pcs.)	**7ME6940-1WU10**	
• ½ inch NPT cable glands (4 pcs.)	**7ME6940-1WU15**	
Display protection cover	**7ME6940-1PL10**	
Sun shield for transmitter, remote mount	**A5E01209496**	

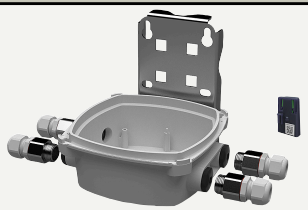
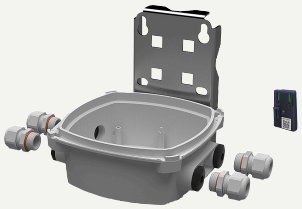
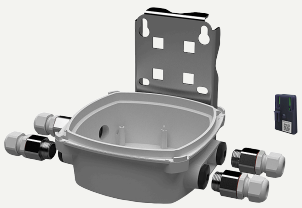
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Selection and ordering data (continued)

Description	Article No.	
Sun shield for transmitter, integral mount (compact design) Only suitable for FMS500 sensors DN 150 ... 1200 (6" ... 48")	**A5E01209500**	
Transmitter conversion kit[1] for MAG 5000/6000 units, integral mount (compact design) including SENSORPROM programmed, terminal box in polycarbonate, cable glands (4 pcs.), sensor housing seal, grounding wire, screws, new sensor nameplate (sensor order code and serial number must be specified when ordering)		
• M20 × 1.5 cable glands	**7ME6940-1RF10**	
• ½ inch NPT cable glands	**7ME6940-1RF15**	
Transmitter conversion kit for MAG 5000/6000 Ex units, remote mount 1/2" NPT including: FMT020 Ex Class 1 Div 2, Wall-mounting unit, connection board, SensorPROM programmed, cable glands and adapters (4 pcs.)		
• 12 ... 42 V DC	**7ME6940-1RF45**	
• 100 ... 240 V AC	**7ME6940-1RF55**	

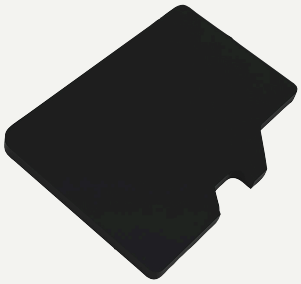
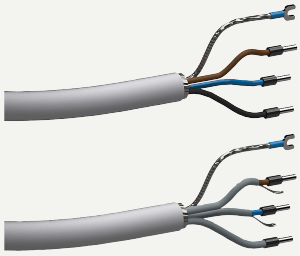
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Selection and ordering data (continued)

Description	Article No.	
		
Transmitter conversion kit[1] for MAG 5000/6000 unit, remote mount including wall-mounting unit with cable glands (4 pcs.), SENSORPROM programmed (sensor order code and serial number must be specified when ordering)		
• M20 × 1.5 cable glands	**7ME6940-1RF30**	
• 1½ inch NPT cable glands	**7ME6940-1RF35**	
Cable glands, material polyamide 4 pcs.		
• M20 × 1.5	**A5E52770729**	
• ½ inch NPT	**A5E52909970**	
Breathing vent, IP67		
• M20	**7ME6940-1BV10**	

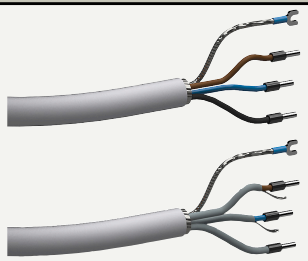
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Selection and ordering data (continued)

Description	Article No.	
• ½ inch NPT	**7ME6940-1BV15**	
Industrial microSD memory card 20 GB storage capacity	**A5E53821516**	
Coil / electrode cable standard type 3 × 1.5 mm², screened, PVC jacket; Temperature range -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.4 ft)	**A5E02296523**	
• 10 m (33 ft)	**FDK:083F0121**	
• 20 m (65 ft)	**FDK:083F0210**	
• 30 m (98 ft)	**A5E02297309**	
• 40 m (131 ft)	**FDK:083F0211**	
• 50 m (164 ft)	**A5E02297317**	
• 60 m (197 ft)	**FDK:083F0212**	
• 100 m (328 ft)	**FDK:083F0213**	
• 150 m (492 ft)	**FDK:083F3052**	
• 200 m (656 ft)	**FDK:083F3053**	
• 500 m (1640 ft)	**FDK:083F3054**	
Electrode cable special type 3 × 0.25 mm², screened single core, PVC jacket; Temperature range -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	**FDK:083F3020**	
• 20 m (65 ft)	**FDK:083F3095**	
• 40 m (131 ft)	**FDK:083F3094**	
• 60 m (197 ft)	**FDK:083F3093**	
• 100 m (328 ft)	**FDK:083F3092**	
• 150 m (492 ft)	**FDK:083F3056**	
• 200 m (656 ft)	**FDK:083F3057**	
• 500 m (1640 ft)	**FDK:083F3058**	
Sensor cable kit including coil cable standard type (3 × 1.5 mm², screened) and electrode cable special type (3 × 0.25 mm², screened single core), PVC jacket, Temperature range -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.4 ft)	**A5E02296329**	
• 10 m (33 ft)	**A5E01181647**	
• 15 m (49 ft)	**A5E02296464**	
• 20 m (65 ft)	**A5E01181656**	
• 25 m (82 ft)	**A5E02296490**	
• 30 m (98 ft)	**A5E02296494**	
• 40 m (131 ft)	**A5E01181686**	
• 50 m (164 ft)	**A5E02296498**	
• 60 m (197 ft)	**A5E01181689**	
• 100 m (328 ft)	**A5E01181691**	
• 150 m (492 ft)	**A5E01181699**	

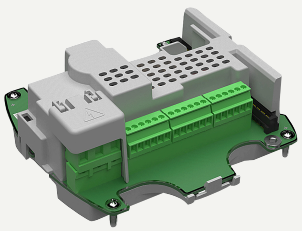
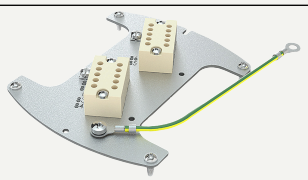
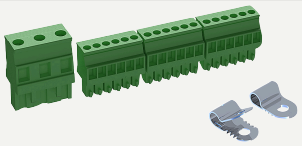
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Selection and ordering data (continued)

Description	Article No.	
• 200 m (656 ft) • 500 m (1640 ft)	**A5E01181703** **A5E01181705**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[3]	**FDK:085U0220**	

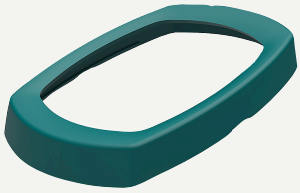
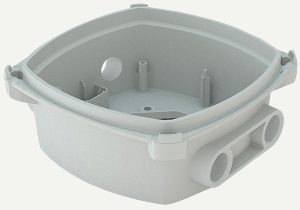
1) Only SITRANS FM MAG 5100W and MAG 3100 sensors, beginning with "7ME" and manufactured after 2011 are supported. Please check the sensor serial number or production date specified on the nameplate. All certificates valid for the old system (combination of sensor and transmitter), will lose their validity. The separate certificates will still be valid.
2) FMT020 with AW050 dongle is certified for RED, FCC (USA and Canada) and the certified list of countries for AW050 dongle is available on SiePortal. We expect that Compliance to local rules and regulations where the product or the dongle accessory will be used is under the responsibility of the person placing the order. Please reach out to your Regional Sales Partner to consider additional certification if needed. For additional support, please contact HQ.
3) Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging

Spare parts FMT020

Description	Article No.	
Transmitter connection board with power supply (including screws, grounding wire), 1 pc. • 100 ... 240 V AC, 50/60 Hz • 12 ... 42 V DC	 **7ME6940-1CB10** **7ME6940-1CB20**	
Sensor terminal board (including screws, grounding wire), 1 pc	**A5E52775102**	
Connector set for transmitter connection board (power supply, IOs and communication) including earthing clips	**A5E52775452**	

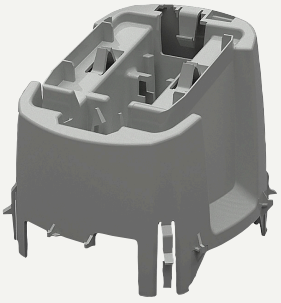
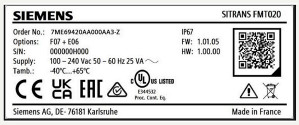
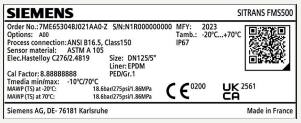
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Selection and ordering data (continued)

Description	Article No.	
Local display and operating unit (incl. ribbon cable and display holder), 1 pc.	**7ME6940-1DU10**	
FMT020 SENSORPROM memory unit • Programmed 1 pc. (sensor order code and serial number must be specified when ordering) • Not programmed 10 pcs.	**7ME6940-1SM10** **A5E52771927**	
Top housing material polycarbonate (including screws, gasket and display frame), 1 pc.	**A5E52784564**	
Display frame material polycarbonate, 1 pc.	**A5E52771997**	
Terminal box material polycarbonate (without cable glands and lid), 1 pc.	**A5E52729542**	
Terminal box lid material polycarbonate (including gasket), 1 pc.	**A5E52729452**	

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Selection and ordering data (continued)

Description	Article No.	
Terminal box gasket 5 pcs.	**A5E52729547**	
Main board cover housing 1 pc.	**A5E52784657**	
Device nameplate		
• Transmitter (transmitter order code and serial number must be specified when ordering)	**A5E52864071**	
• Sensor (sensor order code and serial number must be specified when ordering)	**A5E52864088**	

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Technical specifications

SITRANS FMT020 transmitter	
Measurement of	• Volume flow • Flow velocity • Electrical conductivity
Mode of operation	
Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (electrode cable special type required in remote mounted installation)
Excitation frequency	Depends on the sensor size, please refer to "Technical specifications" for SITRANS FM sensors
Electrode input impedance	> 1 × 1014 Ω
Current output (active/passive)	
Signal range	0 ... 24 mA or 4 ... 20 mA Signal levels compliant with NAMUR NE 43 (3.8 to 20.5 mA)
Load	< 470 Ω
Resolution	< 1 µA
Accuracy	±20 µA
Temperature coefficient	< 50 ppm/K
Time constant	0.1 ... 100 s, adjustable
Digital output (active/passive)	
Frequency	0 ... 10 kHz, 50 % duty cycle (uni/bidirectional)
Pulse	40 µs ... 5 s pulse duration
Rating	
• Active operation mode	24 V DC, 30 mA, 1 kΩ ≤Ri ≤10 kΩ, short-circuit protected (powered from transmitter)
• Passive operation mode	3 ... 30 V DC, max. 110 mA, 200 Ω ≤Ri ≤10 kΩ (powered from connected supply)
Time constant	0.1 ... 100 s, adjustable
Relay output (passive)	
Type	SPDT Form C relay, potential-free change-over contacts, resistive load
Rating	2 A at 42 V AC, 1 A at 24 V DC
Durability	50 000 operations min. per relay
Galvanic isolation	All inputs and outputs are galvanically isolated, isolation voltage 500 V
Rated operating conditions	
Installation environment	
• Location	Indoor/outdoor (altitude up to 2000 m)
• Installation (overvoltage) category	II
• Pollution degree	2
Ambient temperature	
• Transmitter	-40 ... +65 °C (-40 ... +149 °F) (max. humidity 98% RH)
• Display	-20 ... +60 °C (-4 ... +140 °F)
Storage temperature	
• Transmitter	-40 ... +70 °C (-58 ... +158 °F) (max. humidity 98% RH)
• Display	-40 ... +70 °C (-40 ... +158 °F)
Design	
Enclosure	
• Material	Polycarbonate
• Degree of protection	IP66/67, NEMA 4X/6
Mechanical load	
Integral mount / compact version	Vibration, sinusoidal according to IEC 60068-2-6 • 2 ... 8.4 Hz, 3.5 mm peak • 8.4 ... 500 Hz, 1.0 g peak Vibration broad-band random, according to IEC 60068-2-64 • 10 ... 200 Hz, 0.003 g2/Hz • 200 ... 500 Hz, 0.001 g2/Hz • Total: 0.93 g rms

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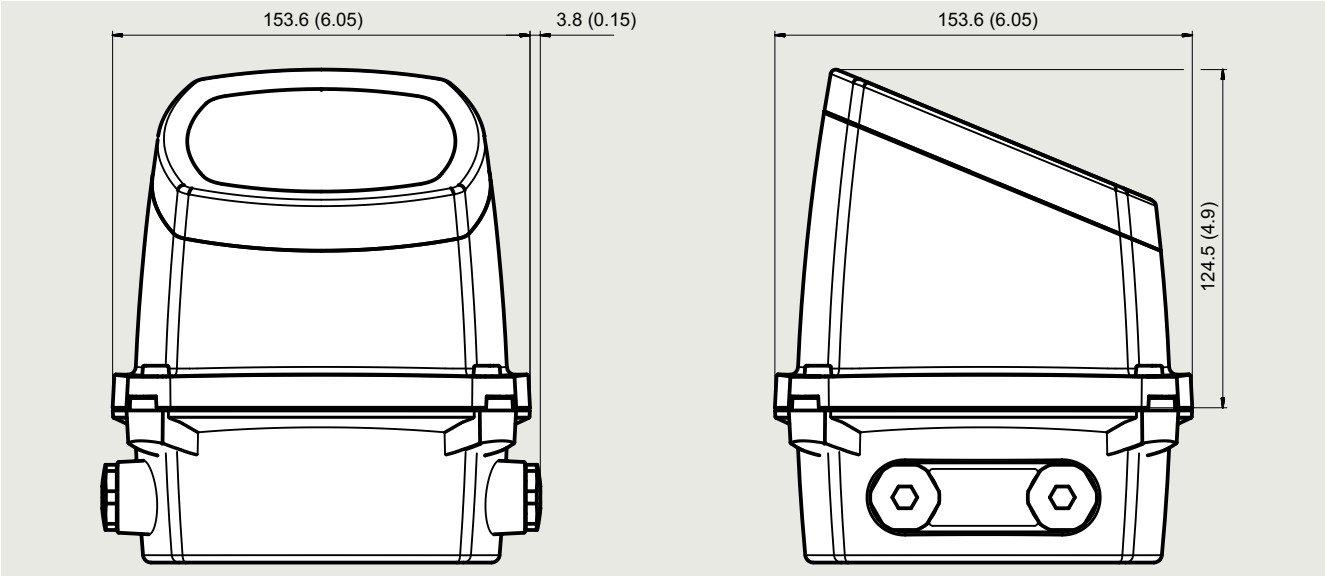
Technical specifications (continued)

SITRANS FMT020 transmitter	
Remote version	Vibration, sinusoidal according to IEC 60068-2-6 • 2 ... 8.4 Hz, 1.5 mm peak • 8.4 ... 500 Hz, 0.7 g peak Vibration broad-band random, according to IEC 60068-2-64 • 10 ... 200 Hz, 0.003 g2/Hz • 200 ... 500 Hz, 0.001 g2/Hz • Total: 0.93 g rms
EMC performance	IEC/EN 61326-1, EN 55011 (Class A)
Dimensions	See dimensional drawings
Weight	See dimensional drawings
Display and control	
LCD display	60 × 40 mm (2.36 × 1.57 inch) LCD, 240 × 160 pixels resolution
Menu navigation	4 capacitive touch keys
Update time	Less than 1 second
Totalizers	3 × 14-digit counters for forward, net, or reverse flow
Memory card	Integrated microSD interface supporting memory cards up to 32 GB storage capacity (need to be in FAT32 format)
Power supply	
AC version	100 ... 240 V AC, 50/60 Hz, 25 VA
DC version	24 V DC ±20%, 12 W
Power consumption	
AC version	6.24 W
DC version	6.45 W
Communication	
Webserver	Web-based interface for local programming via web browser (only with PROFINET, EtherNet/IP communication)
Fieldbus	• HART 7 • PROFINET • PROFIBUS DP • PROFIBUS PA • EtherNet/IP • MODBUS RTU • MODBUS TCP/IP
Remote configuration	• EDD via SIMATIC PDM • SITRANS DTM via PACTware • EDS-AOP file
Certificates and approvals	
General purpose	• CE (LVD, EMC, RoHS), UKCA • UL, CSA certified per standard EN / IEC 61010-1
Explosion protection	• FM - Non-incendive (NI) Class I, Div 2 [1)2)] • ATEX / IECEx - Increased safety (Ex e) Zone 2 [1)2)]
Others	• Environmental Product Declaration (EPD) • EAC (Kazakhstan)

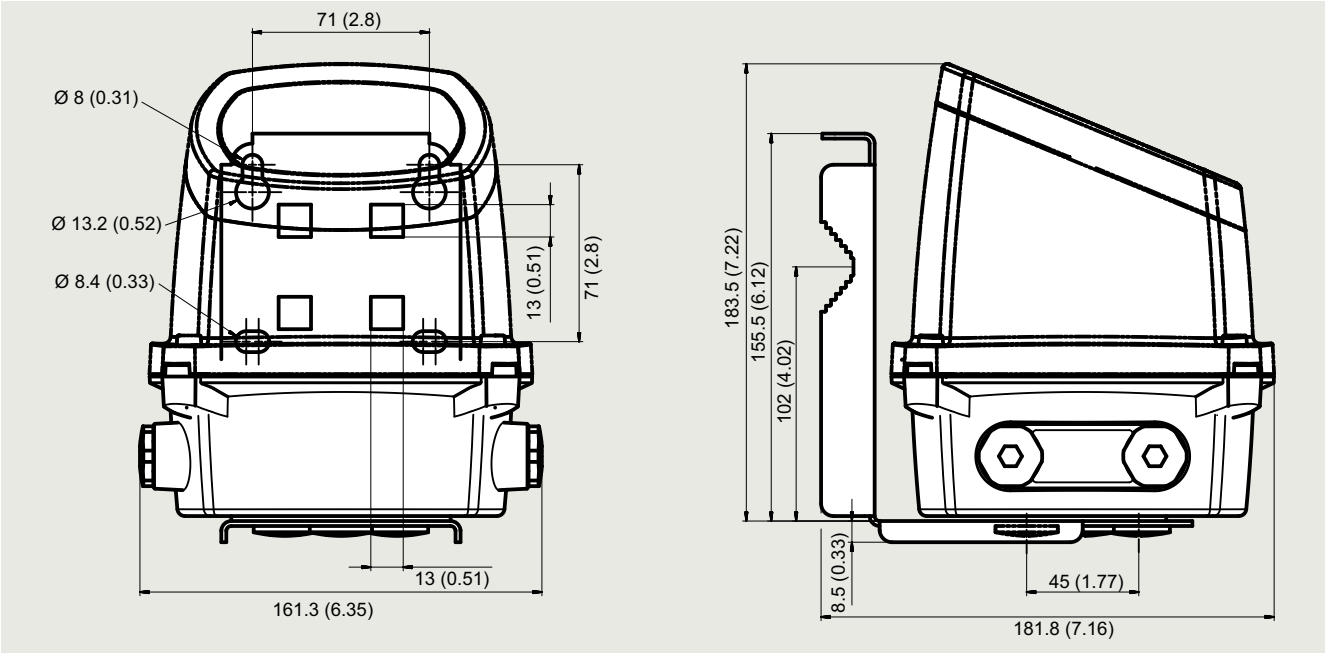
1) The Ex variant is only available with IP64 protection and in remote mounting
2) Only allowed with flexible conduits

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Dimensional drawings



FMT020 transmitter integral mounted, dimensions in mm (inch)



FMT020 transmitter remote mounted, dimensions in mm (inch)

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Overview



Transmitter MAG 5000/6000 compact version (left) and 19" insert version (right)

The MAG 5000 and 6000 are transmitters engineered for high performance, easy installation, commissioning and maintenance. The transmitters evaluate the signals from the SITRANS FM sensors type MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W.

Transmitter types:

- MAG 5000: Max. measuring error ± 0.4 % ± 1 mm/s (incl. sensor)
- MAG 6000: Max. measuring error ± 0.2 % ± 1 mm/s (incl. sensor, see also sensor specifications) and with additional features such as: "plug & play" add-on bus modules; integrated batch functions.

Benefits

- Superior signal resolution for optimum turn down ratio
- Digital signal processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection
- 3 lines, 20 characters display in 11 languages
- Flow rate in various units
- Totalizer for forward, reverse and net flow as well as additional information available
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging (see SITRANS FM diagnostics)
- Batch control (MAG 6000 only)
- Custody transfer approval: MI-001 for cold water, PTB K 7.2 and OE12/C 040 for chilled water
- MAG 6000 with add-on bus modules for HART, FOUNDATION Fieldbus H1, DeviceNet, Modbus RTU/RS 485, PROFIBUS PA and DP

Application

The SITRANS FM flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes and slurries. The main applications can be found in:

- Water and waste water
- Chemical and pharmaceutical industries
- Food and beverage industries
- Power generation and utility

Design

The transmitter is designed as either IP67 NEMA 6 enclosure for compact or wall mounting or 19" version as a 19" insert as a base to be used in:

- 19" rack systems
- Front panel mounting IP65/NEMA 2
- Panel mounting IP20/NEMA 1
- Wall mounting IP66/NEMA 4X

Several options on 19" versions are available such as:

- Transmitters mounted in safe area for Ex ATEX approved flow sensors (incl. barriers)
- Transmitters with electrode cleaning unit on request

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Function

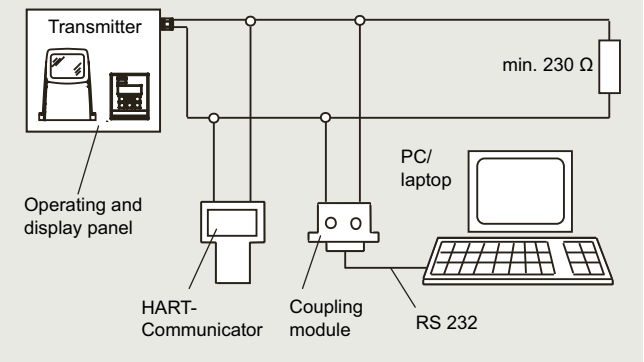
The MAG 5000/6000 are transmitters with a built-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

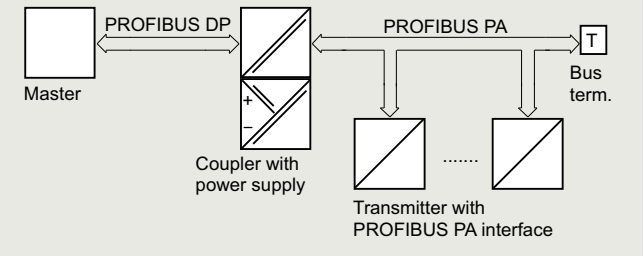
Displays and controls

Operation of the transmitter can be carried out using:

- Control and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS or Modbus communication



HART communication



PROFIBUS PA communication

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Selection and ordering data

Transmitter MAG 5000

Description	Article No.	
Transmitter MAG 5000 for 19" rack and wall mounting		
• 11 ... 30 V DC/11 ... 24 V AC	**7ME6910-2CA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6910-2CA10-1AA0**	

Transmitter MAG 6000

Description	Article No.	
Transmitter MAG 6000 for compact and wall mounting; IP67/NEMA 6, stainless steel AISI 316/1.4436 (only for sensor with stainless steel terminal box) (for remote version order stainless steel terminal box separately)		
• 11 ... 30 V DC/11 ... 24 V AC	**7ME6920-1QA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1QA10-1AA0**	
Transmitter MAG 6000 SV for compact and wall mounting; special excitation frequency 44 Hz for Batch application DN ≤ 25/1" IP67/NEMA 6, glass fibre reinforced polyamide		
• 11 ... 30 V DC/11 ... 24 V AC	**7ME6920-1AB30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1AB10-1AA0**	
Transmitter MAG 6000 for 19" rack and wall mounting		
• 11 ... 30 V DC/11 ... 24 V AC	**7ME6920-2CA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-2CA10-1AA0**	
Transmitter MAG 6000 SV for 19" rack and wall mounting; special excitation frequency 44 Hz for Batch application DN ≤ 25/1"		
• 11 ... 30 V DC/11 ... 24 V AC	**7ME6920-2CB30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-2CB10-1AA0**	

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Selection and ordering data (continued)

Description	Article No.	
MAG 6000 19" insert, complete mounted with IP66/NEMA 4X wall mounting enclosure in ABS plastic;115 ... 230 V AC, 50/60 Hz; cable gland PG13.5	**7ME6920-2EA10-1AA0**	
MAG 6000 19" insert with safety barrier for Ex-approved sensors, complete mounted with IP66/NEMA 4X wall mounting enclosure in ABS plastic, 115 ... 230 V AC, 50/60 Hz; cable gland PG13.5		
• For ATEX 2G D sensors	**7ME6920-2MA11-1AA0**	
MAG 6000 SV 19" insert, complete mounted with IP66/NEMA 4X wall mounting enclosure in ABS plastic, special excitation frequency 44 Hz for Batch application DN ≤ 25/1"; cable gland PG13.5		
• 11 ... 30 V DC/11 ... 24 V AC	**7ME6920-2EB30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-2EB10-1AA0**	

Communication modules for MAG 6000

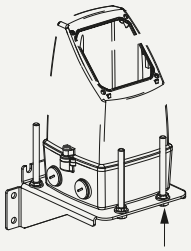
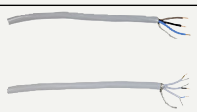
Description	Article No.	
HART (not for MAG 6000 I)	**FDK:085U0226**	
Modbus RTU/RS485	**FDK:085U0234**	
PROFIBUS PA Profile 3	**FDK:085U0236**	
PROFIBUS DP Profile 3	**FDK:085U0237**	
DeviceNet	**FDK:085U0229**	
FOUNDATION Fieldbus H1	**A5E02054250**	

Accessories for MAG 5000 and MAG 6000

Description	Article No.	
Accessory kit for remote use of sensor with two 5-pin terminal blocks	**A5E34827189**	
Wall mounting unit for MAG 5000/6000 with IP67/NEMA 6, terminal box in polyamide[2)]		
• 4 × M20 cable glands	**FDK:085U1018**	
• 4 × ½" NPT cable glands	**FDK:085U1053**	

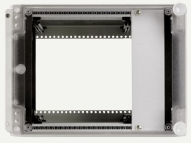
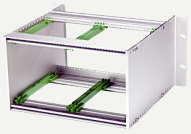
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Selection and ordering data (continued)

Description	Article No.	
Special wall mounting unit for MAG 5000/6000 IP67/NEMA 6, mounting bracket in stainless steel AISI 316 (1.4401), terminal box in polyamide		
• 4 × M20 cable glands	**A5E36699702**	
• 4 × ½" NPT cable glands	**A5E36699938**	
Sun lid for MAG 5000/6000 transmitter (frame and lid)	**A5E02328485**	
Standard coil or electrode cable, 3 × 1.5 mm²/18 gage, single shielded with PVC jacket; Temperature range -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	**A5E02296523**	
• 10 m (33 ft)	**FDK:083F0121**	
• 20 m (65 ft)	**FDK:083F0210**	
• 30 m (98 ft)	**A5E02297309**	
• 40 m (131 ft)	**FDK:083F0211**	
• 50 m (164 ft)	**A5E02297317**	
• 60 m (197 ft)	**FDK:083F0212**	
• 100 m (328 ft)	**FDK:083F0213**	
• 150 m (492 ft)	**FDK:083F3052**	
• 200 m (656 ft)	**FDK:083F3053**	
• 500 m (1640 ft)	**FDK:083F3054**	
Special electrode cable[1)] (empty pipe detection or low conductivity), 3 × 0.25 mm² double shielded with PVC jacket, Temperature range -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	**FDK:083F3020**	
• 20 m (65 ft)	**FDK:083F3095**	
• 40 m (131 ft)	**FDK:083F3094**	
• 60 m (197 ft)	**FDK:083F3093**	
• 100 m (328 ft)	**FDK:083F3092**	
• 150 m (492 ft)	**FDK:083F3056**	
• 200 m (656 ft)	**FDK:083F3057**	
• 500 m (1640 ft)	**FDK:083F3058**	
Low-noise electrode coaxial cable for low conductivity and high vibration levels, 3 × 0.13 mm², Temperature range -25 ... +85 °C (-13 ... +185 °F)		
• 2 m (6.6 ft)	**A5E02272692**	
• 5 m (16.5 ft)	**A5E02272723**	
• 10 m (33 ft)	**A5E02272730**	
Cable kit including standard coil cable (3 × 1.5 mm²/18 gage, single shielded with PVC jacket) and special electrode cable[1)] (3 × 0.25 mm², double shielded with PVC jacket). Temperature range -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	**A5E02296329**	
• 10 m (33 ft)	**A5E01181647**	
• 15 m (49 ft)	**A5E02296464**	

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Selection and ordering data (continued)

Description	Article No.	
• 20 m (65 ft)	**A5E01181656**	
• 25 m (82 ft)	**A5E02296490**	
• 30 m (98 ft)	**A5E02296494**	
• 40 m (131 ft)	**A5E01181686**	
• 50 m (164 ft)	**A5E02296498**	
• 60 m (197 ft)	**A5E01181689**	
• 100 m (328 ft)	**A5E01181691**	
• 150 m (492 ft)	**A5E01181699**	
• 200 m (656 ft)	**A5E01181703**	
• 500 m (1640 ft)	**A5E01181705**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[3]	**FDK:085U0220**	
19" safety barrier (21 MW)[1] [EEx e ia] IIC for MAG 1100 Ex sensors 12 ... 24 V, 115 ... 230 V and MAG 3100 Ex sensors, incl. back plate (A5E02559810)	**FDK:083F5034**	
Front panel mounting enclosure IP65/NEMA 2 in ABS plastic for 19" insert (21 MW)	**FDK:083F5030**	
Front panel mounting enclosure IP65/NEMA 2 in ABS plastic for 19" insert (42 MW)	**FDK:083F5031**	
Panel mounting enclosure IP20/NEMA 1 in aluminum for 19" insert (21 MW)	**FDK:083F5032**	
Panel mounting enclosure IP20/NEMA 1 in aluminum for 19" insert (42 MW)	**FDK:083F5033**	
Wall mounting enclosure IP66/NEMA 4X in ABS plastic for 19" insert (cable glands and connection board not included).		

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Selection and ordering data (continued)

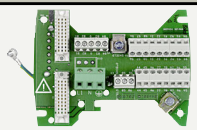
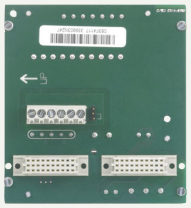
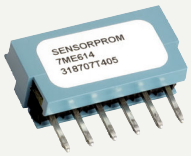
Description	Article No.	
• 21 MW	**FDK:083F5037**	
• 42 MW	**FDK:083F5038**	
Front cover (7TE) for panel mounting enclosure	**FDK:083F4525**	
Sun shield for MAG 5000/6000 transmitter in remote design	**A5E01209496**	
Sun Shield for MAG 5000/6000 transmitter in compact design on MAG 3100 (DN 15 ... 2000 (½" ... 78") or MAG 5100 W (DN 150 ... 1200 (6" ... 48")	**A5E01209500**	

1) Safety cables cannot be used with 19" safety barrier
2) For stainless steel wall mounting kit, order:- M20: FDK:085U1018 and A5E00836867- ½ NPT: FDK:085U1053 and A5E00836868
3) Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging

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Selection and ordering data (continued)

Spare parts

Description	Article No.	
Connection board (for polyamide terminal box)		
• 12 ... 24 V	**A5E02559817**	
• 115 ... 230 V	**A5E02559816**	
Connection board (for stainless steel terminal box)		
• 12 ... 24 V	**A5E02604280**	
• 115 ... 230 V	**A5E02604272**	
Connection board MAG 5000/6000 19" insert for panel mounting enclosure, 12 ... 24 V/115 ... 230 V	**A5E02559809**	
Connection board MAG 5000/6000 19" insert		
• with safety barrier for panel mounting enclosure, 12 ... 24 V/115 ... 230 V	**A5E02559810**	
• with safety barrier for panel mounting enclosure, 12 ... 24 V/115 ... 230 V (only for sensors produced before October 2007)	**A5E02559811**	
• with cleaning unit for panel mounting enclosure, 12 ... 24 V/115 ... 230 V	**FDK:083F4123**	
SENSORPROM memory unit (sensor code and serial numbers must be specified on order)		
• 2 kB (for MAG 5000/6000/6000 I)		
- 1 pc.	**FDK:085U1005**	
- 10 pcs.	**FDK:083F5052**	
Display unit for MAG 5000/6000		
• Black neutral front	**FDK:085U1038**	
• SIEMENS front	**FDK:085U1039**	
HW key	**On request**	

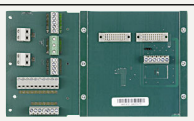
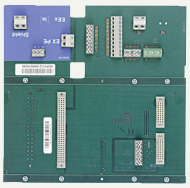
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Selection and ordering data (continued)

Description	Article No.	
Cable glands (polyamide), 4 pcs.		
• M20	**A5E00822490**	
• ½" NPT	**A5E00822501**	
• PG 13.5, 2 pcs.	**FDK:083G0228**	 ½" NPT  M20
Sealing screws for sensor/transmitter, 2 pcs.	**FDK:085U0221**	
Terminal box, in polyamide, inclusive lid, terminal blocks, gasket and screws		
• M20	**FDK:085U1050**	
• ½" NPT	**FDK:085U1052**	
Terminal box lid, in polyamide	**FDK:085U1003**	
Terminal box, in stainless steel, inclusive lid, terminal blocks, gasket and screws, for MAG 6000 in stainless steel and for all Ex sensors		
• M20	**A5E00836867**	
• ½" NPT	**A5E00836868**	
Terminal box (3A) for MAG 1100 F in polyamide, inclusive lid, terminal blocks, gasket and screws		

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Selection and ordering data (continued)

Description	Article No.	
• M20 • ½" NPT	**A5E00822478** **A5E00822479**	
Gasket for terminal box lid in polyamide or for MAG 5000/6000 IP67/ NEMA 6 enclosure in polyamide (5 pcs.)	**A5E37086797**	
Spare part kit for remote use of sensor with twenty 5-pin terminal blocks	**A5E34346873**	
Display frame in polyamide for MAG 5000/6000 IP67/NEMA 6 (5 pcs.)	**A5E43491675**	
Connection board MAG 5000/6000 19" insert for wall mounting enclosure, 12 ... 24 V/115 ... 230 V	**A5E02559813**	
Connection board MAG 5000/6000 19" insert • with safety barrier for wall mounting enclosure, 12 ... 24 V/115 ... 230 V • with safety barrier for wall mounting enclosure, 12 ... 24 V/115 ... 230 V (only for sensors produced before October 2007) • with cleaning unit for wall mounting enclosure, 12 ... 24 V/115 ... 230 V	 **A5E02559814** **A5E02559812** **A5E02559815**	

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Technical specifications

MAG 5000 and MAG 6000	
Mode of operation	
Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	> 1 × 10^{14} Ω
Input	
Digital input	11 ... 30 V DC, R_i = 4.4 KΩ
• Activation time	50 ms
• Current	$I_{11\ V\ DC}$ = 2.5 mA, $I_{30\ V\ DC}$ = 7 mA
Output	
Current output	
• Signal range	0 ... 20 mA or 4 ... 20 mA
• Load	< 800 Ω
• Time constant	0.1 ... 30 s, adjustable
Digital output	
• Frequency	0 ... 10 kHz, 50 % duty cycle (uni/bidirectional)
• Pulse (active)	24 V DC, 30 mA, 1 kΩ ≤ R_i ≤ 10 kΩ, short-circuit-protected (power supplied from flowmeter)
• Pulse (passive)	3 ... 30 V DC, max. 110 mA, 200 Ω ≤ R_i ≤ 10 kΩ powered from connected equipment)
• Time constant	0.1 ... 30 s, adjustable
Relay output	
• Time constant	Changeover relay, same as current output
• Load	42 V AC/2 A, 24 V DC/1 A
Low flow cut off	0 ... 9.9 % of maximum flow
Galvanic isolation	All inputs and outputs are galvanically isolated
Max. measuring error (incl. sensor and zero point) (for detailed accuracy specifications see "System information")	
• MAG 5000	± 0.4 % ± 1 mm/s
• MAG 6000	± 0.2 % ± 1 mm/s
Rated operating conditions	
Ambient temperature	
• Operation	• Display version: -20 ... +60 °C (-4 ... +140 °F)
• Storage	-40 ... +70 °C (-40 ... +158 °F)
Mechanical load (vibration)	
Compact version	18 ... 1000 Hz, 3.17 g RMS, sinusoidal in all directions to IEC 68-2-36
19" insert	1 ... 800 Hz, 1 G, sinusoidal in all directions to IEC 68-2-36
Protection class	
Compact version	IP67, NEMA 6
19" insert	IP20, NEMA 1
EMC performance	IEC/EN 61326-1 (all environments) IEC/EN 61326-2-5
Display and keypad	
Totalizer	Two eight-digit counters for forward, net or reverse flow
Display	Background illumination with alphanumeric text, 3 × 20 characters to indicate flow rate, totalized values, settings and faults; Reverse flow indicated by negative sign
Time constant	Time constant as current output time constant
Design	
Enclosure material	
• Compact version	IP67 / NEMA 6; Fiber glass reinforced polyamide IP67 / NEMA 6; Stainless steel AISI 316/1.4436

MAG 5000 and MAG 6000	
• 19"-insert	DIN 41494 steel sheet housing and aluminum front plate with display; width: 21 MW, height: 3 U
- Panel mounting	IP20/NEMA 1; Aluminium
- Front panel mounting	IP65/NEMA 2; ABS plastic
- Wall mounting	IP66/NEMA 4X; ABS plastic
Dimensions	
• Compact version	See dimensional drawings
• 19" insert	See dimensional drawings
Weight	
• Compact version	0.75 kg (2 lbs)
• 19" insert	See dimensional drawings
Power supply	• 115 ... 230 V AC +10 % -15 %, 50 ... 60 Hz • 11 ... 30 V DC or 11 ... 24 V AC
Power consumption	• 230 V AC: 17 VA • 24 V AC: 9 VA, I_N = 380 mA, I_{ST} = 8 A (30 ms) • 12 V DC: 11 W, I_N = 920 mA, I_{ST} = 4 A (250 ms) • 24 V DC: 8.4 VA, I_N = 350 mA, I_{ST} = 4 A (10 ms) I_{ST}= 4 A (250 ms): for solar panel please securestable current supply
Certificates and approvals	
General purpose	• CE (LVD, EMC, PED, RoHS) • UL (c-UL-us)
Hazardous area	• FM, CSA - NI Class I Div. 2 Groups A, B, C, D
Custody transfer	• Chilled water - PTB K 7.2 (Germany) - OE 12/C 040 (Austria)
Marine (only for remote version with MAG 5100 W, DN 50 ... 300)	• ABS • Bureau Veritas • DNV-GL • Lloyd's Register
Others	• CPA (China) • EAC (Russia, Belarus, Kazakhstan) • KCs (South Korea)
Communication	
Standard	
• MAG 6000	Optional as add-on modules • HART 5.2 • Modbus RTU/RS 485 • FOUNDATION Fieldbus H1 • DeviceNet • PROFIBUS PA • PROFIBUS DP

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Technical specifications (continued)

Safety barrier (e/ia)

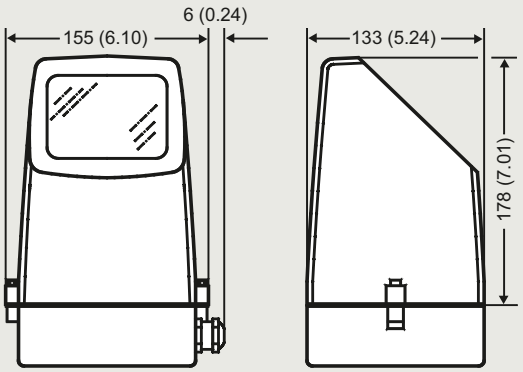


Application	**For use with MAG 5000/MAG 6000 19" and MAG 1100 Ex/MAG 3100 Ex**		
Ex approval	MAG 1100 Ex [EEx e ia] IIB ATEX, EAC Ex		
	MAG 3100 Ex [EEx e ia] IIC ATEX, EAC Ex		
Cable parameter Electrode	Group	Capacity in µF	Inductance in mH
	IIC	≤ 4.1	≤ 80
	IIB	≤ 45	≤ 87
	IIA	≤ 45	≤ 87
Ambient temperature			
• During operation	-20 ... +50 °C (-4 ... +122 °F)		
• During storage	-20 ... +70 °C (-4 ... +158 °F)		
Enclosure			
• Material	Standard 19" insert in aluminum/steel (DIN 41494)		
• Width	21 MW (4.75")		
• Height	3 U (5.25")		
• Degree of protection	IP20/NEMA 1 to EN 60529		
• Mechanical load	1 g, 1 ... 800 Hz sinusoidal in all directions to EN 60068-2-36		

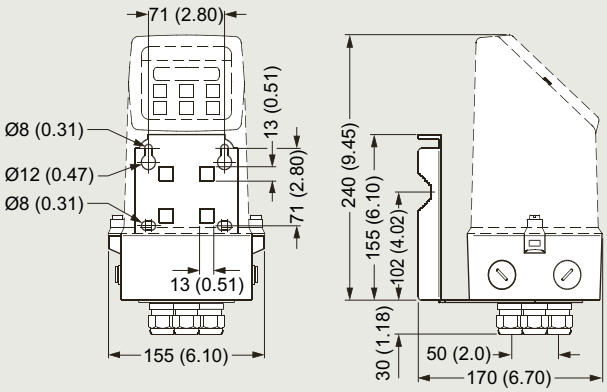
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Dimensional drawings

Transmitter IP67/NEMA 6 compact polyamide



Transmitter compact mounted, dimensions in mm (inch)

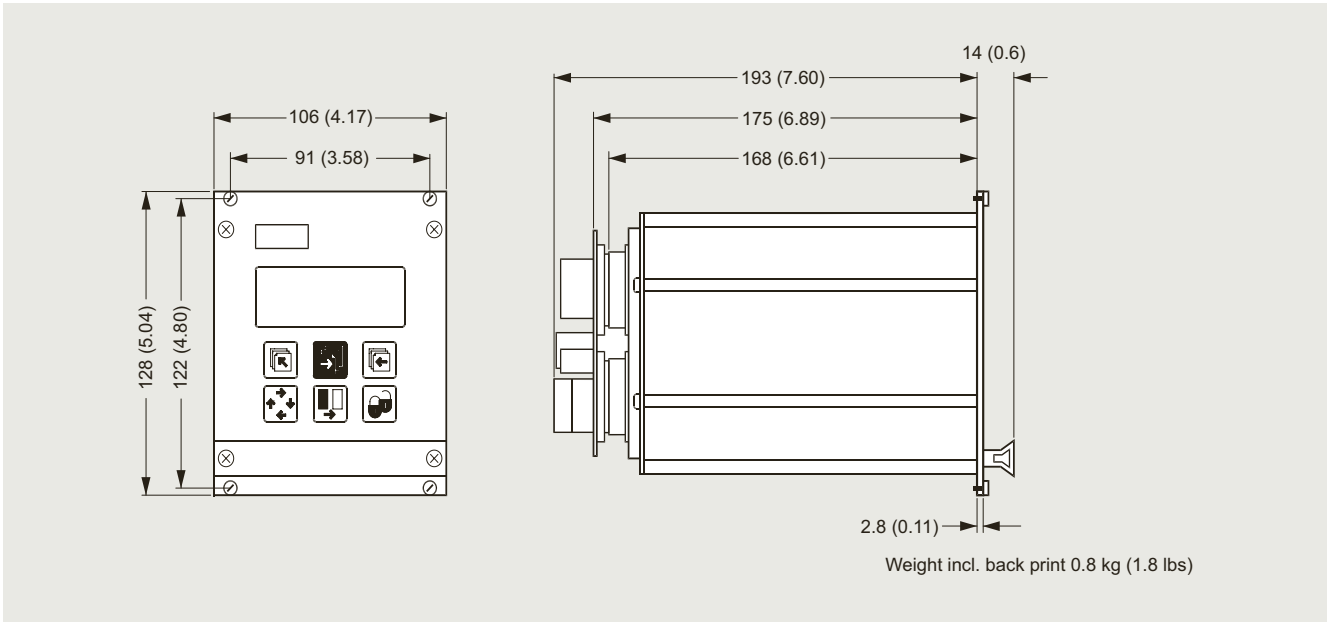


Transmitter wall mounted, dimensions in mm (inch)

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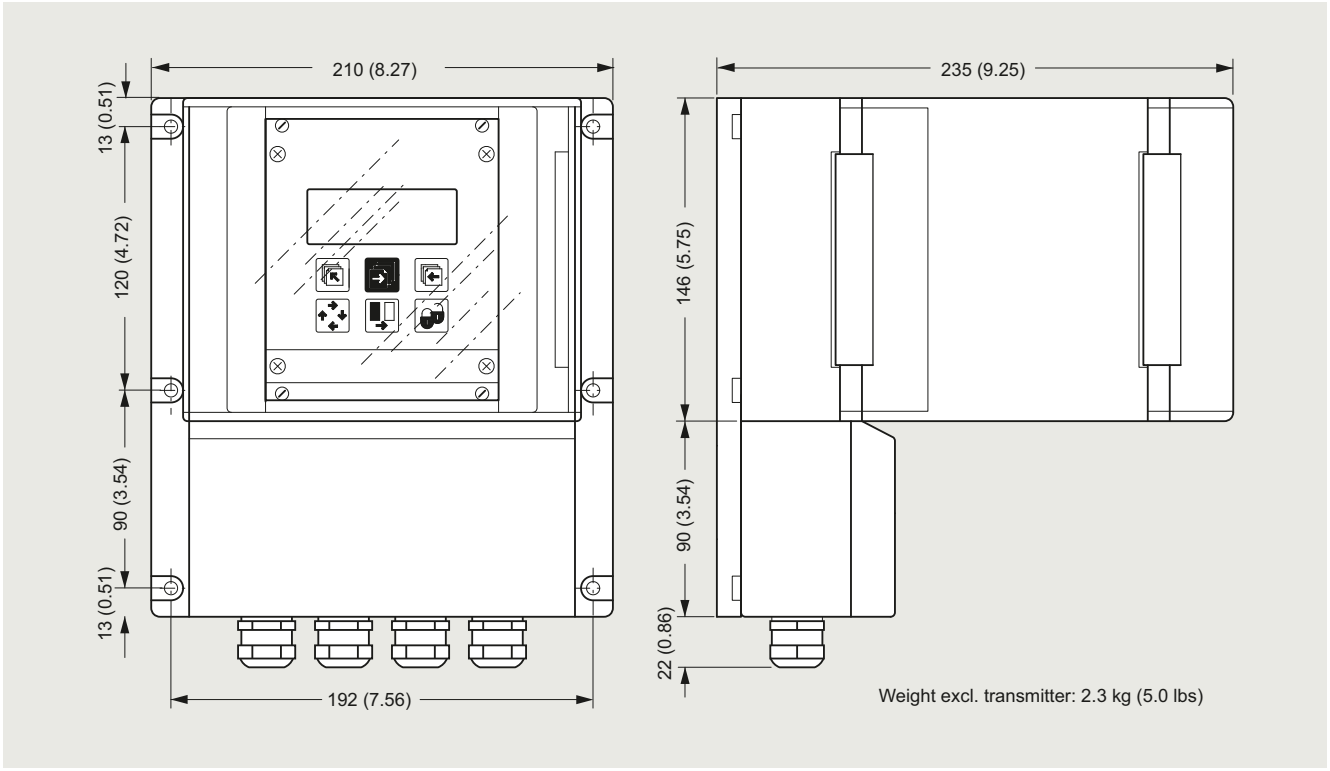
Dimensional drawings (continued)

Transmitter, 19" IP20/NEMA 2 standard unit



Dimensions in mm (inch)

Transmitter, wall mounting IP66/NEMA 4X, 21 TE

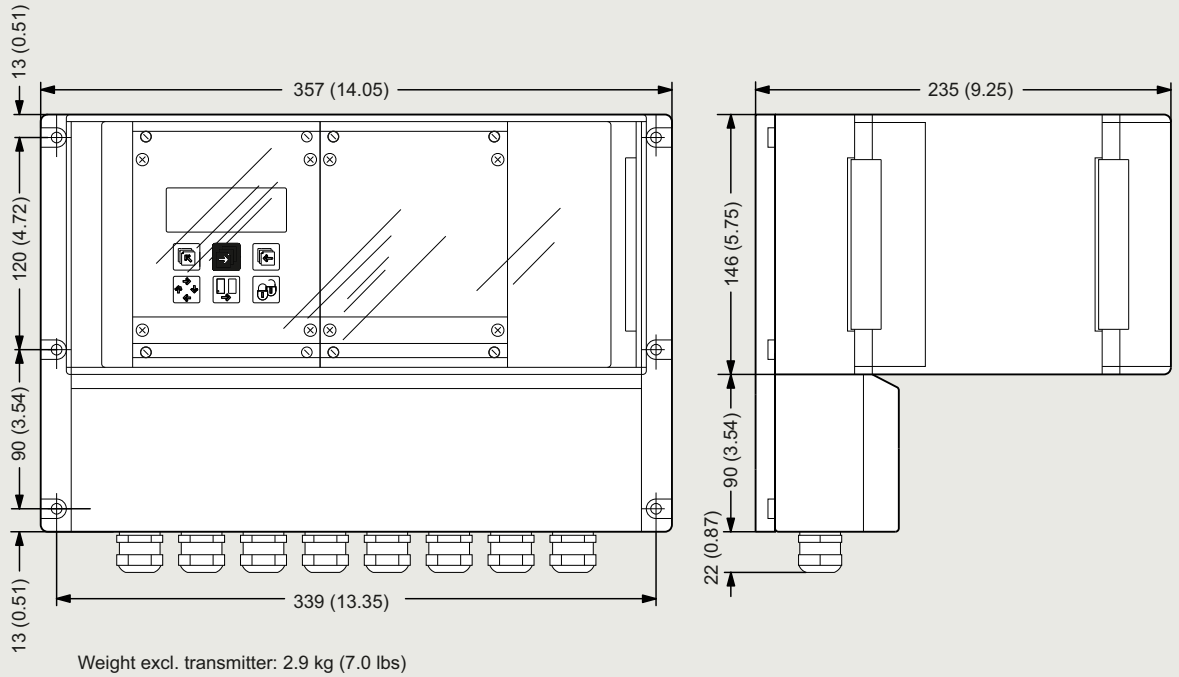


Dimensions in mm (inch)

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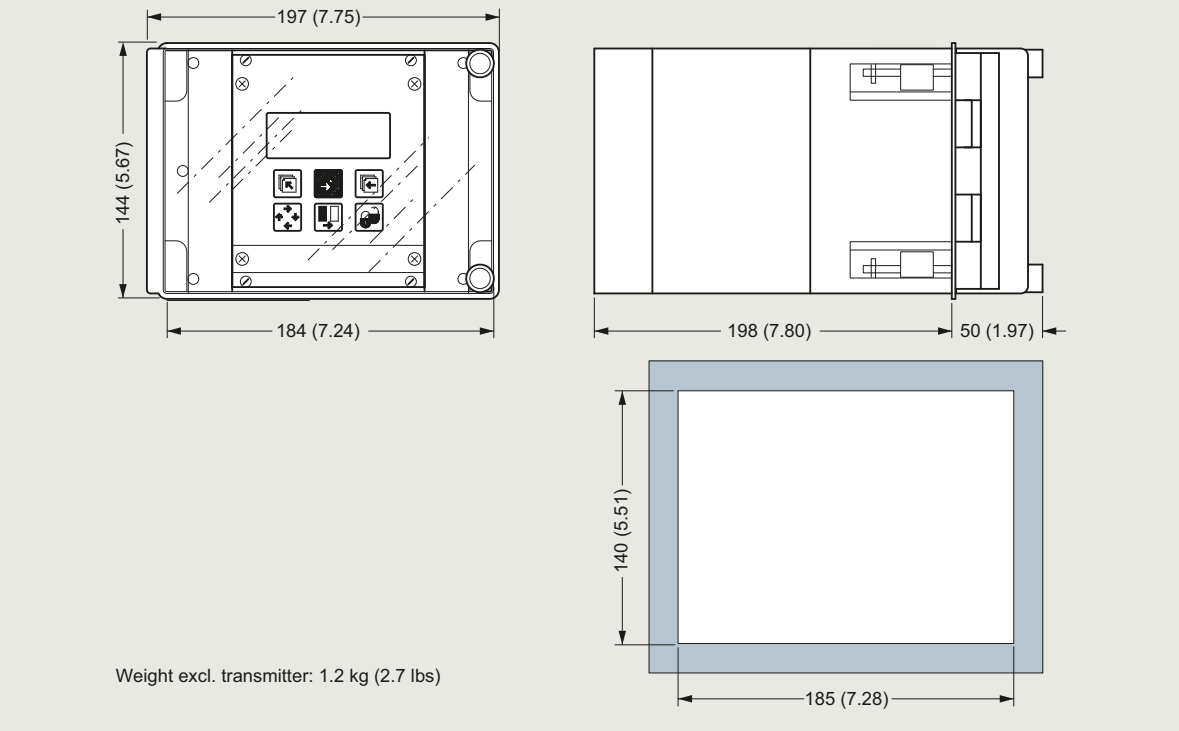
Dimensional drawings (continued)

Transmitter, wall mounting IP66/NEMA 4X, 42 TE



Dimensions in mm (inch)

Transmitter, front panel mounting IP65/NEMA 4, 21 TE

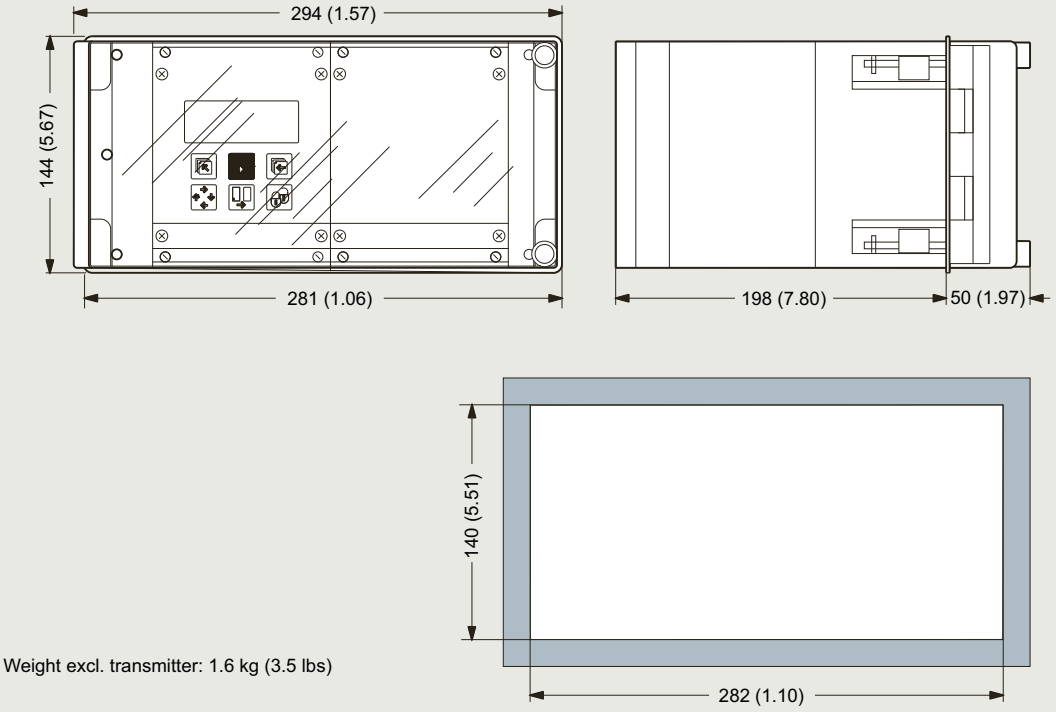


Dimensions in mm (inch)

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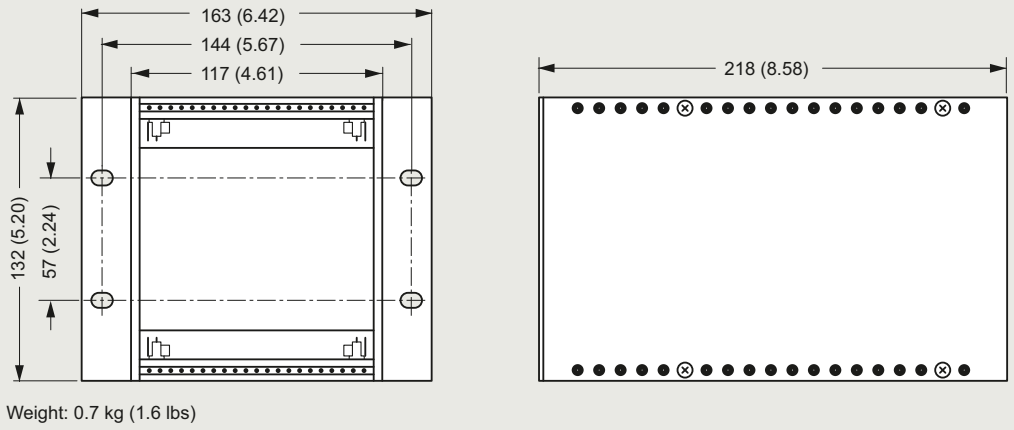
Dimensional drawings (continued)

Transmitter, front panel mounting IP65/NEMA 4, 42 TE



Dimensions in mm (inch)

Transmitter, panel mounting IP20/NEMA 2, 21 TE

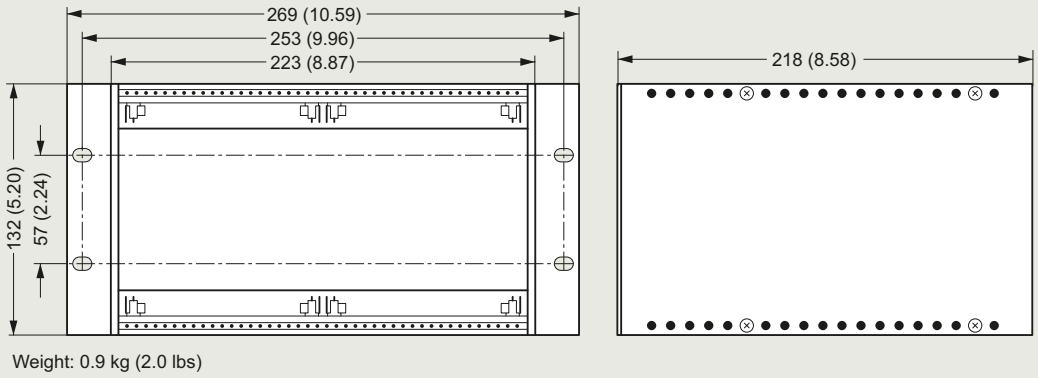


Dimensions in mm (inch)

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Dimensional drawings (continued)

Transmitter, panel mounting IP20/NEMA 2, 42 TE



Dimensions in mm (inch)

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Overview



The SITRANS FM MAG 6000 I/MAG 6000 I Ex transmitter is designed for the demands in the process industry. The robust die-cast aluminum housing provides superb protection, even in the most harsh industrial environments. Full input and output functionality is given even in the Ex version.

Benefits

- Full range of Ex-rated flowmeters with intrinsically safe rated input and outputs
- For compact or remote installation
- HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA and DP, Modbus RTU/RS 485 add-on communication modules available
- Superior signal resolution for optimum turn down ratio
- Digital signal processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection
  - 3 lines, 20 characters display in 11 languages
  - Flow rate in various units
  - Totalizer for forward, reverse and net flow as well as much more information available
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging
- Batch control
- Conforming to NAMUR recommendations NE 21, NE 32, NE 43, NE 53 and NE 70
- Self verification

Design

The transmitter is designed for either compact or remote installation in non-hazardous or hazardous areas (compact mounted transmitter to be ordered together with the sensor).

Function

The following functions are available:

- Flow rate
- 2 measuring ranges
- 2 totalizers
- Low flow cut-off
- Flow direction
- Error system
- Operating time
- Uni-/bidirectional flow
- Limit switches and pulse output
- Batch control

The MAG 6000 I/6000 I Ex de is a microprocessor-based transmitter with a built-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

Displays and keypads

Operation of the transmitter can be carried out using:

- Keypad and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS or Modbus communication

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Selection and ordering data

SITRANS FM Transmitter MAG 6000 I Remote with standard wall mounting bracket, local display, die cast aluminum	Article No. 7ME6930-									
	2	B	A	●	●	-	1	●	A	7
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Supply voltage										
Standard transmitter: 18 ... 90 V DC; 115 ... 230 V AC, 50 ... 60 Hz				**2**						
Ex transmitter: 18 ... 30 V DC				**4**						
Ex transmitter: 115 ... 230 V AC, 50 ... 60 Hz				**5**						
Ex approval										
Standard sensor: FM Class I, Div 2, CSA Class I, Div 2					**0**					
Ex sensor: Hazardous area (ATEX 2 GD; FM Class I, Zone 1; CSA Class I, Zone 1)					**2**					
Standard sensor: Non-hazardous area					**3**					
Communication										
None								**A**		
HART								**B**		
PROFIBUS PA Profile 3								**F**		
PROFIBUS DP Profile 3 (not for Ex version)								**G**		
Modbus RTU/RS 485 (not for Ex version)								**E**		
FOUNDATION Fieldbus H1								**J**		
Cable gland entries										
Metric										**0**
½" NPT										**2**

1) Product Variation Request (PVR).

Further design	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text	
Tag name plate, stainless steel (specify in plain text)	**Y17**
Tag name plate, plastic (self-adhesive)	**Y18**
Special version (specify in plain text)	**Y99**

Communication modules for MAG 6000 I (All standard outputs can still be used)

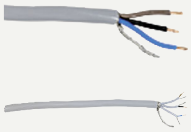
Description	Article No.	
HART (only for MAG 6000 I/Ex)	**FDK:085U0321**	
Modbus RTU/RS 485[1)]	**FDK:085U0234**	
PROFIBUS PA Profile 3	**FDK:085U0236**	
PROFIBUS DP Profile 3[1)]	**FDK:085U0237**	
DeviceNet[1)]	**FDK:085U0229**	
FOUNDATION Fieldbus H1	**A5E02054250**	

1) Not for Ex versions

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Selection and ordering data (continued)

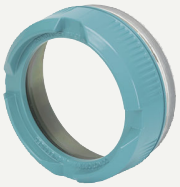
Accessories for MAG 6000 I/6000 I Ex

Description	Article No.	
Standard coil or electrode cable 3 × 1.5 mm²/18 gage, single shielded with PVC jacket Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.4 ft)	**A5E02296523**	
• 10 m (33 ft)	**FDK:083F0121**	
• 20 m (65 ft)	**FDK:083F0210**	
• 30 m (98 ft)	**A5E02297309**	
• 40 m (131 ft)	**FDK:083F0211**	
• 50 m (164 ft)	**A5E02297317**	
• 60 m (197 ft)	**FDK:083F0212**	
• 100 m (328 ft)	**FDK:083F0213**	
• 150 m (492 ft)	**FDK:083F3052**	
• 200 m (656 ft)	**FDK:083F3053**	
• 500 m (1640 ft)	**FDK:083F3054**	
Special electrode cable (empty pipe detection or low conductivity) 3 × 0.25 mm², double shielded with PVC jacket Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	**FDK:083F3020**	
• 20 m (65 ft)	**FDK:083F3095**	
• 40 m (131 ft)	**FDK:083F3094**	
• 60 m (197 ft)	**FDK:083F3093**	
• 100 m (328 ft)	**FDK:083F3092**	
• 150 m (492 ft)	**FDK:083F3056**	
• 200 m (656 ft)	**FDK:083F3057**	
• 500 m (1640 ft)	**FDK:083F3058**	
Cable kit including standard coil cable and special electrode cable Standard coil cable: 3 × 1.5 mm²/ 18 gage, single shielded with PVC jacket Special electrode cable: 3 × 0.25 mm², double shielded with PVC jacket) Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.4 ft)	**A5E02296329**	
• 10 m (33 ft)	**A5E01181647**	
• 15 m (49 ft)	**A5E02296464**	
• 20 m (65 ft)	**A5E01181656**	
• 25 m (82 ft)	**A5E02296490**	
• 30 m (98 ft)	**A5E02296494**	
• 40 m (131 ft)	**A5E01181686**	
• 50 m (164 ft)	**A5E02296498**	
• 60 m (197 ft)	**A5E01181689**	
• 100 m (328 ft)	**A5E01181691**	
• 150 m (492 ft)	**A5E01181699**	
• 200 m (656 ft)	**A5E01181703**	
• 500 m (1640 ft)	**A5E01181705**	
Low noise electrode coax cable for low conductivity and high vibration levels 3 × 0.13 mm². Temperature range -25 °C ... +85 °C (-13 °F ... +185 °F)		
• 2 m (6.6 ft)	**A5E02272692**	
• 5 m (16.5 ft)	**A5E02272723**	
• 10 m (33 ft)	**A5E02272730**	

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Selection and ordering data (continued)

Spare parts

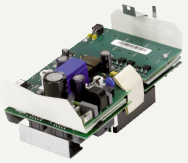
Description	Article No.	
Display unit	FDK:085U3122	
Accessory bag including cable gland inserts and connectors for sensor cables	FDK:085U3144	
Display lid (non-Ex, Ex) in die-cast aluminum, with corrosions resitant coating (min. 60 µm)	7ME5933-0AC01	
Blind lid for sensor cables connection compartment (only remote version) in die-cast aluminum, with corrosion resistant coating (min. 60 µm) incl. O-ring seal	7ME5933-0AC02	
Blind lid (mains supply, input/outputs) in die-cast aluminum, with corrosion resistant coating (min. 60 µm)	7ME5933-0AC03	
Safety clamp	7ME5933-0AC06	
Standard wall-mounting bracket, stainless steel AISI 316L/1.4404	7ME5933-0AC04	

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Selection and ordering data (continued)

Description	Article No.	
Special wall-mounting bracket, BI 2.5 DIN 59382 X6Cr17	**7ME5933-0AC05**	

Complete spare part PCB unit

Description	Article No.	
MAG 6000 I std. (not for Ex), 18 ... 30 V DC; 115 ... 230 V AC Spare PCBA	**FDK:085U3123**	
MAG 6000 I Ex d 115 ... 230 V AC Spare PCBA only for use with Ex approved sensor and explosion protection "Increased safety" (Ex e)	**A5E01013127**	
MAG 6000 I Ex d 18 ... 30 V DC Spare PCBA only for use with Ex approved sensor and explosion protection "Increased safety" (Ex e)	**A5E01013340**	

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Product selector link:
http://www.pia-portal.automation.siemens.com

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Technical specifications

MAG 6000 I and MAG 6000 I Ex	
Mode of operation	
Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	> 1 × 10^{14} Ω
Input	
Digital input	11 ... 30 V DC, Ri = 4.4 kΩ
• Activation time	50 ms
• Current	$I_{11\ V\ DC}$ = 2.5 mA, $I_{30\ V\ DC}$ = 7 mA
Output	
Current output	
• Signal range	4 ... 20 mA (active/passive)
• Load	< 560 Ω
• Time constant	0.1 ... 30 s, adjustable
Digital output	
• Frequency	0 ... 10 kHz, 50 % duty cycle (uni-/bidirectional)
• Time constant	0.1 ... 30 s, adjustable
• Pulse (passive)	3 ... 30 V DC, max. 110 mA (30 mA Ex version), 200 Ω ≤ Ri ≤ 10 kΩ (powered from connected equipment)
• Time constant	0.1 ... 30 s, adjustable
Relay output	
• Time constant	Changeover relay, same as current output
• Load	42 V AC/2 A, 24 V DC/1 A
Low flow cut off	0 ... 9.9 % of maximum flow
Galvanic isolation	All inputs and outputs are galvanic isolated.
Max. measuring error	
MAG 6000 I/MAG 6000 I Ex (incl. sensor)	± 0.2 % ± 1 mm/s
Rated operation conditions	
Ambient temperature	
• Operation	
- MAG 6000 I [2]	-20 ... +60 °C (-4 ... +140 °F)
- MAG 6000 I Ex [2]	-20 ... +60 °C (-4 ... 140 °F)
• Storage	-40 ... +70 °C (-40 ... +158 °F)
Mechanical load	18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36
	Transmitter: 1.14 g RMS
Degree of protection	IP67/NEMA 4X to IEC 529 and DIN 40050 (1 mH_2O 30 min.)
EMC performance	• IEC/EN 61326-1 (all environments) • IEC/EN 61326-2-5 • NAMUR NE 21
Display and keypad	
Totalizer	Two eight-digit counters for forward, net or reverse flow
Display	Background illumination with alphanumeric text, 3 x 20 characters to indicate flow rate, totalized values, settings and faults; Reverse flow indicated by negative sign
Keypad	Capacitive touch keypad with LED light for feedback indication
Time constant	Time constant as current output time constant
Design	
Enclosure material	Die-cast aluminum, with corrosion resistant Basic Polyester powder coating (min. 60 µm)
• Wall mounting	Wall mounting bracket enclosed for remote version
Dimensions	See dimensional drawings
Weight	See dimensional drawings

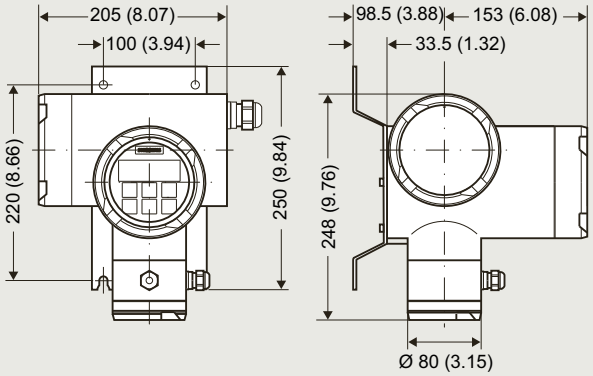
Technical specifications (continued)

MAG 6000 I and MAG 6000 I Ex	
Power supply	• Standard transmitter: 18 ... 90 V DC; 115 ... 230 V AC; 50 ... 60 Hz • Ex transmitter: 18 ... 30 V DC • Ex transmitter: 115 ... 230 V AC; 50 ... 60 Hz
Power consumption	• 230 V AC: 20 VA • 24 V DC: 9.6 W, I_N = 0.4 A, I_{ST} = 1 A (3 ms)
Certificates and approvals	
General purpose	• CE (LVD, EMC, PED, RoHS)
Hazardous areas	• ATEX, IECEx, FM, CSA, EAC Ex, NEPSI - Zone 1 Ex d e [ia] ia IIC T6 Gb • ATEX, IECEx, CSA - Zone 21 Ex tD A21 IP67 T85 °C • FM - XP IS Class I Div. 1 Groups A, B, C, D - DIP Class II+III Div. 1 Groups E, F, G
Others	• CPA (China) • EAC (Russia, Belarus, Kazakhstan) • KCs (South Korea)
Cable entries	
MAG 6000 I	
• Power supply and outputs	2 × M20 (HART)/M25 (PROFIBUS) or 2 × ½" NPT (HART)
• Sensor connection	2 × M16 or 2 × ½" NPT
MAG 6000 I Ex ATEX 2G D	
• Power supply and outputs	2 × M20
• Sensor connection	2 × M16
Communication	
Standard versions	HART, Modbus RTU/RS 485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP add-on modules
Ex versions	HART, PROFIBUS PA (not for Ex version)

[1] Applicable for: Compact mounted MAG 6000 I Ex on MAG 3100, sizes DN 15 ... 300 (½" ... 12").
[2] With HART communication max. ambient temperature 50 °C (122 °F).

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Dimensional drawings



SITRANS FM transmitter MAG 6000 I with wall-mounting bracket, dimensions in mm (inch)

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Overview



The SITRANS FM100 is an electromagnetic flow sensor in a compact design for basic applications in the process and OEM industry.

Benefits

- Connection ½", ¾", 1", 2"
- Flow- and temperature measurement
- IO-Link communication
- Dosing function with external control output
- Colored, multi-parameter configurable TFT display, rotatable 90°
- Bidirectional measuring
- Intuitive setup menu via 4 optical touch keys
- 2 freely configurable outputs
- All-metal design: stainless steel
- Included in Quick Ship Program (delivery time see PIA LCP)

Application

The main applications of the SITRANS FM electromagnetic flow sensors can be found in the following fields:

- OEM industry
- Process industry
- Small water cycles: e.g. cooling water, water leakage
- Dosing e.g. in chemical industry

Design

The SITRANS FM100 is designed to measure small- and medium sized flow of conductive liquids. The small build allows to fit the device in almost any space. The robust stainless-steel housing protects the device in changing surroundings.

The measurement is displayed on the local screen as well as accessible via 2 freely configurable outputs (pulse-/frequency-/alarm- and analogue).

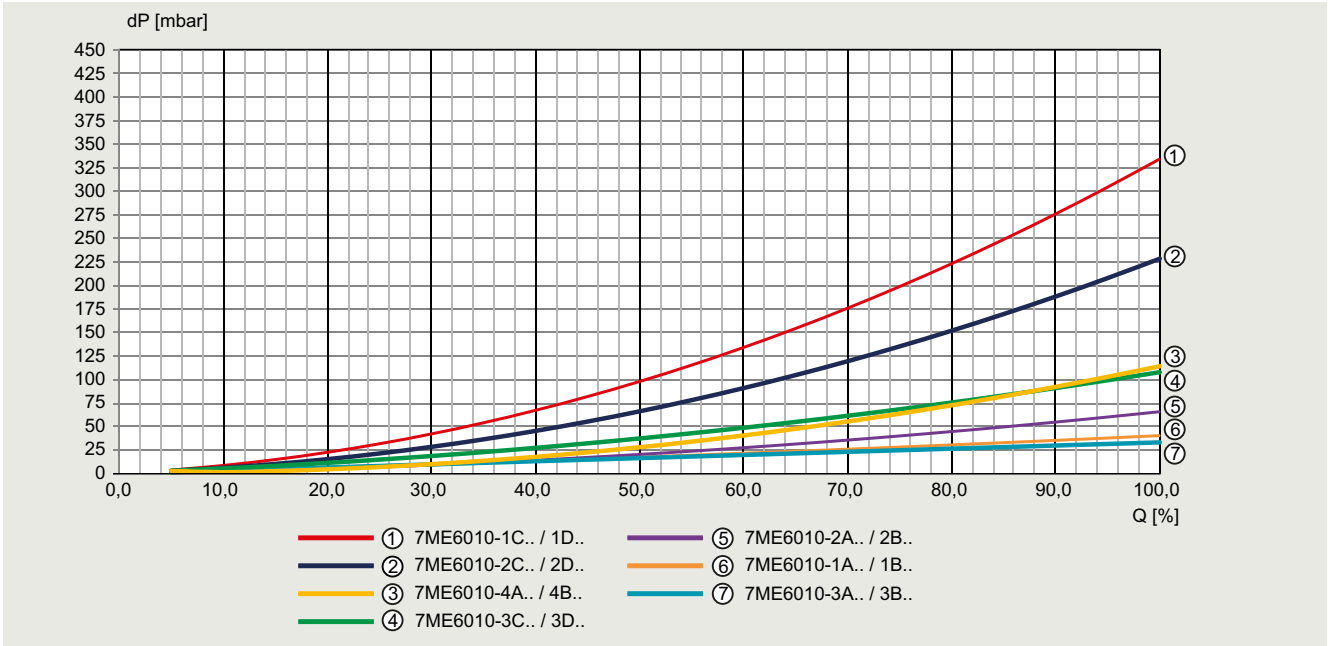
Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

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Integration

Pressure loss



Selection and ordering data

SITRANS FM100 flowmeter	Article No. 7ME6010-	●	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Process connection, measuring range						
Male thread G1/2", 0.03 ... 3 l/min		1	A			
Male thread G1/2", 0.25 ... 48 gal/h		1	B			
Male thread G1/2", 0.04 ... 10 l/min		1	C			
Male thread G1/2", 0.011 ... 2,6 gal/min		1	D			
Male thread G3/4", 0.1 ... 25 l/min		2	A			
Male thread G3/4", 0.025 ... 6,6 gal/min		2	B			
Male thread G3/4", 0.2 ... 50 l/min		2	C			
Male thread G3/4", 0.053 ... 13 gal/min		2	D			
Male thread G1", 0.2 ... 50 l/min		3	A			
Male thread G1", 0.053 ... 13 gal/min		3	B			
Male thread G1", 0.4 ... 100 l/min		3	C			
Male thread G1", 0.1 ... 26 gal/min		3	D			
Male thread G2", 1.5 ... 350 l/min		4	A			
Female thread 2" NPT, 0.4 ... 92 gal/min		4	B			
Transmitter design						
Compact design without cable				A		
Gasket material						
FKM/FPM					0	
EPDM					1	
Quality inspection certificate						
Without						0
3-point factory calibration						3
5-point factory calibration						5

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Technical specifications

FM100	
Measuring principle	Electromagnetic induction
Media	Conductive liquid with ≥ 20 µS/cm
Accuracy	< ± (0.8 % of reading + 0.5 % of full scale)[1]
Repeatability	±0.2 % of full scale
Response time flow t_{90}	
• Alarm/pulse/frequency output	< 100 ms
• Current output	< 1 s
Temperature measurement	
Sensor	PT1000
Accuracy	≤ ±2 °C (flow > 0.2 m/s)
Measuring range	Temperature range of media
Response time temperature t_{90} (signal output)	< 20 s
Process connection	
Nominal size	G ½" ... G 2" Compatible NPT adapter available (¼" ... 2")
Process connection	Threaded fitting
Rated operation conditions	
Mounting position	In all directions, bidirectional measuring
In-/outlet	3 × diameter / 2 × diameter
Ambient temperature	-20 ... +70 °C (-4 ... +158 °F)
Enclosure rating	IP67
Operating pressure	Max. 16 bar
Pressure drop	See pressure loss diagram
Mechanical load	
• Shock resistance	DIN EN 60068-2-27:2010: 20 g (11 ms)
• Vibration resistance	DIN EN 60068-2-6:2008: 5 g (10 ... 2 000 Hz)
• Environmental testing	DIN EN 60068-2-30:2006: severity level b
EMC	2014/30/EU
Design	
Weight	See dimensional drawings
Housing material	Stainless steel 1.4404
Electrode material	Stainless steel 1.4404
Connection fitting	Stainless steel 1.4404
Insulation parts	PEEK
Seals	FKM (Option: EPDM)
Display	PMMA
	Operation via 4 optical touch sensors (operation with hand gloves)
	TFT display, 128 × 128 pixels, 1.4" display, orientation in 90° steps adjustable, repetition rate adjustable 0.5 ... 10 s
Cable entries	M12x1 4-pin connection
Dimensions	See dimensional drawings
Electrical data	
Power supply	19 ... 30 V DC
Power consumption	Max. 200 mA
Outputs	
• Frequency	Push-Pull, freely scalable, 2kHz @ overflow
	f_{min} @ FS = 50 Hz
	f_{max} @ FS = 1 000 Hz
• Pulse	Push-Pull, freely scalable, configurable for partial and accumulated totalizer
• Alarm	NPN, PNP, Push-Pull, configurable max. 30 V DC, max. 200 mA short-circuit proof
• Current	0(4) ... 20 mA (active) or 0(2) ... 10 V DC
	Max. load 500 Ω
Input	
• Control	Active signal U_{high} max. 30 V DC
	0 < Low < 10 V DC
	15 V DC < High < Vs
• Dosing function	Dosing output OUT2:
	Push-Pull, High active
	Control input OUT1:
• Dosing function	START/STOP 0.5 s < t_{high} < 4 s RESET t_{high} > 5 s
Communication	**IO-Link**
• Manufacturer ID	42 (decimal), 0x002A (hex)
• Manufacturer name	Siemens AG
• Version	V1.1
• Bitrate	COM3
• Minimal cycle time	1.1 ms
• SIO-Mode	Yes (OUT1 in configuration IO-Link)
• Block parameterization	Yes
• Operational readiness	10 s
• Max. cable length	20 m

[1] Under reference conditions:
- Media temperature: 15 ... 30 °C
- Ambient temperature: 15 ... 30 °C
- 1 cST
- 500 µS/cm
- 1 bar

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Technical specifications (continued)

Factory calibration points

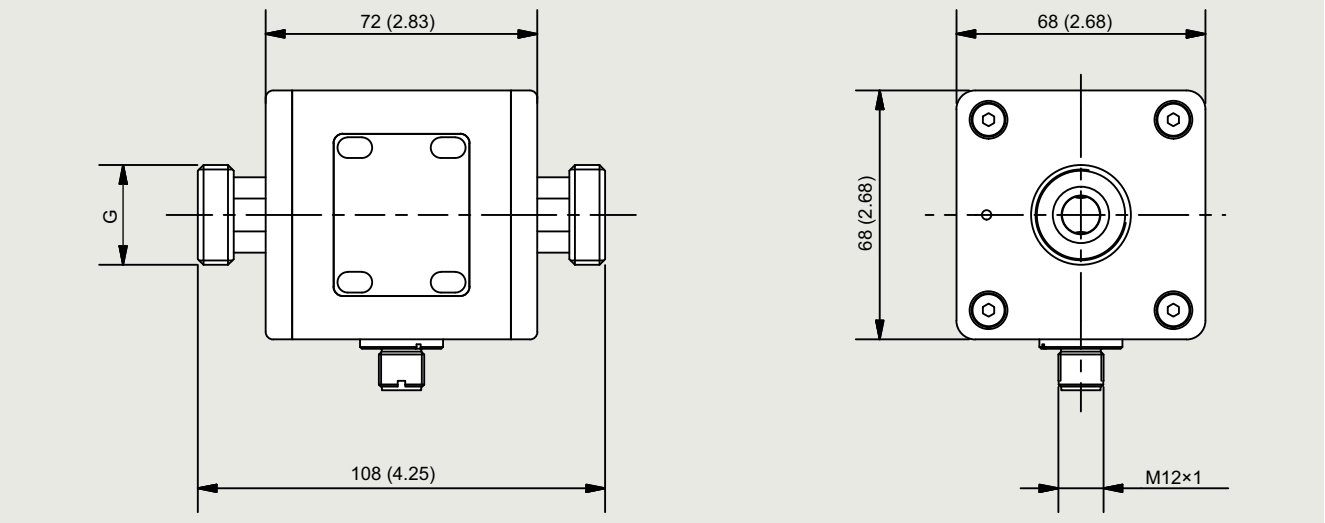
Type	Measuring range	Quality inspection certificate	Measuring point [l/min] 1	2	3	4	5
7ME6010	1A, 1B	0	1.5	-	-	-	-
		3	0.5	1.5	2.5	-	-
		5	0.5	1	1.5	2	2.5
	1C, 1D	0	5	-	-	-	-
		3	1	5	8	-	-
		5	0.5	2	5	6	8
	2A, 2B	0	12	-	-	-	-
		3	2	12	20	-	-
		5	0.5	2	12	15	20
	2C, 2D	0	25	-	-	-	-
		3	4	25	50	-	-
		5	4	15	25	30	40
	3C, 3D	0	50	-	-	-	-
		3	20	50	80	-	-
		5	8	20	50	60	80
	4A, 4B	0	170	-	-	-	-
		3	20	170	280	-	-
		5	20	100	170	200	280

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Dimensional drawings

SITRANS FM100 flowmeter with compact transmitter

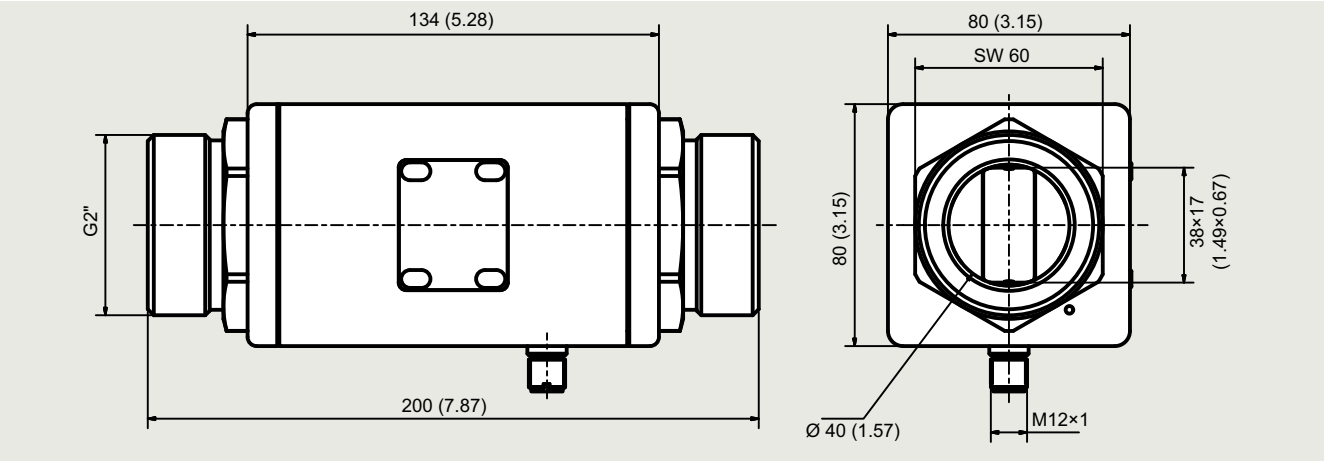
Process connection G1/2", G3/4" and G1



SITRANS FM100 with compact transmitter, process connection G1/2", G3/4" and G1"; dimensions in mm (inch)

Process connection	Nominal size	Weight (g)
Male thread	G1/2"	998
Male thread	G3/4"	988
Male thread	G1"	1010

Process connection G2"



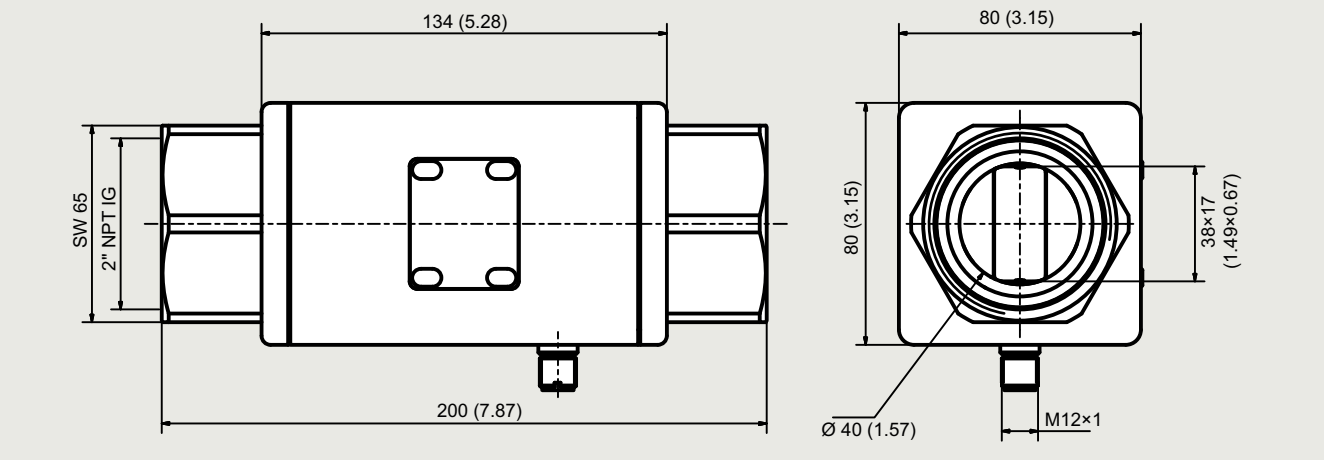
SITRANS FM100 with compact transmitter, process connection G2"; dimensions in mm (inch)

Process connection	Nominal size	Weight (g)
Male thread	G2"	2420

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Dimensional drawings (continued)

Process connection 2" NPT IG



SITRANS FM100 with compact transmitter, process connection 2" NPT (female); dimensions in mm (inch)

Process connection	Nominal size	Weight (g)
Female thread	2" NPT IG	2140

SITRANS FM100 inner diameters

Connection, nominal size	Inside diameters (DN)	Range
G1/2"	5 mm	0.03 ... 3 l/min / 0.04 ... 10 l/min
G3/4"	10 mm	0.1 ... 25 l/min / 0.2 ... 50 l/min
G1"	15 mm	0.2 ... 50 l/min / 0.4 ... 100 l/min
2" NPT IG	see dimensional drawings	1.5 ... 350 l/min

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Overview



SITRANS FM TRANSMAG 2 with the SITRANS FM MAG 911/E sensor is a flowmeter using alternating (AC) field technology where the magnetic field strength is much higher than conventional magnetic flowmeters with pulsed DC field technology.

Benefits

- Wide range of sizes DN 15 to DN 1000 (½" to 40")
- Broad range of liner and electrode materials for extreme process medias
- Fully welded construction provides a ruggedness that suits the toughest applications and environments
- Automatic reading of SmartPLUG for easy commissioning
- Simple menu operation with two-line display
- Comprehensive self-diagnostic with self-monitoring and internal simulation

Application

The main applications of the SITRANS FM transmitter TRANSMAG 2 can be found in the following sectors:

- Pulp and Paper industry
- Mining industry

The patented pulse alternating field technology is ideal for difficult applications like:

- High concentrated paper stock > 3 %
- Heavy mining slurries up to 70 % solid concentration
- Mining slurries with magnetic particles
- Low conductive medias ≥1 µS/cm

Design

- Available for remote mounting
- PROFIBUS PA (profile 2.0) / HART communication
- Analog output and digital outputs for pulses, device status, limits, flow direction, frequency output

Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

Function

The TRANSMAG 2 is a microprocessor-based transmitter with a built-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfill the task of a power supply unit which provides the magnet coils with a constant current.

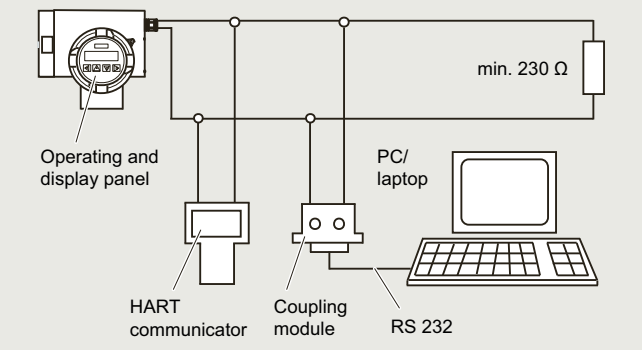
The magnetic flux density in the sensor is additionally monitored by reference coils.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

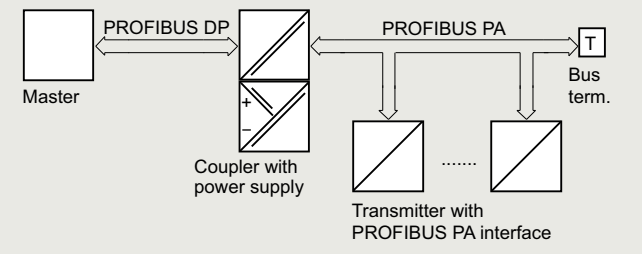
Displays and keypads

Operation of the transmitter can be carried out using:

- Keypad and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS PA communication



HART communication



PROFIBUS PA communication

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Selection and ordering data

Transmitter TRANSMAG 2 Remote with standard wall mounting bracket, local display, die cast aluminum	Article No. 7ME5034-									
	●	A	A	1	1	-	●	A	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Output/communication										
4 ... 20 mA with HART	0									
PROFIBUS PA	1									
4 ... 20 mA with HART and digital input	2									
Cable glands										
M20 × 1.5							1			
½" NPT							2			

	Order code
Additional information	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Special mounting bracket for wall and pipeline installation	**A02**
Transmitter setting for parameter "TAG number" (specify in plain text, max. 8 characters)	**Y15**
Transmitter setting for parameter "TAG descriptor" (specify in plain text, max. 16 characters)	**Y16**
Tag name, stainless steel plate (specify in plain text)	**Y17**
Special version (specify in plain text)	**Y99**

Sensor MAG 911/E	Article No. 7ME5610-									
	●	●	●	●	●	-	●	A	A	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Nominal size										
DN 15 (½")	1	V								
DN 25 (1")	2	D								
DN 40 (1½")	2	R								
DN 50 (2")	2	Y								
DN 65 (2½")	3	F								
DN 80 (3")	3	M								
DN 100 (4")	3	T								
DN 125 (5")	4	B								
DN 150 (6")	4	H								
DN 200 (8")	4	P								
DN 250 (10")	4	V								
DN 300 (12")	5	D								
DN 350 (14")	5	K								
DN 400 (16")	5	R								
DN 450 (18")	5	Y								
DN 500 (20")	6	F								
DN 600 (24")	6	P								
DN 700 (28")	6	Y								
DN 800 (32")	7	H								
DN 900 (36")	7	M								
DN 1000 (40")	7	R								
Flange norm and pressure rating										
EN 1092-1, PN 10 (DN 200 ... 1000 (8" ... 40"))			B							
EN 1092-1, PN 16 (DN 65 ... 1000 (2½" ... 40"))			C							
EN 1092-1, PN 25 (DN 200 ... 1000 (8" ... 40"))			E							
EN 1092-1, PN 40 (DN 15 ... 1000 (½" ... 40"))			F							

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Selection and ordering data (continued)

Sensor MAG 911/E	Article No. 7ME5610-									
	●	●	●	●	●	-	●	A	A	●
ANSI B16.5, Class 150 (½" ... 24")[1]			J							
ANSI B16.5, Class 300 (½" ... 24")[2]			K							
AWWA C-207 Class D (28" ... 40")			L							
JIS 10 K (½" ... 24")			R							
Flange material										
Mid steel flanges 1.0460/1.0570				1						
Stainless steel flanges, AISI 316L/1.4404				3						
Liner material										
Soft rubber (DN 25 ... 1000)					1					
PTFE (DN 15 ... 600)					3					
Hardrubber (DN 15 ... 1000)					4					
Linatex (DN 25 ... 1000)					5					
Novolak (sealing material FFKM) (DN 50 ... 1000)					6					
Electrode material										
AISI 316Ti/1.4571							1			
Hastelloy C276/2.4819							2			
Platinum							3			
Titanium							4			
Tantalum							5			
Cable glands/terminal box										
Metric: Polyamide terminal box										1
½" NPT: Polyamide terminal box										2
Metric: Stainless steel terminal box										3
½" NPT: Stainless steel terminal box										4

[1] 20 °C (68 °F), max. 19.6 bar (285 psi) for steel flanges and max. 15.9 bar (231 psi) for stainless seel flanges
[2] 20 °C (68 °F), max. 51.1 bar (741 psi) for steel flanges and max. 41.4 bar (600 psi) for stainless seel flanges

	Order Code
Additional information	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Two grounding electrodes made of stainless steel AISI 316Ti/1.4571	**A02**
Two grounding electrodes made of Hastelloy C276/2.4819	**A04**
Two grounding electrodes made of Platinum	**A05**
Two grounding electrodes made of Titanum	**A06**
Two grounding electrodes made of Tantalum	**A07**
Factory certificate to EN 10204-2.2	**C14**
Material certificate according to EN 10204-3.1	**C16**
Power supply 110 V/60 Hz	**P01**
Flow range setting: Specify upper flow range value	**Y01**
Pulse output setting: Specify pulse value (1 puse/unit)	**Y02**

	Order Code
Silicon-free version	**Y04**
Tag name, stainless steel plate (specify in plain text)	**Y17**
Special version (specify in plain text)	**Y99**

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Selection and ordering data (continued)

Cable kit for sensor MAG 911/E	Article No. 7ME5930-											Order code		
	5	●	A	0	0	-	0	A	A	0		●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Cable														
Cable kit for sensor MAG 911/E, coil cable 3 × 1.0 mm²(3 × 0.0016 inch²), electrode cable 7 × 0.5 mm² (7 × 0.0008 inch²), single shielded with PVC jacket														
• Length: 5 m (16.4 ft)		B												
• Length: 10 m (32.8 ft)		C												
• Length: 20 m (65.6 ft)		D												
• Length: 30 m (98.4 ft)		E												
• Length: 40 m (131 ft)		F												
• Length: 50 m (164 ft)		G												
• Length: 60 m (197 ft)		H												
• Length: 80 m (260 ft)		J												
• Length: 100 m (328 ft)		K												
• Other length (specify in plain text)		Z										J	1	Y

Grounding and protection ring for sensor MAG 911/E	Article No.									
Protection ring	7ME5942-							●	●	●	●	●
Grounding ring	7ME5943-							●	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.												
Nominal size												
DN 15 (½")								1	V			
DN 25 (1")								2	D			
DN 40 (1½")								2	R			
DN 50 (2")								2	Y			
DN 65 (2½")								3	F			
DN 80 (3")								3	M			
DN 100 (4")								3	T			
DN 125 (5")								4	B			
DN 150 (6")								4	H			
DN 200 (8")								4	P			
DN 250 (10")								4	V			
DN 300 (12")								5	D			
DN 350 (14")								5	K			
DN 400 (16")								5	R			
DN 450 (18")								5	Y			
DN 500 (20")								6	F			
DN 600 (24")								6	P			
DN 700 (28")								6	Y			
DN 800 (32")								7	H			
DN 900 (36")								7	M			
DN 1000 (40")								7	R			
Flange design												
EN 1092-1, PN10										B		
EN 1092-1, PN16										C		
EN 1092-1, PN25										E		
EN 1092-1, PN40										F		
ANSI B16.5, class 150										J		
ANSI B16.5, class 300										K		
AWWA C-207, class D										L		
JIS B2220, 10K										R		

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Selection and ordering data (continued)

Grounding and protection ring for sensor MAG 911/E	Article No.										
Protection ring	7ME5942-	●	●	●	●	●					
Grounding ring	7ME5943-	●	●	●	●	●					
Material											
Stainless steel AISI 316/1.4571										1	
Hastelloy C4/2.4610										2	
Liner											
Soft rubber											1
PTFE											3
Hard rubber											4
Linatex											5
Novolak											6

Accessories

Description	Article No.	
Standard wall-mounting bracket, stainless steel AISI 316L/1.4404	7ME5933-0AC04	
Special wall-mounting bracket, BI 2.5 DIN 59382 X6Cr17	7ME5933-0AC05	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[1)]	FDK:085U0220	

[1)] Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging

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Selection and ordering data (continued)

Spare parts

Description	Article No.	
Display unit	**7ME5933-0AC00**	
Display lid in die-cast aluminum, with corrosion resistant coating (min. 60 mm)	**7ME5933-0AC01**	
Blind lid for sensor cables connection compartment (only remote version) in die-cast aluminum, with corrosion resistant coating (min. 60 mm) incl. O-ring seal	**7ME5933-0AC02**	
Blind lid (mains supply, input/outputs) in die-cast aluminum, with corrosion resistant coating (min. 60 mm)	**7ME5933-0AC03**	
Safety clamp for electronic cover with glass plate (7ME5933-0AC01)	**7ME5933-0AC06**	
M20 cable gland set for power and output connection, gray PA plastic, 2 pcs. • cables Ø 6 ... 12 mm (0.24" ... 0.47") • -40 ... +100 °C (-40 ... +212 °F)	**A5E02246350**	

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Selection and ordering data (continued)

Description	Article No.	
1/2" NPT cable gland set for power and output connection, gray PA plastic, 2 pcs. • cables Ø 6 ... 12 mm (0.24" ... 0.47") • -40 ... +100 °C (-40 ... +212 °F)	**A5E02246396**	
M16 × 1.5 cable gland set for sensor connection, brass chrome, 2 pcs. and 2 pcs. blind • cables Ø 5 ... 9 mm (0.20" ... 0.35") • -20 ... +105 °C (-4 ... +221 °F)	**A5E02246369**	

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Technical specifications

TRANSMAG 2	
Mode of operation and design	
Measuring principle	Electromagnetic with pulsed alternating field (PAC)
Magnetic field excitation	Automatic power supply synchronization
• 50 Hz AC power supply	Bipolar (16.7 Hz) Bipolar with prepulse (10 Hz) Unipolar (8.33 Hz)
• 60 Hz AC power supply	Bipolar (20 Hz) Bipolar with prepulse (12 Hz) Unipolar (10 Hz)
Accuracy under reference conditions	
Measuring tolerance of pulse output	
• With v > 0.25 m/s (0.82 ft/s)	≤ ± 0.5 % of measured value ± 1.2 mm/s (0.05 inch/s)
• With v < 0.25 m/s (0.82 ft/s)	± 2.5 mm/s (0.1 inch/s)
Measuring tolerance of analog output	As pulse output plus ± 0.1 % conversion error ± 20 µA
Repeatability	0.2 % of measured value
Reference conditions	
• Process temperature	25 °C ± 5 °C (77 °F ± 9 °F)
• Ambient temperature	25 °C ± 5 °C (77 °F ± 9 °F)
• Warm-up time	Min. 30 min
• Installation conditions	Inlet pipe section ≥ 10 × DN Outlet pipe section ≥ 5 × DN Installed centered in pipe
• Medium	Water without gaseous or solid components
Calibration	
Default calibration, calibration report shipped with sensor	2 × 20 %, 2 × 50 % and 2 × 100 %
Outputs	
Electrical isolation	Outputs electrically isolated from one another and from the power supply, max. 60 V permissible against PE/equipotential bonding
Current output	0/4 ... 20 mA (7ME5034-0.... or 7ME5034-2....)
• Signal	
- Upper limit	0/4 ... 20 mA, selectable
- Failure	20 ... 22.5 mA, optional 3.6; 20 or 24 mA
• Load	
- Output	max. 600 Ω, max. load voltage 15 V DC
- For HART communication	≥ 250 Ω
Communication	Via analog output with PC coupling module or HART communicator
• Protocol	HART, version 5.1
Digital output	
Signal	
• Output	Configurable as active or passive signals
- Active signal	24 V DC, ≤ 24 mA, R_i = 170 Ω
- Passive signal	Open collector, max. 30 V DC, 200 mA
Output configuration	
• Pulse	
- Pulse significance	≤ 5000 pulses/s
- Pulse width	≥ 0.1 ms
• Limit frequency	≤ 10000 Hz
• Limits	Limits for flow and quantity, flow direction, alarm
Digital output 2 (relay)	
(only 7ME5034-0...)	
Relay	NC or NO function
• Rating	Max. 5 W, max. 50 V AC/DC, max. 200 mA
• Output configuration	Limits for flow and quantity, flow direction, alarm
Digital input (optional to digital output 2)	Non-intrinsically-safe
(only 7ME5034-2...)	

TRANSMAG 2	
• Input function configurable as high-active or low-active	Set measured value to zero or reset totalizer
• Signal voltage	Max. 30 V DC, R_i = 3 kΩ: High level: +11 ... +30 V DC Low level: -30 ... +5 V DC
For PROFIBUS devices	
PROFIBUS PA (for PROFIBUS-devices 7ME5034-1...)	
• Communication	Layer 1 and 2 according to PROFIBUS PA Transmission according to IEC 1158-2 Layer 7 (protocol layer) according to PROFIBUS PA and DP V1 (EN 50170) Device Class B, device profile 2.0 Max. 4 simultaneous C2 connections
• Bus voltage	9 ... 32 V DC permissible
• Current consumption from bus	10 mA; limited to ≤ 15 mA in event of fault by electrical current limitation
Rated operating conditions	
Ambient temperature	
• Operation	-20 ... +60 °C (-4 ... +140 °F)
• Storage	-25 ... +80 °C (-13 ... +176 °F)
Degree of protection	IP67/NEMA 4X
Electromagnetic compatibility (EMC)	
• Emitted interference	To IEC/EN 61326 for use in industrial areas
• Noise immunity	To IEC/EN 61326 for use in industrial areas
Design	
Weight of transmitter	4.4 kg (9.7 lb)
Remote version	Transmitter must be connected to sensor using shielded cable
Maximum cable length	100 m (328 ft)
Housing	Die-cast aluminum, painted
Cables entries	Remote installations
• Power supply and outputs	2 × M20 (HART)/M25 (PROFIBUS) or 2 × ½" NPT (HART)
• Sensor connections	2 × M16 (HART) or 2 × ½" NPT
Displays and keypad	
General display	LCD, backlid, two lines with 16 characters each
Multi-display for	Flow, totalizer, flow velocity
Keypad	4 keys for entering parameters
Power supply	
corresponding to rating plate	
• AC supply	100 ... 250 V AC ± 15 %, 47 ... 63 Hz
• Power consumption	Approx. 120 ... 630 VA, depending on sensor
Line fuse	100 ... 230 V AC: T1.6A
Magnet current fuse	F5A/250 V

Sensor cables between sensor and transmitter

Sufficient shielding must be provided, as well as fixed routing of the signal cables (electrode and coil cable).

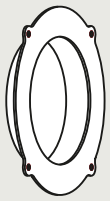
Signal cables must be routed free of vibration, and protected against strong magnetic and stray fields. In case of doubt, the sensor cables must be routed in grounded steel conduit. The cable length between the sensor and transmitter must not exceed 100 m (328 ft).

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Technical specifications (continued)

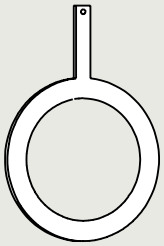
MAG 911/E	
Process connection	
Flanges	
• EN 1092-1, raised face (EN 1092-1, DIN 2501 and BS 4504 have the same mating dimensions)	• DN 200 ... 1000 (8" ... 40"): PN 10 (145 psi) • DN 65 ... 1000 (2½" ... 40"): PN 16 (232 psi) • DN 200 ... 1000 (8" ... 40"): PN 25 (362 psi) • DN 15 ... 1000 (½" ... 40"): PN 40 (580 psi)
• ANSI B16.5 (BS 1560), raised face	• ½" ... 40": Class 150 (20 bar (290 psi)) • ½" ... 24": Class 300 (50 bar (725 psi))
• AWWA C-207, raised face	28" ... 40": Class D (10 bar)
• JIS B 2220:2004	½" ... 24": 10K
Media conductivity	Minimum conductivity ≥ 1 µS/cm
Rated operating conditions	
Enclosure rating	IP67/NEMA 6 Optional IP68/NEMA 6P
Temperature of medium	
• Soft rubber	0 ... +70 °C (32 ... 158 °F)
• Hard rubber	0 ... +90 °C (32 ... 194 °F) Option: 100 °C (212 °F)
• PTFE	• -20 ... +150 °C (-4 ... +302 °F) at 25 bar (363 psi) • -20 ... +100 °C (-4 ... +212 °F) at 40 bar (580 psi)
• Linatex	-40 ... +70 °C (-40 ... +158 °F) (for temperatures below -20 °C (-4 °F) AISI 316L/1.4404 flanges must be used)
• Novolac	130 °C (266 °F) at 40 bar (580 psi)
Design	
Weight	See dimensional drawings
Material	
• Flange and sensor housing	• Carbon steel ASTM A 105, with corrosion protection EN ISO 12944 grade C3 or • AISI 316L/1.4404 flanges and carbon steel housing ASTM A105, with corrosion protection EN ISO 12944 grade C3
• Measuring tube	Stainless steel AISI 304 or higher
• Electrode	• AISI 316/1.4571 • Hastelloy C276/2.4819 • Platinum • Titanium • Tantalum
• Terminal box	
- Standard	Fibre glass reinforced polyamide
- Option	Stainless steel AISI 316/1.4436

Protection ring



Technical specifications	
Function	To protect the edges of liners from abrasion (e.g. gravel, sand etc.). Used mainly with soft rubber liners and for PTFE liners at high temperatures from 100 to 150 °C (212 to 302 °F).
Contact with medium	Yes, please always check resistance to measured medium.
Material	Stainless steel AISI 316/1.4571, optionally Hastelloy C276/2.4819
Material thickness	The overall length of the sensor is increased by • 6 mm for DN 15 ... 150 (0.24" for ½" ... 6") or • 10 mm for DN 200 ... 600 (0.4" for 8" ... 24")
Standard	Optional for all liners. Must be ordered separately.
Article No.	**7ME5942-...**

Grounding ring



Technical specifications	
Function	Electrical reference and grounding of the medium. Required if the pipelines are not electrically conducting or are lined (plastic pipelines, concrete pipelines etc.). All grounding rings must be connected to the grounding screw present on the sensor.
Contact with medium	Yes, please always check resistance to measured medium.
Material	Stainless steel AISI 316/1.4571 or Hastelloy C4/2.4610
Material thickness	The overall length of the sensor is increased by 2 mm (0.08") per grounding ring.
Standard	Optional for all liners. Required between the medium and sensor for equipotential bonding between non-conducting pipelines or lined pipelines.
Article No.	**7ME5943-...**

Important:
The rings must be ordered together with the sensor. Gaskets are not included. In case of replacement please include the sensor MLFB code on the order.

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Technical specifications (continued)

Classification according to pressure equipment directive (PED 2014/68/EU)

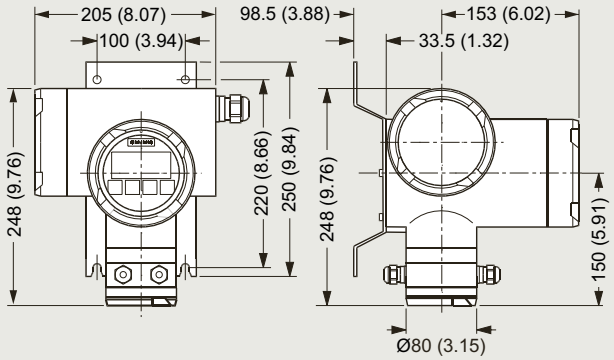
Nominal size DN	(inches)	Nominal pressure PN	(MWP psi)	Permissible media	Category
15 ... 25	(½" ... 1")	40	580	Gases fluid group 1 and liquids fluid group 1	Article 4.3
200 ... 300	(8" ... 12")	10	(145)	Gases fluid group 1 and liquids fluid group 1	II
65 ... 250	(2½" ... 10")	16	(232)	Gases fluid group 1 and liquids fluid group 1	II
40 ... 100	(1½" ... 4")	40	(580)	Gases fluid group 1 and liquids fluid group 1	II
350 ... 1000	(14" ... 40")	10	(145)	Gases fluid group 1 and liquids fluid group 1	III
300 ... 1000	(12" ... 40")	16	(232)	Gases fluid group 1 and liquids fluid group 1	III
200 ... 600	(8" ... 24")	25	(363)	Gases fluid group 1 and liquids fluid group 1	III
125 ... 600	(5" ... 24")	40	(580)	Gases fluid group 1 and liquids fluid group 1	III

Notes on pressure equipment directive

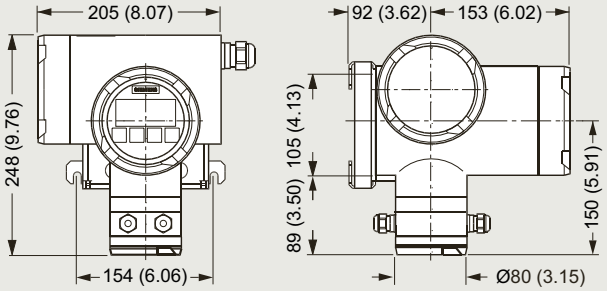
The devices are designed for liquids of danger group "Gases of fluid group 1". The categories differ according to the version, and are listed in the table below.

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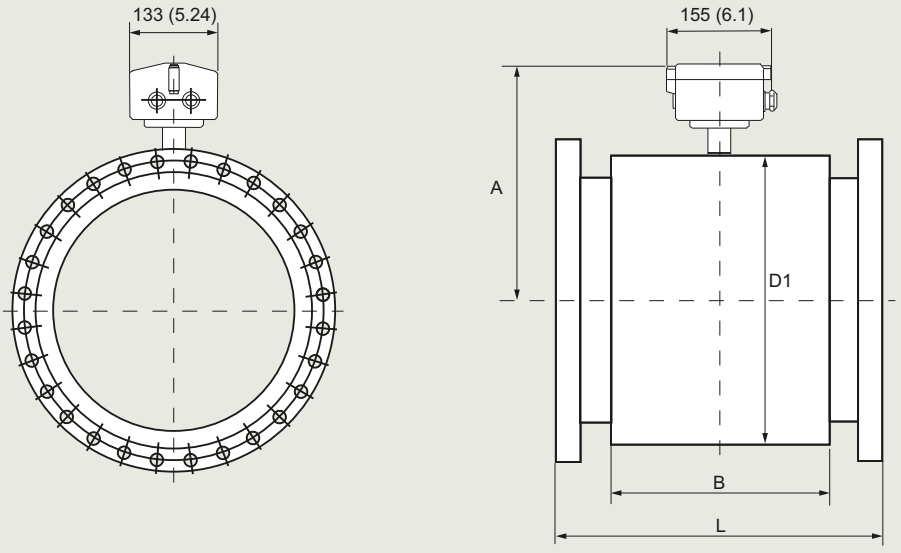
Dimensional drawings



SITRANS FM transmitter TRANSMAG 2 with wall-mounting bracket, dimensions in mm (inch)



SITRANS FM transmitter TRANSMAG 2 with special wall-mounting bracket, dimensions in mm (inch)



SITRANS FM flow sensor MAG 911/E, compact version, dimensions in mm (inches)

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Dimensional drawings (continued)

Built-in length MAG 911/E

Nominal size	DN 15 ½"	DN 25 1"	DN 40 1½"	DN 50 2"	DN 65 2½"	DN 80 3"	DN 100 4"
Built-in length L[1)]							
Hard rubber version Linatex/soft rubber version	270 (10.63)	270 (10.63)	280 (11.02)	280 (11.02)	330 (12.99)	340 (13.39)	340 (13.39)
PTFE-liner without protection rings	270 (10.63)	270 (10.63)	280 (11.02)	280 (11.02)	330 (12.99)	340 (13.39)	340 (13.39)
Novolak-version	-	-	275 (10.83)	275 (10.83)	325 (12.79)	335 (13.19)	333 (13.11)
Dimensions of sensor housing							
Housing width B	170 (6.69)	170 (6.69)	170 (6.69)	170 (6.69)	170 (6.69)	170 (6.69)	170 (6.69)
Height A	206 (8.11)	206 (8.11)	222 (8.74)	229 (9.02)	262 (10.32)	262 (10.32)	274 (10.79)
Housing diameter D_1	135 (5.35)	135 (5.35)	167 (6.58)	182 (7.17	247 (9.73)	247 (9.73)	272 (10.71)
Weight of PN 16 version in kg (MWP 232 psi version in lb) approx.	8.0 (17.64)	8.5 (18.74)	11.5 (25.35)	25.0 (55.12)	26 (57.32)	27 (59.53)	28 (61.73)

Nominal size	DN 125 5"	DN 150 6"	DN 200 8"	DN 250 10"	DN 300 12"	DN 350 14"	DN 400 16"
Built-in length L[1)]							
Hard rubber version Linatex/soft rubber version	370 (14.57)	370 (14.57)	410 (16.14)	470(18.50)	500 (19.68)	550 (21.65)	600 (23.62)
PTFE-liner without protection rings	370 (14.57)	370 (14.57)	410 (16.14)	470 (18.50)	500 (19.68)	550 (21.65)	600 (23.62)
Novolak-version	362 (14.25)	362 (14.25)	401 (15.79)	460 (18.11)	489 (19.25)	538 (21.18)	592 (23.31)
Dimensions of sensor housing							
Housing width B	170 (6.69)	170 (6.69)	240 (9.45)	240 (9.45)	240 (9.45)	225 (8.86)	250 (9.84)
Height A	286 (11.26)	299 (11.78)	334 (13.15)	358 (14.10)	383 (15.08)	375 (14.76)	400 (15.75)
Housing diameter D_1	296 (11.65)	322 (12.68)	392 (15.43)	440 (17.32)	490 (19.29)	474 (18.66)	524 (20.63)
Weight of PN 16 version in kg (MWP 232 psi version in lb) approx.	34 (74.95)	38 (83.78)	68 (149.9)	81 (178.6)	95 (209.4)	118 (260.2)	161 (354.9)

Nominal size	DN 450 18"	DN 500 20"	DN 600 24"	DN 700 28"	DN 750 30"	DN 800 32"	DN 900 36"	DN 1000 40"
Built-in length L[1)]								
Hard rubber version Linatex/soft rubber version	650 (25.59)	650 (25.59)	780 (30.71)	910 (35.83)	910 (35.83)	1040 (40.95)	1170 (46.06)	1300 (51.18)
PTFE-liner without protection rings	660 (25.98)	650 (25.59)	780 (30.71)	-	-	-	-	-
Novolak-version	638 (25.12)	638 (25.12)	772 (30.39)	903 (35.55)	903 (35.55)	1033 (40.63)	1163 (45.79)	1293 (50.91)
Dimensions of sensor housing								
Housing width B	270 (10.63)	300 (11.81)	360 (14.17)	420 (16.54)	420 (16.54)	500 (19.69)	560 (22.05)	620 (24.41)
Height A	433 (17.05)	453 (17.84)	505 (19.88)	558 (21.97)	590 (23.23)	608 (23.94)	658 (25.91)	713 (28.07)
Housing diameter D_1	591 (23.26)	629 (24.76)	734 (28.90)	839 (33.03)	904 (35.59)	939 (36.97)	1039 (40.91)	1150 (45.28)
Weight of PN 16 version in kg (MWP 232 psi version in lb) approx.	185 (407.9)	233 (513.7)	401 (884.1)	420 (925.9)	450 (992.1)	500 (1102.3)	560 (1234.6)	620 (1366.9)

1) Tolerance for built-in lenght: L + 0.0 mm/-4.0 mm (-0.00/-0.157 inches). With protection rings for > DN 25 +6.0 mm, > DN 200 +10.0 mm (> 1" +0.236 inches, > 8" +0.394 inches)

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Overview



MAG 8000 is a comprehensive meter which intelligent information and high performance measurement as well as the easy to install concept take cost of ownership and customer service to a new level for water meter.

Benefits

Easy to install

- Compact or remote solution with factory mounted cable and customer setting from factory
- IP68/NEMA 6P enclosure. Sensor can be buried.
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities
- Superior measurement
- Down to 0.2% maximum uncertainty
- Suitable for 0D in- and outlet conditions
- OIML R 49 type approval
- FM Fire Service Approval
- Bi-directional measurement

Long lasting performance/Low cost of Ownership

- No moving parts means less wear and tear.
- Up to 6 to 10 years maintenance-free operation in typical revenue application
- Robust construction built for the application

Intelligent information, easy to access

- Embedded self-testing and alarm/fault detection feature
- Internal data logger
- Advanced statistics and diagnostics
- Various add-on communication modules

Application

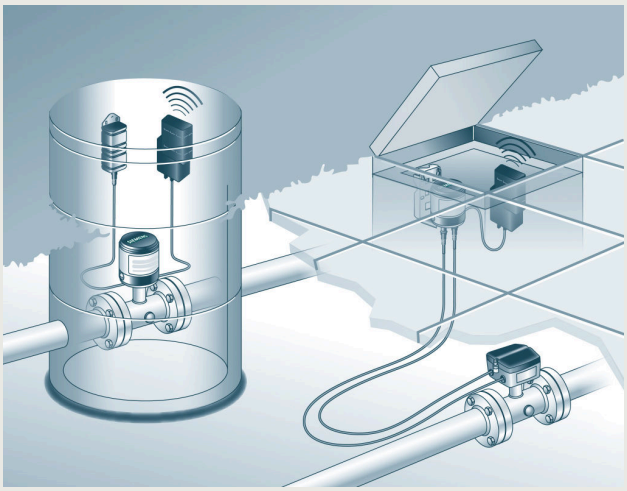
The following MAG 8000 versions are available as stand-alone water meters:

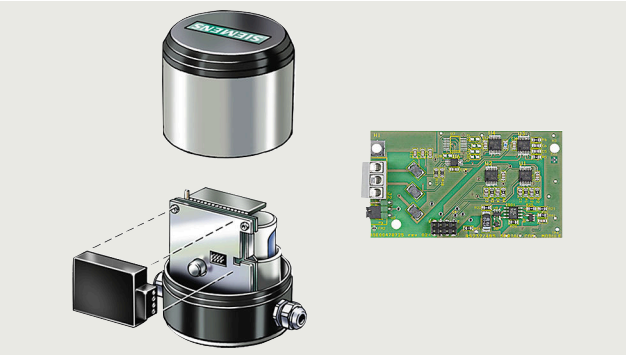
- MAG 8000 (7ME6810) for abstraction and distribution network
- MAG 8000 CT (7ME6820) for revenue and bulk metering

Design

MAG 8000 is designed to minimize power consumption.
The product program consists of

- Basic and advanced version
- Sensor sizes from DN 25 to 1200 (1" to 48")
- Compact and remote installation in IP68/NEMA 6P enclosure and factory-mounted cable
- SIMATIC PDM and Flow Tool PC configuration softwares





Modbus/Encoder module

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Function

MAG 8000 is a microprocessor-based water meter with graphical display and key for optimum customer operation and information on site. The transmitter drives the magnetic field in the sensor, evaluates the flow signal from the sensor and calculates the volume passing through. It delivers the required information via the integrated pulse output or communication interfaces as part of a system solution. Its intelligent functionality, information and diagnostic ensure optimum meter performance and information to optimize water supply and billing.



MAG 8000 can be ordered as a Basic or an Advanced version.

Features/Version	MAG 8000 Basic	MAG 8000 Advanced
Measuring frequency in battery power mode (Manually selected)[1)]	1/15 or 1/30 or 1/60 Hz	6.25 ... 1/60 Hz depending of sensor size
Output MAG 8000	2 FW/RV/AI/CA	2 FW/RV/AI/CA
Communication	Add-on	Add-on
Data logger	Yes	Yes
Insulation test	Yes	Yes
Leakage detection	No	Yes
Meter utilization	No	Yes
Statistics	No	Yes
Tariff	No	Yes
Settle date (Revenue)	No	Yes

1) Excitation frequency settings with mains power supply, see technical specifications for each version

Some information is accessible via the display whereas all information is accessible via the IrDA communication interface with the PDM software. Data and parameters are registered in a EEPROM. They can all be read, but changing the information demands a software password or a hardware key attached to the printed circuit board.

The SIMATIC PDM tool gives the possibility of testing and verifying the flowmeter on site and creating a printed "Qualification Certificate" with all specific data that define the quality status of the measurement.

The Qualification Certificate consists of two pages with information about the actual status of the sensor:

Part 1 provides general settings, sensor and battery info, totalizer values and pulse output settings.

Part 2 provides detailed information about electronic and sensor functionality and a main parameter list for evaluating the functionality of the MAG 8000 water meter.

Function (continued)



SIMATIC PDM

For more details about SIMATIC PDM please go to "Communication".

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Technical specifications

MAG 8000	
Installation	• Compact (integral) • Remote with factory-mounted cable 5, 10, 20 or 30 m (16.4, 32.8, 65.6 or 98.4 ft)
Enclosure	• Stainless steel top housing (AISI 316) and coated brass bottom • Remote wall mount bracket in stainless steel (AISI 304) • Remote version terminal box in fibre glass reinforced polyamide
Cable entries	2 × M20
Display	• Display with 8 digits for main information • Index, menu and status symbols for dedicated information
Resolution	Totalized information can be displayed with 1, 2 or 3 decimals or automatic adjustment (default)
Flow unit	
Europe	Volume in $m^3$and flow rate in m^3/h
US	Volume in Gallon and flow rate in GPM
Australia	Volume in Mi and flow rate as Ml/d
Optional display units	• Volume: m^3 × 100, l × 100, G × 100, G × 1000, MG, CF × 100, CF × 1000, AF, Al, kl, BBL42 • Flow: m^3/min, m^3/d, l/s, l/min, GPS, GPH, GPD, MGD, CFS, CFM, CFH, BBL42/s, BBL42/min, BBL42/h, BBL42/d
Digital output	• 2 passive outputs (MOS), individual galvanically isolated • Maximum load ±35 V DC, 50 mA short circuit protected
Output A function	Programmable as pulse volume – forward – reverse – forward/net – reverse/net
Output B function	Programmable as pulse volume (like output A), alarm
Output	Max. pulse rate of 50 Hz (pulse B) and 100 Hz (pulse A), pulse width of 5, 10, 50, 100, 500 ms
Communication	IrDA: Standard integrated infrared communication interface with Modbus RTU protocol
Add-on modules	• RS 232 serial interface with Modbus RTU (Rx/Tx/GND), point to point with max. 15 m cable • RS 485 serial interface with Modbus RTU (+/-/GND), multidrop with up to 32 devices with max. 1000 m cable • Encoder interface module (for Itron 200WP) "Sensus protocol" • 3G/UMTS module with or without analog input cable • IIoT Wireless Communication Module with or without analog input cable • LW BLE Wireless Communication Module
Power supply	Auto detection of power source with display symbol for operation power
Internal battery pack	• 1 D-Cell 3.6 V/16.5 Ah • 2 D-Cell 3.6 V/33 Ah
External battery pack	4 D-Cell 3.6 V/66 Ah
Mains power supply	• 12 ... 24 V AC/DC (10 ... 32 V) 2 VA • 115 ... 230 V AC (85 ... 264 V) 2 VA • Both mains power supply systems are upgradable for battery backup via internal D-Cell (3.6 V 16.5 Ah) or external battery pack.
Cable	3 m (9.8 ft) for external connection to mains supply (without cable plug)

Features	
Application identification	Tag number up to 15 characters
Time and date	Device embedded Real Time Clock (Synchronization with NTP server if 3G/UMTS module or IIoT WCM connected)
Totalizer	
MAG 8000	• Totalizer 1 and Totalizer 2: Configurable to Forward, Reverse and Bidirectional netflow • Totalizer 3: (following totalizer 1 setting) resettable via display key
Measurement	
Low flow cut-off	
• 7ME6810	Cut-off at 15 mm/s[1)]
• 7ME6820	Cut-off at 15 mm/s[1)]
Empty pipe detection	Symbolized in display
Data logger	Logging of 26 records: selectable as daily, weekly or monthly logging
Alarm	Active alarm is indicated on the display.
Data protection	• All data stored in an EEPROM. Totalizers 1 and 2 are backed up every 10 min, statistic every hour and power consumption and temperature measurement every 4 hours. • Password protection of all parameters and hardware protection of calibration and revenue parameters
Battery power management	• Optimal battery information on remaining capacity • Calculated capacity includes all consuming elements and available battery capacity is adjusted related to change in ambient temperature • Numbers of power-ups • Date and time registered for first and last time power alarm
Diagnostic	
Continuous self test including	• Coil current to drive the magnetic field • Signal input circuit • Data calculation, handling and storing
Alarm statistics and logging for fault analyzing	• Electrode impedance to check actual media contact • Flow simulation to check pulse and communication signal chain for correct scaling • Number of sensor measurements (excitations) • Transmitter temperature (battery capacity calculation) • Low impedance alarm for change in media • Flow alarm when defined high flow exceeds • Verification mode for fast measure performance check
Insulation test	Test of signal immunity against disturbance and bad installation. Test interval is selectable and measurement is interrupted during the test period of 4 min.
Leakage detection (only Advanced version)	Monitoring the lowest flow or volume during selected time window within 24 hours. Leakage is detected over a selectable period where monitored value exceed the possible leakage level. Min. and max. values are stored with date registration. Last store value visible on the display.
Meter Utilization (only Advanced version)	6 registers for monitoring total time the meter has operated in different flow intervals. Registered intervals are free selectable as % of Q_n (Q3).
Tariff (only Advanced version)	• 6 tariff registers count the volume delivered within the selected tariff windows, based on time of day or flow rates or a combination • Tariff can also be used for consumption profile where consumption is related to different time intervals or flow rates • Tariff values visible on the display

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Technical specifications (continued)

Features	
Settling date (only Advanced version)	• On a predefined date the totalizer 1 index value is stored. Old values are stored to show the latest two totalized 1 index values • Settling values visible on the display
Statistic (only Advanced version)	• Min. flow rate with time and date registration • Max. flow rate with time and date registration • Min. daily consumption with date registration • Max. daily consumption with date registration • Latest 7 days total and daily consumption • Actual month consumption • Latest month consumption
PC Configuration Software PDM	• Meter configuration – online and offline mode • Own parameter settings • Parameter documentation • Print and export of data and parameters PDM 9.0/9.1 Service Pack 1

1) Siemens warrants the measurement accuracy down to a flow velocity of 15 mm/s. For a flow velocity below 15 mm/s, we don't warrant the measurement accuracy.

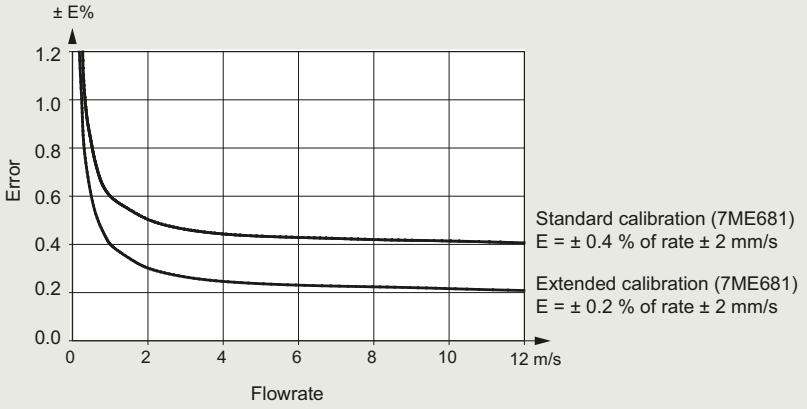
MAG 8000 water meter uncertainty

To ensure continuous accurate measurement, flowmeters must be calibrated. The calibration is conducted at Siemens flow facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

Therefore, the calibration certificate ensures recognition of the test results worldwide, including the US (NIST traceability).

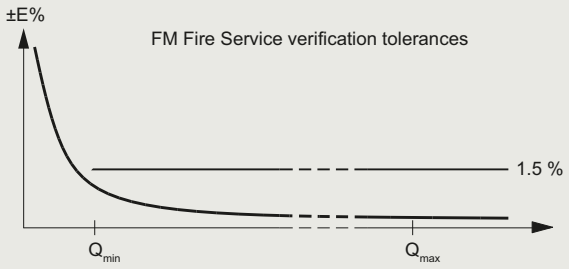
Siemens offers accredited calibrations assured to ISO 17025 in the flow range from 0.0001 m^3/h to 10 000 m^3/h. Siemens Flow Instruments accredited laboratories are recognized by ILAC MRA (International Laboratory Accreditation Corporation - Mutual Recognition Arrangement) ensuring international traceability and recognition of the test results worldwide.

The selected calibration determines the accuracy of the meter. A standard calibration results in max. ±0.4% uncertainty and an extended calibration ±0.2%. A calibration certificate follows every sensor and calibration data are stored in the meter unit.



MAG 8000 (7ME6810) for Fire Service applications

MAG 8000 (7ME6810) is FM Fire Service approved for automatic fire protection systems according to the Fire Service Meters Standard, Class Number 1044. The approval is applicable for the sizes DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges. The FM Fire Service approved product can be ordered via the Z-options P20, P21 and P22.



Grounding

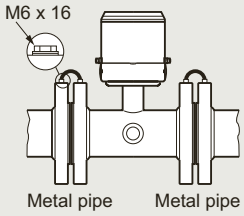
The sensor body must be grounded using grounding straps and/or grounding rings to protect the flow signal against stray electrical noise. This ensures that the noise is carried through the sensor body and a noise-free measuring area within the sensor body. For MAG 8000 Irrigation grounding rings on both sides are factory-mounted.

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Technical specifications (continued)

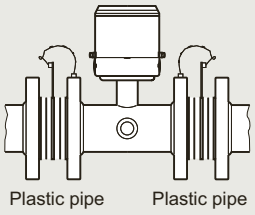
Metal pipes

On metal pipes, connect the straps to both flanges.



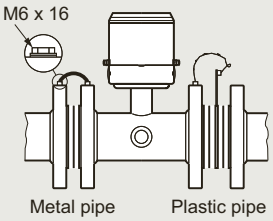
Plastic pipes

On plastic pipes and lined metal pipes, optional grounding rings must be used at both ends.Grounding rings has to be ordered separately see “grounding ring kit”.



Combination of metal and plastic pipes

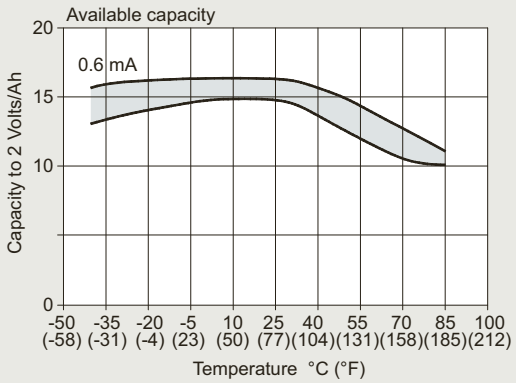
A combination of metal and plastic requires straps for metal pipe and grounding rings for plastic pipe.



Battery operation time and calculation

The battery operation time depends on the connected battery pack as well as the operation condition of the meter.

MAG 8000 calculates the remaining capacity every 4 hours and includes all consuming elements. Calculation compensates for temperature influence on battery capacity.



The graphic shows the effect from other temperatures. A variation in temperature from 15 °C to 55 °C (59 to 131 °F) reduces the capacity by 17% in the table from 15 Ah to 12.5 Ah.

At typical revenue scenario of expected battery operation time can be seen in the table below.

The measurement for calculating the rest capacity of the battery life time is only completed if the system has no active fatal faults or the empty pipe is active. Maximum battery specification is 10 years operation.

Scenario - Revenue application	
Output A	Pulse rate max. 10 Hz
Output B	Alarm or call-up
Meter dialog	1 hour per month
Add-com	None
Temperature profile	• 5% at 0 °C (32 °F) • 80% at 15 °C (59 °F) • 15% at 50 °C (122 °F)

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Technical specifications (continued)

Battery lifetime (subject to the assumptions mentioned above)[1)]

MAG 8000 for abstraction and distribution network applications (7ME6810) and MAG 8000 CT for revenue and bulk metering (7ME6820)

Excitation frequency (24 h operation)		1/60 Hz	1/30 Hz	1/15 Hz	1/5 Hz	1.5625 Hz	3.125 Hz	6.25 Hz
2 D-Cell battery 33 Ah Internal battery pack	DN 25 ... 150 (1″ ... 6")	9 years	9 years	7 years	43 months	8 months	3 months	2 months
	DN 200 ... 600 (8" ... 24")	9 years	6 years	4 years	22 months	3 months	1 month	N/A
	DN 700 ... 1200 (28" ... 48")	7 years	4 years	2 years	12 months	1 months	N/A	N/A
4 D-Cell battery 66 Ah External battery pack	DN 25 ... 150 (1" ... 68")	15 years	15 years	14 years	86 months	16 months	7 months	4 months
	DN 200 ... 600 (8" ... 24")	15 years	13 years	8 years	44 months	7 months	3 months	N/A
	DN 700 ... 1200 (28" ... 48")	14 years	9 years	5 years	24 months	3 months	N/A	N/A

1) Battery lifetime determined under lab conditions at +20 °C.

Typical battery lifetime scenario for MAG 8000 with 3G or IIoT Wireless Communication Module

Transmission once a day and MAG 8000 factory settings	
2 D-Cell battery 33 Ah Internal battery pack	3 ... 4 years
4 D-Cell battery 66 Ah External battery pack	7 ... 8 years

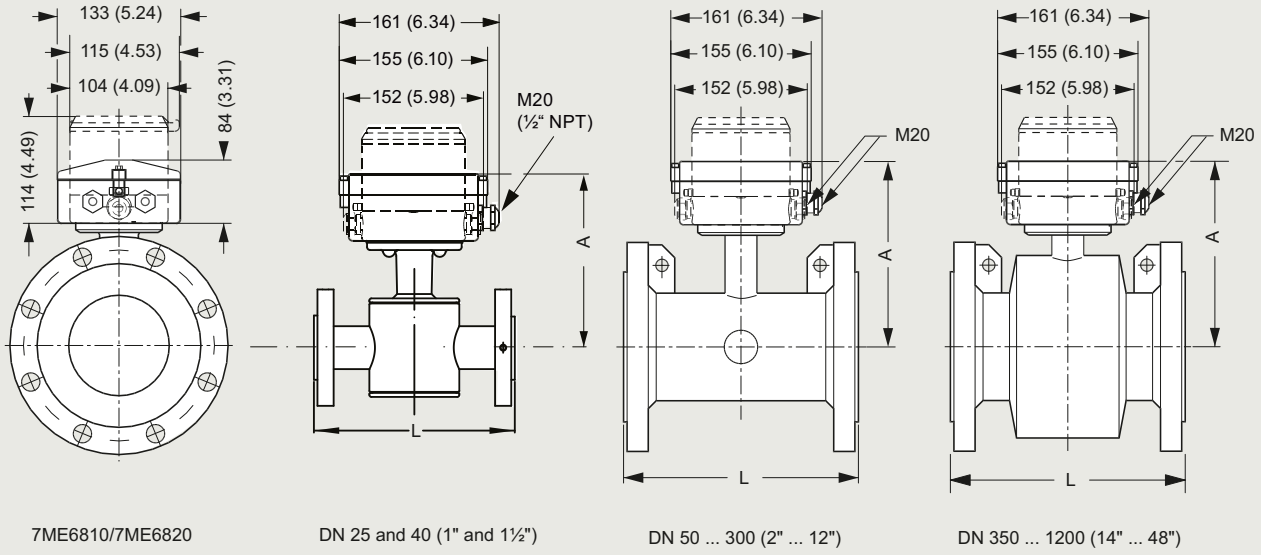
External battery pack can be used as battery backup for mains power supply (if two cable entries in one cable gland are needed, order cable glands with two entries, see accessories)

Serial RS 232/RS 485 add-on communication modules are designed for mains powered systems as the battery operation time will be reduced. At 1 hour communication per month (all meter data collected 2 times per day) and the module is connected, the operation time is reduced to:

- RS 232:
  - Switched on constantly:
    6.4 months for 2 D-cell internal battery pack / 12.8 months for 4 D-cell ext. battery pack
  - Switched on 2 s/day:
    39 months for 2 D-cell internal battery pack / 78 months for 4 D-cell ext. battery pack
- RS 485:
  - With the termination resistor on:
    2.3 months for 2 D-cell internal battery pack / 4.6 months for 4 D-cell ext. battery pack
  - With the termination resistor off:
    39 months for 2 D-cell internal battery pack / 78 months for 4 D-cell ext. battery pack, in case the entire communication time is less than 4 hours/month

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Dimensional drawings



Dimensions in mm (inch)

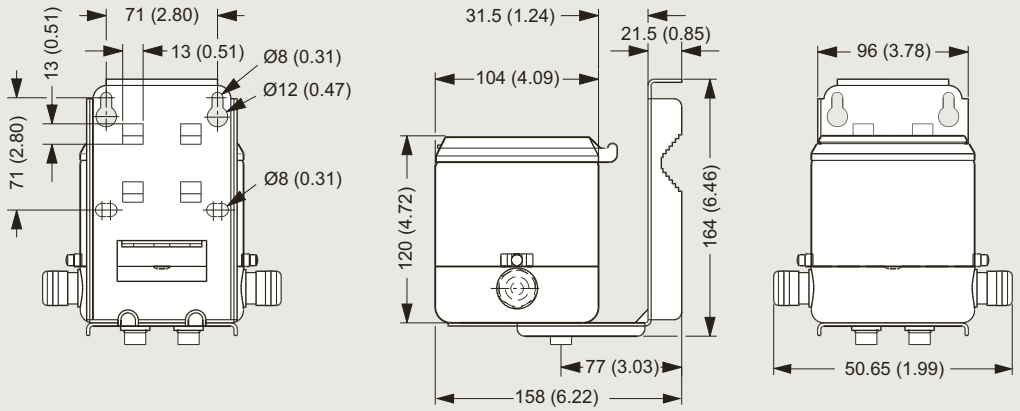
Nominal DN size	A	L, lengths[1]							Weight[2]	
	EPDM (7ME6810 and 7ME6820)	EN 1092-1 PN 10	EN 1092-1 PN 16/PN 16 non-PED	EN 1092-1 PN 40	ANSI 16.5 Class 150	AS 4087 PN 16	AWA C-207 Class D	AS 2129		
mm (inch)	mm (inch)	mm	mm	mm	inch	mm	mm	mm	kg	lb
25 (1)	188 (7.4)	-	-	200	7.9	200	-	200	6	13
40 (1½)	203 (8.0)	-	-	200	7.9	200	-	200	9	20
50 (2)	178 (7.0)	-	200	-	7.9	200	-	-	11	25
65 (2½)	181 (7.1)	-	200	-	7.9	200	-	-	13	29
80 (3)	191 (7.5)	-	200	-	7.9	200	-	-	15	34
100 (4)	197 (7.8)	-	250	-	9.8	250	-	-	17	38
125 (5)	210 (8.3)	-	250	-	9.8	250	-	250	22	50
150 (6)	224 (8.8)	-	300	-	11.8	300	-	-	28	63
200 (8)	249 (9.8)	350	350	-	13.8	350	-	-	50	113
250 (10)	276 (10.9)	450	450	-	17.7	450	-	-	71	160
300 (12)	303 (11.9)	500	500	-	19.7	500	-	-	88	198
350 (14)	365 (14.4)	550	550	-	21.7	550	-	-	127	279
400 (16)	391 (15.4)	600	600	-	23.6	600	-	-	145	318
450 (18)	421 (16.6)	600	600	-	23.6	600	-	-	175	384
500 (20)	447 (17.6)	600	600	-	23.6	600	-	-	225	494
600 (24)	497 (19.6)	600	600	-	23.6	600	-	-	340	747
700 (28)	548 (21.6)	700	875/700	-	N/A	700	700	-	316	694
750 (30)	573 (22.6)	N/A	N/A	-	N/A	N/A	750	-	N/A	N/A
800 (32)	603 (23.7)	800	1000/800	-	N/A	800	800	-	398	1045
900 (36)	656 (25.8)	900	1125/900	-	N/A	900	900	-	476	1045
1000 (40)	708 (27.9)	1000	1250/1000	-	N/A	1000	1000	-	602	1322
1050 (42)	708 (27.9)	N/A	N/A	-	N/A	N/A	1050	-	N/A	N/A
1100 (44)	759 (29.9)	N/A	N/A	-	N/A	N/A	1100	-	N/A	N/A
1200 (48)	814 (32.0)	1200	1500/1200	-	N/A	1200	1200	-	887	1996

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Dimensional drawings (continued)

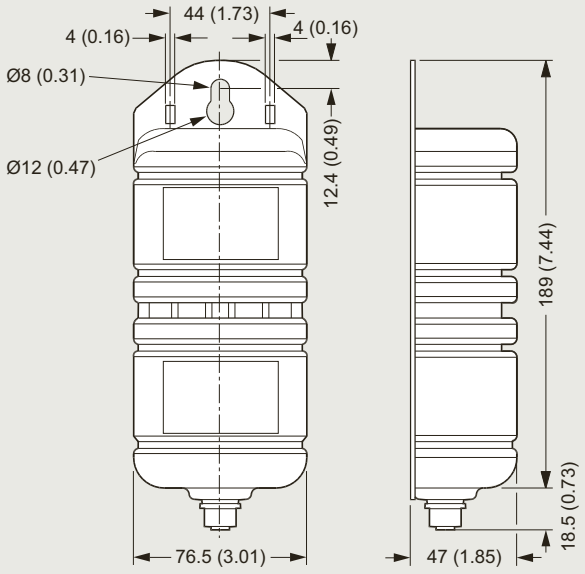
1) Tolerances on built-in length: DN 15 to DN 200 (½" to 8"): +0/-3 mm (+0/-0.12"), DN 250 to DN 400 (10" to 16"): +0/-5 mm (+0/-0.20"), DN 450 to DN 600 (18" to 24"): +5/-5 mm (+0.20/-0.20"), DN 700 to DN 1200 (28" to 48"): +10/-10 mm (+0.39/-0.39").
2) For remote version the sensor weight is reduced with 2 kg (4.5 lbs).

Remote version



Dimensions in mm (inch), weight 3.5 kg (8 lbs)

External battery pack



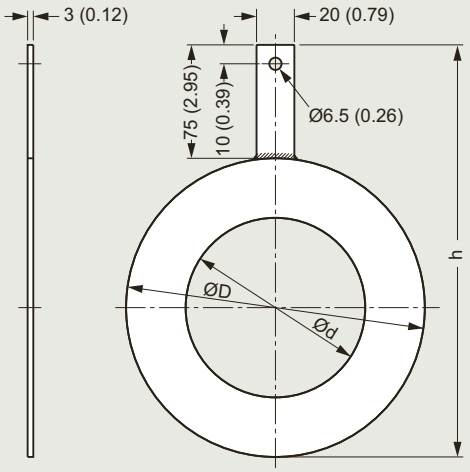
Dimensions in mm (inch), weight 2.0 kg (4.5 lbs)

Battery pack has to be mounted in upwards position to ensure maximum battery capacity.

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Dimensional drawings (continued)

Grounding rings



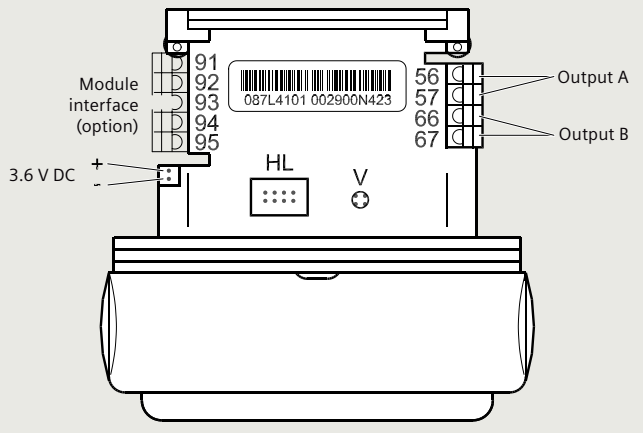
Dimensions in mm (inch) for grounding rings MAG 8000 with EPDM lining (7ME6810 and 7ME6820) DN 25 to DN 300

Dimension	Internal diameter (d)	Outside diameter (D)	h
DN 25	27	68	143
DN 40	38	88	163
DN 50	52	100	175
DN 65	64	120	195
DN 80	79	133	208
DN 100	95	158	233
DN 125	115	188	263
DN 150	145	216	291
DN 200	193	268	343
DN 250	246	324	399
DN 300	295	374	449

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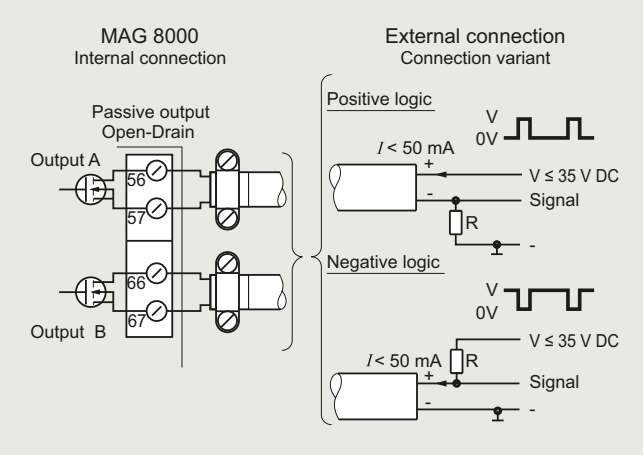
Circuit diagrams

Electrical installation and pulse output – Connection diagram



HL = Hardware lock key connection
V = Push button for verification mode

Pulse wire connection



The pulse output can be configured as volume, alarm or call-up. The output can be connected as positive or negative logic. R = pull up/down is selected in relation to the Vx power supply and with a max. current I of 50 mA.

Use shielded cable to avoid EMC problems. Make sure the shield is correctly mounted under the cable clamp (no pig tail).

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Overview



SITRANS FM MAG 8000 for abstraction and distribution network application

Benefits

Easy to install

- Compact or remote solution with factory mounted cable
- IP68/NEMA 6P enclosure. Sensor can be buried
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities

Long-term stability/Low cost of ownership

- No moving parts in a robust construction means less wear and tear
- Basic and advanced transmitter versions with different optional add-on communication modules fulfill various customer requirements for high cost efficiency
- Up to 0.2% maximum uncertainty
- Bi-directional measurement with an outstanding low flow performance
- Up to 10 years maintenance-free operation in typical applications

Intelligent information, easy to access

- Advanced information on site
- Advanced statistics and diagnostics
- Optional high-performance 3G/UMTS module offers an efficient solution for remote measurement and monitor via wireless networks

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Selection and ordering data

SITRANS FM MAG 8000 water meter	Article No. 7ME6810-									
	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Diameter										
DN 25, 1 inch	2	D								
DN 40, 1½" inch	2	R								
DN 50, 2 inch	2	Y								
DN 65, 2½ inch	3	F								
DN 80, 3 inch	3	M								
DN 100, 4 inch	3	T								
DN 125, 5 inch	4	B								
DN 150, 6 inch	4	H								
DN 200, 8 inch	4	P								
DN 250, 10 inch	4	V								
DN 300, 12 inch	5	D								
DN 350, 14 inch	5	K								
DN 400, 16 inch	5	R								
DN 450, 18 inch	5	Y								
DN 500, 20 inch	6	F								
DN 600, 24 inch	6	P								
DN 700, 28 inch[1)]	6	Y								
DN 750, 30 inch[1)]	7	D								
DN 800, 32 inch[1)]	7	H								
DN 900, 36 inch[1)]	7	M								
DN 1000, 40 inch[1)]	7	R								
DN 1050, 42 inch[1)]	7	U								
DN 1100, 44 inch[1)]	7	V								
DN 1200, 48 inch[1)]	8	B								
Process connection										
EN 1092-1, PN 10 flanges			B							
EN 1092-1, PN 16 flanges			C							
EN 1092-1, PN 16 flanges, non-PED type of equipment (excluded from scope of PED 2014/68/EU)			D							
EN 1092-1, PN 25 flanges			E							
EN 1092-1, PN 40 flanges			F							
ANSI B16.5, Class 150 flanges			J							
AWWA C-207, Class D flanges			L							
AS 4087, PN 16 flanges			N							
Sensor version										
EPDM liner and Hastelloy electrodes, corrosion-resistant coating of category C4				3						
EPDM liner and Hastelloy electrodes, 300 µm corrosion-resistant coating of category C5				4						
Calibration										
Standard ±0.4% of rate ±2 mm/s					1					
Extended ±0.2% of rate ±2 mm/s DN 50 ... 300 (2" ... 12")					2					
NMI M 10 (2.5%) without verification					3					
Region version										
Europe (m^3, m^3/h, 50 Hz)							1			
USA (Gallon, GPM, 60 Hz)							2			
Australia (Ml, Ml/d, 50 Hz)							3			
Transmitter										
Basic version compact mount								A		
Basic version, remote mount with IP68/NEMA 6P plugs and following cable length:										
• 5 m (16.4 ft)								B		
• 10 m (32.8 ft)								C		
• 20 m (65.6 ft)								D		

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Selection and ordering data (continued)

SITRANS FM MAG 8000 water meter	Article No. 7ME6810- ● ● ● ● ● - ● ● ● ●
• 30 m (98.4 ft)	E
Advanced version compact mount	K
Advanced version, remote mount with IP68/NEMA 6P plugs and following cable length:	
• 5 m (16.4 ft)	L
• 10 m (32.8 ft)	M
• 20 m (65.6 ft)	N
• 30 m (98.4 ft)	P
Communication	
No additional communication, Standard IrDA interface	A
Serial RS 485 with Modbus RTU (terminated as end device)	B
Serial RS 232 with Modbus RTU	C
Encoder interface with ITRON 200WP Sensus protocol	D
IIoT Wireless Communication Module FLEX with remote antenna including cable 5 m (16.4 ft)[2]	K
IIoT Wireless Communication Module with remote antenna including cable 5 m (16.4 ft)[2]	L
IIoT Wireless Communication Module FLEX with remote antenna including cable 5 m (16.4 ft) and connection cable 2.5 m (8.2 ft) for analog inputs[2]	M
IIoT Wireless Communication Module with remote antenna including cable 5 m (16.4 ft) and connection cable 2.5 m (8.2 ft) for analog inputs[2]	N
LW BLE Wireless Communication Module with remote antenna including cable 5 m (16.4 ft)	Q
3G/UMTS communication module with remote antenna; 5 m (16.4 ft)[2]	S
3G/UMTS communication module with remote antenna cable 5 m (16.4 ft) and analog input cable 2.5 m (8.2 ft)[2]	T
Power supply	
Internal battery (battery not included)	0
Internal battery pack installed[2]	1
Power cable 1.5 m (4.9 ft) with IP68/NEMA 6P plugs for external battery (no battery included)	2
12/24 V AC/DC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	3
115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	4
External battery (battery included) and 1.5 m (4.9 ft) power cable with IP68/NEMA 6P plugs[2]	5
12/24 V AC/DC power supply with backup battery included and 3 m (9.8 ft) power cable for external connection[2]	6
115 ... 230 V AC power supply with backup battery included and 3 m (9.8 ft) power cable for external connection[2]	7
115 ... 230 V AC power supply with 3 m (9.8 ft) power cable for external connection and 1.5 m (4.9 ft) power cable for external battery pack as backup (battery not included)	8

1) The diameter DN 700 (28") to DN 1200 (48") is only available as remote transmitter type installation.
2) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.

	Order code
Options	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificate	
Inspection certificate 3.1 (EN 10204) - pressure test	**C01**
Special calibration	
5-point calibration for DN 25 ... 200[2]	**D01**
5-point calibration for DN 250 ... 600[2]	**D02**
5-point calibration for DN 700 ... 1200[2]	**D03**
10-point calibration for DN 25 ... 200[3]	**D06**
10-point calibration for DN 250 ... 600[3]	**D07**
10-point calibration for DN 700 ... 1200[3]	**D08**
Default (2 × 25% and 2 × 90%) match-pair calibration for DN 25 ... 200	**D11**
Default (2 × 25% and 2 × 90%) match-pair calibration for DN 250 ... 600	**D12**
Default (2 × 25% and 2 × 90%) match-pair calibration for DN 700 ... 1200	**D13**

	Order code
5-point, matched-pair calibration for DN 25 ... 200[2]	**D15**
5-point, matched-pair calibration for DN 250 ... 600[2]	**D16**
5-point, matched-pair calibration for DN 700 ... 1200[2]	**D17**
10-point, matched-pair calibration for DN 25 ... 200[3]	**D18**
10-point, matched-pair calibration for DN 250 ... 600[3]	**D19**
10-point, matched-pair calibration for DN 700 ... 1200[3]	**D20**
Country of origin	
France	**F55**
Customer label	
ADDC (Abu Dhabi)	**H23**
Flow unit	
l/s	**L00**
MGD	**L01**
CFS	**L02**
l/min	**L03**
m^3/min	**L04**

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Selection and ordering data (continued)

	Order code
GPM	L05
CFM	L06
l/h	L07
m^3/h	L08
GPH	L09
CFH	L10
GPS	L11
Ml/d	L12
m^3/d	L13
GPD	L14
BBL42/s	L15
BBL42/min	L16
BBL42/h	L17
BBL42/d	L18
Totalizer Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)	
Totalizer 1 = RV, reverse flow	L20
Totalizer 1 = NET, net flow	L22
Totalizer 2 = FW, forward flow	L30
Totalizer 2 = NET, net flow	L31
Volume unit	
m^3	L40
Ml	L41
G	L42
AF	L43
l × 100	L44
m^3 × 100	L45
G × 100	L46
CF × 100	L47
MG	L48
G × 1000	L49
CF × 1000	L50
Al	L51
kl	L52
BBL42 (US oil barrel, 1 barrel = 42 US gallons)	L54
Volume unit = AF, amount per pulse A = 1 US Gallon[5)]	L55
Volume unit = Al, amount per pulse A = 1 US Gallon[5)]	L56
Volume unit = CFx100, amount per pulse A = 1 US Gallon[5)]	L57
Volume unit = BBL42, amount per pulse A = 1 US Gallon[5)]	L58
Pulse set up (default pulse A = forward and pulse B = Alarm, pulse width = 50 ms)	
Pulse A function = RV, reverse flow	L62
Pulse A function = FWnet, forward net flow	L63
Pulse A function = RVnet, reverse net flow	L64
Pulse A function = Off	L65
Pulse A Volume per pulse Unit × 0.0001; pulse width 10 ms	L70
Pulse A Volume per pulse Unit × 0.001; pulse width 10 ms	L71
Pulse A Volume per pulse Unit × 0.01; pulse width 10 ms	L72
Pulse A Volume per pulse Unit × 0.1; pulse width 10 ms	L73
Pulse A Volume per pulse Unit × 1; pulse width 5 ms	L75
Pulse A Volume per pulse Unit × 1; pulse width 10 ms	L76
Pulse A Volume per pulse Unit × 1; pulse width 50 ms	L77
Pulse A Volume per pulse Unit × 1; pulse width 100 ms	L78
Pulse A Volume per pulse Unit × 1; pulse width 500 ms	L79
Pulse B function = FW, forward flow	L80
Pulse B function = RV, reverse flow	L81
Pulse B function = FWnet, forward net flow	L82
Pulse B function = RVnet, reverse net flow	L83
Pulse B function = Alarm	L84
Pulse B function = Call up	L85
Pulse B Volume per pulse Unit × 0.0001; pulse width 10 ms	L90
Pulse B Volume per pulse Unit × 0.001; pulse width 10 ms	L91
Pulse BVolume per pulse Unit × 0.01; pulse width 10 ms	L92
Pulse B Volume per pulse Unit × 0.1; pulse width 10 ms	L93
Pulse B Volume per pulse Unit × 1; pulse width 10 ms	L94
Device operation	
Only operator menu activated	M11
Data logger set up (default month logging)	
DataloggerInterval = Daily	M31
DataloggerInterval = Weekly	M32
Region specific settings	
Low flow cut off = 5 mm/s[6)]	M50
Factory mounted cables	
4.8 m (15.75 ft) pulse cable A+B	M81
4.8 m (15.75 ft) communication cable RS 232/RS 485 terminated as end device	M82
Fixed cable/COM cable, 2 × 4.8 m, connected at A and B and COM 2 × 2 × 2-wire twisted. Marking on Modbus cable	M83
20 m (65.6 ft) pulse cable A+B	M84
20 m (65.6 ft) communication cable RS 232/RS 485 terminated as end device	M85
Fixed cable/COM cable, 2 × 20 m, connected at A and B and COM 2 × 2 × 2-wire twisted. Marking on Modbus cable	M86
Cello 2 channel, input cable 3 m (9.84 ft) with Brad Harrison micro-change 3 way connector	M87
Cello 2 channel, input cable 5 m (16.4 ft) with MIL-C-26482 spec. connectors	M89
Encoder interface cable with connector for ITRON 200WP radio, length 25 ft	M90
Encoder interface cable with connector for ITRON 200WP radio, length 5 ft	M91
SOFREL cable 2 m for LS42 data logger	M92
Adaptors for conduit installation	M94
SOFREL cable 2 m for LS-Flow data logger	M97
FM Fire Service Approval (with ANSI B16.5 Class 150 flanges)	
DN 50, DN 80, DN 100 (2", 3", 4")	P20
DN 150, DN 200 (6", 8")	P21
DN 250, DN 300 (10", 12")	P22
PED options	
Not compliant to PED Cat I/II/III, approved for use under 2014/68/EU Art. 1 §2	P30
Region specific approvals	
CPA and Name plate in Chinese language	W06
KCC label (South Korea)	W28

1) Under preparation.
2) 20%, 40%, 60%, 80%, 100% of factory Q_{max}
3) Ascending and descending at 20%, 40%, 60%, 80%, 100% of factory Q_{max}
5) Pulse width = 5 ms
6) Siemens warrants the measurement accuracy down to a flow velocity of 15 mm/s. For a flow velocity below 15 mm/s, we don't warrant the measurement accuracy.

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Selection and ordering data (continued)

Operating instructions for SITRANS FM MAG 8000

Description	Article No.
• English	A5E03071515
• German	A5E00740986

Operating instructions for MAG 8000 3G/UMTS communication module

Description	Article No.
• English	A5E03644134

All literature is available to download for free, in a range of languages, at
http://www.siemens.com/processinstrumentation/documentation

Technical specifications

MAG 8000 for abstraction and distribution network application (7ME6810)	
Accuracy	• Standard calibration: ±0.4% ±2 mm/s • Extended calibration DN 50 ... 300 (2" ... 12"): ± 0.2% of rate ±2 mm/s[5)]
Low flow cut-off (default)	15 mm/s
Media conductivity	Clean water > 20 µs/cm
Temperature	
Ambient	-20 ... +60 °C (-4 ... +140 °F)
Media	0 ... 70 °C (32 ... 158 °F)
Storage	-40 ... +70 °C (-40 ... +158 °F)
Enclosure rating	
Remote sensor	IP68 to EN 60529/NEMA 6P, 10 mH_2O continuously
Compact version	IP68 to EN 60529/NEMA 6P, 3 mH_2O for six months
Certificates and approvals	
Calibration	
• Standard calibration	2 × 25% and 2 × 90% (default)
• Special calibration	5-point calibration: 20%, 40%, 60%, 80%, 100% of factory Q_{max} 10-point calibration: ascending and descending at 20%, 40%, 60%, 80%, 100% of factory Q_{max} Matched-pair calibration: default, 5-point, 10-point
Material certificate EN 10204-3.1	Available when ordering together with meter[1)]
Drinking water approvals	• NSF/ANSI Standard 61[2)] (cold water) USA • WRAS (BS 6920 cold water) UK • ACS Listed France • KTW-BWGL (Germany) • Belgaqua (B) • MCERTS (GB) • AS/NZS 4020 (Australia/New Zealand) up to 70 °C water temperature • AS/NZS 4020: 2018
Fire Service Approvals	FM Fire Service Meter (Class Number 1044)
Metrological approvals	CPA (CN)
Conformity	• PED: 2014/68/EU[4)] • EMC: IEC/EN 61326
Sensor version	Coned sensor (octagon liner): DN 25 and 40 (½" ... 1½") Coned sensor: DN 50 ... 300 (2" ... 12") Full bore sensor: DN 350 ... 1200 (14" ... 48")
Sensor material	
• Housing and flanges	DN 25 ... 1200 (2" ... 48"): Carbon steel ASTM A 105 with corrosion-resistant coating of category C4 or C5 according to ISO 12944-2
• Measuring pipe	DN 350 ... 1200 (14" ... 48"): Stainless steel AISI 304/1.4301
Measuring principle	Electromagnetic induction
Excitation frequency	
Basic version	
• Battery-powered	DN 25 ... 150 (1″ ... 6″): 1/15 Hz DN 200 ... 600 (8″ ... 24″): 1/30 Hz DN 700 ... 1200 (28″ ... 48″): 1/60 Hz
• Mains-powered	DN 25 ... 150 (1″ ... 6″): 6.25 Hz DN 200 ... 600 (8″ ... 24″): 3.125 Hz DN 700 ... 1200 (28″ ... 48″): 1.5625 Hz
Advanced version	

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Technical specifications (continued)

MAG 8000 for abstraction and distribution network application (7ME6810)	
• Battery-powered	DN 25 ... 150 (1″ ... 6″): 1/15 Hz (adjustable up to 6.25 Hz; reduced battery lifetime) DN 200 ... 600 (8″ ... 24″): 1/30 Hz (adjustable up to 3.125 Hz; reduced battery lifetime) DN 700 ... 1200 (28″ ... 48″): 1/60 Hz (adjustable up to 1.5625 Hz; reduced battery lifetime)
• Mains-powered	DN 25 ... 150 (1″ ... 6″): 6.25 Hz DN 200 ... 600 (8″ ... 24″): 3.125 Hz DN 700 ... 1200 (28″ ... 48″): 1.5625 Hz
Flanges	
EN 1092-1 (DIN 2501)	PN 10 (145 psi): DN 200 ... 300 (8" ... 12") Flat face PN 10 (145 psi): DN 350 ... 1200 (14" ... 48") Raised face[6)] PN 16 (232 psi): DN 50 ... 300 (2" ... 12") Flat face[6)] PN 16 (232 psi): DN 350 ... 1200 (14" ... 48") Raised face PN 40 (580 psi): DN 25 and 40 (½" ... 1½") Flat face
ANSI 16.5	Class 150 (20 bar (290 psi)): 1" ... 12" Flat face Class 150 (20 bar (290 psi)): 14" ... 24" Raised face
AWWA C-207	PN 10 (145 psi): 28" ... 48" Flat face
AS 4087	PN 16 (232 psi): DN 50 ... DN 300 (2" ... 12") Flat face PN 16 (232 psi): DN 350 ... DN 1200 (14" ... 48") Raised face
Liner	EPDM
Electrode and grounding electrodes	Hastelloy C276/2.4819
Grounding straps	Grounding straps are premounted from the factory on each side of the sensor.

1) Has to be ordered with the meter. It is not possible to order the certificate afterwards.
2) Including Annex G.
4) For further information on PED standard and requirements see the section about Pressure Equipment Directive.
5) Siemens warrants the measurement accuracy down to a flow velocity of 15 mm/s. For a flow velocity below 15 mm/s, we don't warrant the measurement accuracy.
6) DN ≤ 600 type 01 (SORF); DN > 600 type 11 (WNRF).

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Overview



SITRANS FM MAG 8000 CT, compact version

Benefits

Approvals

- MI-001, OIML R 49/OIML R 49 MAA
- FM Fire Service

Easy to install

- Compact or remote solution with factory mounted cable and customer setting from factory
- IP68/NEMA 6P enclosure. Sensor can be buried.
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities

Long-term stability/Low cost of ownership

- No moving parts in a robust construction means less wear and tear
- Basic and advanced transmitter versions with different optional add-on communication modules fulfill various customer requirements for high cost efficiency
- Bi-directional measurement with an outstanding low flow performance
- Up to 10 years maintenance-free operation in typical applications
- Insignificant pressure drop

Intelligent information, easy to access

- Advanced information on site
- Advanced statistics and diagnostics
- Connectable to common AMR systems

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Selection and ordering data

SITRANS FM MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes	Article No. 7ME6820-									
	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Diameter										
DN 50, 2 inch	2	Y								
DN 65, 2½ inch	3	F								
DN 80, 3 inch	3	M								
DN 100, 4 inch	3	T								
DN 125, 5 inch	4	B								
DN 150, 6 inch	4	H								
DN 200, 8 inch	4	P								
DN 250, 10 inch	4	V								
DN 300, 12 inch	5	D								
DN 350, 14 inch	5	K								
DN 400, 16 inch	5	R								
DN 450, 18 inch	5	Y								
DN 500, 20 inch	6	F								
DN 600, 24 inch	6	P								
Process connection										
EN 1092-1, PN 10 flanges			B							
EN 1092-1, PN 16 flanges			C							
ANSI B16.5, Class 150 flanges			J							
AS 4087, PN 16 flanges			N							
Sensor version										
EPDM liner and Hastelloy electrodes, corrosion-resistant coating of category C4				0						
EPDM liner and Hastelloy electrodes, 300 µm corrosion-resistant coating of category C5				4						
Approval/Verification[2]										
Standard calibration (without initial verification)[3]					0					
MI-001 Q3/Q1 = 40					1					
MI-001 Q3/Q1 = 63					2					
MI-001 Q3/Q1 = 80					3					
MI-001 Q3/Q1 = 160					4					
MI-001 Q3/Q1 = 200					5					
MI-001 Q3/Q1 = 250					6					
MI-001 Q3/Q1 = 100					7					
Select OIML R49 or CPA in option group P5x					8					
Region version										
Europe (m^3, m^3/h, 50 Hz)							1			
USA (m^3, m^3/h, 60 Hz)							2			
Transmitter										
Basic version compact mount								A		
Basic version, remote mount with IP68/NEMA 6P plugs and following cable length:										
• 5 m (16.4 ft)								B		
• 10 m (32.8 ft)								C		
• 20 m (65.6 ft)								D		
• 30 m (98.4 ft)								E		
Advanced version compact mount								K		
Advanced version, remote mount with IP68/NEMA 6P plugs and following cable length:										
• 5 m (16.4 ft)								L		
• 10 m (32.8 ft)								M		
• 20 m (65.6 ft)								N		
• 30 m (98.4 ft)								P		
Communication										
No additional communication, Standard IrDA interface									A	
Serial RS 485 with Modbus RTU (Terminated as end device)									B	

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Selection and ordering data (continued)

SITRANS FM MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes	Article No. 7ME6820- ● ● ● ● ● - ● ● ● ●
Serial RS 232 with Modbus RTU	C
Encoder interface for ITRON 200WP radio with "Sensus" protocol"	D
IIoT Wireless Communication Module FLEX with remote antenna including cable 5 m (16.4 ft)[2]	K
IIoT Wireless Communication Module with remote antenna including cable 5 m (16.4 ft)[1]	L
IIoT Wireless Communication Module FLEX with remote antenna including cable 5 m (16.4 ft) and connection cable 2.5 m (8.2 ft) for analog inputs[2]	M
IIoT Wireless Communication Module with remote antenna including cable 5 m (16.4 ft) and connection cable 2.5 m (8.2 ft) for analog inputs[1]	N
LW BLE Wireless Communication Module with remote antenna including cable 5 m (16.4 ft)	Q
3G/UMTS communication module with remote antenna; cable 5 m (16.4 ft)[1]	S
3G/UMTS communication module with analog inputs and remote antenna; cable 5 m (16.4 ft)[1]	T
Power supply	
Internal battery (battery not included)	0
Internal battery pack installed[1]	1
Power cable 1.5 m (4.9 ft) with IP68/NEMA 6P plugs for external battery (battery not included)	2
12/24 V AC/DC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (battery not included)	3
115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (battery not included)	4

1) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.
2) For more details and references of the ranges please see the tables on the previous pages.
3) Standard calibration or according to FM Fire Service requirements if P20, P21 or P22 is selected as Z option.

	Order code
Options	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificate	
Inspection certificate 3.1 (EN 10204) - pressure test	**C01**
Country of origin	
France	**F55**
Customer label	
FP2E label (France)	**H20**
ADDC label	**H23**
Totalizer	
Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)	
Totalizer 1 = RV, reverse flow	**L20**
Totalizer 1 = NET, net flow	**L22**
Totalizer 2 = FW, forward flow	**L30**
Totalizer 2 = NET, net flow	**L31**
Pulse set up (default pulse A = forward and pulse B = Alarm, pulse width = 50 ms)	
A function = RV, reverse flow	**L62**
A function = FWnet, forward net flow	**L63**
A function = RVnet, reverse net flow	**L64**
A function = Off	**L65**
Volume per pulse A = × 0.001[2]	**L71**
Volume per pulse A = × 0.01[2]	**L72**
Volume per pulse A = × 0.1[2]	**L73**
Volume per pulse A = × 1[2]	**L74**
B function = FW, forward flow	**L80**
B function = RV, reverse flow	**L81**
B function = FWnet, forward net flow	**L82**
B function = RVnet, reverse net flow	**L83**

	Order code
B function = Alarm	**L84**
B function = Call up	**L85**
Volume per pulse B = × 0.001[2]	**L91**
Volume per pulse B = × 0.01[2]	**L92**
Volume per pulse B = × 0.1[2]	**L93**
Volume per pulse B = × 1[2]	**L94**
Data logger set up (default month logging)	
DataloggerInterval = Daily	**M31**
DataloggerInterval = Weekly	**M32**
Factory mounted cables	
4.8 m (15.75 ft) pulse cable A+B	**M81**
4.8 m (15.75 ft) communication cable RS 232/RS 485 terminated as end device	**M82**
20 m (65.6 ft) pulse cable A+B	**M84**
20 m (65.6 ft) communication cable RS 232/RS 485 terminated as end device	**M85**
Cello 2 channel, input cable 3 m (9.84 ft) with Brad Harrison micro-change 3 way connector	**M87**
Cello 2 channel, input cable 5 m (16.4 ft) with MIL-C-26482 spec. connectors	**M89**
Encoder interface cable with connector for ITRON 200WP radio, length 25 ft (7.6 m)	**M90**
Encoder interface cable with connector for ITRON 200WP radio, length 5 ft (1.5 m)	**M91**
SOFREL cable 2 m (6.6 ft) for LS42 data logger	**M92**
SOFREL cable 2 m (6.6 ft) for LS-Flow data logger	**M97**
FM Fire Service Approval (with ANSI B16.5 Class 150 flanges)	
DN 50, DN 80 and DN 100 (2", 3" and 4")	**P20**
DN 150 and DN 200 (6" and 8")	**P21**
DN 250 and DN 300 (10" and 12")	**P22**
PED options	
Not compliant to PED Cat I/II/III, approved for use under 2014/68/EU Art. 1 §2	**P30**

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Selection and ordering data (continued)

	Order code
MI-001 enhancement	
Enhancement to Q3/Q1=400 MI-001 verification	**P40**
OIML R49/CPA calibration / verification	
Q3/Q1 = 250, according to OIML R49 without sealing	**P50**
Q3/Q1 = 160, CPA verification	**P51**
Region specific approvals	
CPA and Name plate in Chinese language	**W06**

1) Under preparation.
2) Pulse width = 10 ms.

Operating instructions for SITRANS FM MAG 8000

Description	Article No.
• English	**A5E03071515**
• German	**A5E00740986**

All literature is available to download for free, in a range of languages, at
http://www.siemens.com/processinstrumentation/documentation

Operating instructions for MAG 8000 3G/UMTS communication module

Description	Article No.
• English	**A5E03644134**

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Technical specifications

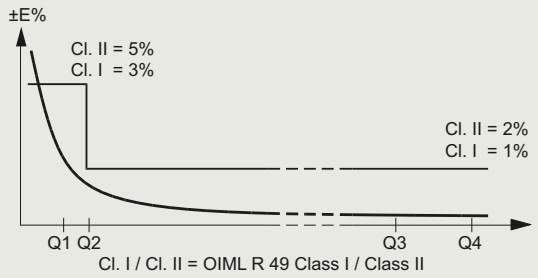
MAG 8000 CT for revenue and bulk metering (7ME6820)	
Accuracy	• OIML R 49/OIML R 49 MAA accuracy class I for DN 50, DN 350 ... 600 accuracy class II for DN 50 ... 600 • MI-001 verification for DN 50 ... 600 (2" ... 24"), with Q3/Q1 = 315 • FM Fire Service for DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") ±1,5% (Q_{min} to Q_{max})[5]
Low flow cut-off (default)	15 mm/s
Media conductivity	Clean water > 20 µs/cm
Temperature	
Ambient	-20 ... +60 °C (-4 ... +140 °F) MI-001: -25 ... +55 °C (-13 ... +131 °F)
Media	0.1 ... 50 °C (32 ... 122 °F)
Storage	-40 ... +70 °C (-22 ... +158 °F)
Enclosure rating	
Remote sensor	IP68 to EN 60529/NEMA 6P, 10 mH_2O continuously
Compact version	IP68 to EN 60529/NEMA 6P, 3 mH_2O for 6 months
Certificates and approvals	
Calibration (standard)	according OIML/MI-001
Material certificate EN 10204-3.1	Available when ordering together with meter[1]
Drinking water approvals	• NSF/ANSI Standard 61[2] (cold water) USA • WRAS (BS 6920 cold water) UK • ACS Listed France • KTW-BWGL (Germany) • Belgaqua (B) • MCERTS (GB) • AS/NZS 4020: 2018
Fire Service approval	FM Fire Service (1044)[3]
Metrological approvals	• CPA (CN) • KIWA (NL)
Custody transfer approval	• OIML R 49 and OIML R 49 MAA approval • MI-001 approval (DK-0200-MI001-011)
Conformity	• CEN EN 14154, ISO 4064 • PED: 2014/68/EU[4] For pressure/temperature curves see MAG 3100 • EMC: IEC/EN 61326 • CRN (DN 50 ... 1200 (2" ... 48"))
Sensor version	• Coned sensor: DN 50 ... 300 (2" ... 12") • Full bore sensor: DN 350 ... 600 (14" ... 24")
Sensor material	
• Housing and flanges	DN 50 ... 600 (2" ... 24"): Carbon steel ASTM A 105, with corrosion-resistant coating of category C4 or C5 according to ISO 12944-2
• Measuring pipe	DN 350 ... 600 (14" ... 24"): Stainless steel AISI 304/1.4301
Measuring principle	Electromagnetic induction
Excitation frequency	
Basic version	
• Battery-powered	DN 50 ... 150 (2" ... 6"): 1/15 Hz DN 200 ... 600 (8" ... 24"): 1/30 Hz
• Mains-powered	DN 50 ... 150 (2" ... 6"): 6.25 Hz DN 200 ... 600 (8" ... 24"): 3.125 Hz
Advanced version	
• Battery-powered	DN 50 ... 150 (2" ... 6"): 1/15 Hz (adjustable up to 6.25 Hz; reduced battery lifetime) DN 200 ... 600 (8" ... 24"): 1/30 Hz (adjustable up to 3.125 Hz; reduced battery lifetime)
• Mains-powered	DN 50 ... 150 (2" ... 6"): 6.25 Hz DN 200 ... 600 (8" ... 24"): 3.125 Hz

MAG 8000 CT for revenue and bulk metering (7ME6820)	
Flanges	
EN 1092-1 (DIN 2501)	PN 10 (145 psi): DN 200 ... 300 (8" ... 12") Flat face PN 10 (145 psi): DN 350 ... 600 (14" ... 24") Raised face[6] PN 16 (232 psi): DN 50 ... 300 (2" ... 12") Flat face[6] PN 16 (232 psi): DN 350 ... 600 (14" ... 24") Raised face PN 40 (580 psi): DN 25 and 40 (½" ... 1½") Flat face
ANSI 16.5	Class 150 (20 bar (290 psi)): 1" ... 12" Flat face Class 150 (20 bar (290 psi)): 14" ... 24" Raised face
AS 4087	PN 16 (232 psi): DN 50 ... 300 (2" ... 12") Flat Face PN 16 (232 psi): DN 350 ... 600 (14" ... 24") Raised face
Liner	EPDM
Electrode and grounding electrodes	Hastelloy C276/2.4819
Grounding straps	Grounding straps are premounted from the factory on each side of the sensor.

1) Has to be ordered with the meter. It is not possible to order the certificate afterwards.
2) Including Annex G
3) Not for sensors with 300 µm coating.
4) For further information on the PED standard and requirements see the section about Pressure Equipment Directive.
5) Siemens warrants the measurement accuracy down to a flow velocity of 15 mm/s. For a flow velocity below 15 mm/s, we don't warrant the measurement accuracy.
6) DN ≤ 600 type 01 (SORF); DN > 600 type 11 (WNRF)

MAG 8000 CT (Revenue program) water meter type approval

MAG 8000 CT program is type approved and verified according to international water meter standard OIML R 49. The custody transfer program is approved as Class 1 (DN 50 ... 600) and Class 2 (DN 50 ... 600), at different Q3 and Q3/Q1, according to OIML R 49:2013 specification.



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Technical specifications (continued)

OIML R 49:2013 specification for Class 1 horizontal and vertical[1)]

Size	50 (2")	65 (2½")	80 (3")	100 (4")	125 (5")	150 (6")	200 (8")	250 (10")	300 (12")	350 (14")	400 (16")	450 (18")	500 (20")	600 (24")
R (Q³/Q1)	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**125**	**125**	**125**	**125**	**125**
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000	3125	5000	5000	7875	7875
Q3 [m³/h]	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	0.504	0.8	1.28	2	3.2	5.04	8	12.8	12.8	32	51.2	51.2	80.64	80.64
Q1 [m³/h]	0.315	0.5	0.8	1.25	2	3.15	5	8	8	20	32	32	50.4	50.4

OIML R 49:2013 specification for Class 2 horizontal and vertical [1)]

Size	50 (2")	65 (2½")	80 (3")	100 (4")	125 (5")	150 (6")	200 (8")	250 (10")	300 (12")	350 (14")	400 (16")	450 (18")	500 (20")	600 (24")
R (Q³/Q1)	**315**	**315**	**315**	**315**	**315**	**315**	**315**	**315**	**315**	**200**	**200**	**200**	**200**	**200**
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000	3125	5000	5000	7875	7875
Q3 [m³/h]	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**	**2500**	**4000**	**4000**	**6300**	**6300**
Q2 [m³/h]	0.32	0.508	0.813	1.27	2.032	3.2	5.079	8.127	8.127	20	32	32	50.4	50.4
Q1 [m³/h]	0.2	0.317	0.508	0.794	1.27	2	3.175	5.079	5.079	12.5	20	20	31.5	31.5

1) The product will be delivered according to requested specifications, which may deviate from the specifications of the approval frame described in tables below.

MAG 8000 CT (Revenue program) MI-001

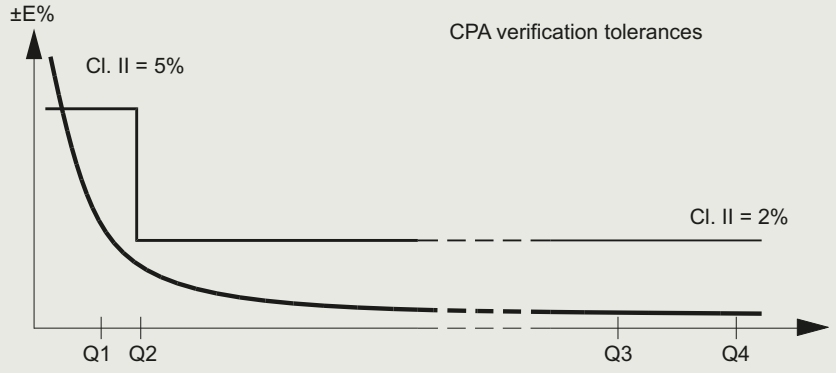
MAG 8000 CT program is type approved according to international water meter standard OIML R 49. Since the first November 2006 the MI-001 water meter directive is in force, which means that all water meters can be sold across the EU borders if the water meters contain a MI-001 label.

The MAG 8000 CT MI-001 verified and labeled products are a Class II approval according to Directive 2014/32/EU of the European Parliament and Council of 26 February, 2014 on measuring instruments, Annex III Water meters (MI-001) in the sizes from DN 50 to DN 600.

The MID certification is obtained as a B + D module approval according to the above mentioned directive.

Module B: Type approval according to OIML R 49

Module D: Quality insurance approval of production



MAG 8000 CT MI-001 verified and labeled products at a given Q3 and Q4/Q3 = 1.25 and Q2/Q1 = 1.6 measuring ranges see below table:

7ME6820-xxxx1	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
Straight pipe up/ downstream:	**0 x DN**													
Orientation:	**All orientations**									**Horizontal & Vertical**				
R (Q3/Q1)	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
Q4(m³/h)	78,75	125,00	200,00	312,50	500,00	787,50	1250,00	2000,00	2000,00	3125,00	5000,00	5000,00	7875,00	7875,00
Q3(m³/h)	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**	**2500**	**4000**	**4000**	**6300**	**6300**
Q2(m³/h)	2,520	4,000	6,400	10,000	16,000	25,200	40,000	64,000	64,000	100,000	160,000	160,000	252,000	252,000
Q1(m³/h)	1,575	2,500	4,000	6,250	10,000	15,750	25,000	40,000	40,000	62,500	100,000	100,000	157,500	157,500

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Technical specifications (continued)

7ME6820-xxxx2	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
Straight pipe up/ downstream:	0 x DN													
Orientation:	All orientations									Horizontal & Vertical				
R (Q3/Q1)	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Q4(m³/h)	20,00	31,25	50,00	78,75	125,00	200,00	312,50	500,00	787,50	3125,00	5000,00	5000,00	7875,00	7875,00
Q3(m³/h)	63	100	160	250	400	630	1000	1600	1600	2500	4000	4000	6300	6300
Q2(m³/h)	1,600	2,540	4,063	6,349	10,159	16,000	25,397	40,635	40,635	63,492	101,587	101,587	160,000	160,000
Q1(m³/h)	1,000	1,587	2,540	3,968	6,349	10,000	15,873	25,397	25,397	39,683	63,492	63,492	100,000	100,000

7ME6820-xxxx3	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
Straight pipe up/ downstream:	0 x DN													
Orientation:	All orientations									Horizontal & Vertical				
R (Q3/Q1)	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Q4(m³/h)	31,25	50,00	78,75	125,00	200,00	312,50	500,00	787,50	1250,00	3125,00	5000,00	5000,00	7875,00	7875,00
Q3(m³/h)	63	100	160	250	400	630	1000	1600	1600	2500	4000	4000	6300	6300
Q2(m³/h)	1,260	2,000	3,200	5,000	8,000	12,600	20,000	32,000	32,000	50,000	80,000	80,000	126,000	126,000
Q1(m³/h)	0,788	1,250	2,000	3,125	5,000	7,875	12,500	20,000	20,000	31,250	50,000	50,000	78,750	78,750

7ME6820-xxxx7	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
Straight pipe up/ downstream:	0 x DN													
Orientation:	All orientations									Horizontal & Vertical				
R (Q3/Q1)	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Q4(m³/h)	31,25	50,00	78,75	125,00	200,00	312,50	500,00	787,50	1250,00	3125,00	5000,00	5000,00	7875,00	7875,00
Q3(m³/h)	63	100	160	250	400	630	1000	1600	1600	2500	4000	4000	6300	6300
Q2(m³/h)	1,008	1,600	2,560	4,000	6,400	10,080	16,000	25,600	25,600	40,000	64,000	64,000	100,800	100,800
Q1(m³/h)	0,630	1,000	1,600	2,500	4,000	6,300	10,000	16,000	16,000	25,000	40,000	40,000	63,000	63,000

7ME6820-xxxx4	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
Straight pipe up/ downstream:	0 x DN													
Orientation:	All orientations									Horizontal & Vertical				
R (Q3/Q1)	160	160	160	160	160	160	160	160	160	160	160	160	160	160
Q4(m³/h)	78,75	125,00	200,00	312,50	500,00	787,50	1250,00	2000,00	2000,00	3125,00	5000,00	5000,00	7875,00	7875,00
Q3(m³/h)	63	100	160	250	400	630	1000	1600	1600	2500	4000	4000	6300	6300
Q2(m³/h)	0,630	1,000	1,600	2,500	4,000	6,300	10,000	16,000	16,000	25,000	40,000	40,000	63,000	63,000
Q1(m³/h)	0,394	0,625	1,000	1,563	2,500	3,938	6,250	10,000	10,000	15,625	25,000	25,000	39,375	39,375

7ME6820-xxxx5	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
Straight pipe up/ downstream:	0 x DN													
Orientation:	All orientations									Horizontal & Vertical				
R (Q3/Q1)	200	200	200	200	200	200	200	200	200	PVR				
Q4(m³/h)	78,75	125,00	200,00	312,50	500,00	787,50	1250,00	2000,00	2000,00					
Q3(m³/h)	63	100	160	250	400	630	1000	1600	1600					
Q2(m³/h)	0,504	0,800	1,280	2,000	3,200	5,040	8,000	12,800	12,800					
Q1(m³/h)	0,315	0,500	0,800	1,250	2,000	3,150	5,000	8,000	8,000					

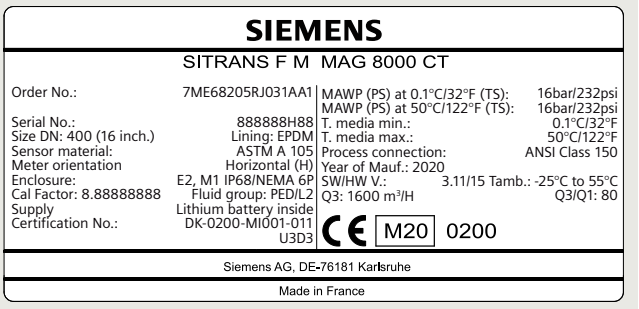
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Technical specifications (continued)

7ME6820-xxxx6	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
Straight pipe up/ downstream:	0 x DN								
Orientation:	All orientations								
R (Q3/Q1)	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**250**
Q4(m^3/h)	78,75	125,00	200,00	312,50	500,00	787,50	1250,00	2000,00	2000,00
Q3(m^3/h)	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**
Q2(m^3/h)	0,403	0,640	1,024	1,600	2,560	4,032	6,400	10,240	10,240
Q1(m^3/h)	0,252	0,400	0,640	1,000	1,600	2,520	4,000	6,400	6,400

7ME6820-xxxx6 +P40	DN 50 (2")	DN 65 (21/2")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
Straight pipe up/ downstream:	0 x DN								
Orientation:	All orientations								
R (Q3/Q1)	400	400	400	400	400	400	400	400	400
Q4(m^3/h)	78.75	125.00	200.00	312.50	500.00	787.50	1250.00	2000.00	2000.00
Q3(m^3/h)	63	100	160	250	400	630	1000	1600	1600
Q2(m^3/h)	0.252	0.400	0.640	1.000	1.600	2.520	4.000	6.400	6.400
Q1(m^3/h)	0.158	0.250	0.400	0.625	1.000	1.575	2.500	4.000	4.000

The Label is placed on the side of the encapsulation.
An example of the product label is shown below:



Installation conditions

Please refer to “System information SITRANS FM electromagnetic flowmeters”.

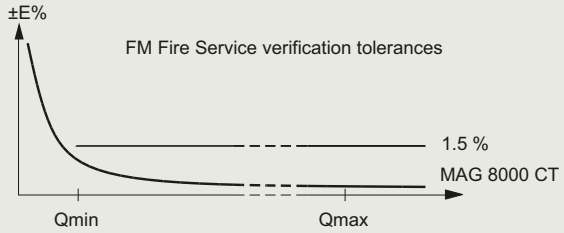
Battery operation time and calculation

The battery operation time depends on the connected battery pack as well as the operation condition of the meter.

MAG 8000 calculates the remaining capacity every 4 hours and includes all consuming elements. Calculation compensates for temperature influence on battery capacity (drawing).

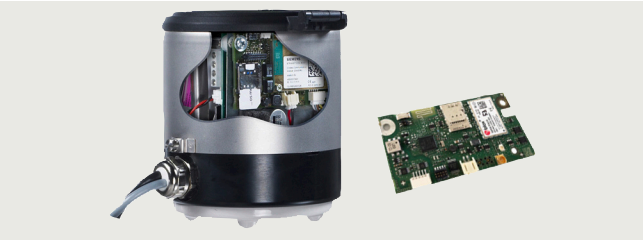
MAG 8000 CT (7ME6820) for Fire Service applications

MAG 8000 CT (7ME6820) is FM Fire Service approved for automatic fire protection systems according to the Fire Service Meters Standard, Class Number 1044. The approval is applicable for the sizes 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges. The FM Fire Service approved product can be ordered via the Z-options P20, P21 and P22.



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Overview



LW BLE WCM

The MAG 8000 LW BLE WCM (LoRaWAN® Bluetooth® Low Energy; Long Range Wide Area Network; Wireless communication module) is a wireless add-on designed for the SITRANS FM MAG 8000 battery-powered electromagnetic flowmeter. It is part of Siemens IIoT (Industrial Internet of Things) LPWAN (Low Power Wide Area Network) portfolio and enables seamless integration into remote monitoring infrastructures. The module supports BLE for local commissioning and diagnostics, and LoRaWAN® for long-range, low-power data transmission.

This module is compliant with LoRaWAN® Specification 1.0.4 and operates as a Class A device, supporting OTAA (Over-The-Air Activation) only. Compatibility is ensured with major LNS (LoRa® Network Server) providers and gateways which comply to the LoRaWAN® 1.0.4 specification. On-demand BLE functionality is activated via a hall effect switch, allowing secure local access using the SITRANS Mobile IQ app. The module is designed for ultra-low power operation and does not require a buffer battery. It can be factory-integrated (Article No.: 7ME68 POS 15 = Q), retrofitted (Article No.: A5E53940261), or ordered as a spare part (Article No.: A5E54763490).

Benefits

The MAG 8000 LW BLE WCM provides a reliable and secure solution for remote water metering and flow monitoring, enabling efficient data collection and management across diverse geographic regions. Its dual BLE and LoRaWAN® communication capabilities ensure both local and long-range connectivity, while features like secure OTA updates and fixed data payloads enhance operational efficiency and data integrity.

Key benefits include:

- BLE 5.0 (Bluetooth® Low Energy version 5.0) for local configuration, telemetry and firmware updates via the SITRANS Mobile IQ app.
- LoRaWAN® communication for secure, long-distance data transmission.
- Compatibility with EU868 (Europe), IN865 (India), US915 (America), KR920 (South Korea), AU915 (Australia), AS923 (Asia).
- Alarm notifications and configurable data transmission interval.
- Secure OTA (Over-The-Air) firmware updates via BLE.
- Fixed length data payload in predefined format, including:
  - Flow rate (in m^3/h or user-defined units)
  - Totalizer 1, 2, and 3 (cumulative volume counters)
  - Battery level (in %)
  - Fault status (as hexadecimal or decimal code)
  - WCM fault status

Custom Javascript decoders are available for integration with cloud platforms and secure provisioning using DEVEUI (Device Extended Unique Identifier), JoinEUI (Extended Unique Identifier) and APPKEY (Application Key), ensuring data integrity and confidentiality.

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Selection and ordering data

Accessories and spare parts for SITRANS FM MAG 8000 LW BLE WCM

Description	Article No.	
Upgrade kit MAG 8000 LW BLE WCM including module, antenna, adaptor cable, cable gland, O-ring	**A5E53940261**	
MAG 8000 LW BLE WCM	**A5E54763490**	
Antenna set for MAG 8000 IIoT or LW BLE WCM PVC, IP68, cable length 5 m (16.4 ft) with SMA male connector (type RG 58) and internal antenna adaptor cable, and single entry cable gland	**A5E51198820**	
Antenna adaptor cable for 3G, IIot or LW BLE WCM Package: 2 pieces	**A5E41896494**	
Cable entry 2 ... 5 mm (0.08 ... 0.20") M12 brass glands with M20 reduction Package of 10 pcs, for Sensus encoder card cable and power cable of external battery pack	**FDK:087L4154**	
Cable entry 4.5 ... 10 mm (0.17 ... 0.39") M16 brass glands with M20 reduction Package of 10 pcs, for WCM module antenna cable	**A5E54481123**	
Two cable entries 3.5 ... 5 mm (0.14 ... 0.20") M20 brass glands Package: 10 pcs	**FDK:087L4158**	
Two cable entries 5.5 ... 7.5 mm (0.22 ... 0.30"), M20 brass glands Package: 10 pcs	**FDK:087L4159**	

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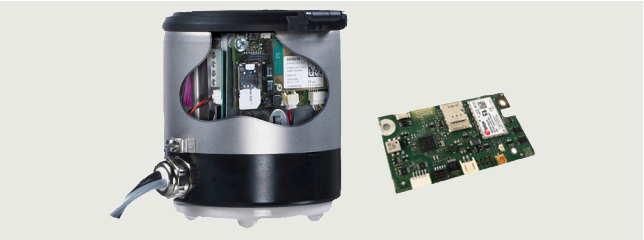
Selection and ordering data (continued)

Description	Article No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[1)]	**FDK:085U0220**	

1) Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging.

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Overview



IIoT Wireless Communication Module

The IIoT Wireless Communication Module[1] for SITRANS FM MAG 8000 is a communication system consisting of a hardware part combined with a web-hosted application for device management and measurement data transfer. The main features of the module are to transmit periodically the flow readings from a MAG 8000 field device to an end user, real time notifications of alarms, online configuration, and remote diagnosis of the field device.

The IIoT Wireless Communication Module is using the public mobile network as channel for transferring the measurement data to the MAG 8000 IIoT Web Application, where only authorized users have access to. In addition, the IIoT Web Application serves as an interface for the end user to provide the measurement data per Email or FTPS/SFTP.

Communication between the field device and web application runs over MQTT protocol, which is a widely used protocol in the IoT (Internet of Things) world.

The IIoT Wireless Communication Module can be installed in the existing MAG 8000 with SW version 3.11 and higher. A Cat M1, NB-IoT or 2G network must be available at the installation site of the MAG 8000.

It can be factory-integrated (Article No.: 7ME68 POS 15=L; N), retrofitted (Article No.: A5E51150447+A5E03436686), or ordered as a spare part (Article No.: A5E51093917).

[1] A rechargeable buffer battery is mandatory, even if the MAG 8000 is mains power operated.

Benefits

The MAG 8000 IIoT Web Application provides options for remote configuration of all MAG 8000 parameters, remote diagnostics, remote qualification and communication via email, FTPS/SFTP (TLS/SSL-based encryption).

This enables data to be received by e-mail or FTPS/SFTP and used for monitoring and control in further systems such as SIWA Leak Finder.

TLS/SSL based data encryption provides a highlevel information security to protect customers data privacy.

The IIoT Wireless Communication Module offers:

- LTE-M and NB-IoT communication with 2G fallback
- Remote Qualification Certificate feature to enable the offsite diagnostic and audit on devices installed anywhere in the world
- 2-channel analog input measurement for external ratiometric pressure transmitter, transmission together with flow measurement (2-in-1 solution)
- Real-time clock synchronization with internet NTP server, ensuring that all measurement data is accurately timestamped
- Data transmission at customer-specified points in time, allowing for synchronization of information from multiple MAG 8000 devices. The package of information retrieved via the csv file includes:
  - Time stamp
  - Flow rate
  - Totalizer 1
  - Totalizer 2
  - Totalizer 3
  - Analog 1 (V)
  - Analog 2 (V)
  - Battery lifetime
  - Alarm list (as decimal format)

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Selection and ordering data

Accessories and spare parts for SITRANS FM MAG 8000 IIoT Wireless Communication Module

Description	Article No.	
Upgrade kit MAG 8000 IIoT Wireless Communication Module (LTE-M, NB-IoT, 2G) including module, SIM-Card, antenna, adaptor cable, cable gland, O-ring (without rechargeable battery)	**A5E51150447**	
Upgrade kit MAG 8000 IIoT Wireless Communication Module Flex (LTE-M, NB-IoT, 2G) including module, antenna, adaptor cable, cable gland, O-ring, No SIM-Card included, requires customer-provided SIM card (without rechargeable battery)	**A5E51150448**	
MAG 8000 IIoT Wireless Communication Module (LTE-M, NB-IoT, 2G) including SIM-Card (without rechargeable battery)	**A5E51093917**	
MAG 8000 IIoT Wireless Communication Module Flex (LTE-M, NB-IoT, 2G) No SIM-Card included, requires customer-provided SIM card (without rechargeable battery)	**A5E51093918**	
Antenna set for MAG 8000 IIoT or IIoT or LW BLE WCM PVC, IP68, cable length 5 m (16.4 ft) with SMA male connector (type RG 58) and internal antenna adaptor cable, and single entry cable gland	**A5E51198820**	
Rechargeable Lithium battery for MAG 8000 3G or IIoT Wireless Communication Module[1)]	**A5E03436686**	
Analog input cable for MAG 8000 IIoT WCM or 3G WCM 2.5 m (8.2 ft) cable with M12 connector (IP67) A-Coding female 5 pins, and two-entry cable gland	**A5E03436698**	
Antenna adaptor cable for 3G, IIot, or LW BLE WCM Package: 2 pieces	**A5E41896494**	
Cable entry 2 ... 5 mm (0.08 ... 0.20") M12 brass glands with M20 reduction Package of 10 pcs, for Sensus encoder card cable and power cable of external battery pack	**FDK:087L4154**	
Cable entry 4.5 ... 10 mm (0.17 ... 0.39") M16 brass glands with M20 reduction Package of 10 pcs, for WCM module antenna cable	**A5E54481123**	
Two cable entries 3.5 ... 5 mm (0.14 ... 0.20") M20 brass glands Package: 10 pcs	**FDK:087L4158**	

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Selection and ordering data (continued)

Description	Article No.	
Two cable entries 5.5 ... 7.5 mm (0.22 ... 0.30"), M20 brass glands Package: 10 pcs	**FDK:087L4159**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[2]	**FDK:085U0220**	

[1] Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.
[2] Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging.

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Overview



3G/UMTS communication module



PC-IrDA connection

MAG 8000 3G/UMTS Wireless Communication Module

The 3G/UMTS wireless communication module is a compact built-in solution which can be installed in the existing MAG 8000 with SW version 3.02 and higher, supporting HSDPA cat. 8/HSUPA Cat.6 at 5 UMTS bands, with the ability to fall back to GSM/GPRS network in case there is no 3G signal. The 3G/UMTS module collects comprehensive measurement data from MAG 8000 at an interval down to 1 minute, allows for data transmission via numerous protocols including SMS, email via SMTP, email via SMTPS (TLS/SSL-based encryption), FTP, and FTPS (TLS/SSL-based encryption, implicit), with a customer configurable transmission interval (down to 1 hour). This provides customers with the flexibility to receive data via email, FTP or text message for the monitoring and control systems anywhere in the world.

TLS/SSL based data encryption provides a high level information security to protect customers data privacy.

It can be factory-integrated (Article No.: 7ME68 POS 15=S; T), retrofitted (Article No.: A5E51150447+A5E40957990+A5E03436686), or ordered as a spare part (Article No.: A5E41011589).

The 3G/UMTS module offers:

Overview (continued)

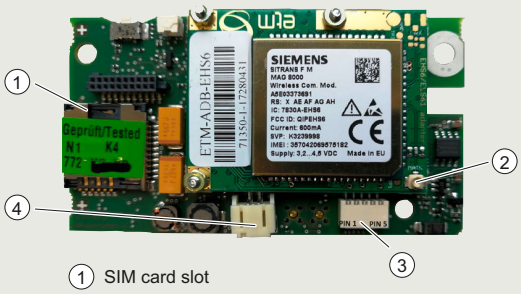
- Remote Qualification Certificate feature to enable the offsite diagnostic and audit on devices installed anywhere in the world
- 2-channel analog input measurement for external ratiometric pressure transmitter, transmission together with flow measurement (2-in-1 solution)
- 4-20 mA alarm signal detection and realtime SMS alarm for tamper protection and flooding situations
- Real-time clock synchronization with internet NTP server, ensuring that all measurement data is accurately timestamped
- Data transmission at customer-specified points in time, allowing for synchronization of information from multiple MAG 8000 devices

The OPC server specifically designed for the MAG 8000 3G/UMTS module is offered free of charge. With this value-added package, the opportunity for measurement data collection and further processing/analyzing for system integration and automation is offered.

The package of information retrieved via the csv file includes:

- Time stamp
- Flow rate
- Tot 1
- Tot 2
- Tot 3
- Analog 1 (mA)
- Analog 2 (V)
- Battery lifetime
- Alarm list (as decimal format)

Electrical installation of 3G/UMTS module



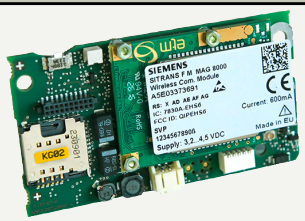
1 SIM card slot
2 3G module's antenna connector
3 Analog inputs inlet
4 Rechargeable battery inlet

A rechargeable buffer battery is mandatory, even if the MAG 8000 is mains power operated.

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Selection and ordering data

Accessories and spare parts for SITRANS FM MAG 8000 3G WCM

Description	Article No.	
MAG 8000 3G/UMTS module Rechargeable battery, antenna and analog cable input must be ordered separately	**A5E41011589**	
High gain antenna for MAG 8000 3G/UMTS PVC, IP68, cable length 5 m (16.4 ft), with SMA male connector (type RG 58) and internal antenna adaptor cable, and single entry cable gland	**A5E40957990**	
Rechargeable lithium battery for MAG 8000 3G or IIoT Wireless Communication Module[1)]	**A5E03436686**	
Analog input cable for MAG 8000 IIoT WCM or 3G WCM 2.5 m (8.2 ft) cable with M12 connector (IP67) A-Coding female 5 pins, and two-entry cable gland	**A5E03436698**	
Antenna adaptor cable for 3G, IIoT or LW BLE WCM Package: 2 pieces	**A5E41896494**	
Cable entry 2 ... 5 mm (0.08 ... 0.20") M12 brass glands with M20 reduction Package of 10 pcs, for Sensus encoder card cable and power cable of external battery pack	**FDK:087L4154**	
Cable entry 4.5 ... 10 mm (0.17 ... 0.39") M16 brass glands with M20 reduction Package of 10 pcs, for WCM module antenna cable	**A5E54481123**	
Two cable entries 3.5 ... 5 mm (0.14 ... 0.20") M20 brass glands Package: 10 pcs	**FDK:087L4158**	

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Selection and ordering data (continued)

Description	Article No.	
Two cable entries 5.5 ... 7.5 mm (0.22 ... 0.30"), M20 brass glands Package: 10 pcs	**FDK:087L4159**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[2]	**FDK:085U0220**	

[1] Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.
[2] Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging.

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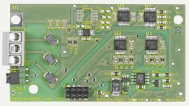
Selection and ordering data

Accessories

Description	Article No.	
IrDA infrared interface adapter with USB for data acquisition with 1.2 m (3.9 ft) cable	**FDK:087L4163**	
Battery backup for mains power supply 1 pc. D-cell (3.6 V, 17 Ah)[1)]	**A5E03354392**	
Internal battery pack one set of 2 D-cell (3.6 V, 34 Ah) and accessories for replacement[1)] incl. NBR O-ring	**FDK:087L4150**	
Internal battery pack with connector 2 D-cell (3.6 V, 34 Ah), incl. accessories for replacement[1)] and NBR O-ring. Certified according to IEC 62281:2019. Made in Europe.	**A5E50698081**	 
External battery pack IP68/NEMA 6P with connector 4 D-cell (3.6 V, 68 Ah)[1)]	**FDK:087L4151**	
External battery pack, IP68/NEMA 6P with connector 4 D-Cell (3.6 V, 68 Ah) without power cable. Certified according to IEC 62281:2019. Made in Europe.[1)]	**A5E50698048**	
Mains power supply 12 ... 24 V AC/DC (average power consumption during line ≤ 0.1 VA) with battery backup and 3 m (9.8 ft) power cable for external connection (backup battery not included) Temperature range Fixed laying: -40 ... +90 °C (-40 ... +194 °F) Flexible application: -30 ... +80 °C (-22 ... +176 °F)	**FDK:087L4210**	
Mains power supply 115 ... 230 V AC, 50/60 Hz with battery backup up and 3 m (9.8 ft) power cable for external connection (backup battery not included)	**FDK:087L4211**	
RS 232 add-on module point to point communication interface with Modbus RTU protocol	**FDK:087L4212**	
RS 485 add-on module multidrop communication interface with Modbus RTU protocol	**FDK:087L4213**	

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Selection and ordering data (continued)

Description	Article No.	
Encoder interface module with "Sensus" protocol for ITRON 200WP and 100W radio	**A5E02475650**	
Cable entry 2 ... 5 mm (0.08 ... 0.20") M12 brass glands with M20 reduction Package of 10 pcs, for Sensus encoder card cable and power cable of external battery pack	**FDK:087L4154**	
Cable entry 4.5 ... 10 mm (0.17 ... 0.39") M16 brass glands with M20 reduction Package of 10 pcs, for WCM module antenna cable	**A5E54481123**	
One cable entry 6 ... 8 mm (0.24 ... 0.31 "), M20 brass glands package[2] Package of 10 pcs, for pulse output cable or MODBUS cable, cello cable or mains power supply	**FDK:087L4155**	
One cable entry 8 ... 11 mm (0.31 ... 0.43 "), M20 brass glands package[2] Package of 10 pcs, for SOFREL cable	**FDK:087L4156**	
One cable entry 11 ... 15 mm (0.43 ... 0.59 "), M20 brass glands package[2] Package of 10 pcs	**FDK:087L4157**	
Two cable entries 3.5 ... 5 mm (0.14 ... 0.20 "), M20 brass glands package[2] Package of 10 pcs	**FDK:087L4158**	
Two cable entries 5.5 ... 7.5 mm (0.22 ... 0.30 "), M20 brass glands package[2] Package of 10 pcs	**FDK:087L4159**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P[3]	**FDK:085U0220**	
MAG 8000 Hardware key to access protected parameters	**FDK:087L4165**	
MAG 8000 demo - training unit pack operating on Alkaline batteries Transmitter with flow tool CD, IrDA interface adapter and hardware key (No dangerous goods limitations)	**FDK:087L4080**	 

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Selection and ordering data (continued)

Description	Article No.	
MAG 8000 IIoT demo case MAG 8000 demo unit with IIoT wireless communication module, remote antenna and antenna cable 5 m (16.4 ft) (including batteries) (considered as product for internal use/demo equipment, special conditions acc. to SPR process can be applied)	**A5E53943523**	
Alkaline battery for MAG 8000 demo transmitter (3 V 13 Ah) (No dangerous goods limitations)	**FDK:087L4142**	

1) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.
2) For cable connection through MAG 8000 transmitter bottom part.
3) Due to its chemical properties, the potting kit cannot be stocked and must be used timely. Information on expiry date can be found on the product packaging.

Spare parts

Description	Article No.	
MAG 8000 Programmed (Basic version) transmitter compact replacement kit[1)] No battery included. Programmed. Comes with original product label. System serial number and MLFB required to order.	**FDK:087L4166**	
MAG 8000 Unprogrammed (Basic version) transmitter compact replacement kit[1)] No battery included. Unprogrammed. Comes with blank product label. No system serial number or MLFB required.	**A5E54176714**	
MAG 8000 Programmed (Basic version) transmitter remote replacement kit[1)] No battery included. Programmed. Comes with original product label. System serial number and MLFB required to order.	**FDK:087L4202**	
MAG 8000 Unprogrammed (Basic version) transmitter remote replacement kit[1)] No battery included. Unprogrammed. Comes with blank product label. No system serial number or MLFB required.	**A5E54176723**	
MAG 8000 Unprogrammed (Advanced version) transmitter compact replacement kit[1)] No battery included. Unprogrammed. Comes with blank product label. No system serial number or MLFB required.	**FDK:087L4203**	

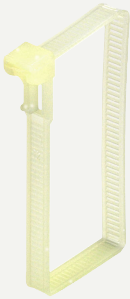
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Selection and ordering data (continued)

Description	Article No.	
MAG 8000 Programmed (Advanced version) transmitter compact replacement kit[1)] No battery included. Programmed. Comes with original product label. System serial number and MLFB required to order.	**A5E54176326**	
MAG 8000 Unprogrammed (Advanced version) transmitter remote replacement kit[1)] No battery included. Unprogrammed. Comes with blank product label. No system serial number or MLFB required.	**FDK:087L4204**	
MAG 8000 Programmed (Advanced version) transmitter remoter eplacement kit[1)] No battery included. Programmed. Comes with original product label. System serial number and MLFB required to order.	**A5E54176680**	
MAG 8000 Unprogrammed (Basic version) transmitter PCB replacement kit[1)] Unprogrammed. No system serial number or MLFB required.	**A5E01171569**	
MAG 8000 Unprogrammed (advanced version) transmitter PCB replacement kit[1)] Unprogrammed. No system serial number or MLFB required.	**FDK:087L4168**	
Enclosure top including plastic lid, screws, O-ring and blank product label	**FDK:087L4167**	
Power cable 1.5 m (4.9 ft) with IP68/NEMA 6P plugs for external battery (no battery included); PE jacket, ambient temperature: -20 °C ... +60 °C (-4 °F ... 140 °F)	**FDK:087L4152**	
Encoder interface cable with IP68/NEMA 6P plugs included, for ITRON 200WP and 100W radio; 22 AWG stranded TC conductors, polypropylene insulation, twisted pair, overall Beldfoil shield, 22 AWG stranded TC drain wire, PVC jacket • Length: 152.4 cm (5 ft)	**A5E02551263**	

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Selection and ordering data (continued)

Description	Article No.	
• Length: 762 cm (25 ft)	**A5E02551182**	
Service kit package with various components for service and replacement Content: • 10 × plastic top lids • 20 × screws • 10 × wire holders • 10 × battery cups • 10 × greased O-rings • 20 × clamp kits • 10 × IrDA adaptor holding rings	**FDK:087L4162**	     
Remote cable set with IP68/NEMA 6P plugs, M20, 1 pc. • 5 m (16.4 ft)	**A5E00862482**	

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Selection and ordering data (continued)

Description	Article No.	
• 10 m (32.8 ft)	A5E00862487	
• 20 m (65.6 ft)	A5E00862492	
• 30 m (98.4 ft)	A5E00862497	
Remote cable set, M20 plug with pre-mounted M40 conduit adaptor		
• 10 m (32.8 ft)	A5E33400834	
• 20 m (65.6 ft)	A5E33400836	
Grounding ring kit, flat ring, in stainless steel AISI 316 1.4436, incl. screws, 2 pcs[2]		
• DN 25 (1")	A5E01002946	
• DN 40 (1½")	A5E01002947	
• DN 50 (2")	A5E01002948	
• DN 65 (2½")	A5E01002950	
• DN 80 (3")	A5E01002952	
• DN 100 (4")	A5E01002953	
• DN 125 (5")	A5E01002954	
• DN 150 (6")	A5E01002955	
• DN 200 (8")	A5E01002957	
• DN 250 (10")	A5E01002958	
• DN 300 (12")	A5E01002962	

1) Not applicable to custody transfer (CT) verified systems without re-verification.
2) When MAG 8000 (7ME6810 and 7ME6820) is installed in PVC or coated pipelines, grounding rings must be installed additionally. Grounding rings, type C must be used for the 7ME6810 and 7ME6820 routes (sizes > DN 300). Please see grounding rings in the section MAG 3100 Grounding rings and be aware that the mentioned MLFB codes include only 1 grounding ring. Grounding rings DN 25 to DN 300 in stainless steel are packed in pairs and sold as a "grounding ring kit".

Operating instructions for SITRANS FM MAG 8000

Description	Article No.
• English	A5E03071515
• German	A5E00740986

Operating instructions for MAG 8000 3G/UMTS communication module

Description	Article No.
• English	A5E03644134

All literature is available to download for free, in a range of languages, at
www.siemens.com/processinstrumentation/documentation

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Overview



The SITRANS FM Verificator is an external tool designed for MAG 5000 and MAG 6000 with MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P or MAG 5100 W sensors to verify the entire product, the installation and the application.

The goal is to improve operation, reduce downtime and maintain measurement accuracy as long as possible.

The SITRANS FM Verificator is highly advanced and carries out the complex verification and performance check of the entire flowmeter system, according to unique SIEMENS patented principles. The whole verification test is automated and easy to operate so there is no opportunity for human error or influence. The system is traceable to international standards and tested by WRc (Water Research Council).

- Stand alone Verificator to measure a number of selected parameters in the flow sensor and a transmitter which affects the integrity of the flow measurement.
- Up to 20 measurements can be stored in the Verificator.
- The Verificator can be connected via a serial cable to a PC enabling download of the data. A Windows program enables printing and management of verificator reports.

Mode of operation

Verification - Steps

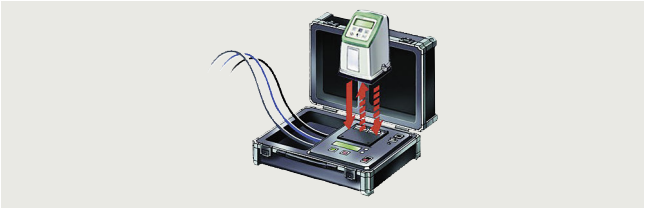
Transmitter test

Verification of a SITRANS FM flowmeter consists of the following test routines:

1. Transmitter test
2. Flowmeter and cable insulation test
3. Sensor magnetism test

1. Transmitter test

The transmitter test is the traditional way of on-site testing on the market and checks the complete electronic system from signal input to output.

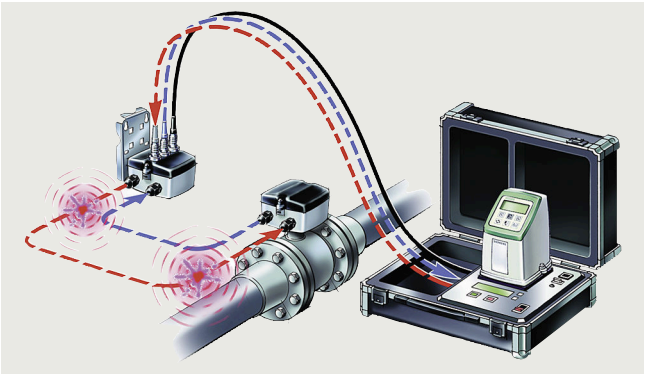


Transmitter test

Using the excitation power output, which is generated to drive the magnetic field of the sensor, the verificator simulates flow signal to the transmitter input. By measuring the transmitter outputs the verificator calculates its accuracy against defined values. The test includes:

- Excitation power to drive the magnetic field
- Signal function from signal input to output
- Signal processing – gain, offset and linearity
- Test of analogue and frequency output

2. Insulation test



Flowmeter insulation test

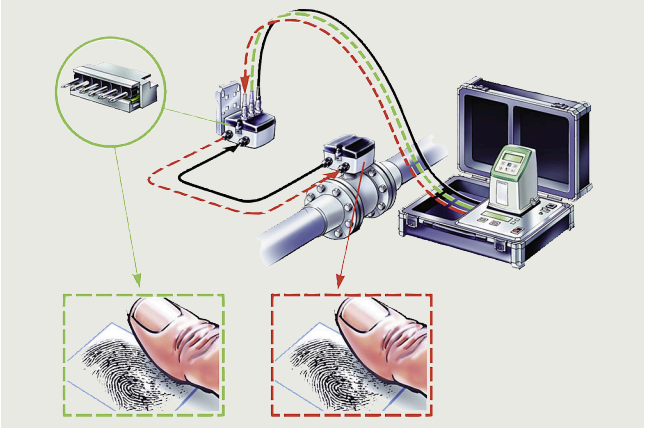
The verification test of the flowmeter insulation is a “cross-talk” test of the entire flowmeter which ensures that the flow signal generated in the sensor is not affected by any external influences. In the “cross-talk” test the verificator generates a high voltage disturbance within the coil circuit and then looks for any “cross-talk” induced in the flow signal circuit. By generating dynamic disturbances close-coupled to the flow signal, the flowmeter is tested for noise immunity to a maximum level:

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Mode of operation (continued)

- EMC influence on the flow signal
- Moisture in sensor, connection and terminal box
- Non-conductive deposit coating the electrodes within the sensor
- Missing or poor grounding, shielding and cable connection

3. Sensor magnetism test



Sensor magnetism test

The verification of the sensor magnetism is a "boost" test of the magnetic field coil. The test ensures that the magnetism behaviour is like the first time, by comparing the current sensor magnetism with the "fingerprint" which was determined during initial calibration and stored in the SENSORPROM memory unit.

In the "boost" test the verificator changes the magnetic field in certain pattern and with high voltage to get quick stable magnetic condition. This unique test is fulfilled without any interference or compensation of surrounding temperature or interconnecting cabling.

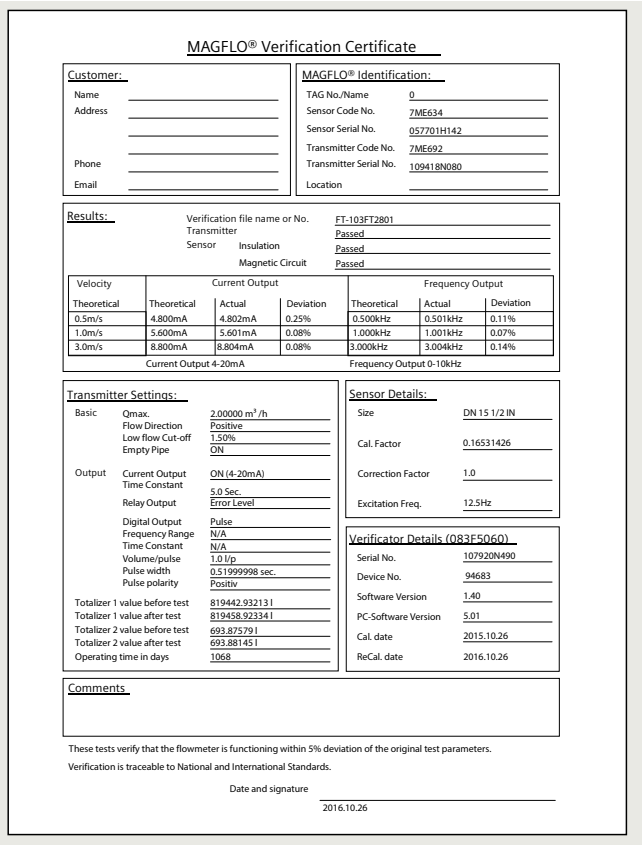
- Changes in dynamic magnetic behaviour
- Magnetic influence inside and outside the sensor
- Missing or poor coil wire and cable connection

Certificate

The test certificate generated by a PC contains:

- Test result with passed or failed
- Installation specification
- Flowmeter specification and configuration
- Verificator specification with date of calibration ensuring traceability to international standards

Mode of operation (continued)



MAGFLO® Verification Certificate

Customer:
Name
Address
Phone
Email

MAGFLO® Identification:
TAG No./Name 0
Sensor Code No. 7ME634
Sensor Serial No. 057701H142
Transmitter Code No. 7ME692
Transmitter Serial No. 109418N080
Location

Results:
Verification file name or No. FT-103FT2801
Transmitter
Sensor Insulation Passed
Magnetic Circuit Passed

Velocity	Current Output			Frequency Output		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.802mA	0.25%	0.500kHz	0.501kHz	0.11%
1.0m/s	5.600mA	5.601mA	0.08%	1.000kHz	1.001kHz	0.07%
3.0m/s	8.800mA	8.804mA	0.08%	3.000kHz	3.004kHz	0.14%
	Current Output 4-20mA			Frequency Output 0-10kHz		

Transmitter Settings:
Basic Qmax. 2.00000 m³/h
Flow Direction Positive
Low flow Cut-off 1.50%
Empty Pipe ON
Output Current Output ON (4-20mA)
Time Constant 5.0 Sec.
Relay Output Error Level
Digital Output Pulse
Frequency Range N/A
Time Constant N/A
Volume/pulse 1.0 l/p
Pulse width 0.51999998 sec.
Pulse polarity Positiv
Totalizer 1 value before test 819442.93213 l
Totalizer 1 value after test 819458.92334 l
Totalizer 2 value before test 693.87579 l
Totalizer 2 value after test 693.88145 l
Operating time in days 1068

Sensor Details:
Size DN 15 1/2 IN
Cal. Factor 0.16531426
Correction Factor 1.0
Excitation Freq. 12.5Hz

Verificator Details (083F5060)
Serial No. 107920N490
Device No. 94683
Software Version 1.40
PC-Software Version 5.01
Cal. date 2015.10.26
ReCal. date 2016.10.26

Comments

These tests verify that the flowmeter is functioning within 5% deviation of the original test parameters.
Verification is traceable to National and International Standards.

Date and signature
2016.10.26

Note:

It is mandatory to have the Verificator returned to the factory once a year for check and re-verification.

Selection and ordering data

Description	Article No.
SITRANS FM Verificator	
11 ... 30 V DC, 11 ... 24 V AC, 115 ... 230 V, 50 Hz	**FDK:083F5060**
11 ... 30 V DC, 11 ... 24 V AC, 115 ... 230 V, 60 Hz	**FDK:083F5061**

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Overview



In-situ verification tool SITRANS Verificator

The SITRANS Verificator is the next generation in-situ verification device for use with a various of SITRANS FM flow meters. The battery powered device carries out a complex verification and performance check of the entire flowmeter system. The whole verification test is fully automated and can be controlled using a mobile software application via the Bluetooth interface.

Key features

- In-situ check of performance without interrupting the flowmeter installation
- Simple method of checking product health
- Easy-to-use connection to your device
- Automated input/output tester
- Field-replaceable battery
- Full verification test with one click
- Generation of verification test certificate
- Fast feedback of device condition
- Easy emailing of verification test certificate in the field
- Condition monitoring for predictive maintenance to optimize asset reliability
- Full traceability – Annual certification of verification system insures complete documentation for regulatory and ISO standards compliances
- Always up to date through periodic recalibration and service checks

The software application SITRANS mobile IQ gives you easy access to the SITRANS Verificator via your smartphone or tablet.

Download the software application SITRANS mobile IQ for free and activate the verification license to provide the best possible check of measurement accuracy, without stopping your process. The validation device verifies the condition and performance of the device under test. With the mobile IQ software, test reports can be generated and stored locally for further analysis on the mobile device.

License model

To perform a verification, a token-based license (pay-per-use) must be purchased and activated for the Verificator. This is a hardware-locked license that can only be assigned to one SITRANS Verificator at a time. After activation the license validity is 12 months (plus 2 months grace period). Various license packs are available:

Overview (continued)

- Basic 1 (20 tokens)
- Basic 2 (50 tokens)
- Pro 100 (100 tokens)
- Pro 200 (200 tokens)
- Pro 300 (300 tokens)
- Premium (unlimited tokens)

Supported products

The SITRANS Verificator confirms accurate performance for the following SITRANS FM products:

New MAG System

- SITRANS FMS100 flow sensor
- SITRANS FMS300 flow sensor
- SITRANS FMS500 flow sensor
- SITRANS FMT020 flow transmitter

Old MAG System

- SITRANS FM MAG1100 flow sensor
- SITRANS FM MAG1100F flow sensor
- SITRANS FM MAG1100HT flow sensor
- SITRANS FM MAG3100 flow sensor
- SITRANS FM MAG3100P flow sensor
- SITRANS FM MAG3100HT flow sensor
- SITRANS FM MAG5100W flow sensor
- SITRANS FM MAG5000 flow transmitter
- SITRANS FM MAG5000 19" flow transmitter
- SITRANS FM MAG6000 flow transmitter
- SITRANS FM MAG6000 19" flow transmitter

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Benefits

External verification

The inspection of the flowmeter is carried out by an external verification device. During the entire testing process, the verification device is connected to the flowmeter via test interfaces, and a functional test is carried out by simulating calibrated reference signals and observing system response.

- Traceable check of entire electromagnetic flowmeter by performing functional tests using injected reference signals for flow simulation
- Qualitative assessment based on a pass-fail criterion
- Verificator calibration concept according to ISO 17025 standards ensuring long term stability of the external test system
- Metrologically traceable factory references for user confidence
- Annual calibration of verification system to meet ISO 9001 quality regulations

Test coverage

- Signal input processing - Linearity of the amplifier
- I/O processing - Current and digital output
- Crosstalk measurement
- Insulation resistance
- Coil boost time (“Fingerprint”)
- Coil resistance

Device status

The verification device itself includes LED indicators to advise operation status:

- Bluetooth connection
- Instrument detected
- Under test (verification in progress)
- Device power ON indicator
- Battery condition

Mobile software application

The SITRANS Verificator is designed to be connected to the software application SITRANS mobile IQ running on an Android and iOS mobile device in order to communicate information and data via the Bluetooth interface.

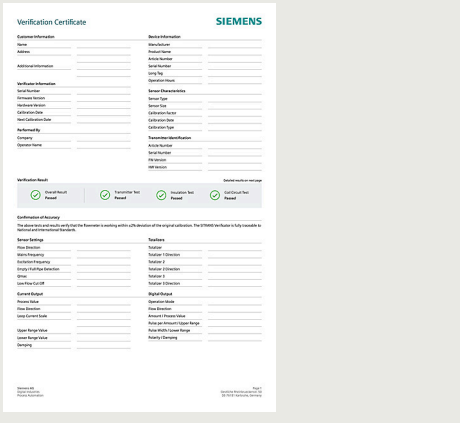
- Easy to operate testing of product performance and maintenance needs
- Detailed certificate printing for regulatory and quality system management
- Move from reactive to predictive maintenance planning with historical data analysis
- Local data storage capabilities

Verification test certificate

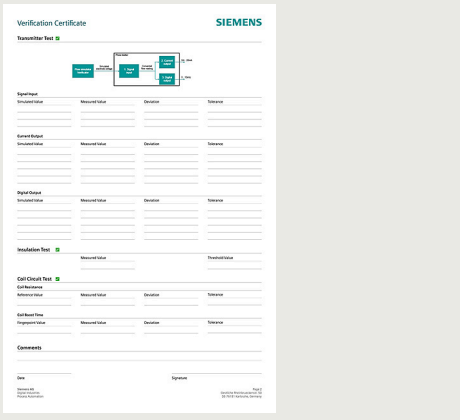
The test certificate generated by the SITRANS mobile IQ software application contains:

Benefits (continued)

- Test result with passed or failed
- Detailed measurement results for all verification tests
- Customer and operator information
- Flowmeter specification and configuration
- Verificator specification with date of calibration ensuring traceability to international standards.


Verification Certificate

SIEMENS


Verification Certificate

SIEMENS

Transmitter Test

Application

The SITRANS Verificator can be used in:

- New applications: to approve new installations with valid certificate for handover
- Existing applications: to ensure correct product quality and continuous accuracy
- To confirm that a flowmeter fulfills certain technical requirements of functionality as defined by the manufacturer
- As assessment tool to produce a qualitative statement about the product stability

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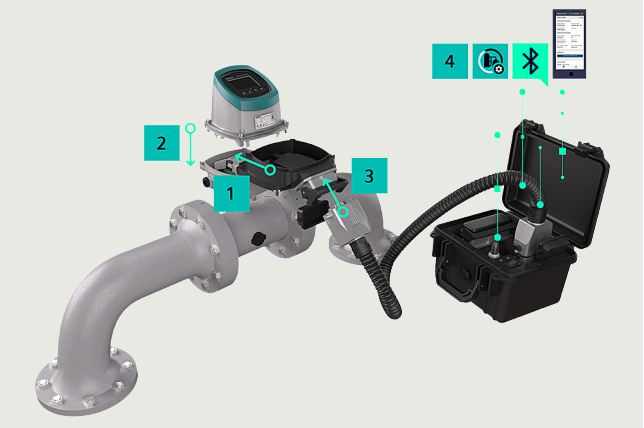
Mode of operation

Test functions

Transmitter test

The transmitter verification checks the whole electronic system from signal input to output. Using a traceable calibrated precision network, the Verificator simulates flow signals to the transmitter input. By measuring the transmitter outputs, the Verificator calculates its accuracy against defined factory values.

- Signal function from signal input to output
- Signal processing – gain, offset, and linearity
- Test of current and digital output



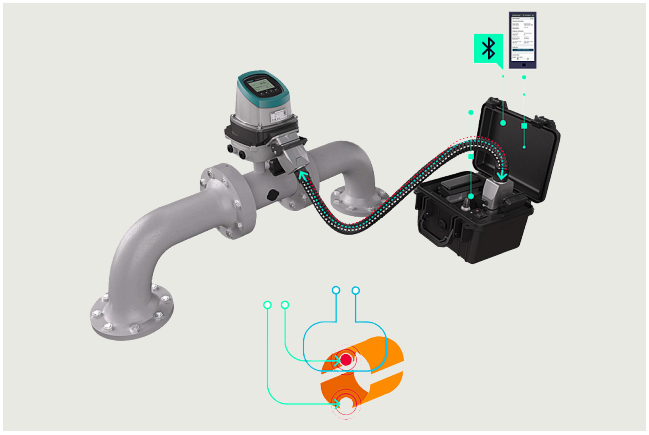
Transmitter test: Steps for connecting SITRANS Verificator to SITRANS FMx20

Insulation test

The verification test of the flowmeter insulation is a “crosstalk” test of the entire flowmeter and installation, which ensures that the flow signal generated in the sensor is not affected by any external influences. By generating dynamic disturbances close coupled to the flow signal, the flowmeter is tested for noise immunity to a maximum level.

- EMC influence on the flow signal
- Moisture in sensor, connection and terminal box
- Non-conductive deposit coating the electrodes
- Missing or poor grounding, shielding and cable connection

Mode of operation (continued)



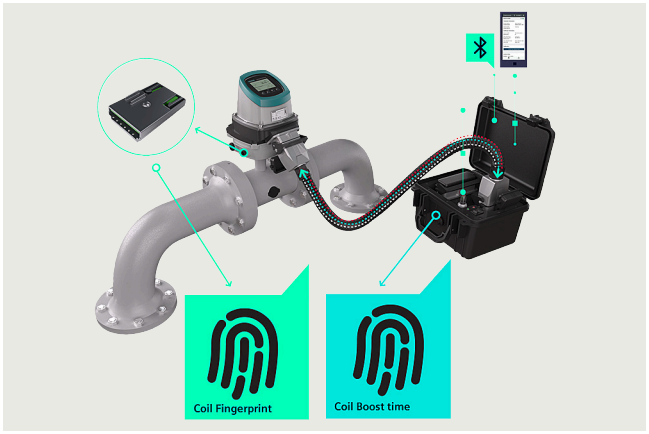
Flowmeter insulation test

Coil circuit test

The verification of the coil circuit is an integrity check of the sensor magnetic field coil. The test ensures that the magnetism behavior is like the first time, by comparing the current sensor magnetism with the “fingerprint” (coil boost time) which was determined during initial calibration and stored in the SENSORPROM memory unit.

In the “Coil Boost Time” test the Verificator changes the magnetic field in certain pattern and with high voltage to get quick stable magnetic condition. This unique test is performed without any interference or compensation of surrounding temperature or interconnecting cabling.

- Changes in dynamic magnetic behaviour
- Magnetic influence inside and outside the sensor
- Missing or poor coil wire and cable connection



Fingerprint test

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Selection and ordering data

Description	Article No.	
SITRANS Verificator Validation device for in-situ performance check of magnetic flow meters without process interruption. Scope of supply: Protective case with Verificator test unit, connection cable, battery charger, batteries (2 pcs.), SITRANS FMT020 adapter, snap hook	**7ME6900-1AA10-....**	

SITRANS Verificator	Article No. 7ME6900-									
	1	A	A	1	0	-	●	●	●	1
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Transmitter adaptor versions										
FMT020 Adaptor							1			
FMT020 and MAG5000/6000 Adaptors							2			
License										
Without license								A		
Basic 20 (token quantity 20, license validity 12 months after activation)								C		
Basic 50 (token quantity 50, license validity 12 months after activation)								D		
Pro 100 (token quantity 100, license validity 12 months after activation)								F		
Pro 200 (token quantity 200, license validity 12 months after activation)								G		
Pro 300 (token quantity 300, license validity 12 months after activation)								H		
Premium (token quantity unlimited, license validity 12 months after activation)								P		
Premium 10 (token quantity unlimited, license validity 10 years after activation)								T		
Battery charger										
Type A, CEE7/7 mains connector (Europe)									A	
Type C, AS3112 mains connector (Australia)									B	
Type D, BS1363 mains connector (United Kingdom)									C	
Type K, NEMA 5-15P mains connector (United States)									D	
Type L, SEV1011 mains connector (Switzerland)									E	
Type J, JIS8303 mains connector (Japan)									F	

Additional information	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Device options	
Car charger for battery	**J01**

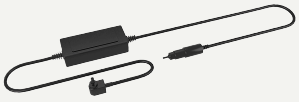
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Selection and ordering data (continued)

Licenses SITRANS Verificator

Description	Article No.	
Token-based license type (pay-per-use) License validity 12 months (plus 2 months grace period) after activation		
• License pack – Basic 20 (Token quantity 20)	**7ME6901-1AA10-1LB0**	
• License pack – Basic 50 (Token quantity 50)	**7ME6901-1AA10-1LB1**	
• License pack – Pro 100 (Token quantity 100)	**7ME6901-1AA10-1LE0**	
• License pack – Pro 200 (Token quantity 200)	**7ME6901-1AA10-1LE1**	
• License pack – Pro 300 (Token quantity 300)	**7ME6901-1AA10-1LE2**	
• License pack – Premium (Token quantity unlimited)	**7ME6901-1AA10-1LU0**	
• License pack – Premium 10 (Token quantity unlimited, license validity 10 years after activation)	**7ME6901-1AA10-1LU3**	

Accessories SITRANS Verificator

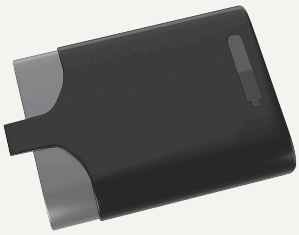
Description	Article No.	
Battery charger		
• Type I (AS3112) for Australia	**7ME3940-4PS00**	
• Type G (BS1363) for U.K.	**7ME3940-4PT00**	
• Type A (JIS8303) for Japan	**7ME3940-4PQ00**	
• Type B (NEMA 5-15P) for United States	**7ME3940-4PU00**	
• Type J (SEV1011) for Switzerland	**7ME3940-4PV00**	
• Type E, F (CEE7/7) for Europe	**7ME3940-4PR00**	
Car adapter	**A5E50441092**	

Spare parts SITRANS Verificator

Description	Article No.	
SITRANS FMT020 adapter (serial number of SITRANS Verificator must be specified when ordering)	**7ME6901-1AD10**	
Connection cable	**7ME6901-1CA10**	

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Selection and ordering data (continued)

Description	Article No.	
Portable protective case including foam padding	**A5E50441009**	
Rechargeable battery 1 pc.	**A5E50441091**	
Shoulder strap	**A5E50441096**	
Gasket for SITRANS FMT020 adapter	**A5E50441094**	
Snap hook	**A5E50441093**	

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Technical specifications

FM Verificator	
Test capability	
Transmitter test	• Signal input • Current output • Digital output
Coil circuit test	• Coil boost time (Fingerprint) • Coil resistance
Insulation test	• Signal immunity
Verification accuracy	
Current output (active/passive)	
• 4 ... 20 mA signal	±0.1 %
Digital output (active/passive)	
• 0.5 ... 10 kHz signal	±0.02 %
Signal input	
• 0.5 m/s (1.6 ft/s)	±0.05 %
• 1.0 m/s (3.3 ft/s)	±0.05 %
• 3.0 m/s (9.8 ft/s)	±0.05 %
Fingerprint (coil boost time)	±0.5 %
Coil resistance	±0.2 %
Insulation	Threshold = 12.5 mm/s
Operating conditions	
Ambient temperature	
• Operation (Humidity max. 90 %)	-20 ... +50 °C (-4 ... +122 °F)
• Storage (without battery) (Humidity max. 90 %)	-40 ... +70 °C (-40 ... +158 °F)
• Storage with battery	-20 ... +50 °C (-4 ... +122 °F)
Environnemental class	4M11
Altitude	Up to 2000 m (6560 ft)
Pollution degree	3
Overvoltage category	II
Design	
Material	
• Enclosure	Polycarbonate
• Interface adapter	Aluminum
Degree of protection	IP54
Mechanical load	
• Vibration resistance	Vibration, sinusoidal according to EN 60068-2-6 / IEC 60068-2-6
• Shock resistanc	Shock, half-sine according to EN 60068-2-27 / IEC 60068-2-27
EMC performance	
• Emission	EN 300328
• Immunity	IEC/EN 61326-1
Dimensions	See dimensional drawings
Weight	See dimensional drawings
Power supply	Battery-powered, battery capacity allows for 10 hours continuous use
Battery pack	Lithium-ion battery, 14.4 V DC, 3800 mAh
Charger for battery pack	External battery charger, AC-Adapter: 100 ... 240 V AC, 60 Hz, 1.7 A
Connectivity	
Bluetooth interface	BLE 4.2
• Range	Class 2; approx. 10 m depending on mounting position
Certificates and approvals	
General purpose	CE (LVD, EMC, RoHS) UL certified per standard IEC 61010-1
Radio approvals	RED (EU, UK) FCC (US) IC (Canada) RCM (Australia)

Technical specifications (continued)

SITRANS Mobile IQ	
Device connectivity	Manages connection with SITRANS Verificator to enable data sharing
Device cockpit	Indicates useful information about the connected devices, and license status
License management	Activation and management of verification licenses
Test result analysis	Documentation and management of past test results
Charts	History of selected test results and diagnostic values

Download app

SITRANS mobile IQ App in App Store

SITRANS mobile IQ App in Google Play Store

Dimensional drawings

Dimensions of SITRANS Verificator

Portable protective case

Size: 603 × 470 × 230 mm (23.8 × 18.5 × 9.1 inch)

Weight: 15.25 kg (33.1 lb)

Verificator test unit

Size: 269 × 245 × 175 mm (10.6 × 9.6 × 6.9 inch)

Weight: 4.1 kg (8.8 lb)

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Overview

Siemens offers two types of ultrasonic flowmeters, inline flowmeters and clamp-on flowmeters. This offers the end user the maximum flexibility to choose the technology that best fits his needs. This following chapter shows the inline versions.



SITRANS FS inline ultrasonic flowmeters measure flow of electrically conductive and non-conductive liquids.

Benefits

- Greater flexibility:
  - Sensor sizes from DN 50 to DN 1200 mm (2" to 48")
  - Inline retrofit as 1-path and 2-path up to DN 1200 (2" to 48")
  - Compact and remote transmitter installation
  - HART and PROFIBUS PA communication
  - Mains or battery powered solutions
  - Dedicated transmitter portfolio for HVAC, power generation, utility and general industry as well as more demanding applications
- Easier service:
  - Exchange of the transducers without interrupting operation
  - Battery lifetime of up to 6 years
- Approvals/certificates:
  - Custody transfer approvals within district heating
  - Standard with calibration certificate

Application

Inline ultrasonic flowmeters are suitable for measuring the flow of liquids with good acoustic permeability, independent of conductivity, viscosity, temperature, density and pressure:

- Max. 3 % solids
- Max. 3 % air and gas
- Max. 350 cSt

The main applications can be found in the following sectors:

- Raw water intake for water treatment plants
- Treated waste water
- Power generation and utility
- Irrigation systems
- Cooling water plants within the industry and in power stations
- Plants transporting non-conductive liquids
- Custody transfer - district heating (MID-004)
- HART/4 to 20 mA output
- PROFIBUS PA

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Application

Please see Product selector
http://www.pia-selector.automation.siemens.com
on the Internet, since some constrains might be related to some of the features

PIA Life Cycle Portal
The tool for Engineering, Ordering, Installation and Operation



	FS130 7ME3723...	FS120 7ME3570...
Industry		
Water, treated waste water	XXX	XXX
Irrigation	XXX	XXX
Utility, district heating water, cooling	XXX	XXX
Utility, district heating, CT approvals required		
Onshore and Offshore applications	XX	X
Design		
Compact transmitter mounted on pipe		
Remote transmitter- Sensor up to 100 m	●	●
Transducers can be replaced under pressure	●	●
Retrofit on existing steel pipes/non weldable	●	●
Transmitter enclosure		
Polyamid, IP67		●
Die-cast aluminum (painted), IP65	●	
Communication		
HART	●	●
PROFIBUS PA	●	
Power supply		
3.6 V Battery		
115 ... 230 V AC	●	●
115 ... 230 V AC and 3.6 V battery backup		
24 V AC/DC	●	●
Accuracy		
0.25 % (2- 4 path system)	●	
0.50 %	●	●
Sensor design		
1-path ultrasonic measurement	●	●
2-path ultrasonic measurement	●	
4-path ultrasonic measurement	●	
Dimension		
DN 50 (2")		
DN 65 (2½")		
DN 80 (3")		
DN 100 (4")	1-path only	1-path only
DN 125 (5")	1-path only	1-path only
DN 150 (6")	1-path only	1-path only
DN 200 (8")	●	●
DN 250 (10")	●	●
DN 300 (12")	●	●
DN 350 (14")	●	●
DN 400 (16")	●	●
DN 500 (20")	●	●
DN 600 (24")	●	●
DN 700 (28")	●	●
DN 800 (32")	●	●
DN 900 (36")	●	●
DN 1000 (40")	●	●
DN 1200 (48")	●	●
Process connection		
Flanges		
Flanges norm		
EN 1092-1		

Application (continued)

Please see Product selector
http://www.pia-selector.automation.siemens.com
on the Internet, since some constrains might be related to some of the features

PIA Life Cycle Portal
The tool for Engineering, Ordering, Installation and Operation



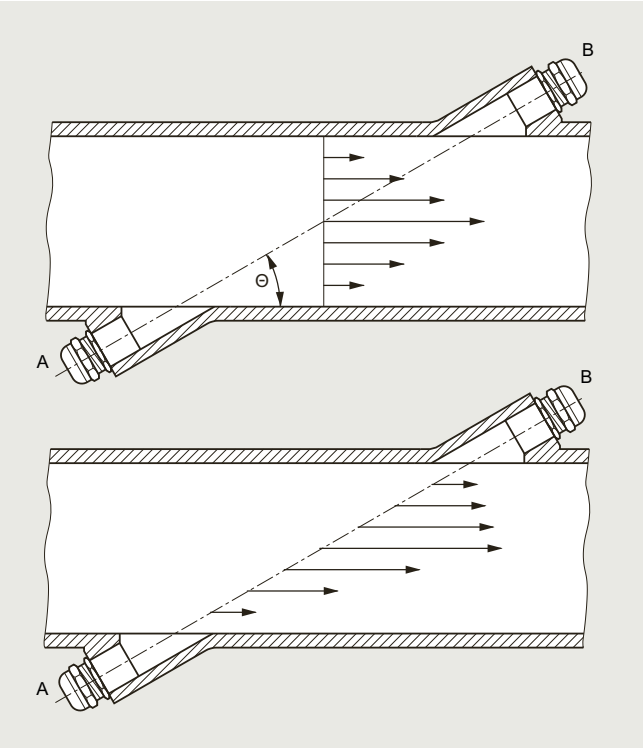
	FS130 7ME3723...	FS120 7ME3570...
Pressure rating		
PN 6	●	●
PN 10	●	●
PN 16	●	●
PN 25	●	●
PN 40	●	●
Pipe, flange		
Carbon steel	●	●
Die-cast bronze (DN 50, 65, 80)		
Media temperature		
-20 °C (-4 °F)	●	●
-10 °C (+14 °F)	●	●
+2 °C (+35.6 °F)	●	●
+60 °C (+140 °F)	●	●
+120 °C (+248 °F)	●	●
+150 °C (+302 °F)	●	●
+160 °C (+320 °F)	●	●
+190 °C (+374 °F)	●	●
+200 °C (+392 °F)	●	●
Measuring principle		
Transit time principle	●	●
Approvals		
Custody transfer approval		
MID, MI-004, EN 1434 (European energy meter standard)		
Other country-specific type approval available for:		
• China (CPA/CMC)	●	●
• Korea KC	●	●
Ex approval		
Ex d ATEX	●	
Ex i ATEX	●	

X = can be used, **XX** = often used, **XXX** = most often used, ● = available

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Function

Physical principle (single path)



Velocity distribution along sound path

A sound wave traveling in the same direction as the liquid flow arrives at point B from point A in a shorter time than the sound wave traveling against the direction of flow (from point B to A). The difference in sound transit time indicates the flow velocity in the pipe.

Since delay time is measured at short intervals both in and against flow direction, viscosity and temperature have no influence on measurement accuracy.

Measuring principle

In SITRANS F US flowmeters the two ultrasonic transducers are placed at an angle θ in relation to the pipe axis. The transducers function as transmitters and receivers of the ultrasonic signals. Measurement is performed by determining the time the ultrasonic signal takes to travel with and against the flow. The principle can be expressed as follows:

$v = K \cdot (t_{B,A} - t_{A,B}) / (t_{A,B} \cdot t_{B,A}) = K \cdot \Delta t/t^2$

v = Average flow velocity
t = Transit time
K = Proportional pipe geometry factor

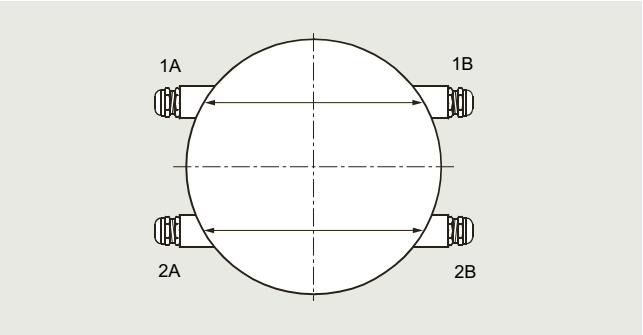
This measuring principle offers the advantage that it is independent of variations in the actual sound velocity of the liquid, i.e. independent of the temperature. Proportional factor K is determined by wet calibration.

Direct signal processing

The ultrasonic signal is sent directly between the transducers. The advantage gained sending signals from point to point is an extremely good signal strength.

Function (continued)

2-path solution



Ultrasonic 2-path flowmeter with 4 transducers. In the upper path transducers 1A/1B and in the lower path 2A / 2B are displayed.

The accuracy of ultrasonic flowmeters depends on the pipe geometry before and after the flowmeter and the number of ultrasonic measuring paths.

When water flows through a pipe, it has a tendency to swirl and/or flow with different velocities inside the pipe, depending on the pipe design.

A 2-path ultrasonic flowmeter offers:

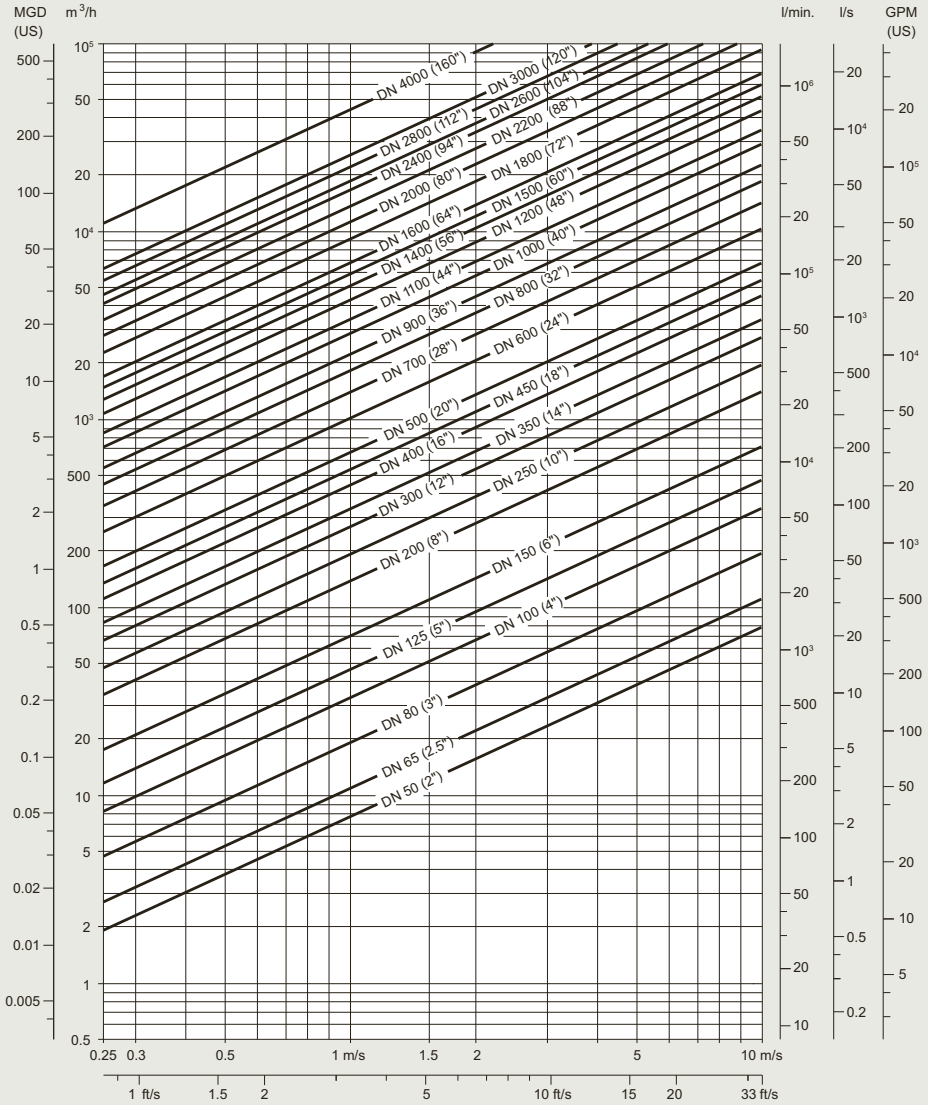
- less sensitivity to upstream obstruction like bends, pumps or valves
- high security in the measurements as the meter continues to measure even if, for some reason, one path stops working

Typical straight inlet requirements are upstream 10 x D_i (D_i = diameter of the flowmeter) and downstream 3 x D_i.

Typical accuracy that can be reached with 2-path ultrasonic flowmetering is ± 0.5 % with installations according to above demands.

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Technical specifications



Nominal size and flow

Guidelines for selection of sensor

- Min. measuring range: 0 ... 1 m/s
- Max. measuring range: 0 ... 10 m/s

Nominal flow velocity:

- Normal: 1 ... 3 m/s
- Minimum: not permanently below 0.5 m/s
- Maximum: up to 8 m/s

Flow velocity calculation formula:

- $v = (4 \times Q_{max}) / (\pi \times D_i^2 \times 3600)$
- v in m/s, Q_{max} in m^3/h, D_i in m

Additional to the flow velocity check it is recommended to observe the Reynolds number (Re):

The optimal performance of the flowmeter is with a Re above 10 000, which is typical for flow velocities (water) above 0.5 m/s. Avoid an Re value between 2000 and 5000. In order to observe this and to be above the recommended 0.5 m/s flow velocity limit the sensor size must be reduced.

Re formula: Re = V × Di / Viscosity

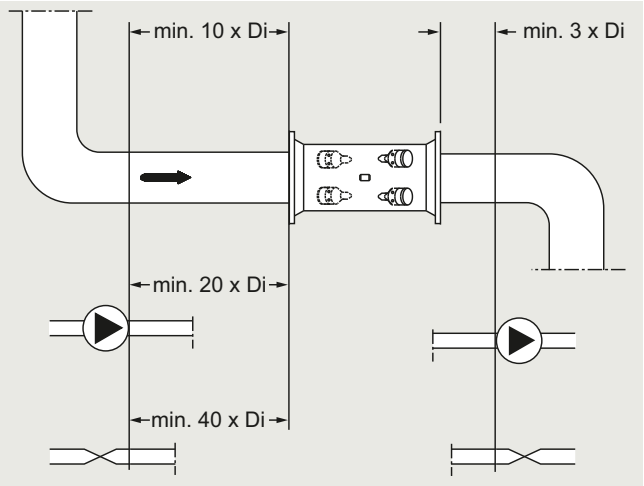
V in m/s, Di in m, Viscosity in cSt ($X \times E^{-6}$ m^2/s)

Example: Viscosity for water at 20 °C = $1 \times E^{-6}$ m^2/s

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Technical specifications (continued)

Inlet and outlet conditions



Recommended inlets and outlets

To maximize performance inlet and outlet must be straight. There must be a certain distance between flowmeter and bends, pumps and valves. It is also important to centre the flowmeter in relation to pipe flanges and gaskets.

Valves must always be installed after the flowmeter. The only exception is installation of the sensor in a vertical pipe. In this case a valve below the sensor is necessary to allow zero point adjustment. It is important to select a valve which does not alter the flow when fully open.

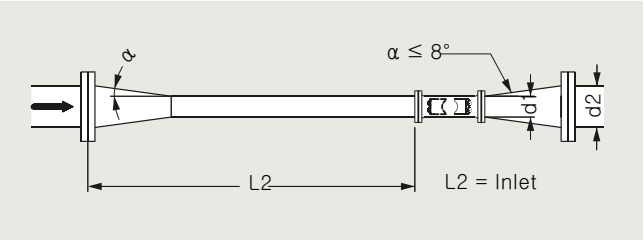
Recommended inlet/outlet	
	SONO 3300, SONO 3100
90° bend	10 × D_i
Fully opened valve	10 × D_i
Partially opened valve	40 × D_i
2 x 90° bends in same plane	15 × D_i
2 x 90° bends in two planes	20 × D_i
Reductions (Outlet 0 x D_i)	10 × D_i
Pumps	20 × D_i
Outlet	3 × D_i

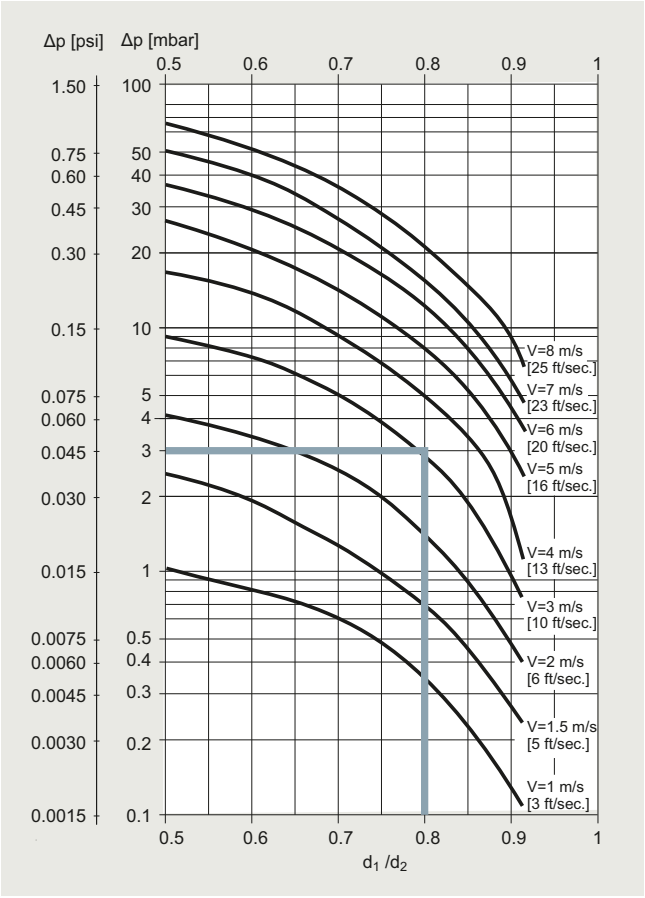
Reductions

The flowmeter can be installed between two reducers (e.g. DIN 28545). At 8° the pressure drop curve below applies.

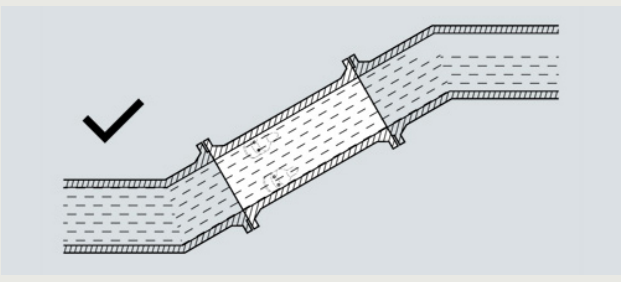
Example:

A flow velocity of 3 m/s (V) in a sensor with a diameter reduction from DN 250 to DN 200 (d_1/d_2 = 0.8) gives a pressure drop of 3 mbar.





The sensor must always be completely filled with liquid:

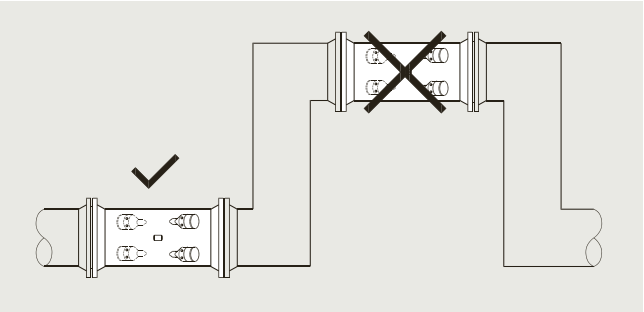


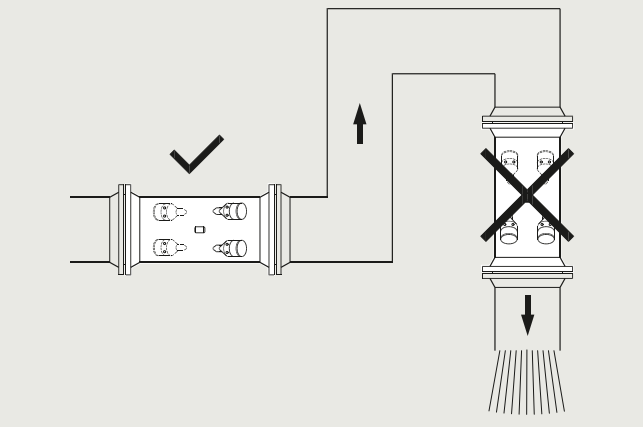
The following installations must be avoided:

- Installation at the highest point of the pipe system
- Installation in vertical pipes with free outlet

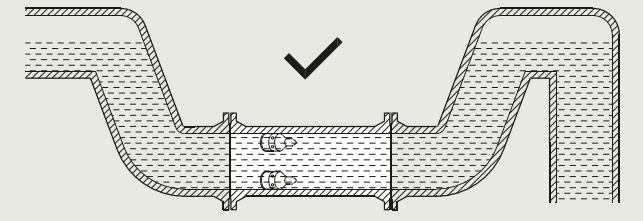
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Technical specifications (continued)

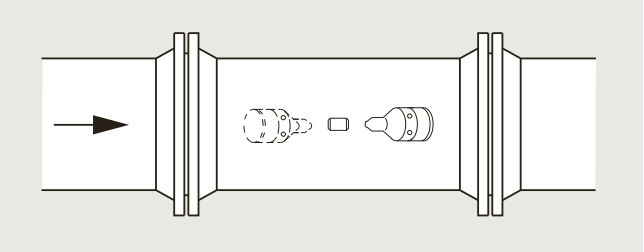




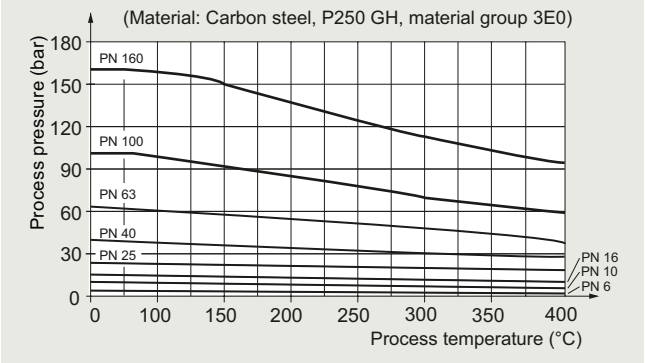
With partially full pipes or pipes with free outlet the flowmeter should be located in a U-shaped tube:

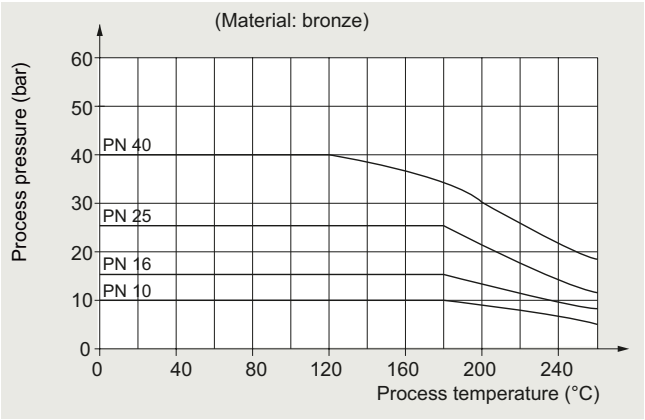


Installing the transducers in horizontal position is recommended:

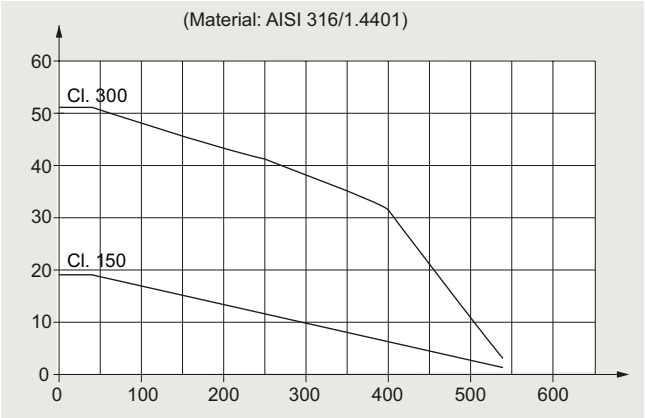


Pressure/temperature curve to EN (DIN) flanges





Pressure/temperature curve to ANSI B16.5 flanges



Note: The pressure/temperature curves only assist in the selection of a system. No responsibility is taken for the correctness of the information. For exact data please refer to the PED requirements.

Reference conditions

To ensure continuous accurate measurement, flowmeters must be calibrated. The calibration is conducted at Siemens flow facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

Therefore the calibration certificate ensures recognition of the test results worldwide, including the US (NIST traceability).

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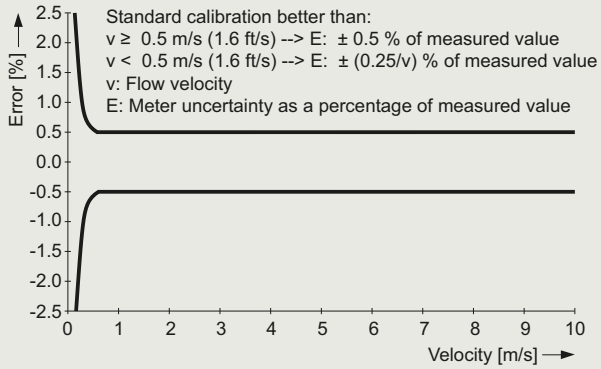
Technical specifications (continued)

Siemens offer accredited calibrations assured to ISO 17025. Siemens Flow Instruments accredited laboratories are recognized by ILAC MRA (International Laboratory Accreditation Corporation - Mutual Recognition Arrangement) ensuring international traceability and recognition of the test results worldwide.

Flowmeter calibration data are stored in the internal EEPROM of the transmitter FUS060 or FUS080.

The system accuracy refers to the following systems:

SONO 3300/FUS060, SONO 3100/FUS060 which are typically calibrated on the frequency output.



Typical calibration reference conditions:	
Fluid	Water
Fluid temperature	22 ± 5 °C
Ambient temperature	22 ± 5 °C
Supply voltage	• 115/230 V AC +10 ... -15 % • 24 V DC +25 ... -15 %, • 24 V AC ± 15 %
Straight inlet length	20 × D_i
Outlet	3 × D_i
Rangeability	0 ... 1 m/s to 0 ... 10 m/s
Repeatability	Better than 0.25 % in the range 0.5 ... 10 m/s
Linearity (for water)	
• Reynolds number 1000 < Re < 5000	Better than 1 %
• Reynolds number > 5000	Better than 0.5 %

Additional effects of deviations from reference conditions

- Current output: As frequency output (± 0.1 % of actual flow +0.05 % FSO)
- Effect of ambient temperature: Frequency/pulse output: < 0.005 % SPAN/K; Current output: < ± 0.0075 % SPAN/K
- Effect of supply voltage: 0.005 % of measuring value at 1 % change

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Overview



SITRANS FSS100 is a transit time based ultrasonic flowmeter for retrofitting on existing pipelines. Together with the transmitters SITRANS FST030 or FST020, a high-precision inline flow meter is set up directly on site.

The kit offers all parts and special tools to make the installation as 1- up to 4-path flowmeter. The set is made for installation on empty pipes.

SITRANS FSS100 has in-line transducers (in contact with media) which assure superior accuracy and performance.

Benefits

- Cost-effective solution – contains all the necessary components for retrofitting.
- SITRANS FSS100 is easy to install in pipeline sizes DN 100 to DN 3000 (4″ to 120″): 1-path from DN 100 (4″), 2-path from DN 200 (8″), 3- and 4-path from DN 400 (16″)
- No bypass installation necessary – withstands pressures up to 40 bar (580 psi) and media temperatures between -20 °C and +200 °C (-4 °F and +392 °F).
- High accuracy – the bigger the pipe, the more accurate the result.
- Solid construction and no moving parts for a 100% maintenance and obstruction-free flowmeter.
- The FSS100 comes with transducers in IP68 enclosure.
- In-line transducers assure superior accuracy and performance.
- Transmitter SITRANS FST030 for 1- up to 4-path or SITRANS FST020 for water application with 1-path measuring. Please select the transmitter separate.

Naming convention	
FSS100	Sensor
FS130	FST030 + FSS100
FS120	FST020 + FSS100
Sensor pair	Consists of two sensors (two transducers)
System	Transmitter + sensor
One sensor pair	Forms a single-path flow meter
Two sensor pairs	Form a dual-path flowmeter
Three sensor pairs	Form a three-path flowmeter
Four sensor pairs	Form a four-path flowmeter

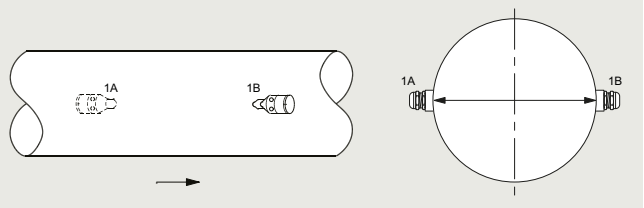
Application

- Raw water intake for water treatment plants
- Water distribution systems
- Irrigation systems
- Power generation (energy and water)
- District heating plants
- Cooling water plants within the industry and in power stations
- Systems within the oil and refinery business
- Sewage treatment plants
- Plants transporting non-conductive liquids

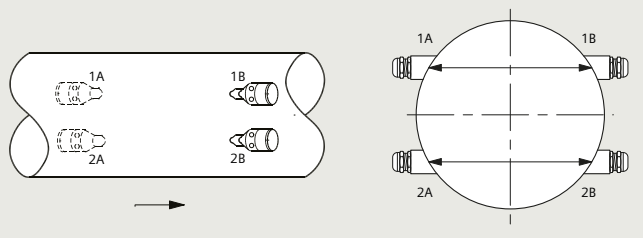
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Design

The FSS100 sensors can be installed into existing pipelines, regardless of the pipe material and without cutting out sections of the pipe. Installation is done by drilling holes for the sensors in the pipe, thus providing a low cost and low effort solution compared to installing an inline sensor. Up to four measurement paths can be installed to improve the measuring accuracy.



1-track-ultrasonic flowmeter with 2 transducers (1A and 1B)



2-track-ultrasonic flowmeter with 4 transducers (1A and 1B, 2A and 2B)

The FSS100 package box contains all necessary parts to build an ultrasonic flowmeter on existing pipes.

The sensor pair consists of two transducers, which represent a measurement path. One transducer is installed on top of the pipe and the other one on the bottom of the pipe.

Variants	
1-path	The transducers are installed in the center of the pipe
2-path	The transducers are installed on the right and left at the same distance from the center of the pipe
3-path	Combination of a 1-path and 2-path installation
4-path	Combination of two 2-path installations, these are installed crosswise

- Papers to wrap around pipes for alignment of the transducers.
- Alignment tools for the transducers.
- Mounting plates, transducer holders and the FSS100 transducers.

The FSS100 sensors can be directly connected to the transmitter SITRANS FST030 or SITRANS FST020. The transmitter must be ordered separately.

The transmitter related to this system is the SITRANS FST020 or FST030 (see Technical specifications for SITRANS FST020 or FST030). SITRANS FST020 for 1-path and water application. SITRANS FST030 for 1- up to 4-path, Ex-application, industrial liquids, water and wastewater.

Information on PED approval

The FSS100 system includes the pipe mounting parts only and therefore it cannot be delivered as PED-approved. After the installation, all installation-related activities (welding, pressure test, etc.) are the responsibility of the customer.

[1] Mounting plates are only included for empty pipe installation types (refer to selection "A"). For hot tap mounting the mounting plates are not included (refer to selection "B").

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Selection and ordering data

SITRANS FSS100		Article No. 7ME3810-									
		●	●	●	●	●	-	0	0	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Installation method [1] (incl. transducer holder and mounting plates). Alignment rods and tools must be ordered as accessories.											
Installation	Size										
Empty pipe	DN < 200 (8")	**1**									
Empty pipe	DN ≥ 200 (8")	**2**									
Empty pipe concrete	DN ≥ 600 (24")	**4**									
Transducer holder											
Transducer carbon steel, mounting plates in carbon steel			**B**								
Transducer stainless steel, mounting plates in stainless steel			**C**								
Sensor cable											
Standard cable, 3 m for FST030 or FST020				**B**							
Standard cable, 15 m for FST030 or FST020				**C**							
Standard cable, 30 m – only for FST020				**D**							
Standard cable, 60 m – only for FST020				**E**							
Standard cable, 90 m – only for FST020				**F**							
High-temp cable, 3 m for FST030 or FST020				**J**							
High-temp cable, 15 m for FST030 or FST020				**K**							
High-temp cable, 30 m for FST020				**L**							
Transducer type and approval											
IP68 (NEMA 4X/6) PA polyamide housing, PN 40, O-ring, 100 °C (212 °F)					**1**						
IP68 SS stainless steel housing, PN 40, O-ring, 190 °C (374 °F), EX d type, ATEX approval (only with SITRANS FST030 Ex version)					**4**						
IP68 SS stainless steel housing, PN 40, O-ring, 190 °C (374 °F), EX i type, ATEX approval (only with SITRANS FST030 Ex version)					**5**						
Number of tracks											
1 track (path) with FST030, FST030 and FS DSL or FST020						**1**					
2 tracks (path) with FST030, FST030 and FS DSL or FST020						**2**					
3 tracks (path) require FST030 and FS DSL						**3**					
4 tracks (path) require FST030 and FS DSL						**4**					
Ex approvals											
Non Ex										**A**	
ATEX zone 1 ...										**C**	
IECEx zone 1 ...										**F**	
NEPSI										**N**	
INMETRO										**P**	
KCs										**Q**	

	Order code
Additional information Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificate	
Material certificate acc. to EN 10204 3.1	**C12**
Factory certificate acc. to EN 10204 2.1	**C15**
Transducers accessories	
Alignment rods-set for DN 100 ... 750 (4" ... 30") Ø = 25 mm, l = 500 mm, 3 pcs	**S10**
Alignment rods-set for DN 800 ... 2100 (32" ... 84") Ø = 25 mm, l = 500 mm, 6 pcs	**S11**
Alignment rods-set for DN 2200 ... 3000 (88" ... 120") Ø = 25 mm, l = 500 mm, 8 pcs	**S12**
Alignment rods-set for DN 100 ... 750 (4" ... 30") Ø = 25 mm, l = 500 mm, 3 pcs	**S13**

	Order code
Tranducers toolkits	
Spanner key for transducer mounting FSS100 O-ring type	**T11**
Toolbox set with various mounting/spare parts for FSS100	**T12**
Tag name	
Stainless steel TAG plate (1 × 24 × 80 mm), wire fixed. Font size depends on length: 8 mm for 1 ... 10 characters, 4 mm for 11 ... 20 characters (specify in plain text).	**Y17**

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Selection and ordering data (continued)

Operating instructions

Description	Article No.
SITRANS FSS100	
• English	
• German	

All literature is available to download for free, in a range of languages, at
www.siemens.com/processinstrumentation/documentation
Please use online Product selector to get latest updates. Product selector link:
www.pia-portal.automation.siemens.com

Technical specifications

SITRANS FSS100	
Accuracy [2]	± (0.5 ... 1.5%) of flow
Typical, depending on accuracy of measurements of installation.	Flow speed of 0.5 ms/s up to 10 m/s
Repeatability	± 0.25% according to ISO 11631
Requirements for pipes	
Size	• SITRANS FS130 (1- ... 4-path): DN 100 ... 3000 (4" ... 120") • SITRANS FS120: DN 100 ... 3000 (4" ... 120")
Line pressure	Max. 40 bar (580 psi)
Media temperature:	
• Standard version	• -10 ... +200 °C (14 ... 392 °F)
• ATEX Ex d version (FST030)	• -20 ... +180 °C (-4 ... +356 °F)
• ATEX Ex i version (FST030)	• -10 ... +190 °C (14 ... 374 °F)
Ambient temperature sensor:	
• Standard and Ex i version	• -20 ... +60 °C (-4 ... +140 °F)
• Ex d version	• -20 ... +180 °C (-4 ... +356 °F)
Transducer enclosure/approvals/certificates	
Standard version	IP67 (NEMA 6)/IP68 (NEMA 6P)
Ex approval	System ATEX approval for FSS100 Ex i transducers together with transmitter SITRANS FST030-Ex: • ATEX WII 2G Ex dem [ia/Ib] IIC T6/T4/T3 Gb • ATEX II 2G Ex d T3-T6 Gb with SONO 3200 Ex d transducers (for standard SITRANS FST030 transmitter, installed outside of Ex zone)
Material certificates	EN 10204-3.1 material certificate on transducer mounting parts
Transducer materials	
Terminal housing	Standard version: • PA 6.6, 100 °C (212 °F) or stainless steel • AISI 316, 200 °C (392 °F)
Transducer body	Standard version: • Stainless steel AISI 316, 200 °C (392 °F)
Materials of existing pipeline	
Steel	• Transducer holder: EN 10273 or EN 10216 (P235GH) • Mounting plates [1]: EN 10273 or EN 10216 (P235GH)
Concrete	• Transducer holder: Stainless steel AISI 316 or similar • Mounting plates [1]: (not included)
Stainless steel	• Transducer holder: Stainless steel AISI 316 or similar • Mounting plates [1]: Stainless steel AISI 316 or similar
Pipe wall thickness	
Steel pipe (AISI 316 and St. 37.2 or corresponding material)	Transducer and holder available in length L = 160, allowing a pipe wall thickness up to 20 mm (0.79")
Concrete pipe	Transducer and holder available in length L = 230, allowing a pipe wall thickness up to 200 mm (7.9") and pipe sizes ≥ DN 600
Dimension of the package box	
(L × W × H)	856 × 390 × 344 mm (33.7" × 15.4" × 13.5")
Weight example of a package	
(Standard 1-path)	Approx. 53 kg (116.8 lb)

Technical specifications (continued)

SITRANS FSS100	
Certificates and approvals	
Conformity certificate	The devices are supplied as standard with a Siemens Certificate of Conformity
Material certificate	Material certificate for the transducer parts according to EN 10204-3.1 is optionally available

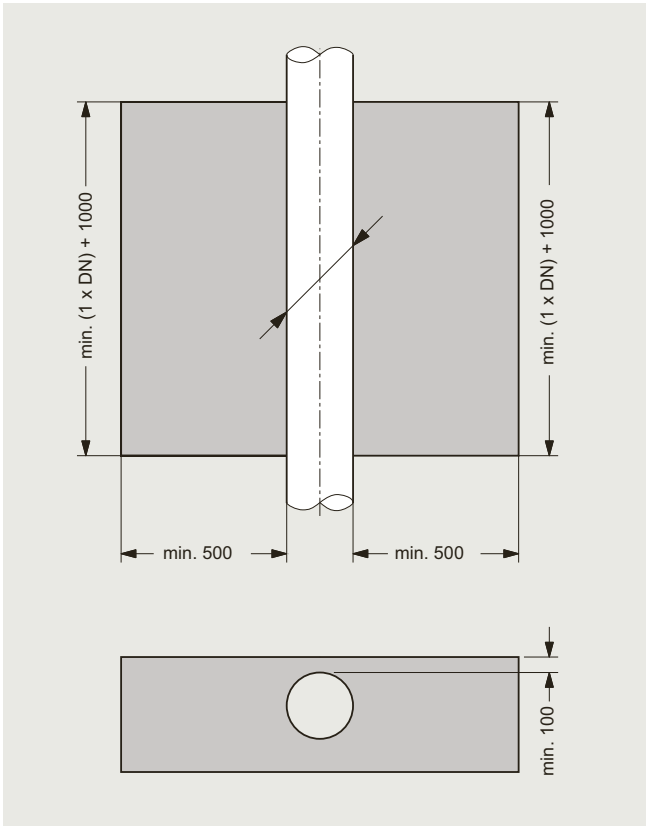
[1] Mounting plates are only included for empty pipe installation types (refer to selection "A"). For hot tap mounting the mounting plates are not included (refer to selection "B").
[2] Accuracy depends on the accuracy of the measurements taken at location during installation. This means that inaccurate measurements of angles, distance between transducers, wall thickness and pipe diameter have a direct effect on the accuracy. Values measured are entered into the memory of the SITRANS FST030 or FST020 transmitter. Multiple path systems provide a better flow profile compensation, this can lead to better measurement accuracy.

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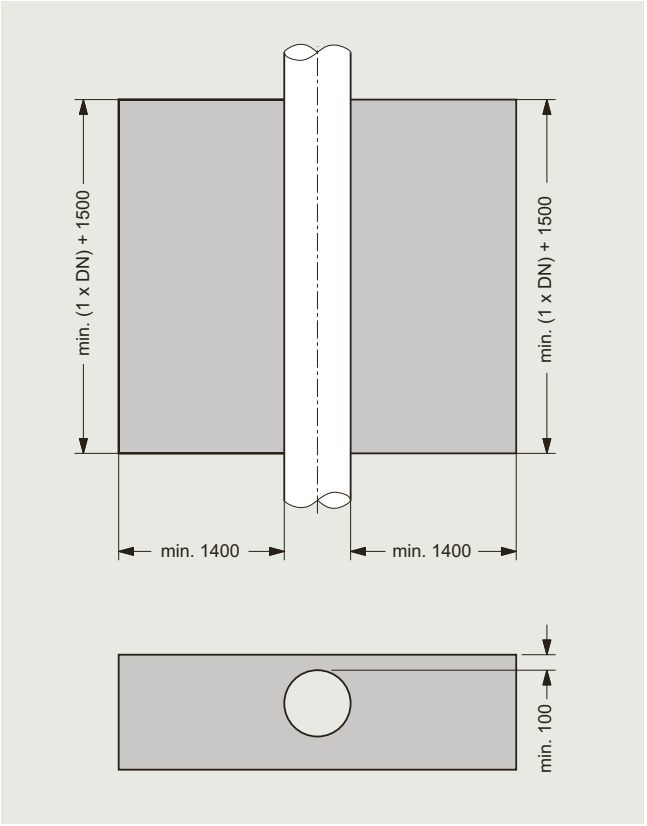
Dimensional drawings

Installation requirements

The space requirements (in mm) around the pipe for retrofitting a SITRANS FS100 ultrasonic flowmeter type SITRANS 120 or FS130 are given below:



Dimensional drawings (continued)



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Overview



SITRANS FST030 can be used together with FSS200 clamp-on sensors and with the FSS100 inline sensors. Please order the FSS100 7ME381 sensors for the SITRANS FST030 separately.

The SITRANS FST030 transmitter delivers true multi-parameter measurements i.e. volume flow, standard volume flow, density, mass flow, fluid sound velocity and temperature. The multiple outputs and bus communication mean that all primary process information can be read either instantaneously (10 ms update) or periodically as required by plant operations.

The SITRANS FST030 can be used with the FSS100 sensors (SONOKIT).To get a SITRANS FS130 system, the SITRANS FST030 transmitter and FSS100 sensors must be ordered separately. The FSS100 sensors are tested and quality controlled individually and do not require to be paired or calibrated with an FST030 transmitter.

The transmitter related to this system is the SITRANS FST030 (see Technical specifications for SITRANS FST030).

Process value

- Volume flow
- Mass flow
- Flow velocity
- Sound velocity
- Density
- Kinematic viscosity
- Pressure
- Medium temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3

Benefits

Flow calculation and measurement

- Dedicated volume flow calculation with DSP technology
- 100 Hz update rate for all output on all primary process values
- Maximum data age from sensor to output is 20 ms
- Independent low flow cut-off settings for volume and mass flow, standard volume flow and velocity
- Zero-point adjustment on command from discrete input or host system

Operation and display

User-configurable operation display:

- Full graphical display 240 × 160 pixels with up to 6 programmable views
- Self-explaining alarm handling/log in clear text
- Help text for all parameters appears automatically in the configuration menu

SensorFlash technology stores production specific system documentation and provides removable memory of all flowmeter setups and functions:

- Factory certification
- Non-volatile memory backup of operational data
- Transfer of user configuration to other flowmeters
- 8 GB SD card for storage and data logging
- Audit trail of all parameter changes
- Alarm logging

Alarms and safety

- Advanced diagnosis and service menu enhances troubleshooting and meter validation
- Configurable upper and lower alarm and warning limits for all process values
- Alarm handling can be selected between Siemens and NAMUR standard configurations

Outputs and control

Monitoring comprising of 3 individually configurable totalizers.

Multi-parameter outputs, configurable outputs assigned individually to any of the following parameters:

- Volume flow
- Standard volume flow
- Mass flow
- Flow velocity
- Sound velocity
- Density
- Process viscosity
- Process pressure
- Process/medium temperature

Up to six I/O channels are configured as follows.

Channel 1

Channel 1 is 4 to 20 mA analog output with HART 7.5. The current signal can be configured for massflow, volumeflow and includes the

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Benefits (continued)

availability of active or passive function selected by wiring on the non-Ex terminals. Alternative Modbus RTU RS 485 is available.

Channel 2

Channel 2 is a signal output which can be freely configured for any process variable:

- Analog current (0/4 to 20 mA)
- Frequency or pulse
- Operational and alarm status

Channels 3 and 4

Channels 3 and 4 can be ordered with signal (freely configured for any process variable) or relay outputs, or signal input.

Signal output

Signal output can be user configured to:

- Analog current (0/4 to 20 mA)
- Frequency or pulse
- Redundant frequency or pulse (linked to channel 2)
- Operational and alarm status

Signal input

Signal input can be user configured for:

- Totalizer reset functions
- Force outputs or freeze process values
- Initiate automatic zero point adjustment

Relay

Relay output(s) can be user configured to:

- Alarm status

4-20 mA signal outputs and inputs are ordered as active or passive for Ex versions, active and passive for non-Ex versions – function selected by wiring on the terminals.

During initial commissioning of the flowmeter, all outputs can be forced to a preset value for simulation, verification or calibration purposes.

Channels 5 and 6 (with internal DSL)

- RTD temperature inputs for 1000, 500 or 100 Ω RTD's 2-, 3- or 4-wire RTD's supported
- Channels 5 and 6 (with external DSL option)
- RTD temperature inputs or 4-20 ma inputs. Selectable in menu

Approvals and certificates

The SITRANS FST030 transmitter was designed to comply with or exceed the requirements of international standards and regulations.

Design

The SITRANS FST030 is designed in an IP67/NEMA 4X aluminum enclosure with corrosion resistant coating. It can be wall or pipe mounted and the enclosure can be locked with a padlock or wired with lead security seals. Includes all flow and DSL functions integrated into one unit.

The FST030 is available as standard with one current, HART 7.5 output and can be ordered with additional input/output functions.

The SITRANS FST030 wall mount housing transmitter has a modular design with discrete, replaceable electronic modules and connection boards to maintain separation between functions and facilitate field service. All modules are fully traceable and their provenance is included in the transmitter setup.

SensorFlash

SensorFlash is a standard, 8 GB micro SD card with the ability to be updated by PC. It is supplied with each transmitter and comes with a complete set of certification documents including report if ordered. Factory conformance certificates are optional at ordering.

The Siemens SensorFlash memory unit offers the following features and benefits:

- Copy site setups to SD card for easy transfer to other similar transmitters
- Permanent database of operational and functional information from the moment that the flowmeter is switched on
- New firmware updates can be downloaded from the Siemens internet portal for Product Support and placed onto SensorFlash (unmounted from the transmitter and inserted into a PC's SD card slot). The firmware is then inserted into the existing flowmeter for system/firmware upgrade

SITRANS FST030 industrial housing

Separate field enclosure with modular design. The FST030 can installed direct in the field. The SITRANS FST030 use always the seperate FS DSL for the sensor connection.

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Function

The following functions are available:

- Up to four configurable outputs and 2 RTD input channels selected at ordering
- Outputs can be individually configured for mass flow, volume flow, etc.
- Three built-in totalizers which can count positive, negative or net flows
- Independent low flow cut-offs, adjustable
- Uni/bidirectional flow measurement
- Flow direction adjustable
- Alarm system consisting of alarm-log, alarm pending menu
- Change log, logs all changes made to menu parameters or via communications
- Internal data logger
- Display of operating time with real-time clock
- Flowrate outputs are freely configurable between maximum negative and maximum positive flows according to the sensor capacity
- Limit switches programmable for flow, density and temperature. Limit points can be graded as warning and alarm for values both above and below nominal process conditions
- Zero adjustment menu, with zero point evaluation display
- Full service menu for effective and straight forward application and meter troubleshooting
- Precise temperature measurement ensures optimal accuracy on massflow and density
- Fully compatible with Siemens PDM version 8.2 service pack 1 or higher

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Selection and ordering data

SITRANS FS130 inline flowmeter	Article No. 7ME3723-											Order code		
	0	A	A	3	●	-	●	●	●	●		●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Sensor mounting kit														
SITRANS FST030 for SITRANS FSS100 (SONOKIT), please order SITRANS FSS100 separately														
Number of paths (sensor pairs)														
Transmitter only – no sensor					0									
Environment														
Standard							1							
Transmitter/DSL material and mounting style														
Industrial enclosure transmitter with external FS DSL for remote to the sensors. Transmitter and DSL: aluminum cast, NEMA 4X, max. 4-path, M12 connection between transmitter and FS DSL with SSL cable								G						
Industrial enclosure transmitter with external FS DSL for remote to the sensors. Transmitter and DSL: aluminum cast, NEMA 4X, max. 4-path, cable connection between transmitter and FS DSL with SSL cable								K						
Wallmount transmitter, internal DSL, transmitter: aluminum wallbox, NEMA 4X, DSL: none, direct connected sensor cables, (max. 2-path, max. 20 meter sensor cable)								U						
Wall box housing, external DSL, remote to sensor Transmitter: aluminum wallbox, Nema 4X DSL: aluminum cast, Nema 4X, M12 socket for DSL to transmitter interconnect cable (max. 4-path, max. 20 meter sensor cable, max. 150 meter interconnect cable)								V						
Wall box housing, external DSL, remote to sensor Transmitter: aluminum wall box, Nema 4X DSL: aluminum cast, Nema 4X, terminal block for DSL to transmitter interconnect cable (max. 4-path, max. 20 meter sensor cable, max. 150 meter interconnect cable)								W						
Ex approvals														
Non Ex									A					
ATEX, wallbox enclosure									B					
ATEX, industrial enclosure									C					
IECEx, wallbox									E					
IECEx, industrial enclosure									F					
FM, FMc, wallbox enclosure									G					
FM, FMc, industrial enclosure									H					
CSA, wallbox enclosure									L					
CSA, industrial enclosure									M					
ATEX, IECEx, FM, CSA, industrial enclosure									N					
ATEX, IECEx, FM, FMc, wallbox enclosure									P					
NEPSI									Z			Q	0	B
INMETRO									Z			Q	0	D
KCs									Z			Q	0	F
Local User Interface														
Blind version transmitter										1				
Graphical local user interface, 240 × 160 pixels										3				

	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Cable glands – transmitter, DSL (not for sensor cables)	
No glands, metric threads on transmitter	A01
No cable glands, NPT thread, nickle plated brass, quantity based on option "G" data place 14	A20
No cable glands, NPT thread, stainless steel, quantity based on option "G" data place 14	A21
Cable glands, nickle plated brass, quantity based on option "G" data place 14	A22
Cable glands, plastic, quantity based on option "G" data place 14	A24
Cable glands, stainless seel, quantity based on option "G" data place 14	A26
No cable glands, NPT thread, nickle plated brass, quantity based on option "K" data place 14	A30
No cable glands, NPT thread, stainless steel, quantity based on option "K" data place 14	A31

	Order code
Cable glands, nickle plated brass, quantity based on option "K" data place 14	A32
Cable glands, plastic, quantity based on option "K" data place 14	A34
Cable glands, stainless seel, quantity based on option "K" data place 14	A36
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "N" in data place 14	A40
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "N" in data place 14	A41
Nickel plated brass glands: quantity based on selection "N" in data place 14	A42
Plastic glands: quantity based on selection "N" in data place 14	A44
Stainless steel glands: quantity based on selection "N" in data place 14	A46
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "Q" in data place 14	A50

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Selection and ordering data (continued)

	Order code
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "Q" in data place 14	**A51**
Nickel plated brass glands: quantity based on selection "Q" in data place 14	**A52**
Plastic glands: quantity based on selection "Q" in data place 14	**A54**
Stainless steel glands: quantity based on selection "Q" in data place 14	**A56**
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "U" in data place 14	**A60**
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "U" in data place 14	**A61**
Nickel plated brass glands: quantity based on selection "U" in data place 14	**A62**
Plastic glands: quantity based on selection "U" in data place 14	**A64**
Stainless steel glands: quantity based on selection "U" in data place 14	**A66**
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "V" in data place 14	**A70**
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "V" in data place 14	**A71**
Nickel plated brass glands: quantity based on selection "V" in data place 14	**A72**
Plastic glands: quantity based on selection "V" in data place 14	**A74**
Stainless steel glands: quantity based on selection "V" in data place 14	**A76**
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "W" in data place 14	**A80**
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "W" in data place 14	**A81**
Nickel plated brass glands: quantity based on selection "W" in data place 14	**A82**
Plastic glands: quantity based on selection "W" in data place 14	**A84**
Stainless steel glands: quantity based on selection "W" in data place 14	**A86**
Software functions and CT approvals	
For standard industry applications (liquids, e.g. water)	**B11**
I/O configuration Ch1	
Non Ex, 4 ... 20 mA HART, menu selected passive/active	**E02**
Ex, 4 ... 20 mA HART, active	**E06**
Ex, 4 ... 20 mA HART, passive	**E07**
Modbus RTU 485	**E14**
I/O configuration Ch2, Ch3 and Ch4	
None	**F00**
Non Ex	
• Ch2: current/freq./pulse, Ch3: none, Ch4: none. Active/passive menu selected	**F01**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: none. Active/passive menu selected	**F02**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: current/freq./pulse. Active/passive menu selected	**F03**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: relay. Active/passive menu selected	**F04**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: relay. Active/passive menu selected	**F05**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: none. Active/passive menu selected	**F06**
Ex Passive	
• Ch2: current/freq./pulse, Ch3: none, Ch4: none	**F11**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: none	**F12**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: current/freq./pulse	**F13**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: relay	**F14**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: relay	**F15**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: none	**F16**

	Order code
Ex Active	
• Ch2: current/freq./pulse, Ch3: none, Ch4: none	**F21**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: none	**F22**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: current/freq./pulse	**F23**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: relay	**F24**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: relay	**F25**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: none	**F26**
Certificates	
Factory certification 2.2 to EN 10204:2004	**C19**
DSL strap kit (to strap DSL to pipe)	
• 60.3 mm (2 inch) pipe mount with U-bolts	**G01**
• Stainless steel strap to mount DSL to pipe DN 60 ... 150 pipe size (2 ... 6 inch)	**G03**
• Stainless steel strap to mount DSL to pipe DN 150 ... 300 (6 ... 12 inch)	**G05**
• Stainless steel strap to mount DSL to pipe DN 300 ... 400 (12 ... 16 inch)	**G07**
• Stainless steel strap to mount DSL to pipe DN 400 ... 600 (16 ... 24 inch)	**G08**
Temperature sensors and pockets	
1 000 Ω platinum standard clamp-on RTD	**J61**
1 000 Ω platinum submersible clamp-on RTD	**J62**
Cable, DSL to wallbox transmitter	
5 m (16.4 ft) standard DSL cable (2 mounted M12 plugs)	**L51**
5 m (16.4 ft) standard DSL cable (no plugs mounted)	**L52**
10 m (32.8 ft) standard DSL cable (2 mounted M12 plugs)	**L55**
10 m (32.8 ft) standard DSL cable (no plugs mounted)	**L56**
25 m (82 ft) standard DSL cable (2 mounted plugs)	**L59**
25 m (82 ft) standard DSL cable (no plugs mounted)	**L60**
50 m (164 ft) standard DSL cable (2 mounted plugs)	**L63**
50 m (164 ft) standard DSL cable (no plugs mounted)	**L64**
75 m (246.1 ft) standard DSL cable (2 mounted plugs)	**L67**
75 m (246.1 ft) standard DSL cable (no plugs mounted)	**L68**
150 m (492.1 ft) standard DSL cable (2 mounted plugs)	**L71**
150 m (492.1 ft) standard DSL cable (no plugs mounted)	**L72**
RTD cable (clamp temperature sensor to transmitter)	
6 m (20 ft) standard RTD cable	**R50**
15 m (50 ft) standard RTD cable	**R51**
30 m (100 ft) standard RTD cable	**R52**
46 m (150 ft) standard RTD cable	**R53**
61 m (200 ft) standard RTD cable	**R54**
91 m (300 ft) standard RTD cable	**R55**
6 m (20 ft) submersible RTD cable	**R56**
15 m (50 ft) submersible RTD cable	**R57**
30 m (100 ft) submersible RTD cable	**R58**
46 m (150 ft) submersible RTD cable	**R59**
61 m (200 ft) submersible RTD cable	**R60**
91 m (300 ft) submersible RTD cable	**R61**
Mass storage	
Enable mass storage function for SD card (not available for USA)	**S30**
Country specific approval	
KC-Approval for South Korea	**W28**
Tag plate	
Tag plate for external DSL, stainless steel	**Y14**
Tag plate for transmitter, stainless steel	**Y15**

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Selection and ordering data (continued)

	Order code
Tag name plate, stainless steel	Y17

	Article No.
System spare parts	
Tool kits and loose parts	
"F" connector tool kit, 2 per	A5E38145699
Bag of loose spare parts; for wallmount, including cable strain relief components, mounting tool, seals and gasket, assorted screws and washers, hex cap nut, blind plugs, and O-rings	A5E38288072
Electronics assemblies and modules	
Wall mount transmitter	
• Display and keypad assembly	A5E37697615
• Digital Sensor Link (DSL), internal, for wall box, standard process values	A5E38014726
• Digital Sensor Link (DSL), internal, for wall box, hydrocarbon process values	A5E42138542
• Digital Sensor Link (DSL), internal, for wall box, gas process values	A5E47202379
• SensorFlash (4 GB microSD card) -40 °C ... +85 °C	A5E38288507
• Power supply, for wall box, (240 V AC, 47 ... 63 Hz), (24 ... 90 V DC)	A5E38263021
• Foam insert for wall box with connectors	A5E38287828
External DSL	
• Digital Sensor Link (DSL), external, module only, standard process values	A5E38014662
• Digital Sensor Link (DSL), external, module only, hydrocarbon process values	A5E37843869
• Digital Sensor Link (DSL), external, module only, gas process values	A5E47202369
• F connector board set: board A, board B and screws for mounting	A5E45882316
• Front end module cover plate with screws for mounting	A5E45882046
Cassettes, I/O configuration and communication	
• Ch1: I/O and comm (active) 4 ... 20 mA output and HART 7.2, Ex	A5E38012278
• Ch1: I/O and comm (passive) 4 ... 20 mA output and HART 7.2, Ex	A5E38013025
• Ch1: communication Modbus RTU 485, Ex	A5E38013054
• Ch1: I/O and comm (active/passive) 4 ... 20 mA output and HART 7.2, Non Ex	A5E38013040
• Ch1: communication Modbus RTU 485, Non Ex	A5E38013069
• F01, Non Ex Ch2: current/freq./pulse Ch3: none Ch4: none Menu select active/passive	A5E38006256
• F02, Non Ex Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: none Menu select active/passive	A5E38006558
• F03, Non Ex Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: current/freq./pulse Menu select active/passive	A5E38006598
• F04, Non Ex Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: relay Menu select active/passive	A5E38006896
• F05, Non Ex Ch2: current/freq./pulse Ch3: relay Ch4: relay Menu select active/passive	A5E38006900

	Article No.
• F06, Non Ex Ch2: current/freq./pulse Ch3: relay Ch4: none Menu select active/passive	A5E38011432
• F11, Ex Passive Ch2: current/freq./pulse Ch3: none Ch4: none	A5E38011478
• F12, Ex Passive Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: none	A5E38011509
• F13, Ex Passive Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: current/freq./pulse	A5E38011541
• F14, Ex Passive Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: relay	A5E38011600
• F15, Ex Passive Ch2: current/freq./pulse Ch3: relay Ch4: relay	A5E38011618
• F16, Ex Passive Ch2: current/freq./pulse Ch3: relay Ch4: none	A5E38011908
• F21, Ex Active Ch2: current/freq./pulse Ch3: none Ch4: none	A5E38012039
• F22, Ex Active Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: none	A5E38012056
• F23, Ex Active Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: current/freq./pulse	A5E38012121
• F24, Ex Active Ch2: current/freq./pulse Ch3: current/freq./pulse Ch4: relay	A5E38019235
• F25, Ex Active Ch2: current/freq./pulse Ch3: relay Ch4: relay	A5E38019263
• F26, Ex Active Ch2: current/freq./pulse Ch3: relay Ch4: none	A5E38019378
Miscellaneous parts	
General	
• Blind plug brass-nickel 10 pcs (Ex version)	A5E38145685
• Blind plug stainless steel 10 pcs (Ex version)	A5E38145689
• Twist-on F connectors, 4 pcs	A5E38268608
• M12 adapter for DSL or wall mounted transmitter	A5E03906095
Wall mount transmitter	
• Wall bracket "pipe mounting"	A5E38288020
• Wall bracket "panel mounting"	A5E38288032
• Metal kit: PSU cover, back plane	A5E38415145
• Power input cover plate	A5E38415205
External DSL	
• Wall mount bracket and screws for mounting DSL on bracket	A5E45882610
• Lid with O-ring	A5E45818351
• Bag with parts: cable strain reliefs, screws and washers, lid lock screw, grounding parts	A5E38111577
• Acessory pipe mounting kit for FS DSL, max. 60.3 mm (2.4 inch) pipe	A5E36617118001

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Selection and ordering data (continued)

	Article No.
• Accessory pipe strap kit for FS DSL, DN 50 ... 150 (2 ... 6 inch) pipe	A5E36617118002
• Accessory pipe strap kit for FS DSL, DN 150 ... 300 (6 ... 12 inch) pipe	A5E36617118003
• Accessory pipe strap kit for FS DSL, DN 300 ... 400 (12 ... 16 inch) pipe	A5E36617118004
• Accessory pipe strap kit for FS DSL, DN 400 ... 600 (16 ... 24 inch) pipe	A5E36617118005
Cable glands	
Set of cable glands, plastic, black, metric	A5E03907414
Set of cable glands, Ex e/i, plastic, metric	A5E03907424
Set of cable glands, Ex e/i, stainless steel, metric	A5E03907429
Set of cable glands, Ex e/i, brass nickel-plated, metric	A5E03907430
Set of cable glands, plastic, black, NPT	A5E03907435
Set of cable glands, Ex e/i, plastic, NPT	A5E03907451
Set of cable glands, Ex e/i, stainless steel, NPT	A5E03907467
Set of cable glands, Ex e/i, brass nickel-plated, NPT	A5E03907473

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Technical specifications

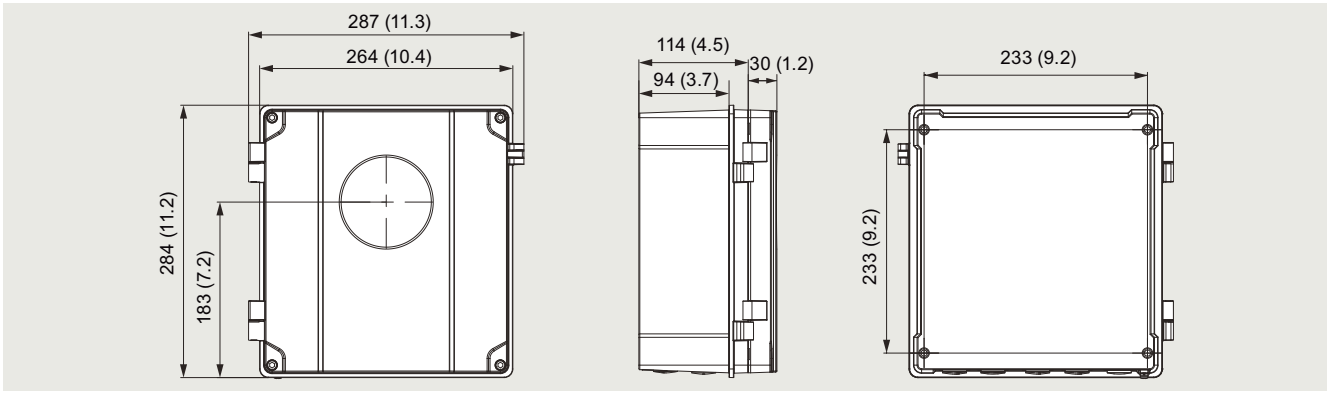
SITRANS FS130	
Process media	• Suitable for virtually any sonically conductive fluid, including hazardous liquids • Aggregate state: Light slurry and liquid
Process variables	• Volume flow • Mass flow • Flow velocity • Sound velocity • Standard volume flow (hydrocarbon variant only) • Density • Kinematic viscosity • Pressure • Medium temperature • Specific gravity (hydrocarbon variant only) • Totalizer 1 • Totalizer 2 • Totalizer 3
Current output	
Current	0 ... 20 mA or 4 ... 20 mA (channel 1 only 4 ... 20 mA)
Load	< 500 Ω per channel
Time constant	0 ... 100 s adjustable
Digital output	
Pulse	41.6 µs ... 5 s pulse duration
Frequency	0 ... 10 kHz, 50% duty cycle, 120% overscale provision
Time constant	0 ... 100 s adjustable
Active	0 ... 22 V DC, 30 mA, short-circuit-protected
Passive	3 ... 30 V DC, max. 110 mA
Relay	
Type	SPDT dry contact relay
Load	30 V AC/100 mA
Functions	Alarm level, alarm number, limit, flow direction
Digital input	
Voltage	15 ... 30 V DC (2 ... 15 mA)
Current	4 ... 20 mA
Functionality	Reset totalizer 1, 2 and 3, force output, freeze process values, zero point adjustment
Galvanic isolation	All inputs and outputs are galvanically isolated, isolation voltage 500 V
Alarm and warning limit	Available for all process values
Totalizer	Three counters for forward, net and reverse flow
Display	• Background illumination with alphanumerical text to indicate flow rate, totalized values, settings and faults • Adjustable damping constant of 0 ... 100 s • Reverse flow indicated by negative sign
SD card functions	• Parameter change log • Configurable data logger • FW update log • Diagnostic log • Error and alarm log • Parameter backup
Ambient temperature	
Operation:	
• Transmitter	• -40 ... +60 °C (-40 ... +140 °F), humidity max. 95%
• Display	• -20 ... +60 °C (-4 ... +140 °F)
Storage:	
• Transmitter	• -40 ... +70 °C (-40 ... +158 °F), humidity max. 95%
Communication	• HART 7.5 • Modbus RTU RS 485
Enclosure	
Material	Aluminum
Rating	IP66/67, NEMA 4X to IEC 529 and DIN 40050 (1 mH_2O for 30 min.)

Technical specifications (continued)

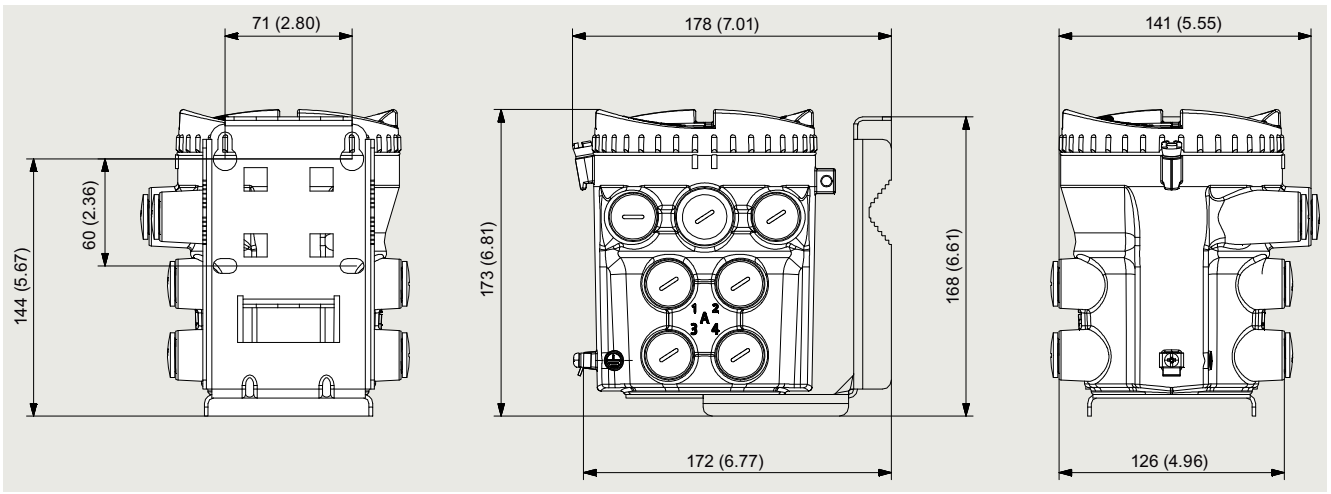
SITRANS FS130	
Mechanical load	18 ... 400 Hz random, 3.17 g RMS, in all directions
Power supply	
Universal	20 ... 27 V DC, 100 ... 240 V AC, 47 ... 63 Hz
Fluctuation	No limit
Power consumption	20 W/22 VA
Minimum pressure for Gas	7 ... 10 bar (100 ... 145 psi), typical (gas composition and application dependent; plastic pipes support operation at atmospheric pressure)
Environment	
Environmental conditions according to IEC/EN/UL 61010-1	• Altitude up to 2 000 m • Pollution degree 2 • Overvoltage category II
Maintenance	The flowmeter has a built-in error log/pending menu which should be inspected on a regular basis
Cable glands	Cable glands are available in nylon, nickel plated brass or stainless steel (316L/W1.4404)
Approvals	
For non-hazardous area	No approval required
For hazardous area	Ex approvals required
Certificates	
CE conformity marking	• Low voltage directive • WEEE • RoHS
EMC performance	
Emission	CISPR 11:2009/A1:2010 and EN 55011:2009/A1:2010
Immunity	IEC/EN 61326-1:2013

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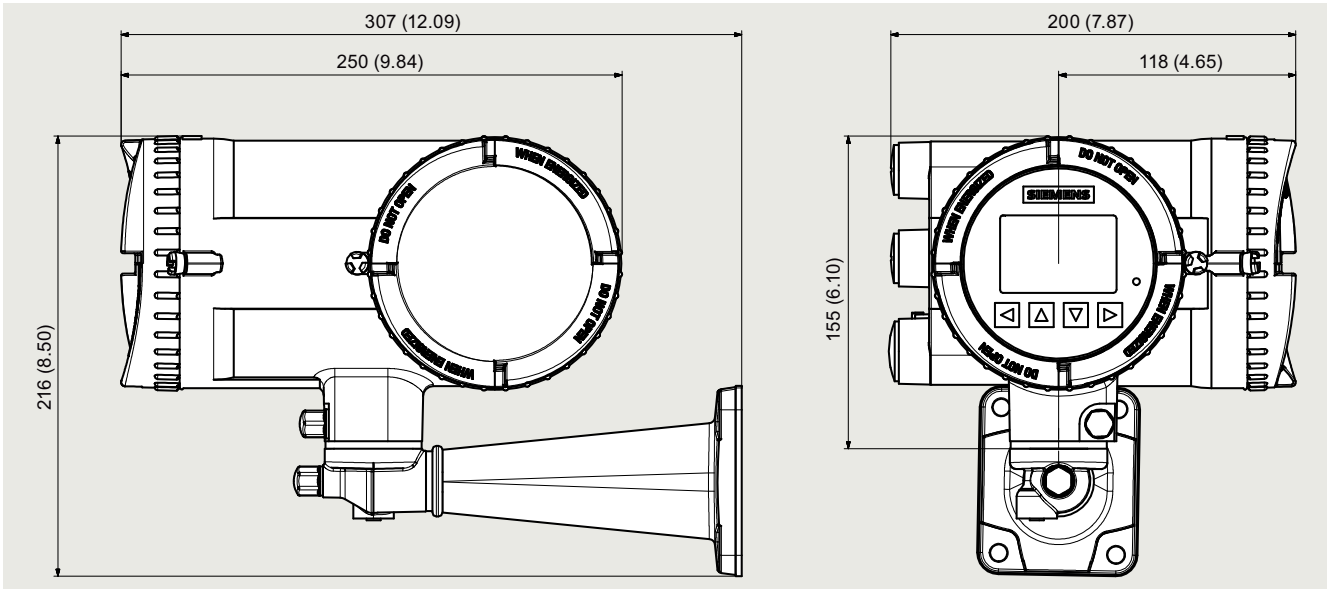
Dimensional drawings



SITRANS FST030, wall mount version, dimensions in mm (inch)



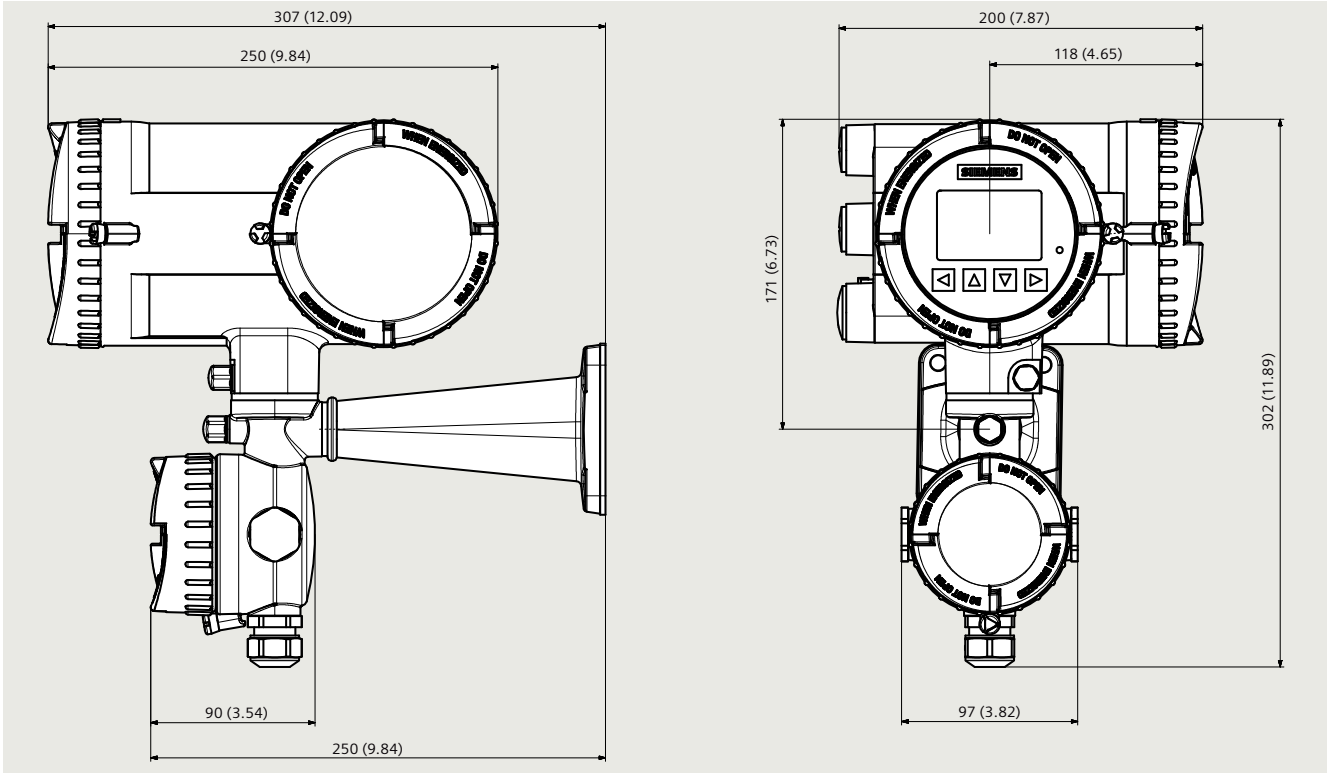
External DSL, dimensions in mm (inch)



SITRANS FST030 industrial transmitter with M12 connection, dimensions in mm (inch)

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Dimensional drawings (continued)



SITRANS FST030 with terminal house, dimensions in mm (inch)

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Overview



The SITRANS FST020 is the basic device for simple and cost-effective solution for FSS100 inline and FSS200 clamp-on sensors. To combine the SITRANS FST020 with the FSS100 sensors, please order the transmitter SITRANS FST020 and the sensors SITRANS FSS100 separately. With the SITRANS FST020 only a single-path measuring is possible.

As a single-path device, it is suitable for flow measurement on liquids that do not require temperature or viscosity consideration and where highest accuracies are not required.

The SITRANS FST020 is part of a digital platform based on the latest developments within Digital Signal Processing (DSP) technology – engineered for high measuring performance, fast response to step changes in flow, high immunity against process noise and simplicity in installation, commissioning and maintenance.

The FST020 transmitter delivers standard parameter measurements i.e. volume flow, flow speed or sound velocity by analog outputs and Modbus communication.

Process values

- Volume flow
- Flow velocity
- Sound velocity
- Totalizer 1

Benefits

Flow calculation and measurement

- Dedicated volume flow calculation with DSP technology
- 100 Hz update rate for all primary process values
- Maximum data age from sensor to output is 20 ms
- Independent low flow cut-off settings for volume flow and velocity
- Zero-point adjustment on command from discrete input or host system

Operation and display

User configurable operation display:

- Fully graphical display 240 × 160 pixel display with up to 6 programmable views
- Self-explaining alarm handling/log in clear text
- Help text for all parameters appears automatically in the configuration menu

SensorFlash technology stores production specific system documentation and provides removable memory of all flowmeter setups and functions:

- Calibration certificates (with ordered calibration)
- Non-volatile memory backup of operational data
- Transfer of user configuration to other flowmeters
- 8 GB SD card org higher for storage and data logging
- Audit trail of all parameter changes
- Alarm logging

Alarms and safety

- Advanced diagnosis and service menu enhances troubleshooting and meter validation
- Configurable upper and lower alarm and warning limits for all process values

Outputs and control

Monitoring comprised of 1 individually configurable totalizer.

Single parameter outputs that can be assigned individually to any of the following parameters:

- Volume flow
- Flow velocity
- Sound velocity
- Flow direction

Channel 1 is 4 to 20 mA analog output. The current signal can be configured for passive volume flow.

Relay output(s) can be user configured to Alarm status or warning. Modbus RTU RS 485 comes as standard.

Signal input

The signal input can be user configured for:

- Totalizer reset functions
- Forcing outputs or freezing process values
- Initiating automatic zero point adjustment

Approvals and certificates

The SITRANS FST020 transmitter was designed to comply with or exceed the requirements of international standards and regulations.

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Design

- For clamp-on FSS200 or inline FSS100 sensor
- Single-path, for only one pair of sensors on one pipe
- IP65 (NEMA 4X) wall mount housing, constructed of polycarbonate
- Available AC or DC power, 100 to 240 V AC, 11.5 to 28.5 V DC

Function

- 240 × 160 pixel graphical display with 4 key navigation and backlight
- 6 user programmable views for individual process and diagnostic information
- Modbus RTU communication
- 100 Hz update rate for all primary process value
- Independent low flow cut-off settings for volume and flow velocity
- Fully compatible with Siemens PDM version 8.2 service pack 1 or higher
- Bidirectional flow operation
- Menus available in English and German

Selection and ordering data

Transmitter SITRANS FST020 (Basic), IP65 (NEMA 4X)	Article No. 7ME3570- ● ● ● 4 0 - 0 X ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Number of ultrasonic paths	
Single-path	1
Flowmeter functions and I/O configurations	
With display, keypad, 1 × 4 ... 20 mA, 1 × relay, 1 × pulse/frequency, 2 × digital input, Modbus RTU	J
Meter power options	
100 ... 240 V AC	A
11.5 ... 28.5 V DC	B
Sensor pair	
SITRANS FST020 for SITRANS FSS100 (SONOKIT): Sensor FSS100 not included! Please order SITRANS FSS100 separately	
Sensor cable set pair	
No cables	A
Approvals	
UL, ULc, CE	1

	Order Code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Cable termination kit for customer supplied sensor cable pair	
Sensor cable termination for standard and plenum cable	**T01**
Mass storage	
Enable mass storage function or SD-card (not available for USA)	**S30**

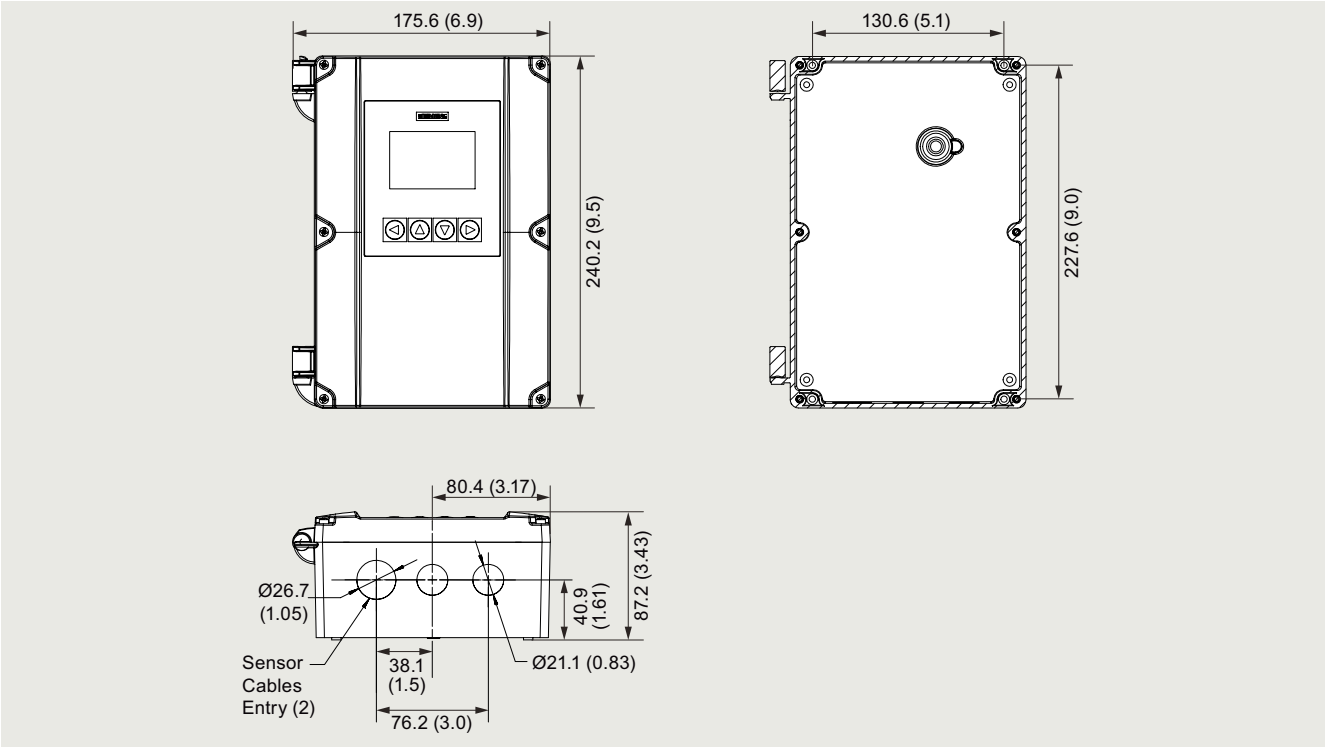
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Technical specifications

SITRANS FS120	
Input	
Flow range	±12 m/s (±40 ft/s), depending on pipe size higher or lower
Flow direction	bi-directional
Flow sensitivity	0.0003 m/s (0.001 ft/s) flow rate independent
Digital inputs	
Totalizer Hold	• Optically isolated diode • Activated ON: Input voltage: 2 ... 10 V DC
Totalizer Reset	• Opticall isolated diode • Activated ON: Input voltage: 2 ... 10 V DC
Output	
Current	• 4 ... 20 mA (isolated) • Externally powered 10 ... 30 V DC
Passive	30 V DC, 3 VA AC max.
Pulse	• Optically isolated transistor 10 mA, 30 V DC max • Relay: 41.6 ms ... 5 s pulse duration • Frequency: 0 ... 12.5 kHz (50% duty cylce)
Accuracy	
Accuracy	For velocities above 0.5 m/s - 10 m/s (1 ft/s), ±1-3% of flow
Repeatability	±0.25% (according to ISO 11631)
Zero Drift	0.1% of rate; < ±0.001 m/s (±0.003 ft/s)
Data refresh rate	100 Hz
Rated operation conditions	
Operating temperature	-10 ... +50 °C (14 ... +122 °F)
Storage temperature	-20 ... +60 °C (-4 ... +140 °F)
Degree of protection	IP65/NEMA 4X
Design	
Weight	1.4 kg (3.0 lbs)
Dimensions (W × H × D)	176 × 240 × 87 mm (6.9 × 9.5 × 3.4 inch)
Enclosure material	Polycarbonate
Power supply	100 ... 240 V AC @ 20 VA or 11.5 ... 28.5 V DC @ 10 W
Certificates and approvals	
Unclassified locations	
• General safety	• UL, cUL, CE

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Dimensional drawings



SITRANS FST020 IP65 (NEMA 4X), wall mount enclosure, dimensions in mm (inch)

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Selection and ordering data

FSS100 couplant grease

Description	Article No.	
FSS100 couplant grease lubrication for high temperature based on PFPE/PTFE	**A5E02904544**	

Tools for FSS100 transducers

Description	Article No.	
Extraction tool for replacement of FSS100 O-ring transducers under pressure and for hot-tapping (working conditions: typically water, max. 40 bar and max. 60 °C (max. 580 psi and max. 140 °F)) For transducer length: • Up to 160 mm (6.3") • Up to 230 mm (9.1")	 **FDK:085B5333** **FDK:085B5335**	
Angle measurement tool for FSS100	**FDK:085B5330**	
Hot-tap drilling tool for FSS100, the extraction tool is required, max. pressure 40 bar (580 psi)	**FDK:085B5392**	
Alignment tool for FSS100 (typically for hot-tapping). For use on pipe sizes in the range DN 300 ... 1200	**FDK:085B5393**	
Alignment rods-set • for DN 100 ... 650 (4" ... 26"), Ø = 25 mm, L = 500 mm, 3 pcs • for DN 700 ... 1900 (28" ... 76"), Ø = 25 mm, L = 500 mm, 6 pcs • for DN 2000 ... 3000 (80" ... 120"), Ø = 25 mm, L = 500 mm, 10 pcs	 **A5E02609214** **A5E02609215** **A5E02609216**	
Spanner key for transducer mounting type FSS100	**A5E02609218**	
Tool set with various mounting/spare parts for FSS100 transducer installation	**A5E02609219**	 

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Selection and ordering data (continued)

Transducer SITRANS FSS100 spare parts, complete transducer with ½"-NPT cable glands

Type	Material	Gasket	Pressure rating	Terminal housing	Approval	Temperature range [°C (°F)]	Length [mm (inch)]	Article No.	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 ... +100 (-420 ... +212)	160 (6.3)	**A5E00839476**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 ... +200 [1] (-4 ... +392)	160 (6.3)	**A5E00839435**	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 ... +100 (-4 ... +212)	230 (9.41)	**A5E00839477**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 ... +200 [1] (-4 ... +392)	230 (9.41)	**A5E00839437**	

[1] 316 SS housing for -20 ... +200 °C (-4 ... +392 °F) media temperature but cable glands only for -20 ... +100 °C (-4 ... +212 °F) ambient temperature

Transducer SITRANS FSS100 spare parts, complete transducer with M20 cable glands

Type	Material	Gasket	Pressure rating	Terminal housing	Approval	Temperature range [°C (°F)]	Length [mm (inch)]	Article No.	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 ... +100 (-4 ... +212)	160 (6.3)	**FDK:085B5454**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 ... +200 [1] (-4 ... +392)	160 (6.3)	**FDK:085B5455**	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 ... +100 (-4 ... +212)	230 (9.41)	**FDK:085B5458**	
O-ring	316 SS	O-ring	PN 40	316 SS	Ex d [2]	-20 ... +180 (-4 ... +356)	160 (6.3)	**FDK:085B5452**	
O-ring	316 SS	O-ring	PN 40	316 SS	Ex I [3]	-10 ... +190 (14 ... 374)	160 (6.3)	**A5E00836462**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 ... +200 [2] (-4 ... +392)	230 (9.41)	**FDK:085B5459**	

[1] 316 SS housing for -20 ... +200 °C (-4 ... +392 °F) media temperature but cable glands only for -20 ... +100 °C (-4 ... +212 °F) ambient temperature
[2] ATEX (Ex) IIC 2G Ex d IIC T3-T6 Gb
[3] For systems with FST030 ATEX IIC 2G Ex dem [ia/ib] T6/T4/ T3

Transducer SITRANS FSS100 spare parts, transducer terminal housing with ½"-NPT cable glands

Description	Article No.	
Material PA 6.6 Temperature range-20 ... +100 °C (-4 ... +212 °F)	**A5E00839460**	
Material AISI 316 Temperature range -20 ... +200 °C (-4 ... +392 °F)	**A5E00839427**	

Transducer FSS100 spare parts, transducer terminal housing with M20 cable glands

Description	Article No.	
Material PA 6.6 Temperature range -20 ... +100 °C (-4 ... +212 °F)	**FDK:085B5501**	
Material AISI 316 Temperature range -20 ... +200 °C (-4 ... +392 °F)	**FDK:085B5504**	
Material AISI 316, Ex d [1] Temperature range -20 ... +180 °C (-4 ... +356 °F)	**FDK:085B5505**	
Material AISI 316, Ex i [2] Temperature range -10 ... +190 °C (14 ... 374 °F)	**A5E00835255**	

[1] ATEX (Ex) IIC 2G Ex d IIC T3-T6 Gb
[2] For systems with FST030 ATEX IIC 2G Ex dem [ia/ib] T6/T4/T3

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Selection and ordering data (continued)

Transducer SITRANS FSS100 spare parts transducer body with insert as well as insert only

Type	Temperature range [°C (°F)]	Length [mm (inch)]	Article No.	
O-ring (FFKM O-ring material) [1]	-20 ... +200 (-4 ... +392)	160 (6.3)	**FDK:085B1406**	
O-ring (FKM 602 O-ring material) [2]	-20 ... +200 (-4 ... +392)	160 (6.3)	**FDK:085B5510**	
O-ring	-20 ... +200 (-4 ... +392)	230 (9.41)	**FDK:085B5511**	

[1] Chemical resistant O-ring material. Body specially for Ex-approved transducers
[2] Body specially for standard transducers

Transducer SITRANS FSS100 gasket

Type	Pressure rating	Material	Temperature range [°C (°F)]	Article No.	
O-ring 3 pcs for O-ring transducers	PN 40	FKM	-20 ... +200 (-4 ... +392)	**FDK:085B1089**	

Transducer holder for1- up to 4-path SITRANS FSS100

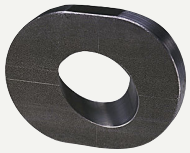
Description	Article No.	
Holders used for 1-path or 3-path for the center transducer mounting (each incl. 1 pc)		
• 160 mm (6.3") stainless steel 45°, DN 100 ... 150 (4" ... 6")	**FDK:085L1103**	
• 160 mm (6.3") carbon steel 45°, DN 100 ... 150 (4" ... 6")	**FDK:085L1102**	
• 230 mm (9.1") for concrete pipe 60°, DN 600 ... 2400 (24" ... 96")	**FDK:085L1107**	
• 160 mm (6.3") stainless steel 60°, DN 200 ... 2400 (8" ... 96")	**FDK:085L1105**	
• 160 mm (6.3") carbon steel 60°, DN 200 ... 2400 (8" ... 96")	**FDK:085L1104**	
Holders used for 2-path, 3-path and 4-path for the non-central transducer mounting (each incl. 1 pc)		
• 230 mm (9.1") for concrete pipe 60°, DN 600 ... 3000 (24" ... 120")	**FDK:085L1111**	
• 160 mm (6.3") stainless steel 60°, DN 200 ... 3000 (8" ... 120")	**FDK:085L1109**	
• 160 mm (6.3") carbon steel 60°, DN 200 ... 3000 (8" ... 120")	**FDK:085L1108**	

The other transducer holder parts are either completely in stainless steel for the concrete and stainless steel pipes (AISI 316L/1.4404 or similar). For carbon pipes the part welded onto the pipe is in carbon steel (St.37 or similar). Thread part is stainless steel (AISI 316L/1.4404 or similar).

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Selection and ordering data (continued)

Mounting plate for SITRANS FSS100 transducers

Description	Article No.	
Mounting plates used for 1-path or 3-path for the center transducer mounting (each incl. 1 pc)		
• Stainless steel plate, 45°, DN 100 ... 150 (4" ... 6")	**FDK:085L1113**	
• Carbon steel plate, 45°, DN 100 ... 150 (4" ... 6")	**FDK:085L1112**	
• Stainless steel plate, 60°, DN 200 ... 2400 (8" ... 96")	**FDK:085L1115**	
• Carbon steel plate, 60°, DN 200 ... 2400 (8" ... 96")	**FDK:085L1114**	
Mounting plates used for 2-path, 3-path and 4-path for the non-central transducer mounting (each incl. 1 pc)		
• Stainless steel plate, 60°, DN 200 ... 3000 (8" ... 120")	**FDK:085L1119**	
• Carbon steel plate, 60°, DN 200 ... 3000 (8" ... 120")	**FDK:085L1118**	

The mounting plates are either completely in stainless steel (AISI 316L/1.4404 or similar) or carbon steel (St.37 or similar).

Cable glands

Description	Temperature range [°C (°F)]	Approvals	Article No.	
Black PA plastic cable Ø 5 ... 13 mm (1 pc)	-20 ... 100 (-4 ... +212)		**A5E02246304**	
½" NPT grey PA plastic cable Ø 5 ... 9 mm (1 pc)	-20 ... 100 (-4 ... +212)		**A5E02246309**	
½" NPT crome-plated brass cable Ø 5 ... 9 mm (1 pc)	-40 ... 100 (-40 ... +212)		**A5E02246258**	
M20 stainless steel cable Ø 4 ... 6 mm (1 pc)	-25 ... 200 (-13 ... +392)	Ex i	**A5E02246194**	

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Selection and ordering data (continued)

Description	Temperature range [°C (°F)]	Approvals	Article No.	
M20 stainless steel cable Ø 5 ... 8 mm (1 pc)	-60 ... 180 (-76 ... +356)	Ex d	**A5E02246311**	
PG 13.5 brass cable gland	-20 ... 100 (-4 ... +212)		**A5E02247692**	

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Overview



SITRANS FST030 with FSS200 and external DSL

SITRANS FS clamp-on ultrasonic flowmeters provide highly accurate measurement while minimizing installation time and maintenance expense.

Benefits

- Easy installation; no need to cut pipe or stop flow
- Minimal maintenance; external sensors do not require periodic cleaning
- No moving parts to foul or wear
- No pressure drop or energy loss
- Wide turn-down ratio
- Single or dual path with internal DSL, up to four paths with external DSL option

System performance	
Approvals	• ATEX Zone 1, 2 (Sensors: Zone 0, 1, 2) • IECEx Zone 1, 2 (Sensors: Zone 0, 1, 2) • FM/FMc Class I Div. 1, 2 (Sensors: Class I Div. 1)
Accuracy at measuring point	± 0.5 ... 1 % for velocities above 0.3 m/s and >10 diameters straight run ± 0.5 % ± 0.0015 m/s with high precision or universal sensors ± 1 % ± 0.003 m/s with high temperature sensors for velocities above 0.3 m/s and > 10 diameters straight run and optimal installation conditions
Repeatability at maesuring point	± 0.25 % (based on ISO 11631)
Accuracy of measuring system	± 0.2 % ± 0.0015 m/s with high precision or universal sensors ± 0.5 % ± 0.003 m/s with high temperature sensors
Repeatability of the measuring system	± 0.05 – 0.1%
Pipe size range	12.7 ... 10 m (0.5" ... 394")
Wall thickness range	0.64 ... 76.2 mm (0.025" ... 3.0")
Pipe material	Any sonically conductive material (steel, plastic, aluminum, glass, cement, ductile iron, copper)
Optional External DSL	Zone 0, 1, 2, Class 1 Div. 1 with Transmitter in Zone 2 Class 1 Div. 2 area

Digitaler Sensor Link (FS-DSL)

The electronics for creating measured values for an ultrasonic measurement are located in a compact module called: Digital Sensor Link.

Together with the ultrasonic sensors, this module creates an analogue measurement signal for volume flow and lots of other data. All data is then immediately digitized and sent to the transmitter without interference.

The advantage: best possible EMC thanks to very short analog signal lines and safer data transfer to possible transmitter variants.

The FS-DSL is suitable for clamp-on sensors as well as for inline - SONO sensors, the set firmware determines the respective technology. The FS-DSL is available for water applications, for oil measurements and also for clamp-on gas measurements.

The module can be used in Ex-Zone 1 (Class 1 Div 1) as an external FS-DSL in a pressure-encapsulated IP 66/67 housing. The distance to the transmitter can be up to 150 m, which is also how the FS-DSL is powered. The FS-DSL offers analog inputs for temperature and pressure and is always designed for up to 4 measuring paths in the external version.

Option:

Optionally, the FS-DSL module is also available integrated in the SITRANS FST030 only in the version as a wall housing, but then with reduced EMC, number of paths and Ex version.

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Application

SITRANS FS230 standard functions are suitable for a wide variety of liquid applications, including the following:

- Water industry
  - Raw water
  - Potable water
  - Chemicals
- Wastewater industry
  - Raw sewage
  - Effluent
  - Sludges
  - Mixed liquor
  - Chemicals
- HVAC industry
  - Condensers
  - Hot & cold water systems
- Power industry
  - Nuclear
  - Fossil
  - Hydroelectric
- Processing industry
  - Process control
  - Batching
  - Rate indication
  - Volumetric and mass measurement

SITRANS FS230 hydrocarbon functions are ideal for applications carrying crude oil, refined petroleum or liquefied gas.

Standard volume (high end system)

- Standard (net) volume flow measurement
- Suitable for use in leak detection systems
- Mass flow output measurement
- Chemical and petrochemical processing
- Precise identification of interfaces on multi-liquid pipelines
- Product identification
- Standard density indication
- Applications with multiple liquids having a wide viscosity range
- Automatic gross volume compensation due to viscosity

SITRANS FS230 is ideal for most natural and process gas industry applications, including:

- Checkmetering
- Allocation
- Flow survey verification
- Lost and unaccounted for (LAUF) gas analysis
- Production
- Storage

The FS230 can be supplied with an external DSL option that allows for up to four paths with two additional analog inputs. The External DSL enclosure can be installed in a Zone 1 or Div 1 area near the sensors and measurement pipe using short sensor cables, with communication cable to transmitter up to 150 meters away.

System information and selection guide

SITRANS FS clamp-on flowmeters	FS230 (Standard)	FS230 (Hydrocarbon)	FS230 (Gas)
Industry/Applications			
Water and aqueous solutions	X	-	-
Utility district heating, cooling	X	-	-
Chemical	X	-	-
Hydrocarbons/petrochemical, multiple products or varying viscosity, liquefied gases, net and gross volume	-	X	-
Hydrocarbons (single product with limited viscosity range) gross volume	X	X	
Very low flow (< 0.1 m/s) in small pipes	X	-	
High temperature applications < 232 °C (450 °F)	X	-	-
Refrigeration liquids	X	-	-
Food products	X	-	-
Natural Gas	-	-	X
Other gases i.e. propane, oxygen, argon etc.	-	-	X
Design			
Field clamp-on (non-intrusive)	X	X	X

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Application (continued)

SITRANS FS clamp-on flowmeters	FS230 (Standard)	FS230 (Hydrocarbon)	FS230 (Gas)
Standard volume or mass flow; per API MPMS chapter 11.1	-	X	X
Interface detection	-	X	X
Standard density output	-	X	X
Temperature measurement	X	X	X
Analog input	X	X	X
Large graphical display	X	X	X
Configuration and diagnostic software PDM compatible	X	X	X
Number of acoustic paths and channels			
1-path	X	X	X
2-path	X	X	X
3-path (with external DSL)	X	X	X
4-path (with external DSL)	X	X	X
Size			
12.7 ... 10 000 mm (0.5" ... 394")	X	-	-
38 ... 10 000 mm (1.5" ... 394")	-	X	-
38 ... 1 200 mm (1.5" ... 48")	-	-	X
Approvals			
FM /FMc[1)]	X	X	X
ATEX	X	X	X
IECEx	X	X	X

[1)] NEMA 4X associated equiptment in DIV 2 connected to DIV 1 sensors and DIV 1 external DSL.

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Selection and ordering data

SITRANS FS230 clamp-on flowmeter	Article No. 7ME372 ● - ● ● ● ● ● - ● ● ● ● ●	Order code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Transmitter model		
Transmitter FST030	**3**	
Pipe material/temperature		
Transmitter only - no sensor	**0**	
Steel (stainless steel, carbon steel), temperature range: best use < 80 °C (176 °F)	**1**	
Steel (stainless steel, carbon steel), temperature range: best use > 80 °C (176 °F)	**2**	
Plastic (PVC) (for gas applications), temperature: -40 ... 65.5 °C (-40 ... 150 °F)	**4**	
Plastic (PVC) (for liquid applications), temperature: -40 ... +121 °C (-40 ... 250 °F)	**6**	
All materials except steel and plastic, temperature: -40 ... +121 °C (-40 ... 250 °F)	**7**	
Any material, very high temperature: -40 ... +230 °C (-40 ... 446 °F)	**8**	
Pipe outer diameter range		
Transmitter only - no sensor	**A**	
13 ... 19 mm (0.5 ... 0.75")	**B**	
19.3 ... 30.5 mm (0.76 ... 1.20")	**C**	
30.7 ... 50.8 mm (1.21 ... 2.00")	**D**	
51 ... 76 mm (2.01 ... 3.00")	**E**	
78 ... 127 mm (3.1 ... 5.0")	**F**	
129 ... 203 mm (5.1 ... 8.0")	**G**	
206 ... 305 mm (8.1 ... 12.0")	**H**	
307 ... 508 mm (12.1 ... 20.0")	**J**	
510 ... 1200 mm (20.1 ... 48.0")	**K**	
1200 ... 9144 mm (48.0 ... 360")	**L**	
Pipe wall thickness range		
Transmitter only - no sensor	**A**	
0.635 ... 1.016 mm (0.025 ... 0.04")	**B**	
1.016 ... 1.524 mm (0.04 ... 0.06")	**C**	
1.524 ... 2.032 mm (0.06 ... 0.08")	**D**	
2.032 ... 3.048 mm (0.08 ... 0.12")	**E**	
3.048 ... 4.064 mm (0.12 ... 0.16")	**F**	
4.064 ... 5.842 mm (0.16 ... 0.23")	**G**	
5.842 ... 8.128 mm (0.23 ... 0.32")	**H**	
8.128 ... 11.176 mm (0.32 ... 0.44")	**J**	
11.176 ... 15.748 mm (0.44 ... 0.62")	**K**	
15.748 ... 31.75 mm (0.62 ... 1.25")	**L**	
31.75 ... 50.8 mm (1.25 ... 2.00")	**M**	
Sensor mounting		
Transmitter only - no sensor	**0**	
Mounting straps only	**1**	
Standard frames and tracks	**2**	
Magnetic - no straps	**4**	
Magnetic - with straps	**6**	
High precision mount (single enclosure)	**7**	
High precision mount (dual enclosure)	**8**	
Number of paths (sensor pairs)		
Transmitter only - no sensor	**0**	
One path	**1**	
Two path	**2**	
Three path	**3**	
Four path	**4**	
Environment		
Standard	**1**	

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Selection and ordering data (continued)

SITRANS FS230 clamp-on flowmeter	Article No. 7ME372 ● - ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
Transmitter/DSL Material and mounting style		
Industrial enclosure transmitter with external FS DSL for remote to the sensors. Transmitter and DSL: aluminum cast, NEMA 4X, max. 4 path, M12 connection between transmitter and FS-DSL with SSL cable	G	
Industrial enclosure transmitter with external FS DSL for remote to the sensors. Transmitter and DSL: aluminum cast, NEMA 4X, max. 4 path, cable connection between transmitter and FS-DSL with SSL cable	K	
Replacement DSL for option V transmitter, no transmitter DSL: aluminium cast, NEMA 4X, M12 socket for DSL to transmitter interconnect cable	N	
Replacement DSL for option W transmitter, no transmitter DSL: aluminium cast, NEMA 4X, terminal block for DSL to transmitter interconnect cable	Q	
Wallmount transmitter, internal DSL, transmitter: aluminum wallbox, NEMA 4X, DSL: none, direct connected sensor cables, (max 2-path, max. 20 meter sensor cable)	U	
Wall box housing, external DSL, remote to sensor Transmitter: aluminum wallbox, NEMA 4X DSL: aluminum cast, NEMA 4X, M12 socket for DSL to transmitter interconnect cable (max 4-path, max. 20 m sensor cable, max. 150 m interconnect cable)	V	
Wall box housing, external DSL, remote to sensor Transmitter: aluminum wall box, NEMA 4X DSL: aluminum cast, NEMA 4X, terminal block for DSL to transmitter interconnect cable (max. 4-path, max. 20 m sensor cable, max. 150 m interconnect cable)	W	
Ex approvals		
Non-Ex	A	
ATEX, wallbox enclosure	B	
ATEX, industrial enclosure	C	
IECEx, wallbox	E	
IECEx, industrial enclosure	F	
FM, FMc, wallbox enclosure	G	
FM, FMc, industrial enclosure	H	
CSA, wallbox enclosure	L	
CSA, industrial enclosure	M	
ATEX, IECEx, FM, CSA, industrial enclosure	N	
ATEX, IECEx, FM, FMc, wallbox enclosure	P	
NEPSI	Z	Q 0 B
InMetro	Z	Q 0 D
KCs	Z	Q 0 F
Local User Interface		
Graphical local user interface, 240 × 160 pixels	3	

	Order code
Further designs Please add "**-Z**" to Article No. and specify Order code(s).	
Cable glands - transmitter, DSL (not for sensor cables)	
No glands, metric threads on transmitter	**A01**
No cable glands, NPT thread, nickle plated brass, quantity based on option "G" data place 14	**A20**
No cable glands, NPT thread, stainless steel, quantity bases on option "G" data place 14	**A21**
Cable glands, nickle plated brass, quantity based on option "G" data place 14	**A22**
Cable glands, plastic, quantity based on option "G" data place 14	**A24**
Cable glands, stainless seel, quantity based on option "G" data place 14	**A26**
No cable glands, NPT thread, nickle plated brass, quantity based on option "K" data place 14	**A30**
No cable glands, NPT thread, stainless steel, quantity bases on option "K" data place 14	**A31**
Cable glands, nickle plated brass, quantity based on option "K" data place 14	**A32**
Cable glands, plastic, quantity based on option "K" data place 14	**A34**

	Order code
Cable glands, stainless seel, quantity based on option "K" data place 14	**A36**
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "N" in data place 14	**A40**
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "N" in data place 14	**A41**
Nickel plated brass glands: quantity based on selection "N" in data place 14	**A42**
Plastic glands: quantity based on selection "N" in data place 14	**A44**
Stainless steel glands: quantity based on selection "N" in data place 14	**A46**
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "Q" in data place 14	**A50**
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "Q" in data place 14	**A51**
Nickel plated brass glands: quantity based on selection "Q" in data place 14	**A52**
Plastic glands: quantity based on selection "Q" in data place 14	**A54**
Stainless steel glands: quantity based on selection "Q" in data place 14	**A56**
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "U" in data place 14	**A60**

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Selection and ordering data (continued)

	Order code
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "U" in data place 14	**A61**
Nickel plated brass glands: quantity based on selection "U" in data place 14	**A62**
Plastic glands: quantity based on selection "U" in data place 14	**A64**
Stainless steel glands: quantity based on selection "U" in data place 14	**A66**
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "V" in data place 14	**A70**
No glands, metric thread with NPT thread adapters, stainless steel: quantity based on selection "V" in data place 14	**A71**
Nickel plated brass glands: quantity based on selection "V" in data place 14	**A72**
Plastic glands: quantity based on selection "V" in data place 14	**A74**
Stainless steel glands: quantity based on selection "V" in data place 14	**A76**
No glands, metric thread with NPT thread adapters, nickel plated brass: quantity based on selection "W" in data place 14	**A80**
No glands, metric thread with NPT thread adapters, stainless steel: Quantity based on selection "W" in data place 14	**A81**
Nickel plated brass glands: quantity based on selection "W" in data place 14	**A82**
Plastic glands: quantity based on selection "W" in data place 14	**A84**
Stainless steel glands: quantity based on selection "W" in data place 14	**A86**
Software functions and CT approvals	
For standard industry applications (liquids, e.g. water)	**B11**
Hydrocarbon applications (oil table with temperature and viscosity compensation)	**B39**
For gas process values	**B50**
I/O configuration Ch1	
Non-Ex, 4 ... 20 mA HART, menu selected passive/active	**E02**
Ex, 4 ... 20 mA HART, active	**E06**
Ex, 4 ... 20 mA HART, passive	**E07**
Modbus RTU 485	**E14**
I/O configuration Ch2, Ch3 and Ch4	
None	**F00**
Non-Ex	
• Ch2: current/freq./pulse, Ch3: none, Ch4: none. Active/passive menu selected	**F01**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: none. Active/passive menu selected	**F02**
• Ch2:current/freq./pulse, Ch3: current/freq./pulse, Ch4:current/freq./pulse. Active/passive menu selected	**F03**
• Ch2:current/freq./pulse, Ch3: current/freq./pulse, Ch4: relay. Active/passive menu selected	**F04**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: relay. Active/passive menu selected	**F05**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: none. Active/passive menu selected	**F06**
Ex Passive	
• Ch2: current/freq./pulse, Ch3: none, Ch4: none	**F11**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: none	**F12**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: current/freq./pulse	**F13**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: relay	**F14**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: relay	**F15**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: none	**F16**
Ex Active	
• Ch2: current/freq./pulse, Ch3: none, Ch4: none	**F21**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: None	**F22**
• Ch2:current/freq./pulse, Ch3: current/freq./pulse, Ch4:current/freq./pulse	**F23**
• Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: relay	**F24**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: relay	**F25**
• Ch2: current/freq./pulse, Ch3: relay, Ch4: none	**F26**
Certificates	
Factory certification 2.2 to EN 10204:2004	**C19**
DSL strap kit (to strap DSL to pipe)	
• 60.3 mm (2 inch) pipe mount with U-bolts	**G01**
• Stainless steel strap to mount DSL to pipe DN 60 ... 150 pipe size (2 ... 6 inch)	**G03**
• Stainless steel strap to mount DSL to pipe DN 150 ... 300 (6 ... 12 inch)	**G05**
• Stainless steel strap to mount DSL to pipe DN 300 ... 400 (12 ... 16 inch)	**G07**
• Stainless steel strap to mount DSL to pipe DN 400 ... 600 (16 ... 24 inch)	**G08**
Temperature sensors and pockets	
1 000 Ω platinum standard clamp-on RTD	**J61**
1 000 Ω platinum submersible clamp-on RTD	**J62**
Sensor cables to transmitter/DSL for 1-path	
1 m (3.2 ft) standard/submersible coax sensor cable pair with nylon glands	**K21**
3 m (9.8 ft) standard/submersible coax sensor cable pair with nylon glands	**K22**
5 m (16.4 ft) standard/submersible coax sensor cable pair with nylon glands	**K23**
10 m (32.8 ft) standard/submersible coax sensor cable pair with nylon glands	**K24**
20 m (65.6 ft) standard/submersible coax sensor cable pair with nylon glands	**K25**
1 m (3.2 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	**K26**
3 m (9.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	**K27**
5 m (16.4 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	**K28**
10 m (32.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	**K29**
20 m (65.6 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	**K30**
1 m (3.2 ft) standard/submersible coax sensor cable pair with stainless steel glands	**K31**
3 m (9.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	**K32**
5 m (16.4 ft) standard/submersible coax sensor cable pair with stainless steel glands	**K33**
10 m (32.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	**K34**
20 m (65.6 ft) standard/submersible coax sensor cable pair with stainless steel glands	**K35**
5 m (16.4 ft) plenum rated coax sensor cable pair with nylon glands	**K36**
20 m (65.6 ft) plenum rated coax sensor cable pair with nylon glands	**K37**
5 m(16.4 ft) plenum rated coax sensor cable pair with nickel plated brass glands	**K38**
20 m (65.6 ft) plenum rated coax sensor cable pair with nickel plated brass glands	**K39**
5 m (16.4 ft) plenum rated coax sensor cable pair with stainless steel glands	**K40**
20 m (65.6 ft) plenum rated coax sensor cable pair with stainless steel glands	**K41**
1 m (3.2 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	**K50**
3 m (9.8 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	**K51**
5 m (16.4 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	**K52**
10 m (32.8 ft) armored sensor cable pair with nickel plated brass glands	**K53**
20 m (65.6 ft) armored sensor cable pair with nickel plated brass glands	**K54**

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Selection and ordering data (continued)

	Order code
10 m (32.8 ft) standard/submersible coax sensor cable pair with no transmitter glands	K76
20 m (65.6 ft) standard/submersible coax sensor cable pair with no transmitter glands	K77
20 m (65.6 ft) plenum rated coax sensor cable pair with no glands	K78
Sensor cables to transmitter/DSL for 2-path	
1 m (3.2 ft) standard/submersible coax sensor cable pair with nylon glands	T21
3 m (9.8 ft) standard/submersible coax sensor cable pair with nylon glands	T22
5 m (16.4 ft) standard/submersible coax sensor cable pair with nylon glands	T23
10 m (32.8 ft) standard/submersible coax sensor cable pair with nylon glands	T24
20 m (65.6 ft) standard/submersible coax sensor cable pair with nylon glands	T25
1 m (3.2 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	T26
3 m (9.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	T27
5 m (16.4 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	T28
10 m (32.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	T29
20 m (65.6 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	T30
1 m (3.2 ft) standard/submersible coax sensor cable pair with stainless steel glands	T31
3 m (9.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	T32
5 m (16.4 ft) standard/submersible coax sensor cable pair with stainless steel glands	T33
10 m (32.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	T34
20 m (65.6 ft) standard/submersible coax sensor cable pair with stainless steel glands	T35
5 m (16.4 ft) plenum rated coax sensor cable pair with nylon glands	T36
20 m (65.6 ft) plenum rated coax sensor cable pair with nylon glands	T37
5 m(16.4 ft) plenum rated coax sensor cable pair with nickel plated brass glands	T38
20 m (65.6 ft) plenum rated coax sensor cable pair with nickel plated brass glands	T39
5 m (16.4 ft) plenum rated coax sensor cable pair with stainless steel glands	T40
20 m (65.6 ft) plenum rated coax sensor cable pair with stainless steel glands	T41
1 m (3.2 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	T50
3 m (9.8 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	T51
5 m (16.4 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	T52
10 m (32.8 ft) armored sensor cable pair with nickel plated brass glands	T53
20 m (65.6 ft) armored sensor cable pair with nickel plated brass glands	T54
10 m (32.8 ft) standard/submersible coax sensor cable pair with no transmitter glands	T76
20 m (65.6 ft) standard/submersible coax sensor cable pair with no transmitter glands	T77
20 m (65.6 ft) plenum rated coax sensor cable pair with no glands	T78
Sensor cables to transmitter/DSL for 3-path	
1 m (3.2 ft) standard/submersible coax sensor cable pair with nylon glands	U21
3 m (9.8 ft) standard/submersible coax sensor cable pair with nylon glands	U22
5 m (16.4 ft) standard/submersible coax sensor cable pair with nylon glands	U23
10 m (32.8 ft) standard/submersible coax sensor cable pair with nylon glands	U24

	Order code
20 m (65.6 ft) standard/submersible coax sensor cable pair with nylon glands	U25
1 m (3.2 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	U26
3 m (9.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	U27
5 m (16.4 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	U28
10 m (32.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	U29
20 m (65.6 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	U30
1 m (3.2 ft) standard/submersible coax sensor cable pair with stainless steel glands	U31
3 m (9.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	U32
5 m (16.4 ft) standard/submersible coax sensor cable pair with stainless steel glands	U33
10 m (32.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	U34
20 m (65.6 ft) standard/submersible coax sensor cable pair with stainless steel glands	U35
5 m (16.4 ft) plenum rated coax sensor cable pair with nylon glands	U36
20 m (65.6 ft) plenum rated coax sensor cable pair with nylon glands	U37
5 m(16.4 ft) plenum rated coax sensor cable pair with nickel plated brass glands	U38
20 m (65.6 ft) plenum rated coax sensor cable pair with nickel plated brass glands	U39
5 m (16.4 ft) plenum rated coax sensor cable pair with stainless steel glands	U40
20 m (65.6 ft) plenum rated coax sensor cable pair with stainless steel glands	U41
1 m (3.2 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	U50
3 m (9.8 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	U51
5 m (16.4 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	U52
10 m (32.8 ft) armored sensor cable pair with nickel plated brass glands	U53
20 m (65.6 ft) armored sensor cable pair with nickel plated brass glands	U54
10 m (32.8 ft) standard/submersible coax sensor cable pair with no transmitter glands	U76
20 m (65.6 ft) standard/submersible coax sensor cable pair with no transmitter glands	U77
20 m (65.6 ft) plenum rated coax sensor cable pair with no glands	U78
Sensor cables to transmitter/DSL for 4-path	
1 m (3.2 ft) standard/submersible coax sensor cable pair with nylon glands	V21
3 m (9.8 ft) standard/submersible coax sensor cable pair with nylon glands	V22
5 m (16.4 ft) standard/submersible coax sensor cable pair with nylon glands	V23
10 m (32.8 ft) standard/submersible coax sensor cable pair with nylon glands	V24
20 m (65.6 ft) standard/submersible coax sensor cable pair with nylon glands	V25
1 m (3.2 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	V26
3 m (9.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	V27
5 m (16.4 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	V28
10 m (32.8 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	V29
20 m (65.6 ft) standard/submersible coax sensor cable pair with nickel plated brass glands	V30
1 m (3.2 ft) standard/submersible coax sensor cable pair with stainless steel glands	V31

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Selection and ordering data (continued)

	Order code
3 m (9.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	V32
5 m (16.4 ft) standard/submersible coax sensor cable pair with stainless steel glands	V33
10 m (32.8 ft) standard/submersible coax sensor cable pair with stainless steel glands	V34
20 m (65.6 ft) standard/submersible coax sensor cable pair with stainless steel glands	V35
5 m (16.4 ft) plenum rated coax sensor cable pair with nylon glands	V36
20 m (65.6 ft) plenum rated coax sensor cable pair with nylon glands	V37
5 m(16.4 ft) plenum rated coax sensor cable pair with nickel plated brass glands	V38
20 m (65.6 ft) plenum rated coax sensor cable pair with nickel plated brass glands	V39
5 m (16.4 ft) plenum rated coax sensor cable pair with stainless steel glands	V40
20 m (65.6 ft) plenum rated coax sensor cable pair with stainless steel glands	V41
1 m (3.2 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	V50
3 m (9.8 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	V51
5 m (16.4 ft) armored sensor cable pair with nickel plated brass glands. Temperature: -25 ... +80 °C	V52
10 m (32.8 ft) armored sensor cable pair with nickel plated brass glands	V53
20 m (65.6 ft) armored sensor cable pair with nickel plated brass glands	V54
10 m (32.8 ft) standard/submersible coax sensor cable pair with no transmitter glands	V76
20 m (65.6 ft) standard/submersible coax sensor cable pair with no transmitter glands	V77
20 m (65.6 ft) plenum rated coax sensor cable pair with no glands	V78
Cable, DSL to wallbox transmitter	
5 m (16.4 ft) standard DSL cable (2 mounted M12 plugs)	L51
5 m (16.4 ft) standard DSL cable (no plugs mounted)	L52
10 m (32.8 ft) standard DSL cable (2 mounted M12 plugs)	L55
10 m (32.8 ft) standard DSL cable (no plugs mounted)	L56
25 m (82 ft) standard DSL cable (2 mounted plugs)	L59
25 m (82 ft) standard DSL cable (no plugs mounted)	L60
50 m (164 ft) standard DSL cable (2 mounted plugs)	L63
50 m (164 ft) standard DSL cable (no plugs mounted)	L64
75 m (246.1 ft) standard DSL cable (2 mounted plugs)	L67
75 m (246.1 ft) standard DSL cable (no plugs mounted)	L68
150 m (492.1 ft) standard DSL cable (2 mounted plugs)	L71
150 m (492.1 ft) standard DSL cable (no plugs mounted)	L72
RTD cable (clamp temperature sensor to transmitter)	
6 m (20 ft) standard RTD cable	R50
15 m (50 ft) standard RTD cable	R51
30 m (100 ft) standard RTD cable	R52
46 m (150 ft) standard RTD cable	R53
61 m (200 ft) standard RTD cable	R54
91 m (300 ft) standard RTD cable	R55
6 m (20 ft) submersible RTD cable	R56
15 m (50 ft) submersible RTD cable	R57
30 m (100 ft) submersible RTD cable	R58
46 m (150 ft) submersible RTD cable	R59
61 m (200 ft) submersible RTD cable	R60
91 m (300 ft) submersible RTD cable	R61

	Order code
Mass storage	
Enable mass storage function for SD card (not available for USA)	S30
Country specific approval	
KC-Approval for South Korea	W28
Tag plate	
Tag plate for external DSL, stainless steel	Y14
Tag plate for transmitter, stainless steel	Y15
Tag name plate, stainless steel	Y17

	Article No.
System spare parts	
Tool kits and loose parts	
"F" connector tool kit, 2 per	A5E38145699
Bag of loose spare parts; for wallmount, including cable strain relief components, mounting tool, seals and gasket, assorted screws and washers, hex cap nut, blind plugs, and O-rings	A5E38288072
Electronics assemblies and modules	
Wall mount transmitter	
• Display and keypad assembly	A5E37697615
• Digital Sensor Link (DSL), internal, for wall box, standard process values	A5E38014726
• Digital Sensor Link (DSL), internal, for wall box, hydrocarbon process values	A5E42138542
• Digital Sensor Link (DSL), internal, for wall box, gas process values	A5E47202379
• SensorFlash (4 GB microSD card) -40 °C ... +85 °C	A5E38288507
• Power supply, for wall box, (240 V AC, 47 ... 63 Hz), (24 ... 90 V DC)	A5E38263021
• Foam insert for wall box with connectors	A5E38287828
Interface module with integrated Ex barrier to remote sensor with DSL for SITRANS FST030 and for SITRANS FCT030 from firmware V4.0	A5E45385709
External DSL	
• Digital Sensor Link (DSL), external, module only, standard process values	A5E38014662
• Digital Sensor Link (DSL), external, module only, hydrocarbon process values	A5E37843869
• Digital Sensor Link (DSL), external, module only, gas process values	A5E47202369
• F connector board set: board A, board B and screws for mounting	A5E45882316
• Front end module cover plate with screws for mounting	A5E45882046
Cassettes, I/O configuration and communication	
• Ch1: I/O and comm (active) 4 ... 20 mA output and HART 7.2, Ex	A5E38012278
• Ch1: I/O and comm (passive) 4 ... 20 mA output and HART 7.2, Ex	A5E38013025
• Ch1: communication Modbus RTU 485, Ex	A5E38013054
• Ch1: I/O and comm (active/passive) 4 ... 20 mA output and HART 7.2, Non-Ex	A5E38013040
• Ch1: communication Modbus RTU 485, Non-Ex	A5E38013069
• F01, Non-Ex Ch2: Current/Frequ./Pulse Ch3: None Ch4: None Menu select active/passive	A5E38006256
• F02, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: None Menu select active/passive	A5E38006558

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Selection and ordering data (continued)

	Article No.
• F03, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Current/Frequ./Pulse Menu select active/passive	A5E38006598
• F04, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Relay Menu select active/passive	A5E38006896
• F05, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: Relay Menu select active/passive	A5E38006900
• F06, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: None Menu select active/passive	A5E38011432
• F11, Ex-passive Ch2: Current/Freq./Pulse Ch3: None Ch4: None	A5E38011478
• F12, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: None	A5E38011509
• F13, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Current/Frequ./Pulse	A5E38011541
• F14, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Relay	A5E38011600
• F15, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Relay, Ch4: Relay	A5E38011618
• F16, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: None	A5E38011908
• F21, Ex-active Ch2: Current/Frequ./Pulse Ch3: None Ch4: None	A5E38012039
• F22, Ex-active Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: None	A5E38012056
• F23, Ex-active Ch2: current/freq./pulse, Ch3: current/freq./pulse, Ch4: current/freq./pulse	A5E38012121
• F24, Ex-active Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Relay	A5E38019235
• F25, Ex-active Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: Relay	A5E38019263
• F26, Ex-active Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: None	A5E38019378
Miscellaneous parts	
General	
• Blind plug brass-nickel 10 pcs (Ex version)	A5E38145685
• Blind plug stainless steel 10 pcs (Ex version)	A5E38145689
• Twist-on F connectors, 4 pcs	A5E38268608
• M12 adapter for DSL or wall mounted transmitter	A5E03906095
Wall mount transmitter	
• Wall bracket "pipe mounting"	A5E38288020

	Article No.
• Wall bracket "panel mounting	A5E38288032
• Metal kit: PSU cover, back plane	A5E38415145
• Power input cover plate	A5E38415205
External DSL	
• Wall mount bracket and screws for mounting DSL on bracket	A5E45882610
• Lid with O-ring	A5E45818351
• Bag with parts: cable strain reliefs, screws and washers, lid lock screw, grounding parts	A5E38111577
• Acessory pipe mounting kit for FS DSL, max. 60.3 mm (2.4 inch) pipe	A5E36617118001
• Accessory pipe strap kit for FS DSL, DN 50 ... 150 (2 ... 6 inch) pipe	A5E36617118002
• Accessory pipe strap kit for FS DSL, DN 150 ... 300 (6 ... 12 inch) pipe	A5E36617118003
• Accessory pipe strap kit for FS DSL, DN 300 ... 400 (12 ... 16 inch) pipe	A5E36617118004
• Accessory pipe strap kit for FS DSL, DN 400 ... 600 (16 ... 24 inch) pipe	A5E36617118005
Cable glands	
Set of cable glands, plastic, black, metric	A5E03907414
Set of cable glands, Ex e/i, plastic, metric	A5E03907424
Set of cable glands, Ex e/i, stainless steel, metric	A5E03907429
Set of cable glands, Ex e/i, brass nickel-plated, metric	A5E03907430
Set of cable glands, plastic, black, NPT	A5E03907435
Set of cable glands, Ex e/i, plastic, NPT	A5E03907451
Set of cable glands, Ex e/i, stainless steel, NPT	A5E03907467
Set of cable glands, Ex e/i, brass nickel-plated, NPT	A5E03907473

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Selection and ordering data (continued)

Article No./Crossreference

Steel (T1)			Steel (T2)			Plastic liquid		
Data place 8,9,10 of 7ME372.-... combination	Sensor part number	Sensor Size Code	Data place 8,9,10 of 7ME372.-... combination	Sensor part number	Sensor Size Code	Data place 8,9,10 of 7ME372.-... combination	Sensor part number	Sensor Size Code
1BB	7ME3950-5LG01	A1HT1	2BB	7ME3950-5LB11	A1	6BB	7ME3950-5LB01	A2
1BC	7ME3950-5LH01	A2HT1	2BC	7ME3950-5LB01	A2	6BC	7ME3950-5LB01	A2
1BD	7ME3950-5LB11	A1	2BD	7ME3950-5LB11	A1	6BD	7ME3950-5LB01	A2
1BE	7ME3950-5LB01	A2	2BE	7ME3950-5LB01	A2	6BE	7ME3950-5LB01	A2
1BF	7ME3950-5LB11	A1	2BF	7ME3950-5LB11	A1	6BF	7ME3950-5LB01	A2
1CB	7ME3950-5LG01	A1HT1	2CB	7ME3950-5LB11	A1	6CB	7ME3950-5LB01	A2
1CC	7ME3950-5LH01	A2HT1	2CC	7ME3950-5LB01	A2	6CC	7ME3950-5LB01	A2
1CD	7ME3950-5LJ01	A3HT1	2CD	7ME3950-5LB11	A1	6CD	7ME3950-5LB01	A2
1CE	7ME3950-5GK01	B1HT1	2CE	7ME3950-5GK21	B1HT2	6CE	7ME3950-5LB01	A2
1CF	7ME3950-5LB11	A1	2CF	7ME3950-5LB11	A1	6CF	7ME3950-5LB01	A2
1CG	7ME3950-5LB11	A1	2CG	7ME3950-5LB11	A1	6CG	7ME3950-5LB01	A2
1DB	7ME3950-5LG01	A1HT1	2DB	7ME3950-5LC11	B1	6DC	7ME3950-5LC01	B3
1DC	7ME3950-5LH01	A2HT1	2DC	7ME3950-5LC21	B2	6DD	7ME3950-5LC01	B3
1DD	7ME3950-5LJ01	A3HT1	2DD	7ME3950-5LC11	B1	6DE	7ME3950-5LC01	B3
1DE	7ME3950-5GK01	B1HT1	2DE	7ME3950-5GK21	B1HT2	6DF	7ME3950-5LC01	B3
1DF	7ME3950-5GL01	B2HT1	2DF	7ME3950-5GL21	B2HT2	6DG	7ME3950-5LC01	B3
1DG	7ME3950-5LC01	B3	2DG	7ME3950-5LC01	B3	6DH	7ME3950-5LC01	B3
1DH	7ME3950-5LC21	B2	2DH	7ME3950-5LC21	B2	6EC	7ME3950-5LC01	B3
1EB	7ME3950-5LG01	A1HT1	2EB	7ME3950-5LC11	B1	6ED	7ME3950-5LC01	B3
1EC	7ME3950-5LH01	A2HT1	2EC	7ME3950-5LC21	B2	6EE	7ME3950-5LC01	B3
1ED	7ME3950-5LJ01	A3HT1	2ED	7ME3950-5LC11	B1	6EF	7ME3950-5LC01	B3
1EE	7ME3950-5GK01	B1HT1	2EE	7ME3950-5GK21	B1HT2	6EG	7ME3950-5LC01	B3
1EF	7ME3950-5GL01	B2HT1	2EF	7ME3950-5GL21	B2HT2	6EH	7ME3950-5LC01	B3
1EG	7ME3950-5GM00	C1HT1	2EG	7ME3950-5GM20	C1HT2	6EJ	7ME3950-5LC01	B3
1EH	7ME3950-5GN00	C2HT1	2EH	7ME3950-5GN20	C2HT2	6EK	7ME3950-5LC01	B3
1EJ	7ME3950-5LC01	B3	2EJ	7ME3950-5LC01	B3	6FE	7ME3950-5LD00	C3
1EK	7ME3950-5LC01	B3	2EK	7ME3950-5LC01	B3	6FF	7ME3950-5LD00	C3
1FC	7ME3950-5LH01	A2HT1	2FC	7ME3950-5LD10	C1	6FG	7ME3950-5LD00	C3
1FD	7ME3950-5LJ01	A3HT1	2FD	7ME3950-5LD10	C1	6FH	7ME3950-5LD00	C3
1FE	7ME3950-5GK01	B1HT1	2FE	7ME3950-5GK21	B1HT2	6FJ	7ME3950-5LD00	C3
1FF	7ME3950-5GL01	B2HT1	2FF	7ME3950-5GL21	B2HT2	6FK	7ME3950-5LD00	C3
1FG	7ME3950-5GM00	C1HT1	2FG	7ME3950-5GM20	C1HT2	6GF	7ME3950-5LD00	C3
1FH	7ME3950-5GN00	C2HT1	2FH	7ME3950-5GN20	C2HT2	6GG	7ME3950-5LD00	C3
1FJ	7ME3950-5GP00	D1HT1	2FJ	7ME3950-5GP20	D1HT2	6GH	7ME3950-5LD00	C3
1FK	7ME3950-5LD10	C1	2FK	7ME3950-5LD10	C1	6GJ	7ME3950-5LD00	C3
1GD	7ME3950-5LJ01	A3HT1	2GD	7ME3950-5LD10	C1	6GK	7ME3950-5LD00	C3
1GE	7ME3950-5GK01	B1HT1	2GE	7ME3950-5GK21	B1HT2	6GL	7ME3950-5LD00	C3
1GF	7ME3950-5GL01	B2HT1	2GF	7ME3950-5GL21	B2HT2	6HG	7ME3950-5LE00	D3
1GG	7ME3950-5GM00	C1HT1	2GG	7ME3950-5GM20	C1HT2	6HH	7ME3950-5LE00	D3
1GH	7ME3950-5GN00	C2HT1	2GH	7ME3950-5GN20	C2HT2	6HJ	7ME3950-5LE00	D3
1GJ	7ME3950-5GP00	D1HT1	2GJ	7ME3950-5GP20	D1HT2	6HK	7ME3950-5LE00	D3
1GK	7ME3950-5GQ00	D2HT1	2GK	7ME3950-5GQ20	D2HT2	6HL	7ME3950-5LE00	D3
1GL	7ME3950-5LD00	C3	2GL	7ME3950-5LD00	C3	6HM	7ME3950-5LE00	D3
1HE	7ME3950-5GK01	B1HT1	2HE	7ME3950-5GK21	B1HT2	6JJ	7ME3950-5LE00	D3
1HF	7ME3950-5GL01	B2HT1	2HF	7ME3950-5GL21	B2HT2	6JK	7ME3950-5LE00	D3
1HG	7ME3950-5GM00	C1HT1	2HG	7ME3950-5GM20	C1HT2	6JL	7ME3950-5LE00	D3
1HH	7ME3950-5GN00	C2HT1	2HH	7ME3950-5GN20	C2HT2	6JM	7ME3950-5LE00	D3
1HJ	7ME3950-5GP00	D1HT1	2HJ	7ME3950-5GP20	D1HT2	6KK	7ME3950-5LF00	E2
1HK	7ME3950-5GQ00	D2HT1	2HK	7ME3950-5GQ20	D2HT2	6KL	7ME3950-5LF00	E2
1HL	7ME3950-5GR00	D4HT1	2HL	7ME3950-5GR20	D4HT2	6KM	7ME3950-5LF00	E2
1JG	7ME3950-5GM00	C1HT1	2JG	7ME3950-5GM20	C1HT2	6LM	7ME3950-5LF00	E2
1JH	7ME3950-5GN00	C2HT1	2JH	7ME3950-5GN20	C2HT2			
1JJ	7ME3950-5GP00	D1HT1	2JJ	7ME3950-5GP20	D1HT2			
1JK	7ME3950-5GQ00	D2HT1	2JK	7ME3950-5GQ20	D2HT2			
1JL	7ME3950-5GR00	D4HT1	2JL	7ME3950-5GR20	D4HT2			
1KH	7ME3950-5GN00	C2HT1	2KH	7ME3950-5GN20	C2HT2			
1KJ	7ME3950-5GP00	D1HT1	2KJ	7ME3950-5GP20	D1HT2			
1KK	7ME3950-5GQ00	D2HT1	2KK	7ME3950-5GQ20	D2HT2			
1KL	7ME3950-5GR00	D4HT1	2KL	7ME3950-5GR20	D4HT2			
1LJ	7ME3950-5GP00	D1HT1	2LJ	7ME3950-5GP20	D1HT2			

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Selection and ordering data (continued)

Steel (T1)			Steel (T2)			Plastic liquid		
1LK	7ME3950-5GQ00	D2HT1	2LK	7ME3950-5GQ20	D2HT2			
1LL	7ME3950-5GR00	D4HT1	2LL	7ME3950-5GR20	D4HT2			

Other (Univ)			Other (VH)		
Data place 8,9,10 of 7ME372.-... combination	Sensor part number	Sensor Size Code	Data place 8,9,10 of 7ME372.-... combination	Sensor part number	Sensor Size Code
7BB	7ME3950-5LB01	A2	8BB	7ME3950-5LA13	1
7BC	7ME3950-5LB01	A2	8BC	7ME3950-5LA13	1
7BD	7ME3950-5LB01	A2	8BD	7ME3950-5LA13	1
7BE	7ME3950-5LB01	A2	8BE	7ME3950-5LA13	1
7BF	7ME3950-5LB01	A2	8BF	7ME3950-5LA13	1
7CB	7ME3950-5LB01	A2	8CB	7ME3950-5LA13	1
7CC	7ME3950-5LB01	A2	8CC	7ME3950-5LA13	1
7CD	7ME3950-5LB01	A2	8CD	7ME3950-5LA13	1
7CE	7ME3950-5LB01	A2	8CE	7ME3950-5LA13	1
7CF	7ME3950-5LB01	A2	8CF	7ME3950-5LA13	1
7CG	7ME3950-5LB01	A2	8CG	7ME3950-5LA13	1
7DB	7ME3950-5LC01	B3	8DB	7ME3950-5LA13	1
7DC	7ME3950-5LC01	B3	8DC	7ME3950-5LA13	1
7DD	7ME3950-5LC01	B3	8DD	7ME3950-5LA13	1
7DE	7ME3950-5LC01	B3	8DE	7ME3950-5LA13	1
7DF	7ME3950-5LC01	B3	8DF	7ME3950-5LA13	1
7DG	7ME3950-5LC01	B3	8DG	7ME3950-5LA13	1
7DH	7ME3950-5LC01	B3	8DH	7ME3950-5LA13	1
7EB	7ME3950-5LC01	B3	8EB	7ME3950-5LA13	1
7EC	7ME3950-5LC01	B3	8EC	7ME3950-5LA13	1
7ED	7ME3950-5LC01	B3	8ED	7ME3950-5LA13	1
7EE	7ME3950-5LC01	B3	8EE	7ME3950-5LA13	1
7EF	7ME3950-5LC01	B3	8EF	7ME3950-5LA13	1
7EG	7ME3950-5LC01	B3	8EG	7ME3950-5LA13	1
7EH	7ME3950-5LC01	B3	8EH	7ME3950-5LA13	1
7EJ	7ME3950-5LC01	B3	8EJ	7ME3950-5LA13	1
7EK	7ME3950-5LC01	B3	8EK	7ME3950-5LA13	1
7FC	7ME3950-5LD00	C3	8FC	7ME3950-5LA23	2
7FD	7ME3950-5LD00	C3	8FD	7ME3950-5LA23	2
7FE	7ME3950-5LD00	C3	8FE	7ME3950-5LA23	2
7FF	7ME3950-5LD00	C3	8FF	7ME3950-5LA23	2
7FG	7ME3950-5LD00	C3	8FG	7ME3950-5LA23	2
7FH	7ME3950-5LD00	C3	8FH	7ME3950-5LA23	2
7GD	7ME3950-5LD00	C3	8GD	7ME3950-5LA23	2
7GE	7ME3950-5LD00	C3	8GE	7ME3950-5LA23	2
7GF	7ME3950-5LD00	C3	8GF	7ME3950-5LA23	2
7GG	7ME3950-5LD00	C3	8GG	7ME3950-5LA23	2
7GH	7ME3950-5LD00	C3	8GH	7ME3950-5LA23	2
7GJ	7ME3950-5LD00	C3	8GJ	7ME3950-5LA23	2
7GK	7ME3950-5LD00	C3	8GK	7ME3950-5LA23	2
7GL	7ME3950-5LD00	C3	8GL	7ME3950-5LA23	2
7HE	7ME3950-5LE00	D3	8HE	7ME3950-5LA43	3
7HF	7ME3950-5LE00	D3	8HF	7ME3950-5LA43	3
7HG	7ME3950-5LE00	D3	8HG	7ME3950-5LA43	3
7HH	7ME3950-5LE00	D3	8HH	7ME3950-5LA43	3
7HJ	7ME3950-5LE00	D3	8HJ	7ME3950-5LA43	3
7HK	7ME3950-5LE00	D3	8HK	7ME3950-5LA43	3
7HL	7ME3950-5LE00	D3	8HL	7ME3950-5LA43	3
7HM	7ME3950-5LE00	D3	8HM	7ME3950-5LA43	3
7JG	7ME3950-5LE00	D3	8JG	7ME3950-5LA43	3
7JH	7ME3950-5LE00	D3	8JH	7ME3950-5LA43	3
7JJ	7ME3950-5LE00	D3	8JJ	7ME3950-5LA43	3

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Selection and ordering data (continued)

Other (Univ)			Other (VH)		
7JK	7ME3950-5LE00	D3	8JK	7ME3950-5LA43	3
7JL	7ME3950-5LE00	D3	8JL	7ME3950-5LA43	3
7JM	7ME3950-5LE00	D3	8JM	7ME3950-5LA43	3
7KH	7ME3950-5LF00	E2	8KH	7ME3950-5LA73	4
7KJ	7ME3950-5LF00	E2	8KJ	7ME3950-5LA73	4
7KK	7ME3950-5LF00	E2	8KK	7ME3950-5LA73	4
7KL	7ME3950-5LF00	E2	8KL	7ME3950-5LA73	4
7KM	7ME3950-5LF00	E2	8KM	7ME3950-5LA73	4
7LJ	7ME3950-5LF00	E2	8LJ	7ME3950-5LA73	4
7LK	7ME3950-5LF00	E2	8LK	7ME3950-5LA73	4
7LL	7ME3950-5LF00	E2	8LL	7ME3950-5LA73	4
7LM	7ME3950-5LF00	E2	8LM	7ME3950-5LA73	4

Spare parts (system) SITRANS FS230 IP65/IP66 (Nema 4X)	Article No. 7ME39-50-	●	●	●	●	●	Option
Approvals							
All, FM/FMc, ATEX, IECEX - Flow sensors		5					
All, FM/FMc, ATEX, IECEX - Temperature sensors		1					
Spare sensor code For liquid flow sensors pipe ranges please refer to catalog sensor selection chart in the FSS200 section							
Flow sensors for use with mounting frames or tracks Suitable for pipes other than steel or stainless steel							
Temperature -40 ... +121 °C (-40 ... +250 °F)							
• A1 Universal		5	L	B	1	1	
• A2 Universal		5	L	B	0	1	
• B1 Universal		5	L	C	1	1	
• B2 Universal		5	L	C	2	1	
• B3 Universal		5	L	C	0	1	
• C1 Universal		5	L	D	1	0	
• C2 Universal		5	L	D	2	0	
• C3 Universal		5	L	D	0	0	
• D1 Universal		5	L	E	1	0	
• D2 Universal		5	L	E	2	0	
• D3 Universal		5	L	E	0	0	
• E1 Universal		5	L	F	1	0	
• E2 Universal		5	L	F	0	0	
• E3 Universal		5	L	F	2	0	
Gas and liquid sensors for use with mounting frames or tracks Suitable for steel or stainless steel pipes							
Temperature T1							
• A1H high precision		5	L	G	0	1	
• A2H high precision		5	L	H	0	1	
• A3H high precision		5	L	J	0	1	
• B1H high precision		5	G	K	0	1	
• B2H high precision		5	G	L	0	1	
• B3H high precision		5	G	t	0	1	
• C1H high precision		5	G	M	0	0	
• C2H high precision		5	G	N	0	0	
• D1H high precision		5	G	P	0	0	
• D2H high precision		5	G	Q	0	0	
• D3H high precision		5	G	U	0	0	
• D4H high precision		5	G	R	0	0	
Temperature T2							
• B1H high precision		5	G	K	2	1	
• B2H high precision		5	G	L	2	1	

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Selection and ordering data (continued)

Spare parts (system) SITRANS FS230 IP65/IP66 (Nema 4X)	Article No. 7ME39-50- ● ● ● ● ●	Option
• B3H high precision	5 G T 2 1	
• C1H high precision	5 G M 2 0	
• C2H high precision	5 G N 2 0	
• D1H high precision	5 G P 2 0	
• D2H high precision	5 G Q 2 0	
• D3H high precision	5 G U 2 0	
• D4H high precision	5 G R 2 0	
High temperature universal liquid sensors		
Very high temperature up to 230 °C (446 °F)		
• Size 1 (Ø 12.7 ... 100 mm (0.47 ... 3.94"))	5 L A 1 3	
• Size 2 (Ø 30 ... 200 mm (1.18 ... 7.87"))	5 L A 2 3	
• Size 2A (Ø 30 ... 200 mm (1.18 ... 7.87"))	5 L A 3 3	
• Size 3 (Ø 150 ... 610 mm (5.9 ... 24.0"))	5 L A 4 3	
• Size 3A (Ø 150 ... 610 mm (5.9 ... 24.0"))	5 L A 6 3	
• Size 4 (Ø 400 ... 1200 mm (16.75 ... 47.24"))	5 L A 7 3	
• Size 4A (Ø 400 ... 1200 mm (16.75 ... 47.24"))	5 L A 8 3	
RTD sensors for temperature measurement		
Standard clamp-on RTD	1 T A 0 0	
Submersible clamp-on RTD	1 T B 0 0	
Insertion sensor PT1000 for use with thermowells - non Ex. For variants please select SITRANS TS500 (7MC7500)		
SITRANS TS500 Insert 140 mm (5.5 in)	7MC7500-1JB26-4BF3-Z	E00
SITRANS TS500 Insert 216 mm (8.5 in)	7MC7500-1JC06-6BF3-Z	E00+Y44
SITRANS TS500 Insert 292 mm (11.5 in)	7MC7500-1JC06-6BF3-Z	E00+Y44
SITRANS TS500 Insert 368 mm (14.5 in)	7MC7500-1JD06-6BF3-Z	E00+Y44
SITRANS TS500 Insert 444 mm (17.5 in)	7MC7500-1JE06-6BF3-Z	E00+Y44
SITRANS TS500 Insert 597 mm (23.5 in)	7MC7500-1JE06-6BF3-Z	E00+Y44
Insert thermowells for TS500 RTD		
For details or variants please select Thermowell BAR (7MT2351)		
SITRANS TS Thermowell 140 mm (5.5 in)	7MT2351-0AB02-1EB2-Z	Y44
SITRANS TS Thermowell 216 mm (8.5 in)	7MT2351-0BB02-1EB2-Z	Y44
SITRANS TS Thermowell 292 mm (11.5 in)	7MT2351-0CB02-1EB2	
SITRANS TS Thermowell 368 mm (14.5 in)	7MT2351-0CB02-1EB2-Z	Y44
SITRANS TS Thermowell 444 mm (17.5 in)	7MT2351-0DB02-1EB2-Z	Y44
SITRANS TS Thermowell 597 mm (23.5 in)	7MT2351-0EB02-1EB2-Z	Y44

Spare parts (Miscellaneous) SITRANS FS Clamp-on	Article No. 7ME396-0- ● ● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
FS230 dedicated sensor mounting hardware	
Sensor mounting frames for	
Universal sensor size B, for pipes > 125 mm (5 inch)	CQO:1012FN-PB
Universal sensor size C	0 M C 0 0
Universal sensor size D	0 M C 0 1
Universal sensor size E	0 M C 0 2
High precision sensor size B, for pipes > 125 mm (5 inch)	CQO:1012FNH-PB
High precision sensor size C	3 M D 0 0
High precision sensor size D	3 M D 0 1
Magnetic mounting frames for size C, D, E, universal and high precision sensors	3 M D 0 2
Spacer bars (for indexing sensors on pipe)	
Spacer bar for pipes to 200 mm/8 inch (liquid), 600 mm/24 inch (gas)	3 M S 1 0

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Selection and ordering data (continued)

Spare parts (Miscellaneous) SITRANS FS Clamp-on	Article No. 7ME396-0-	●	●	●	●	●
Spacer bar for pipes to 500 mm/20 inch (liquid), DN 1200/48 inch (gas)		3	M	S	2	0
Spacer bar for pipes to 800 mm/32 inch (liquid)		3	M	S	3	0
Spacer bar for pipes to 1200 mm/48 inch (liquid). Must be used with 7ME39600SM30		3	M	S	4	0
Mounting straps (slotted stainless steel)						
For pipes						
DN 50 ... 150 (2" ... 4")		0	S	M	0	0
DN 50 ... 300 (2" ... 12")		0	S	M	1	0
DN 300 ... 600 (12" ... 24")		0	S	M	2	0
DN 600 ... 1200 (24" ... 48")		0	S	M	3	0
DN 1200 ... 1500 (48" ... 60")		0	S	M	4	0
DN 1500 ... 2100 (60" ... 84")		0	S	M	5	0
DN 2100 ... 3000 (84" ... 120")		0	S	M	6	0
High precision mounting enclosures for sensors						
Stainless steel mounts for high precision size "C" sensors, single enclosure		0	W	S	5	0
Stainless steel mounts for high precision size "D/E" sensors, single enclosure		0	W	S	6	0
Stainless steel mounts for high precision size "C" sensors, dual enclosure		0	W	D	5	0
Stainless steel mounts for high precision size "D/E" sensors, dual enclosure		0	W	D	6	0
Stainless steel bands for high precision mounting enclosures						
Mounting strap for pipe diameter to						
300 mm (13")		0	S	M	0	1
600 mm (24")		0	S	M	1	1
1200 mm (48")		0	S	M	2	1
1500 mm (60")		0	S	M	3	1
2130 mm (84")		0	S	M	4	1
3050 mm (120")		0	S	M	5	1
5486 mm (216")		0	S	M	6	1
ADAPTER, MTG STRAP, TEMP COMP	CQO-1012WSM-A2					
Sensor mounting tracks (aluminum with mounting straps) for pipes < 125 mm (5 inch)						
Universal sensor size A or B		0	M	A	0	0
High precision sensor size A or B		0	M	B	0	0
Stainless mounting tracks for high temperature 991 sensors						
Size 1 high temperature sensor pair	CQO: 992MTNHMSH-1					
Size 2 high temperature sensor pair	CQO: 992MTNHMSH-2					
Size 3 high temperature sensor pair	CQO: 992MTNHMSH-3					
Size 4 high temperature sensor pair	CQO: 992MTNHMSH-4					
Clamp-on RTD mounting hardware for dedicated systems						
RTD mounting hardware for dedicated system						
1152 ... 610 mm (6 ... 24")		0	M	R	0	0
12.7 ... 50.8 mm (0.5 ... 2")		0	M	R	0	1
31.8 ... 203.2 mm (1.25 ... 8")		0	M	R	0	2
508 ... 1219 mm (20 ... 48")		0	M	R	0	4
Sensor cables						
Coax (CE mark)						
10 m (32.8 ft) armored sensor cable pair with nickel plated brass glands	A5E38028474004					
20 m (65.6 ft) armored sensor cable pair with nickel plated brass glands	A5E38028474005					
10 m (32.8 ft) standard/submersible Coax sensor cable pair with Nylon glands	A5E39669934004					
20 m (65.6 ft) standard/submersible Coax sensor cable pair with Nylon glands	A5E39669934005					
10 m (32.8 ft) standard/submersible Coax sensor cable pair with nickel plated brass glands	A5E39669934009					
20 m (65.6 ft) standard/submersible Coax sensor cable pair with nickel plated brass glands	A5E39669934010					
10 m (32.8 ft) standard/submersible Coax sensor cable pair with stainless steel glands	A5E39669934014					
20 m (65.6 ft) standard/submersible Coax sensor cable pair with stainless steel glands	A5E39669934015					
20 m (65.6 ft) plenum rated Coax sensor cable pair with Nylon glands	A5E39669934020					
20 m (65.6 ft) plenum rated Coax sensor cable pair with nickel plated brass glands	A5E39669934025					

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Selection and ordering data (continued)

Spare parts (Miscellaneous) SITRANS FS Clamp-on	Article No. 7ME396- 0-	●	●	●	●	●
20 m (65.6 ft) plenum rated Coax sensor cable pair with stainless steel glands	A5E39669934030					
Cable glands and adapters						
Cable gland set M20, nylon	A5E38145321					
Cable gland set M20, nickel/brass	A5E38145323					
Cable gland set M20, stainless steel	A5E38145327					
Iris glands, set of 2, nickel plated brass	A5E38635890					
Iris glands, set of 2, stainless steel	A5E38635986					
M20xNPT adapters, set of 8, brass/nickel	A5E38145635					
M20xNPT adapters, set of 8, brass/nickel, Ex	A5E38309159					
M20xNPT adapters, set of 8, stainless steel	A5E38145643					
RTD temperature sensor cables						
6 m (20 ft) standard RTD cable		0	C	R	0	1
15 m (50 ft) standard RTD cable		0	C	R	0	2
30 m (100 ft) standard RTD cable		0	C	R	0	3
46 m (150 ft) standard RTD cable		0	C	R	0	4
61 m (200 ft) standard RTD cable		0	C	R	0	5
91 m (300 ft) standard RTD cable		0	C	R	0	6
6 m (20 ft) submersible RTD cable		0	C	R	1	1
15 m (50 ft) submersible RTD cable		0	C	R	1	2
30 m (100 ft) submersible RTD cable		0	C	R	1	3
46 m (150 ft) submersible RTD cable		0	C	R	1	4
61 m (200 ft) submersible RTD cable		0	C	R	1	5
91 m (300 ft) submersible RTD cable		0	C	R	1	6
Dedicated cable termination kits for:						
Standard, plenum sensor cable (NEMA 4X and NEMA 7 wall)		0	C	T	0	1
Submersible sensor cable (NEMA 4X and NEMA 7 wall)		0	C	T	1	1
Clamp-on RTD cable termination kit for standard RTD		0	C	T	2	1
Clamp-on RTD cable termination kit for submersible RTD		0	C	T	3	1
Insert RTD cable termination kit		0	C	T	4	1
Termination kit for armored cable	CQO:1012CNFX-TK					
Ultrasonic couplants						
Temporary water based for portable systems: 350 ml (12 oz): -34 ... +38 °C (-30 ... +100 °F)		0	U	C	1	0
Permanent synthetic polymer based: 90 ml (3 oz) -40 ... +190 °C (-40 ... +375 °F)		0	U	C	2	0
Permanent high temperature fluoroether: 163 ml (5.5 oz): -40 ... +230 °C (-40 ... +450 °F)		0	U	C	3	1
Dry coupling pad kit (10 pieces)		0	U	C	4	0
Permanent vulcanizing silicone rubber couplant: 90 ml (3 oz): -40...+120C (-40...+250F)	CQO:CC112					
Permanent high temperature silicone grease: 12 ml (0.4 oz): -40 ... +230 °C (-40 ... +450 °F)	CQO:CC117B					
Permanent high temperature silicone grease: 150 ml (5 oz): -40 ... +230 °C (-40 ... +450 °F)	CQO:CC117A					
Couplant for submersible sensor applications	CQO:CC120					
Pipe damping films						
B1, B2, B3, C1 and C2 sensors		0	D	M	1	0
D1 and D3 sensors		0	D	M	2	0
D2 sensor		0	D	M	3	0
D4 sensor		0	D	M	4	0
Universal sensor test blocks						
Test block for size A and B universal sensors		0	T	B	1	0
Test block for size C and D universal sensors		0	T	B	2	0
Thickness gauge						
Stand alone thickness gauge	7ME39510TG20					
Cable, DSL to wallbox transmitter						
Standard cable (non-Ex) with 2 × M12 connectors, PO insulation and PUR sleeve, gray, -40 ... +80 °C (-40 ... +176 °F)						
• 5 m (16.4 ft)	A5E03914805					

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Selection and ordering data (continued)

Spare parts (Miscellaneous) SITRANS FS Clamp-on	Article No. 7ME396- ● ● ● ● ● 0-
• 10 m (32.8 ft)	A5E03914850
• 25 m (82 ft)	A5E03914853
• 50 m (164 ft)	A5E03914859
• 75 m (246 ft)	A5E03914861
• 150 m (492 ft)	A5E03914874
Standard cable (non-Ex) for termination, PO insulation and PUR sleeve, gray, -40 ... +80 °C (-40 ... +176 °F)	
• 5 m (16.4 ft)	A5E03914833
• 10 m (32.8 ft)	A5E03914849
• 25 m (82 ft)	A5E03914854
• 50 m (164 ft)	A5E03914856
• 75 m (246 ft)	A5E03914864
• 150 m (492 ft)	A5E03914873
Standard cable (Ex) with 2 × M12 connectors, PO insulation and PUR sleeve, blue, -40 ... +80 °C (-40 ... +176 °F)	
• 5 m (16.4 ft)	A5E03914929
• 10 m (32.8 ft)	A5E03914962
• 25 m (82 ft)	A5E03914995
• 50 m (164 ft)	A5E03915004
• 75 m (246 ft)	A5E03915074
• 150 m (492 ft)	A5E03915088
Standard cable (Ex) for termination, PO insulation and PUR sleeve, blue, -40 ... +80 °C (-40 ... +176 °F)	
• 5 m (16.4 ft)	A5E03914945
• 10 m (32.8 ft)	A5E03914973
• 25 m (82 ft)	A5E03914984
• 50 m (164 ft)	A5E03915015
• 75 m (246 ft)	A5E03915057
• 150 m (492 ft)	A5E03915100

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Application



SITRANS FSS200 Clamp-on ultrasonic flow sensor

Sensor type selection guide

Considerations for sensor selection	Standard sensors supported in MLFB High precision	Universal	Notes
Media			
General survey (clean liquids) on non-steel pipes	-	X	-
General survey (clean liquids) on a limited range of steel pipes	X	-	-
Moderately aerated liquid or slurry, up to 121 °C (250 °F)	X	-	-
Permanent installation on steel pipe (clean liquids and gases)	X	-	-
Installation in offshore or corrosive environment	X[1)]	X[2)]	Sensor size C/D/E come standard as corrosion resistant. Size A and B optional stainless steel
Liquid temperature greater than 120 °C (248 °F)	O	X	FSS200 high temperature metal block sensors - up to 232 °C (450 °F)
Operation on single pipeline flowing multiple products	X	O	-
Pipe material			
Steel	X	-	-
Steel pipe with diameter/wall thickness ratio < 10	O	X	-
Non-steel pipe material (copper, ductile iron, cast iron, etc.)	O	X	High precision sensors can also be used on plastic and aluminum pipes in special cases
Wall thickness > 31.75 mm (1.25")	O	X	-

O = not suitable
X = preferred choice
1) For steel and stainless steel pipes only
2) Not preferred for steel pipes

Definitions

Sensor chart	Description
FSS200	Formerly 1011 clamp-on sensors of the 1010 systems
Standard	Standard system sensor, selectable as part of a configured product
Special	Sensors available for non-standard applications and pipes. Contact tech support for application use
Corrosions resistant	Stainless steel metal parts on all Size C, D and E and all high temperature sensors
Aluminum	Aluminum metal parts on all HP and Universal size A and B (Corrosion resistant on request for size B)
Spare	Not available as part of a configured product, must be ordered separately
CE	Transmitter and sensors certified for sale in the EU
Trackless mount	Sensors fixed only by straps, no other mounting (spacer bar as an option) - not recommended
Tracks	Permanent installation for universal size A/B, high precision size A/B and all sizes of high temperature. Tracks always come as dual-part for either direct or reflect mounting, and always with straps.
Frames	Three sizes, for permanent installation for universal size C/ D/ E, and for high precision size C/D. For universal and high precision size B available for pipes > 125 OD (Spare)
T1	Usable from -40 ... +120 °C (-40 ... +248 °F), but best for Ø temperature below 80 °C (< 176 °F); standard
T2	Usable from -40 ... +120 °C (-40 ... +248 °F), but best for Ø temperature above 80 °C (< 176 °F)
Submersible	Sensors can be used submerged; adding Denso for supplemental protection is recommended

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Application (continued)

Approvals

Approvals for FSS200 sensors	
Canada, USA • FM16CA0142X • FM16US0280X • CSA 80083297X	Class I, Division 1, Groups A, B, C, D Class II, Division 1, Groups E, F, G Class III Class I, Zone 0, AEx/Ex ia IIC T6...T4 Gc Class II, Zone 21; AEx/Ex ib IIIC T70°C...T110°C Db
ATEX, UKEx, IECEx • IECEx FMG 17.0004X • FM16ATEX0090 • FM21UKEX0057X	II 1G Ex ia IIC T6...T4 Ga II 2D Ex ib IIIC T70°C...T110°C Db
Ambient temperature range	Depends on the sensor
Dust temperature class	$T_{dust} = T_{a\,max}$ +10 °K (T70 °C für T_a = 60 °C, T110 °C für T_a = 100 °C)

Sensor availability guide

FSS200 Universal Sensor

FSS200 Universal Sensor -40 ... 120 °C (-40 ... +248 °F) plastic - stainless steel housing CE IP68												
Sensor models	**Stand-ard**	**Spare only**	**ATEX, FM, FMc, IECEX**	**Corro-sion resist-ant**	**Track-less**	**Tracks**	**Frames**	**High preci-sion mount**	**T1 [2]**	**T2 [3]**	**Sub-mers-ible**	**Catalog**
A1 Universal for pipe OD – 5.8 ... 50.8 mm (0.23" ... 2")	-	X	X	X	X[1]	X	-	-	-	-	X	-
A2 Universal for pipe OD – 12.7 ... 50.8 mm (0.5" ... 2")	X	-	X	X	X[1]	X	-	-	-	-	X	X
B1 Universal for pipe OD – 12.7 ... 76 mm (0.5" ... 3")	-	X	X	X	X[1]	X	X	-	-	-	X	-
B2 Universal for pipe OD – 12.7 ... 76 mm (0.5" ... 3")	-	X	X	X	X[1]	X	X	-	-	-	X	-
B3 Universal for pipe OD – 19 ... 127 mm (0.75" ... 5")	X	-	X	X	X[1]	X	X	-	-	-	X	X
C1 Universal for pipe OD – 51 ... 254 mm (2" ... 10")	-	X	X	X	X	-	X	-	-	-	X	-
C2 Universal for pipe OD – 51 ... 254 mm (2" ... 10")	-	X	X	X	X	-	X	-	-	-	X	-
C3 Universal for pipe OD – 51 ... 305 mm (2" ... 12")	X	-	X	X	X	-	X	-	-	-	X	X
D1 Universal for pipe OD – 102 ... 508 mm (4" ... 20")	-	X	X	X	X	-	X	-	-	-	X	-
D2 Universal for pipe OD – 152 ... 610 mm (6" ... 24")	-	X	X	X	X	-	X	-	-	-	X	-
D3 Universal for pipe OD – 203 ... 610 mm (8" ... 24")	X	-	X	X	X	-	X	-	-	-	X	X
E1 Universal for pipe OD – 254 ... 3048 mm (10" ... 120")	-	X	X	X	X	-	X	-	-	-	X	-
E2 Universal for pipe OD – 254 ... 6096 mm (10" ... 240")	X	-	X	X	X	-	X	-	-	-	X	X
E3 Universal for pipe OD – 304 ... 10007 mm (12" ... 394")	-	X	X	X	X	-	X	X	-	-	X	-

X = available
[1] Usable but not recommended for selection
[2] Best use at a temperature of < 80 °C (176 °F)
[3] Best use at a temperature of > 80 °C (176 °F)

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Application (continued)

FSS200 High Precision Sensor

FSS200 High Precision Sensor -40 ... 120 °C (-40 ... +248 °F) plastic - stainless steel housing T1/T2 CE IP68												
Sensor models	**Stand-ard**	**Spare only**	**ATEX/F-M/FMc/-IECEX**	**Corro-sion resist-ant**	**Track-less**	**Tracks**	**Frames**	**High preci-sion mount**	**T1[2)]**	**T2[3)]**	**Sub-mers-ible**	**Catalog**
A1H (High Precision) for pipe WT - 0.64 ... 1.0 mm (0.025" ... 0.04")	-	X	X	X	X[1)]	X	-	-	X	-	X	X
A2H (High Precision) for pipe WT - 1.0 ... 1.5 mm (0.04" ... 0.06")	X	-	X	X	X[1)]	X	-	-	X	-	X	X
A3H (High Precision) for pipe WT - 1.5 ... 2.0 mm (0.06" ... 0.08")	X	-	X	X	X[1)]	X	-	-	X	-	X	X
B1H (High Precision) for pipe WT - 2.0 ... 3.0 mm (0.08" ... 0.12")	X	-	X	X	X[1)]	X	X	-	X	X	X	X
B2H (High Precision) for pipe WT - 3.0 ... 4.1 mm (0.12" ... 0.16")	X	-	X	X	X[1)]	X	X	-	X	X	X	X
B3H (High Precision) for pipe WT - 2.7 ... 3.3 mm (0.106" ... 0.128")	-	X	X	X	X[1)]	X	X	-	X	X	X	X
C1H (High Precision) for pipe WT - 4.1 ... 5.8 mm (0.16" ... 0.23")	X	-	X	X	X	-	X	X	X	X	X	X
C2H (High Precision) for pipe WT - 5.8 ... 8.1 mm (0..23" ... 0.32")	X	-	X	X	X	-	X	X	X	X	X	X
D1H (High Precision) for pipe WT - 8.1 ... 11.2 mm (0..32" ... 0.44")	X	-	X	X	X	-	X	X	X	X	X	X
D2H (High Precision) for pipe WT - 11.2 ... 15.7 mm (0.44" ... 0.62")	X	-	X	X	X	-	X	X	X	X	X	X
D3H (High Precision) for pipe WT - 7.4 ... 9.0 mm (0..293" ... 0.354")	-	X	X	X	X	-	X	X	X	X	X	X
D4H (High Precision) for pipe WT - 15.7 ... 31.8 mm (0..62" ... 1.25")	X	-	X	X	X	-	X	X	X	X	X	X

X = available
1) Usable but not recommended for selection
2) Best use at a temperature of < 80 °C (176 °F)
3) Best use at a temperature of > 80 °C (176 °F)

FSS200 High Temperature Universal Sensor

FSS200 High Temperature Universal Sensor -40 ... +230 °C (-40 ... +446 °F)												
Sensor models	**Stand-ard**	**Spare only**	**ATEX/F-M/FMc/-IECEX**	**Corro-sion resist-ant**	**Track-less**	**Tracks**	**Frames**	**High preci-sion mount**	**T1[1)]**	**T2[2)]**	**Sub-mers-ible**	**Catalog**
High Temperature size 1 ... 230 °C (Ø 12.7 ... 100 mm)	-	X	X	X	-	X	-	-	-	-	-	-
High Temperature size 2 ... 230 °C (Ø 30 ... 200 mm)	X	-	X	X	-	X	-	-	-	-	-	X
High Temperature size 3 ... 230 °C (Ø 150 ... 610 mm)	X	-	X	X	-	X	-	-	-	-	-	X
High Temperature size 4 ... 230 °C (Ø 400 ... 1200 mm)	X	-	X	X	-	X	-	-	-	-	-	X
High Temperature size 2A ... 230 °C (Ø 30 ... 200 mm)	-	X	X	X	-	X	-	-	-	-	-	-
High Temperature size 3A ... 230 °C (Ø 150 ... 610 mm)	-	X	X	X	-	X	-	-	-	-	-	-
High Temperature size 4A ... 230 °C (Ø 400 ... 1200 mm)	-	X	X	X	-	X	-	-	-	-	-	-

1) Best use at a temperature of < 80 °C (176 °F)
2) Best use at a temperature of > 80 °C (176 °F)

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Application (continued)

Sensor mounting availability guide

Mounting	Sensor FSS200 Universal dedicated	FSS200 Dedicated high precision	FSS200 High temperature universal
Trackless[1)]	X	X	-
Tracks universal dedicated	X	-	-
Tracks HP dedicated	-	X	-
Frames universal dedicated	X	-	-
Frames HP dedicated	-	X	-
Tracks high temperature universal	-	-	X
High precision mounting single enclosure	-	X	-
High precision mounting dual enclosure	-	X	-
Spacer bar	X	X	-
Straps	X	X	X
Denso	X	X	-

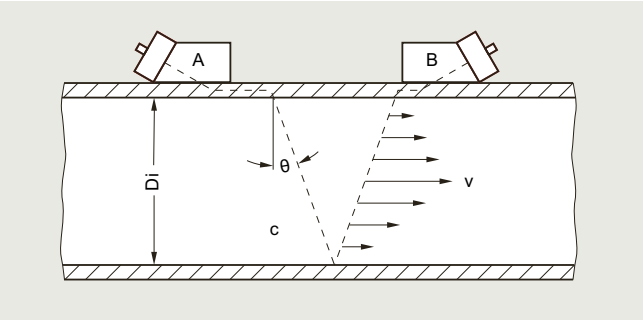
1) Usable but not recommended

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Function

Operating principle

The SITRANS FS system is a transit-time ultrasonic meter that provides exceptional performance using a non-intrusive clamp-on approach. Ultrasonic sensors transmit and receive acoustic signals directly though the existing pipe wall, where the fluid refraction angle is governed by Snell's law of refraction.



Clamp-on sensor mounted in a reflect configuration

The beam refraction angle is calculated as follows:

$\sin \Theta = c / V_\varphi$

c = Velocity of sound in fluid

V_φ = Phase velocity (a constant in the pipe wall)

The flowmeter automatically compensates for any change in fluid sound velocity (or beam angle) in response to variations in the average transit time between sensors A and B. By subtracting the computed fixed times (within the sensor and pipe wall) from the measured average transit time, the meter can then infer the required transit time in the fluid (T_{Fluid}).

The sound waves traveling in the same direction as the flow ($T_{A,B}$) arrive earlier than sound waves traveling against the direction of flow ($T_{B,A}$). This time difference (Δt) is used to compute the line integrated flow velocity (v) as shown in the equation below:

$v = V_\varphi / 2 \cdot \Delta t / T_{Fluid}$

Once the raw flow velocity is determined, the fluid Reynolds Number (Re) must be determined to properly correct for fully developed flow profile. This requires the entry of the fluid's kinematic viscosity (visc) as shown in the equations below, where Q represents the final flow profile compensated volumetric flow rate.

$Re = Di \cdot v / visc \quad Q = K(Re) \cdot (\pi / 4 \cdot Di^2) \cdot v$

v = Flow velocity

visc = μ / ρ = (dynamic viscosity / density)

K(Re) = Reynolds flow profile compensation

In wetted type ultrasonic flowmeters the meter constants are configured prior to leaving the factory. As this is not possible with clamp-on meters, the settings must be made by the customer at the time of installation. These settings include pipe diameter, wall thickness, liquid viscosity, etc.

SITRANS clamp-on flowmeters that include temperature sensing can be configured to dynamically infer changes in fluid viscosity for the purpose of computing the most accurate flow profile compensation (K_{Re}).

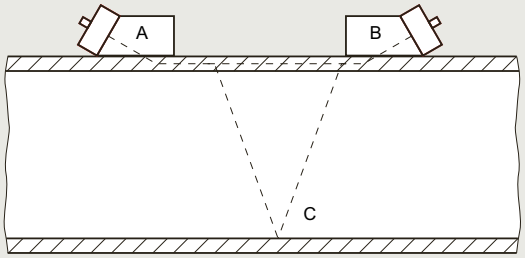
Ultrasonic sensor types

Two basic types of clamp-on sensors can be selected for use with the SITRANS F S flowmeter. The lower cost "universal" sensor is the most common type in the industry and is suitable for most single liquid applications where the sound velocity does not vary much. This sensor type can be used on any sonically conductive pipe material (including steel) making it well suited for portable survey applications. Universal sensors are selected based on the pipe diameter range alone, so wall thickness is less important to the selection process.

Function (continued)

The second sensor type is the patented "WideBeam" sensor (called high precision), which utilizes the pipe wall as a kind of waveguide to optimize the signal to noise ratio and provide a wider area of vibration. This makes this kind of sensor less sensitive to any change in the fluid medium.

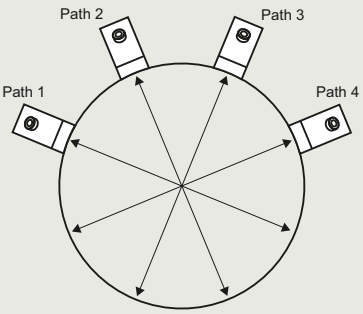
The WideBeam sensor is designed for steel pipes, but can also be used with aluminum and titanium. It is the preferred sensor for HPI applications. Note that unlike the universal type, this sensor selection is dependent only on the pipe's wall thickness.



Multi-path flowmeters

For improved flow profile averaging, redundancy or better cost per measurement, clamp-on meters can be supplied with 1, 2, 3 or 4 path measurement systems.

In the standard FS230 systems, these can be installed on a single pipe as shown below (four paths on same pipe).



Four path installation example

SITRANS meter family description

SITRANS FS230 clamp-on flowmeters

The FS230 system is a basic function, permanent (or dedicated) Clamp-on meter that is available with a full range of safety approvals and I/Os. This meter can be used in a wide range of applications.

FST030 transmitter standard flow functions

When configured with standard flow functions, the FST030 transmitter is typically programmed with a fixed viscosity and specific gravity entry, which can limit the mass flow and volumetric flow accuracy when highly variable (multi-product) liquid properties flow through the same pipeline.

It will have the ability to accommodate clamp-on RTDs, or analog input from a temperature transmitter.

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Function (continued)

FST030 hydrocarbon flow functions

When configured with hydrocarbon functions, the FST030 can be used for applications that will flow a wide range of viscosity with a standard volume (mass) and interface detection functions available. All functions rely on a variable referred to as "LiquIdent (TM)", which is used to infer the liquid's viscosity and density. This variable represents the measured liquid sonic velocity compensated by the operating temperature and pressure, so for a given liquid product the measured LiquIdent (TM) output will remain constant over a wide range of pressure or temperature.

Standard volume description

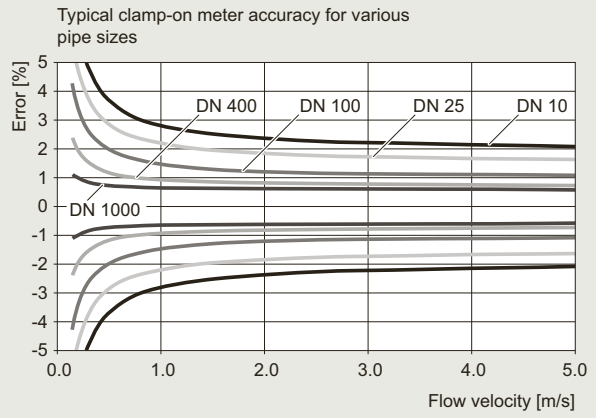
This LiquIdent (TM) variable can also be used to identify the liquid flowing through the pipe as well as it's physical properties (density, viscosity and compressibility) at base conditions. With this information the meter can be configured to output a temperature and pressure compensated (standard) volume flow rate using the API MPMS chapter 11.2.1 methods as shown below.

Correction for temperature	
Compute thermal expansion coefficient (α_b): $\alpha_b = KO / \rho_b^2 + K1 / \rho_b$	where KO and K1 are constants dependent on type of liquid and ρ_b is the liquid density at base conditions
Compute temperature correction factor (K_T): $K_T = \rho_b * EXP (- \alpha_b \Delta T (1 + 0.8 \alpha_b \Delta T))$	where ΔT = (T – base temperature)
Correction for pressure	
Compute compressibility factor (F): $F = EXP(A + B T + (C + D T) / \rho_b^2$	where A, B, C and D are constants, and "T" is liquid temperature
Compute pressure correction factor (Kp): $K_p = 1 / (1 – F (P_{act} – P_{base}) * 10^{-4})$	
Final volume correction	
$Q_{std} = Q_{act} * K_t * K_p$	

Available outputs from this meter include: API, standard density, mass flowrate, standard volume flowrate and liquid identification.

General installation guidelines for transit time clamp-on sensor

- Minimum measuring range: 0 to ± 0.3 m/s velocity (see meter accuracy graph below for more detail)
- Maximum measuring range: 0 to ± 12 m/s (± 30 m/s for high precision sensors). Final flow range determination requires application review



Function (continued)

- Pipe must be completely full within the sensor installation volume for accurate flow measurement
- Typical MINIMUM straight pipe requirements are: 10 Diameters upstream / 5 Diameters downstream. Additional straight run is required for double out-of-plane elbows and partially open valves
- Sensors should be installed at least 20° off vertical for horizontal pipes. This reduces the chance of beam interference from gas buildup at the top of the pipe
- Operation inside the Reynolds transition region, between 1 000 < Re < 5 000 should be avoided for best accuracy
- Submersible and direct burial installations can be accommodated. Consult sales representative for details
- Ultrasonic coupling compound is provided with all sensor orders. Insure that a permanent coupling compound is used for long term installations
- Refer to the "Sensor type selection guide" to insure proper application of the equipment

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Overview



FST030 is based on the latest developments within Digital Signal Processing (DSP) technology – engineered for high measuring performance, fast response to step changes in flow, high immunity against process noise, easy to install commission and maintain.

The FST030 transmitter delivers true multi-parameter measurements i.e. volume flow, standard volume flow, density, mass flow, fluid sound velocity and temperature.

The multiple outputs and bus communication mean that all primary process information can be read either instantaneously (10 ms update) or periodically as required by plant operations.

Process values

- Volume flow
- Mass flow
- Flow velocity
- Sound velocity
- Standard volume flow (hydrocarbon variant only)
- Density
- Kinematic viscosity
- Pressure
- Medium temperature
- Specific gravity (hydrocarbon variant only)
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Standard density (hydrocarbon variant only)
- Standard specific gravity (hydrocarbon variant only)
- Standardizing factor (hydrocarbon variant only)
- Liquident (hydrocarbon variant only)
- API gravity (hydrocarbon variant only)
- Standard API gravity (hydrocarbon variant only)
- Standard kinematic viscosity (hydrocarbon variant only)
- Liquid identifier (hydrocarbon variant only)

Benefits

Flow calculation and measurement

- Dedicated volume flow calculation with DSP technology
- 100 Hz update rate for all output on all primary process values
- Maximum data age from sensor to output is 20 ms
- Independent low flow cut-off settings for volume and mass flow, standard volume flow and velocity
- Zero-point adjustment on command from discrete input or host system

Operation and display

- User-configurable operation display
  - Full graphical display 240 x 160 pixels with up to 6 programmable views
  - Self-explaining alarm handling/log in clear text
  - Help text for all parameters appears automatically in the configuration menu
- SensorFlash technology stores production specific system documentation and provides removable memory of all flowmeter setups and functions
  - Calibration certificates (with ordered calibration)
  - Non-volatile memory backup of operational data
  - Transfer of user configuration to other flowmeters
  - 4 GB SD card for storage and data logging
  - Audit trail of all parameter changes
  - Alarm logging

Alarms and safety

- Advanced diagnosis and service menu enhances troubleshooting and meter validation
- Configurable upper and lower alarm and warning limits for all process values
- Alarm handling can be selected between Siemens and NAMUR standard configurations

Outputs and control

- Monitoring comprising of 3 individually configurable totalizers
- Multi-parameter outputs, configurable outputs assigned individually to any of the following parameters:
  - Volume flow
  - Standard volume flow
  - Mass flow
  - Flow velocity
  - Sound velocity
  - Density
  - Process viscosity
  - Process pressure
  - Process/medium temperature

Up to six I/O channels are configured as follows.

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Benefits (continued)

Channel 1

Channel 1 is 4 to 20 mA analog output with HART 7.5. The current signal can be configured for massflow, volumeflow and includes the availability of active or passive function selected by wiring on the non-Ex terminals. Alternative Modbus RTU RS 485 is available.

Channel 2

Channel 2 is a signal output which can be freely configured for any process variable.

- Analog current (0/4 to 20 mA)
- Frequency or pulse
- Operational and alarm status

Channels 3 and 4

Channels 3 and 4 can be ordered with signal (freely configured for any process variable) or relay outputs, or signal input.

Signal output

Signal output can be user configured to:

- Analog current (0/4 to 20 mA)
- Frequency or pulse
- Redundant frequency or pulse (linked to channel 2)
- Operational and alarm status

Signal input

Signal input can be user-configured for:

- Totalizer reset functions
- Force outputs or freeze process values
- Initiate automatic zero point adjustment

Relay

Relay output(s) can be user configured to:

- Alarm status

4-20 mA signal outputs and inputs are ordered as active or passive for Ex versions, active and passive for non-Ex versions - function selected by wiring on the terminals.

During initial commissioning of the flowmeter, all outputs can be forced to a preset value for simulation, verification or calibration purposes.

Channels 5 and 6 (with internal DSL)

- RTD temperature inputs for 1000, 500 or 100 Ω RTD's - 2, 3 or 4 wire RTD's supported
- Channels 5 and 6 (with external DSL option)
- RTD Temperature inputs or 4-20 ma inputs. Selectable in menu.

Approvals and certificates

The SITRANS FST030 transmitter was designed to comply with or exceed the requirements of international standards and regulations.

Design

The SITRANS FST030 is designed in an IP67/NEMA 4X aluminum enclosure with corrosion resistant coating. It can be wall or pipe mounted and the enclosure can be locked with a padlock or wired with lead security seals. Includes all flow and DSL functions integrated into one unit.

The FST030 is available as standard with one current, HART 7.5 output and can be ordered with additional input/output functions.

The SITRANS FST030 wall mount housing transmitter has a modular design with discrete, replaceable electronic modules and connection boards to maintain separation between functions and facilitate field service. All modules are fully traceable and their provenance is included in the transmitter setup.

SensorFlash

SensorFlash is a standard, 4 GB microSD card with the ability to be updated by PC. It is supplied with each transmitter and comes with a complete set of certification documents including report if ordered. Factory conformance certificates are optional at ordering.

The Siemens SensorFlash memory unit offers the following features and benefits:

- Copy site setups to SD card for easy transfer to other similar transmitters
- Permanent database of operational and functional information from the moment that the flowmeter is switched on
- New firmware updates can be downloaded from the Siemens internet portal for Product Support and placed onto SensorFlash (unmounted from the transmitter and inserted into a PC's SD card slot). The firmware is then inserted into the existing flowmeter for system/firmware upgrade.

SITRANS FST030 industrial housing

Separate field enclosure with modular design. The FST030 can installed direct in the field. The SITRANS FST030 use always the seperate FS DSL for the sensor connection.

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Function

The following functions are available:

- Up to four configurable outputs and 2 RTD input channels selected at ordering
- Outputs can be individually configured for mass flow, volume flow, etc.
- Three built-in totalizers which can count positive, negative or net flows
- Independent low flow cut-offs, adjustable
- Uni/bidirectional flow measurement
- Flow direction adjustable
- Alarm system consisting of alarm-log, alarm pending menu
- Change log, logs all changes made to menu parameters or via communications
- Internal data logger
- Display of operating time with real-time clock
- Flowrate outputs are freely configurable between maximum negative and maximum positive flows according to the sensor capacity
- Limit switches programmable for flow, density and temperature. Limit points can be graded as warning and alarm for values both above and below nominal process conditions
- Zero adjustment menu, with zero point evaluation display
- Full service menu for effective and straight forward application and meter troubleshooting
- Precise temperature measurement ensures optimal accuracy on massflow and density
- Fully compatible with Siemens PDM version 8.2 service pack 1 or higher

Technical specifications

SITRANS FST030	
Process media	• Suitable for virtually any sonically conductive fluid, including hazardous liquids • Aggregate state: Light slurry and liquid
Process variables	• Volume flow • Mass flow • Flow velocity • Sound velocity • Standard volume flow (hydrocarbon variant only) • Density • Kinematic viscosity • Pressure • Medium temperature • Specific gravity (hydrocarbon variant only) • Totalizer 1 • Totalizer 2 • Totalizer 3 • Standard density (hydrocarbon variant only) • Standard specific gravity (hydrocarbon variant only) • Standardizing factor (hydrocarbon variant only) • Liquldent (hydrocarbon variant only) • API gravity (hydrocarbon variant only) • Standard API gravity (hydrocarbon variant only) • Standard kinematic viscosity (hydrocarbon variant only) • Liquid identifier (hydrocarbon variant only)
Current output	
Current	0 ... 20 mA or 4 ... 20 mA (channel 1 only 4 ... 20 mA)
Load	< 500 Ω per channel
Time constant	0 ... 100 s adjustable
Digital output	
Pulse	41.6 µs ... 5 s pulse duration
Frequency	0 ... 10 kHz, 50 % duty cycle, 120 % overscale provision
Time constant	0 ... 100 s adjustable
Active	0 ... 22 V DC, 30 mA, short-circuit-protected
Passive	3 ... 30 V DC, max. 110 mA
Relay	
Type	SPDT dry contact relay
Load	30 V AC/100 mA
Functions	Alarm level, alarm number, limit, flow direction
Digital input	
Voltage	15 ... 30 V DC (2 ... 15 mA)
Current	4 ... 20 mA
Functionality	Reset totalizer 1, 2 and 3, force output, freeze process values, zero point adjustment
Galvanic isolation	All inputs and outputs are galvanically isolated, isolation voltage 500 V
Alarm and warning limit	Available for all process values
Totalizer	Three counters for forward, net and reverse flow
Display	• Background illumination with alphanumerical text to indicate flow rate, totalized values, settings and faults • Adjustable damping constant of 0 ... 100 s • Reverse flow indicated by negative sign
SD card functions	• Parameter change log • Configurable data logger • FW update log • Diagnostic log • Error and alarm log • Parameter backup
Ambient temperature	
Operation	
• Transmitter	-40 ... +60 °C (-40 ... +140 °F), humidity max. 95 %
• Display	-20 ... +60 °C (-4 ... +140 °F)

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Technical specifications (continued)

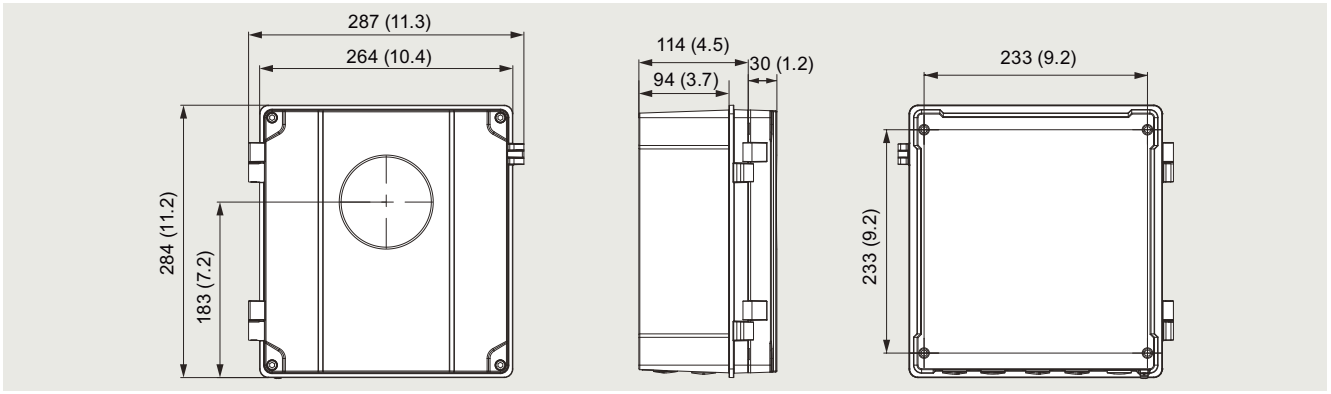
SITRANS FST030	
Storage	
• Transmitter	-40 ... +70 °C (-40 ... +158 °F), humidity max. 95 %
Communication	HART 7.5
	Modbus RTU RS 485
Enclosure	
Material	Aluminum
Rating	IP66/67, NEMA 4X to IEC 529 and DIN 40050 (1 mH_2O for 30 min.)
Mechanical load	18 ... 400 Hz random, 3.17 g RMS, in all directions
Power supply	
Universal	20 ... 27 V DC 100 ... 240 V AC, 47 ... 63 Hz
Fluctuation	No limit
Power consumption	20 W/22 VA
Minimum pressure for gas	10 bar (145 psi), gas composition and application dependent; plastic pipes support operation at atmospheric pressure. For lower pressure application please contact sales
Environment Environmental conditions according to IEC/EN/UL 61010-1	• Altitude up to 2 000 m • Pollution degree 2 • Overvoltage category II
Maintenance	The flowmeter has a built-in error log/pending menu which should be inspected on a regular basis
Cable glands	Cable glands are available in nylon, nickel plated brass or stainless steel (316L/W1.4404)
Approvals for FST030 wall mount enclosure	
Canada, USA • FM17CA0110X • FM17US0219X • CSA 21CA80072942X	Class I, Division 2, Groups A, B, C, D Class II, Division 2, Groups F, G Class III, Division 2 Class I, Zone 2, AEx ia nA [ia Ga] IIC T6...T5 Gc Class I, Zone 2; AEx/Ex ec ia [ia Ga] IIC T6...T5 Gc Class II, Zone 22; AEx/Ex tc [ia Da] IIIC T85°C Dc
ATEX, UKEx, IECEx • FM17ATEX0055X • FM21UKEX0059X • IECEx FMG 17.0023X	II 3(1) G Ex ec ia [ia Ga] IIC T6...T5 Gc II 3(1) D Ex tc [ia Da] IIIC T85°C Dc
Inmetro • BRA 21.GE0013X	Ex ex ia [ia Ga] IIC T6 Gc Ex tc [ia Ga] IIIC T85°C Dc
Ambient temperature range	T6 for -40 °C ≤ T_a ≤ 45 °C T5 for -40 °C ≤ T_a ≤ 60 °C T5 85 °C for -40 °C ≤ T_a ≤ 60 °C
Approvals for FST030 industrial enclosure	
Canada, USA • CSA 2508628 • FM18US0063X • FM21CA0019X	**Canada:** Ex db eb ia [ia Ga] IIC T6 Gb Ex tb [ia Da] IIIC T85°C **USA:** Class I, Division 1, Groups A, B, C, D Class II, Division 1, Groups E, F, G Class III, Division 1 Class I, Zone 1: AEx db eb ia [ia Ga] IIC T6 Gb Class II, Zone 21: AEx tb [ia Da] IIIC T85°C
ATEX, UKEx, IECEx • Sira 11ATEX1342X • CSAE 21UKEX1109X • IECEx SIR 11.0150X	II 2(1) G Ex db eb ia [ia Ga] IIC T6 Gb II 2(1) D Ex tb [ia Da] IIIC T85°C Db
Inmetro • BRA 21.GE0013X	Ex db eb ia [ia Ga] IIC T6 Gb Ex tb [ia Da] IIIC T85°C Db
Ambient temperature range	T_a = -40 ... 60 °C
Approvals for FS230 external DSL	
Canada, USA • FM16CA0157X • FM16US0318X • CSA 21CA8007621X	IS Class I, Division 1, Groups A, B, C, D IS Class II, Division 1, Groups E, F, G IS Class III, Division 1 Class I, Zone 0; AEx/Ex ia IIC T6...T5 Ga Class II, Zone 21; AEx/Ex ib IIIC T64°C...T74°C Db
ATEX, UKEx, IECEx • FM16ATEX0094X • FM21UKEX0058X • IECEx FMG 16.0037X	II 1 G Ex ia IIC T6...T5 Ga II 2 D Ex ib IIIC T5 64°C...T5 74°C Db

Technical specifications (continued)

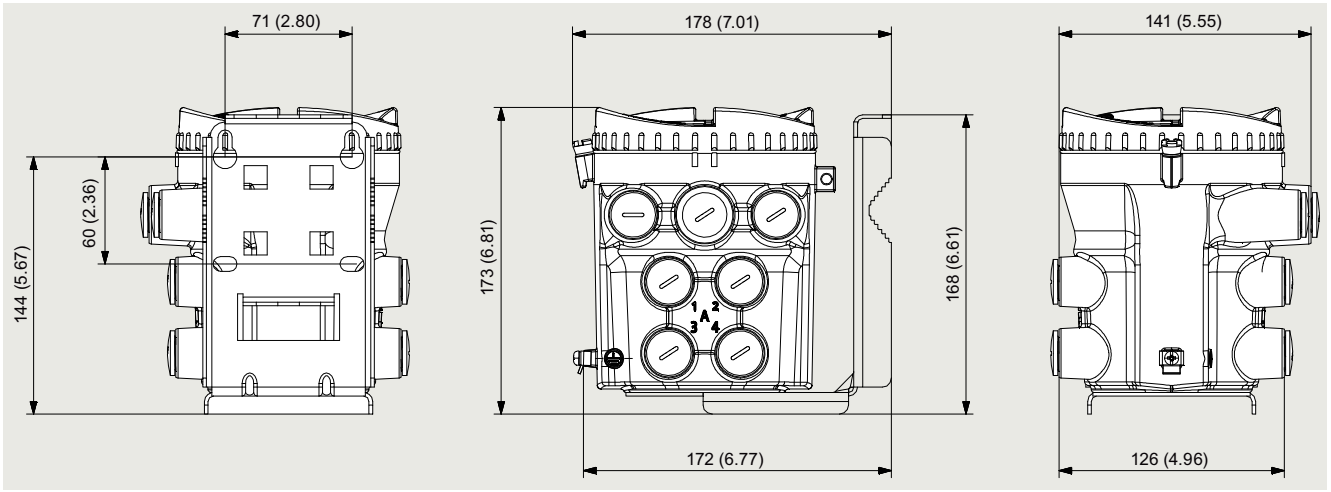
SITRANS FST030	
Inmetro • BRA 21.GE001	Ex ia IIC T6...T5 Ga Ex ib IIIC T5 64°C Db
EAC Ex	Ex ia IIC T6...T5 Ga Ex ib IIIC T64°C...T5 74 °C Db
Ambient temperature range	T6: -40 °C ≤ T_a ≤ 50 °C T5: -40 °C ≤ T_a ≤ 60 °C $T_5$64 °C: -40 °C ≤ T_a ≤ 50 °C $T_5$74 °C: -40° C ≤ T_a ≤ 60 °C
Certificates	
CE conformity marking	• Low voltage directive • WEEE • RoHS
EMC performance	
Emission	CISPR 11:2009/A1:2010 and EN 55011:2009/A1:2010
Immunity	IEC/EN 61326-1:2013

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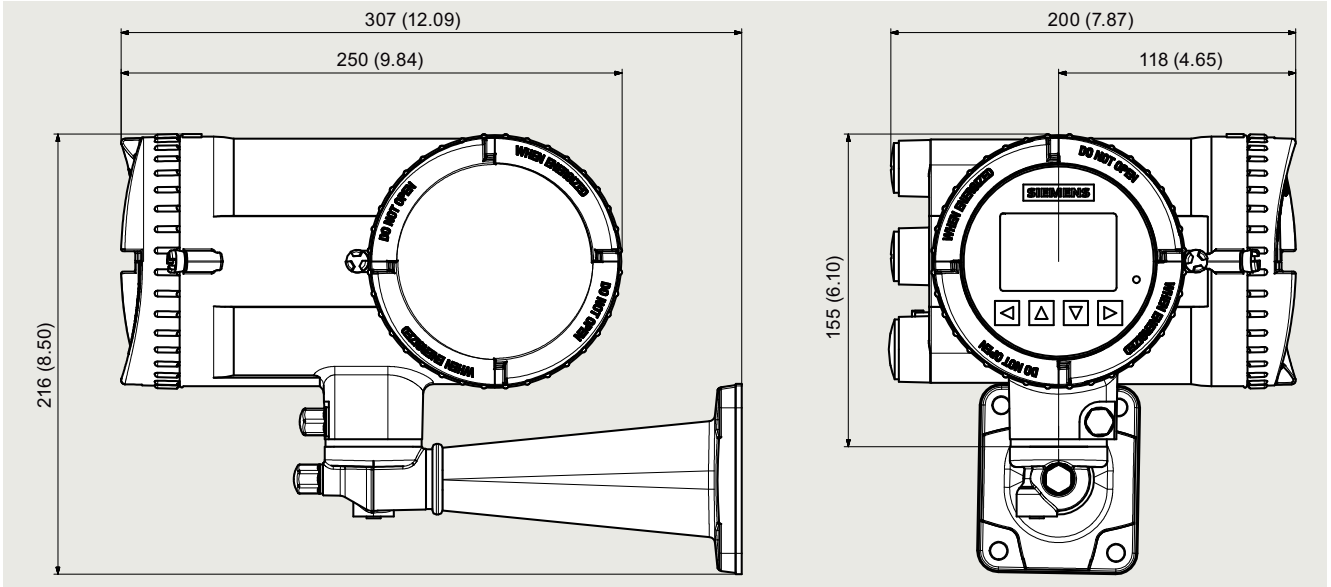
Dimensional drawings



SITRANS FST030, wall mount version, dimensions in mm (inch)



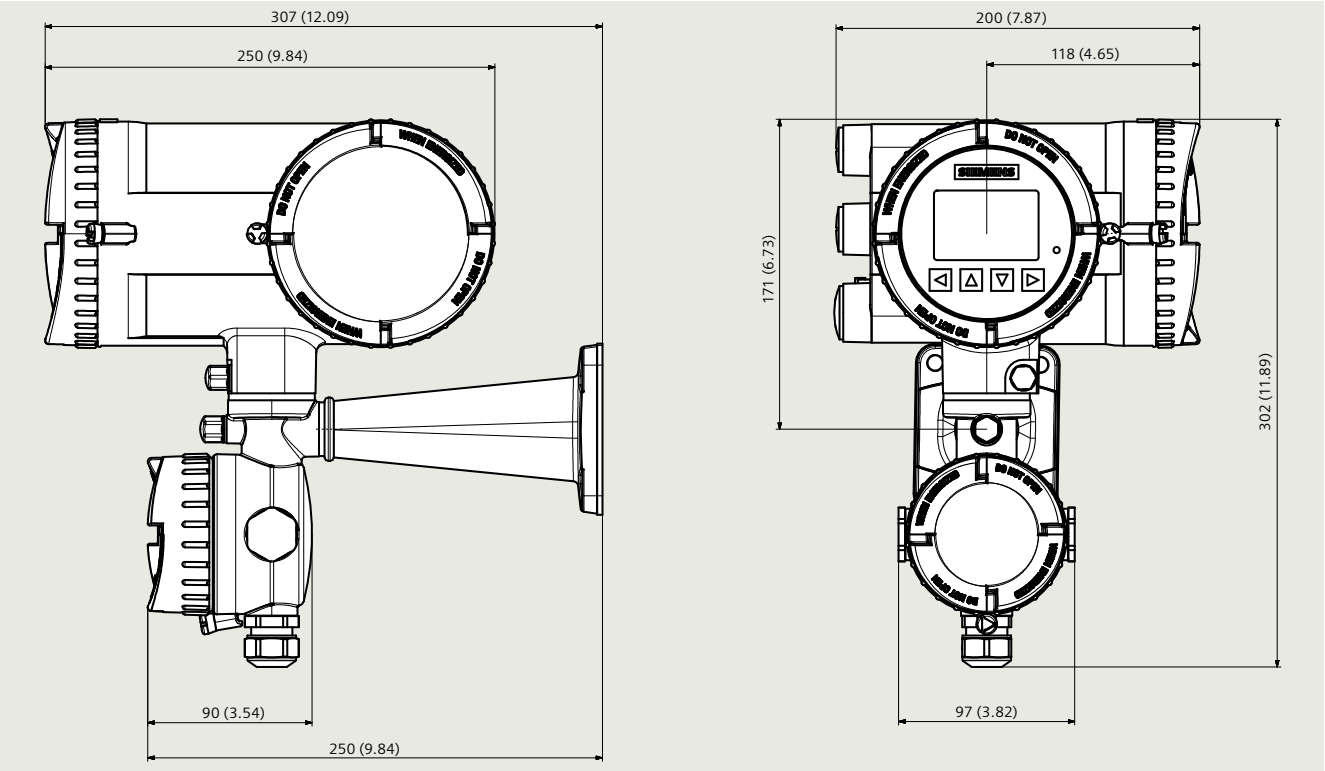
External DSL, dimensions in mm (inch)



SITRANS FST030 industrial transmitter with M12 connection, dimensions in mm (inch)

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Dimensional drawings (continued)



SITRANS FST030 with terminal house, dimensions in mm (inch)

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Overview



The SITRANS FS220 is a clamp-on ultrasonic flow system consisting of an FST020 transmitter and FSS200 clamp-on sensors.

The transmitter classification FST020 describes a basic clamp-on ultrasonic flowmeter for basic application requirements. Based on the same digitalized platform as the FST030 this system provides the same accuracy and similar functions on a lower cost level. This system is ideal for water measurement and any application not requiring temperature or viscosity compensation.

Benefits

- Easy installation at any time; no production stop, no need to cut pipe or stop flow
- Minimal maintenance; external sensors do not require periodic cleaning
- No moving parts to foul or wear. No contact with media
- No pressure drop or energy loss
- Wide turn-down ratio, bidirectional and high stability at zero flow conditions
- Anomaly compensation tool for correction of non-ideal straight pipe runs. Automatic compensation during backflow
- Optional WideBeam technology ensures highest performance and accuracy
- Compatible with all previously installed transit time sensors

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Application

The SITRANS FS220 can be used for the following application conditions:

- Pipe sizes from 10 mm to 10 m
- Pipe materials: ideal for all metals, glass, FRP and most PVC variants; NOT for concrete pipes and special compound pipes
- Pipe wall thickness from 1 to 35 mm; specials on request up to 65 mm
- Media temperatures from -40 to 121 °C; universal high temperature sensors for up to 230 °C max.
- Underground/submerged locations, non-ideal environments, strong pipe vibrations

SITRANS FS220 flowmeters are suitable for most clean liquid applications, including the following:

- Water and wastewater industry
  - Potable water
  - Water and aqueous solutions
  - Wastewater, influent & effluent
  - Processed sewage, sludge
- Chemical feed industry
  - Sodium hypochlorite
  - Sodium hydroxide
- HVAC and power industries
  - Coolant flow
  - Fuel flow
  - Utility district heating, cooling
  - Refrigeration liquids
- Process control
  - Chemicals
  - Pharmaceuticals
  - Food products
  - Very low flow sensitiity (< 0.1 m/s)
  - High temperature liquids > 120 °C (248 °F)

Sensor type selection guide



Application condition Note all that apply before making selection	Standard sensor supported in MLFB High precision	Universal	Notes
Media			
General survey (clean liquids) on non-steel pipes	-	X	-
General survey (clean liquids) on a limited range of steel pipes	X	-	-
Moderately aerated liquid or slurry, up to 121 °C (250 °F)	X	-	-
Permanent installation on steel pipe (clean liquids)	X	-	-
Installation in offshore or corrosive environment	X	-	With optional stainless steel mounting
Liquid temperature greater than 120 °C (248 °F)	O	X	High temperature metal block sensors (up to 230 °C (446 °F))
Operation on single pipeline flowing multiple products	X	O	-
Pipe material			
Steel	X	-	-
Steel pipe with diameter/wall thickness ratio < 10	O	X	-
Non-steel pipe material (copper, ductile iron, cast iron, etc.)	O	X	High precision sensors can also be used on plastic and aluminum pipes in special cases

O = not suitable
X = preferred choice

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Application (continued)

Definitions

Sensor chart	Description
FSS200	Formerly 1011 clamp-on sensors of the 1010 systems
Standard	Standard system sensor, selectable as part of a configured product
Special	Sensors available for non-standard applications and pipes. Contact tech support for application use
Corrosions resistant	Stainless steel metal parts on all Size C, D and E and all high temperature sensors
Aluminum	Aluminum metal parts on all HP and Universal size A and B (Corrosion resistant on request for size B)
Spare	Not available as part of a configured product, must be ordered separately
CE	Transmitter and sensors certified for sale in the EU
Trackless mount	Sensors fixed only by straps, no other mounting (spacer bar as an option) - not recommended
Tracks	Permanent installation for universal size A/B, high precision size A/B and all sizes of high temperature. Tracks always come as dual-part for either direct or reflect mounting, and always with straps.
Frames	Three sizes, for permanent installation for universal size C/ D/ E, and for high precision size C/D. For universal and high precision size B available for pipes > 125 OD (Spare)
T1	Usable from -40 ... +120 °C (-40 ... +248 °F), but best for Ø temperature below 80 °C (< 176 °F); standard
T2	Usable from -40 ... +120 °C (-40 ... +248 °F), but best for Ø temperature above 80 °C (< 176 °F)
Submersible	Sensors can be used submerged; adding Denso for supplemental protection is recommended

Sensor availability guide

Universal Sensor

Universal Sensor -40 ... 120 °C housing CE IP68 Sensor models	Standard	Spare only	Corrosion resistant	Trackless	Tracks	Frames	T1[1]	T2[2]	Submers-ible	Catalog
A1 Universal for pipe OD – 5.8 ... 50.8 mm (0.23" ... 2")	-	X	-	-	X	-	-	-	X	-
A2 Universal for pipe OD – 12.7 ... 50.8 mm (0.5" ... 2")	X	-	-	-	X	-	-	-	X	X
B1 Universal for pipe OD – 12.7 ... 76 mm (0.5" ... 3")	-	X	-	-	X	X	-	-	X	-
B2 Universal for pipe OD – 12.7 ... 76 mm (0.5" ... 3")	-	X	-	-	X	X	-	-	X	-
B3 Universal for pipe OD – 19 ... 127 mm (0.75" ... 5")	X	-	-	-	X	X	-	-	X	X
C1 Universal for pipe OD – 51 ... 254 mm (2" ... 10")	-	X	X	X	-	X	-	-	X	-
C2 Universal for pipe OD – 51 ... 254 mm (2" ... 10")	-	X	X	X	-	X	-	-	X	-
C3 Universal for pipe OD – 51 ... 305 mm (2" ... 12")	X	-	X	X	-	X	-	-	X	X
D1 Universal for pipe OD – 102 ... 508 mm (4" ... 20")	-	X	X	X	-	X	-	-	X	-
D2 Universal for pipe OD – 152 ... 610 mm (6" ... 24")	-	X	X	X	-	X	-	-	X	-
D3 Universal for pipe OD – 203 ... 610 mm (8" ... 24")	X	-	X	X	-	X	-	-	X	X
*E1 Universal for pipe OD – 254 ... 3048 mm (10" ... 120")	-	X	X	X	-	X	-	-	X	-
*E2 Universal for pipe OD – 254 ... 6096 mm (10" ... 240")	X	-	X	X	-	X	-	-	X	X

[1] Best use at a temperature of < 80 °C (176 °F)
[2] Best use at a temperature of 80 ... 120 °C (176 ... 248 °F)

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Application (continued)

High Precision Sensor

High Precision Sensor -40 ... 120 °C (-40 ... +248 °F) T1 (T2) CE IP68										
Sensor models	**Standard**	**Spare only**	**Corrosion resistant**	**Trackless**	**Tracks**	**Frames**	**T1[1)]**	**T2[2)]**	**Submers-ible**	**Catalog**
A1H (High Precision) for pipe WT - 0.64 ... 1.0 mm (0.025" ... 0.04")	-	X	-	-	X	-	X	-	X	X
A2H (High Precision) for pipe WT - 1.0 ... 1.5 mm (0.04" ... 0.06")	X	-	-	-	X	-	X	-	X	X
A3H (High Precision) for pipe WT - 1.5 ... 2.0 mm (0.06" ... 0.08")	X	-	-	-	X	-	X	-	X	X
B1H (High Precision) for pipe WT - 2.0 ... 3.0 mm (0.08" ... 0.12")	X	-	-	-	X	X	X	X	X	X
B2H (High Precision) for pipe WT - 3.0 ... 4.1 mm (0.12" ... 0.16")	X	-	-	-	X	X	X	X	X	X
B3H (High Precision) for pipe WT - 2.7 ... 3.3 mm (0.106" ... 0.128")	-	X	-	-	X	X	X	X	X	X
C1H (High Precision) for pipe WT - 4.1 ... 5.8 mm (0.16" ... 0.23")	X	-	X	X	-	X	X	X	X	X
C2H (High Precision) for pipe WT - 5.8 ... 8.1 mm (0..23" ... 0.32")	X	-	X	X	-	X	X	X	X	X
* D1H (High Precision) for pipe WT - 8.1 ... 11.2 mm (0..32" ... 0.44")	X	-	X	X	-	X	X	X	X	X
* D2H (High Precision) for pipe WT - 11.2 ... 15.7 mm (0.44" ... 0.62")	X	-	X	X	-	X	X	X	X	X
* D3H (High Precision) for pipe WT - 7.4 ... 9.0 mm (0..293" ... 0.354")	-	X	X	X	-	X	X	X	X	X
* D4H (High Precision) for pipe WT - 15.7 ... 31.8 mm (0..62" ... 1.25")	X	-	X	X	-	X	X	X	X	X

1) Best use at a temperature of < 80 °C (176 °F)
2) Best use at a temperature of 80 ... 120 °C (176 ... 248 °F)

High Temperature Universal Sensor

High Temperature Universal Sensor -40 ... +230 °C (-40 ... +446 °F)										
Sensor models	**Standard**	**Spare only**	**Corrosion resistant**	**Trackless**	**Tracks**	**Frames**	**T1[1)]**	**T2[2)]**	**Submers-ible**	**Catalog**
High Temperature size 1 ... 230 °C (Ø 12.7 ... 100 mm)	-	X	X	-	X	-	-	-	X	-
High Temperature size 2 ... 230 °C (Ø 30 ... 200 mm)	X	-	X	-	X	-	-	-	X	X
High Temperature size 3 ... 230 °C (Ø 150 ... 610 mm)	X	-	X	-	X	-	-	-	X	X
High Temperature size 4 ... 230 °C (Ø 400 ... 1200 mm)	X	-	X	-	X	-	-	-	X	X
High Temperature size 2A ... 230 °C (Ø 30 ... 200 mm)	-	X	X	-	X	-	-	-	X	-
High Temperature size 3A ... 230 °C (Ø 150 ... 610 mm)	-	X	X	-	X	-	-	-	X	-
High Temperature size 4A ... 230 °C (Ø 400 ... 1200 mm)	-	X	X	-	X	-	-	-	X	-

1) Best use at a temperature of < 80 °C (176 °F)
2) Best use at a temperature of 80 ... 120 °C (176 ... 248 °F)

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Application (continued)

Sensor mounting availability guide

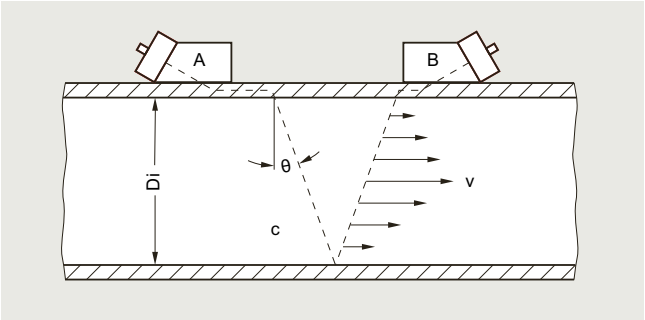
Mounting	Sensor (Dedicated) Universal	High precision	High temperature universal
Trackless (straps only)	X	X	-
Tracks universal dedicated	X	-	-
Tracks HP dedicated	-	X	-
Frames universal dedicated	X	-	-
Frames HP dedicated	-	X	-
Tracks high temperature universal	-	-	X
High precision mounting single enclosure for one pair sensors	-	X	-
High precision mounting dual enclosure for one pair sensors	-	X	-
Spacer bar	X	X	-
Straps	X	X	X
Denso	X	X	-

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Function

Operating principle

The SITRANS FS system is a transit-time ultrasonic meter that provides exceptional performance using a non-intrusive clamp-on approach. Ultrasonic sensors transmit and receive acoustic signals directly though the existing pipe wall, where the fluid refraction angle is governed by Snell's law of refraction.



Clamp-on sensor mounted in a reflect configuration

The beam refraction angle is calculated as follows:

$\sin \Theta = c / V_\varphi$

c = Velocity of sound in fluid

V_φ = Phase velocity (a constant in the pipe wall)

The flowmeter automatically compensates for any change in fluid sound velocity (or beam angle) in response to variations in the average transit time between sensors A and B. By subtracting the computed fixed times (within the sensor and pipe wall) from the measured average transit time, the meter can then infer the required transit time in the fluid (T_{Fluid}).

The sound waves traveling in the same direction as the flow ($T_{A,B}$) arrive earlier than sound waves traveling against the direction of flow ($T_{B,A}$). This time difference (Δt) is used to compute the line integrated flow velocity (v) as shown in the equation below:

$v = V_\varphi / 2 \cdot \Delta t / T_{Fluid}$

Once the raw flow velocity is determined, the fluid Reynolds Number (Re) must be determined to properly correct for fully developed flow profile. This requires the entry of the fluid's kinematic viscosity (visc) as shown in the equations below, where Q represents the final flow profile compensated volumetric flow rate.

$Re = Di \cdot v / visc \quad Q = K(Re) \cdot (\pi / 4 \cdot Di^2) \cdot v$

v = Flow velocity

visc = μ / ρ = (dynamic viscosity / density)

K(Re) = Reynolds flow profile compensation

In wetted type ultrasonic flowmeters the meter constants are configured prior to leaving the factory. As this is not possible with clamp-on meters, the settings must be made by the customer at the time of installation. These settings include pipe diameter, wall thickness, liquid viscosity, etc.

SITRANS clamp-on flowmeters that include temperature sensing can be configured to dynamically infer changes in fluid viscosity for the purpose of computing the most accurate flow profile compensation (K_{Re}).

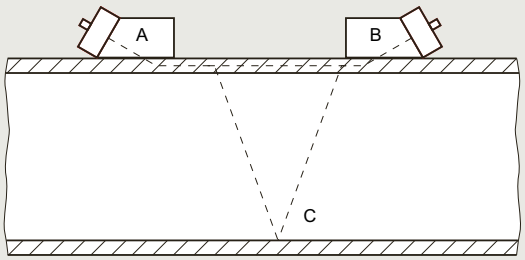
Ultrasonic sensor types

Two basic types of clamp-on sensors can be selected for use with the SITRANS FS flowmeter. The lower cost "universal" sensor is the most common type in the industry and is suitable for most single liquid applications where the sound velocity does not vary much. This sensor type can be used on any sonically conductive pipe material (including steel) making it well suited for temporary survey applications. Universal sensors are selected based on the pipe diameter range alone, so wall thickness is less important to the selection process..

Function (continued)

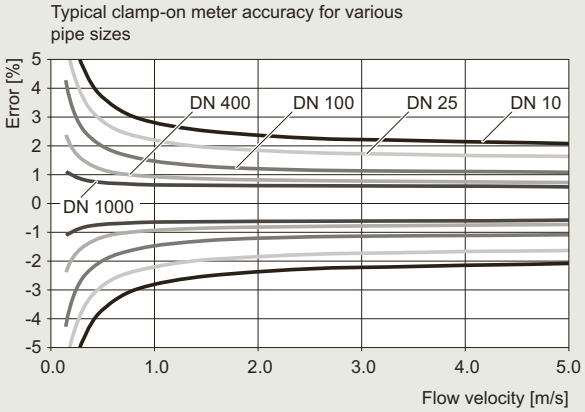
The second sensor type is the patented "WideBeam" sensor (called high precision), which utilizes the pipe wall as a kind of waveguide to optimize the signal to noise ratio and provide a wider area of vibration. This makes this kind of sensor less sensitive to any change in the fluid medium.

The WideBeam sensor is designed for steel pipes, but can also be used with aluminum and titanium. It is the preferred sensor for HPI applications. Note that unlike the universal type, this sensor selection is dependent only on the pipe's wall thickness.



General installation guidelines for SITRANS FSS200 clamp-on sensor

- Minimum measuring range: 0 to ± 0.3 m/s velocity (see meter accuracy graph on next page for more detail)
- Maximum measuring range: 0 to ± 12 m/s (± 30 m/s for high precision sensors). Final flow range determination requires application review



- Pipe must be completely full within the sensor installation volume for accurate flow measurement
- Typical MINIMUM straight pipe requirements are: 10 Diameters upstream/5 Diameters downstream. Additional straight run is required for double out-of-plane elbows and partially open valves.
- Sensors should be installed at least 20° off vertical for horizontal pipes. This reduces the chance of beam interference from gas buildup at the top of the pipe
- Operation inside the Reynolds transition region, between 1000 < Re < 5000 should be avoided for best accuracy
- Submersible and direct burial installations can be accommodated. Consult sales representative for details

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Function (continued)

- Ultrasonic coupling compound is provided with all sensor orders. Insure that a permanent coupling compound is used for long term installations
- Refer to the "Sensor type selection guide" to insure proper application of the equipment

Selection and ordering data

Spare parts (FSS200 sensors) SITRANS F US clamp-on	Article No. 7ME395- 5 ● ● ● ● 0-
Temperature range for all sensors is unless otherwise noted -40 °C ... +120 °C (-40 °F ... +248 °F)	
Ideal operating temperatures as follows:	
T1: -40 ... +8065 °C (-40 ... +176 °F)	0
T2: -80 ... 121 °C (30 ... 250 °F)	2
Spare sensor code (Stainless steel construction)	
Liquid flow sensors for use with mounting frames or tracks (including portable)	
FSS200 A2 universal	L B 0 1
FSS200 B3 universal	L C 0 1
FSS200 C3 universal	L D 0 0
FSS200 D3 universal	L E 0 0
FSS200 E2 universal	L F 0 0
FSS200 A1H (high precision)	L G 0 1
FSS200 A2H (high precision)	L H 0 1
FSS200 A3H (high precision)	L J 0 1
FSS200 B1H (high precision)	G K 1
FSS200 B2H (high precision)	G L 1
FSS200 B3H (high precision)	G T 1
FSS200 C1H (high precision)	G M 0
FSS200 C2H (high precision)	G N 0
FSS200 D1H (high precision)	G P 0
FSS200 D2H (high precision)	G Q 0
FSS200 D3H (high precision)	G U 0
FSS200 D4H (high precision)	G R 0
High temperature universal liquid sensors up to 230 °C (446 °F)	
FSS200 high temperature sensor size 1 for Ø 12.7 ... 100 mm	L A 1 3
FSS200 high temperature sensor size 2 for Ø 30 ... 200 mm	L A 2 3
FSS200 high temperature sensor size 3 for Ø 150 ... 600 mm	L A 4 3
FSS200 high temperature sensor size 4 for Ø 400 ... 1200 mm	L A 7 3

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Selection and ordering data (continued)

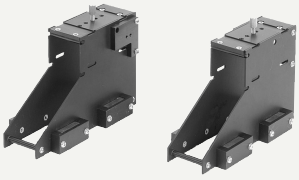
Spare parts (Miscellaneous) SITRANS F US clamp-on	Article No. 7ME396- 0-	●	●	●	●	●
Dedicated sensor mounting hardware						
Sensor mounting tracks (dual part aluminium with mounting straps) for pipes < 125 mm (5 inch)						
• Tracks for Universal sensor pair size A or B		0	M	A	0	0
• Tracks for High precision sensor pair size A or B		0	M	B	0	0
Sensor mounting frames pair with mounting straps						
• Frames for universal sensor size B (for pipes >125 mm (5 inch)	CQO:1012FN-PB					
• Frames for universal sensor size C		0	M	C	0	0
• Frames for universal sensor size D		0	M	C	0	1
• Frames for universal sensor size E		0	M	C	0	2
• Frames for High precision sensor size B (for pipes >125 mm (5 inch))	CQO:1012FNH-PB					
• Frames for High precision sensor size C		0	M	D	0	0
• Frames for High precision sensor size D		0	M	D	0	1
Mounting straps for mounting frames (slotted stainless steel)						
• Straps for pipes from DN 50 ... 150		0	S	M	0	0
• Straps for pipes from DN 50 ... 300		0	S	M	1	0
• Straps for pipes from DN 300 ... 600		0	S	M	2	0
• Straps for pipes from DN 600 ... 1200		0	S	M	3	0
• Straps for pipes from DN 1200 ... 1500		0	S	M	4	0
• Straps for pipes from DN 1500 ... 2100		0	S	M	5	0
• Straps for pipes from DN 2100 ... 3000		0	S	M	6	0
Spacer bars (for indexing sensors on pipe)						
• Spacer bar for pipes to 200 mm/8 inch (liquid), 600 mm/24 inch (gas)		0	M	S	1	0
• Spacer bar for pipes to 500 mm/20 inch (liquid), DN 1200/48 inch (gas)		0	M	S	2	0
• Spacer bar for pipes to 800 mm/32 inch (liquid)		0	M	S	3	0
• Spacer bar-extension for pipes to 1200 mm/48 inch (liquid), only use in conjunction with 7ME3960-0MS30		0	M	S	4	0
High precision mounting enclosures. Spacer bar is included; straps should be ordered separately						
• Stainless steel mounts for high precision size "C" sensor pair, single enclosure (each)		0	W	S	5	0
• Stainless steel mounts for high precision size "D/E" sensor pair, single enclosure (each)		0	W	S	6	0
• Stainless steel mounts for high precision size "C" sensors, dual enclosure (pair)		0	W	D	5	0
• Stainless steel mounts for high precision size "D/E" sensors, dual enclosure (pair)		0	W	D	6	0
Stainless steel straps for weld seal enclosure mounting (2 x required for dual enclosures)						
Mounting strap for pipe diameter to 300 mm (13 inch)		0	S	M	0	1
Mounting strap for pipe diameter to 600 mm (24 inch)		0	S	M	1	1
Mounting strap for pipe diameter to 1200 mm (48 inch)		0	S	M	2	1
Mounting strap for pipe diameter to 1500 mm (60 inch)		0	S	M	3	1
Mounting strap for pipe diameter to 2130 mm (84 inch)		0	S	M	4	1
Mounting strap for pipe diameter to 3050 mm (120 inch)		0	S	M	5	1
Stainless mounting tracks for high temp 991 sensors, with straps, dual part for direct and reflect ount, inc. straps						
Size 1 high temp sensor pair	CQO:992MTNHMSH-1					
Size 2 high temp sensor pair	CQO:992MTNHMSH-2					
Size 3 high temp sensor pair	CQO:992MTNHMSH-3					
Size 4 high temp sensor pair	CQO:992MTNHMSH-4					
Dedicated cable termination kits						
For externally supplied sensor cables, standard and plenum		0	C	T	0	1
Cable gland kit (normally supplied with transmitter) for IP65 NEMA 4X enclosures	A5E41693895					
Ultrasonic couplan						
Temporary water based for portable systems: 350 ml (12 oz): -34 ... +38 °C (-30 ... +100 °F)		0	U	C	1	0
Permanent synthetic polymer based: 90 ml (3 oz) -40 ... +190 °C (-40 ... +375 °F)		0	U	C	2	0
Permanent high temp fluoroether: -40 ... +230 °C (-40 ... +450 °F)		0	U	C	3	0
Permanent vulcanizing silicone rubber couplant: 90 ml (3 oz): -40 ...+120 °C (-40 ... +250 °F)	CQO:CC112					
Permanent high temp silicone grease: 12 ml (0.4 oz): -40 ... +230 °C (-40 ... +450 °F)	CQO:CC117					
Permanent high temp silicone grease: 150 ml (5 oz): -40 ... +230 °C (-40 ... +450 °F)	CQO:CC117A					

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Selection and ordering data (continued)

Spare parts (Miscellaneous) SITRANS F US clamp-on	Article No. 7ME396- 0-	●	●	●	●	●
Couplant for submersible sensor applications	CQO:CC120					
Dry coupling pads (qty of 10): -34 ... +200 °C (-30 ... +392 °F)		0	U	C	4	0
Universal sensor test blocks						
Test block for size A and B universal sensors		0	T	B	1	0
Test block for size C and D universal sensors		0	T	B	2	0

Accessories

Description	Article No.	
FSS200 universal sensors Selected for general purpose measurement. Since they are selected based on diameter only, a wide range of pipe sizes and materials can be covered with a minimum number of sensors. These can also be selected for cost savings on applications where standard accuracy is sufficient.	**7ME3950-...**	
FSS200 high precision sensors Selected for increased performance on steel pipes. They provide the highest accuracy achievable by the meters and therefore should be selected whenever higher accuracy / repeatability is required primarily based on pipe wall thickness.	**7ME3950...**	
FSS200 high temperature sensors Selected whenever pipe temperature will exceed 250 °F (120 °C) up to a maximum of 450 °F (232 °C). They are universal type and can therefore be used on any pipe material and are selected by pipe diameter. Constructed in stainless steel. Connection junction box included.	**7ME3950-...**	
Mounting tracks Typically used on smaller pipes for easier and more stable mounting of dedicated universal style sensor size A or B; also available for dedicated high precision sensor size A or B.	**7ME3960-...**	
Mounting frames These items are useful in simplifying sensor installation. They are strapped to the pipe first and then the sensors are installed, making the installation less cumbersome and more precise. They also enable easy repeated mounting of the sensors assuring alignment to the original sensor positioning. They may be left in place at each measurement location where periodic flow surveys are conducted to simplify subsequent installations and ensure repeatable results.	**7ME3960-...**	
Magnetic mounting frames Magnetic mounting frames are designed to simplify clamp-on sensor installation on pipelines 8 inches (DN 200) and larger by eliminating the need for straps to secure them. They feature powerful magnets to ensure quick and accurate setup. Compatible with all C, D and E universal and high-precision sensors belonging to the SITRANS FSS200 clamp-on family. Magnetic mounting frames are constructed in aluminum for a high level of durability. Ideal use on temporary installations.	**7ME3960-0MD02**	
Test block Used for checking operation of a meter and sensors prior to a field installation, or as a troubleshooting tool. Selected by sensor size, each block accommodates 2 sensor sizes. Available only for universal sensors.	**7ME3960...**	

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Selection and ordering data (continued)

Description	Article No.	
Straps Used to fasten sensors or mounting frames to pipe for dedicated meter installations. Stainless steel construction for corrosion resistance.	**7ME3960-...**	
Cable gland Cable gland kit for use with SITRANS FST020 transmitters housed in IP65 NEMA 4X wall mount enclosures. Kit contains two single port glands for power and one dual port gland for sensor cables.	**A5E41693895**	
Ultrasonic couplant Fills any voids between sensor emitting surface and pipe wall to allow maximum energy transfer between sensor and pipe. Several different types of couplants are employed as determined by the application conditions and type of installation (Temporary or permanent).	**7ME3960-...**	
Dry couplant The dry coupling pad is intended for use in any liquid, clamp-on transit time or Doppler applications that require a more durable coupling material. Installation is easy by simply placing one strip of material between sensor and pipe. Not intended for clamp-on gas where damping material is used. The temperature range is -34 to +200 °C (-30 to +392 °F).	**7ME3960-...**	
Termination kit (flow sensors) Termination kit for one pair of sensor cables. These can be provided in cases where users will be purchasing bulk cable directly and cutting to length at site, or when existing cable length is to be altered. Selected by cable type.	**7ME3960-...**	
FST020 transmitter module Main transmitter module for FST020 including microSD card and firmware load	**A5E41693884**	
FST020 transmitter module cover AC Cover for FST020 Main transmitter module for AC powered units; includes label and screws	**A5E41693888**	
FST020 transmitter module cover DC Cover for FST020 Main transmitter module for DC powered units; includes label and screws	**A5E41693889**	
FST020 enclosure cover Enclosure lid for FST020; includes display module, connection label and screws	**A5E38846901**	

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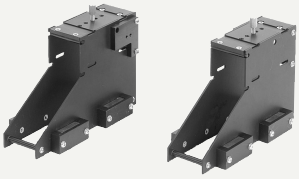
Selection and ordering data (continued)

Description	Article No.	
FST020 power supply AC Power supply module for FST020, AC power	**7ML1830-1MD**	
FST020 power supply DC Power supply module for FST020, DC power	**7ML1830-1ME**	
SensorFlash SD-card 4 GB SD card -40 °C ... +85 °C for FST020 or FST030 for data storage, firmware and back-up	**A5E38288507**	
Hardware kit Various nuts, screws, and grounding strap for FST020 transmitter	**A5E41944763**	
Sensor cables FSS220 (IP65 NEMA 4X) wall mount Sensor cable for connection between FSS200 sensors and FST020 transmitter		
Sensor cable pair, terminated, 5 m	**A5E39669934031**	
Sensor cable pair, terminated, 10 m	**A5E39669934032**	
Sensor cable pair, terminated, 20 m	**A5E39669934033**	
Sensor cable pair, terminated, 30 m	**A5E39669934042**	
Sensor cable pair, terminated, 60 m	**A5E39669934043**	
Sensor cable pair, terminated, 100 m	**A5E39669934044**	

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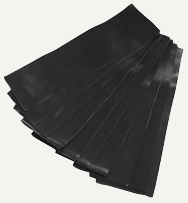
Accessories

Accessories

Description	Article No.	
FSS200 Universal Sensors Selected for general purpose measurement. Since they are selected based on diameter only, a wide range of pipe sizes and materials can be covered with a minimum number of sensors. These can also be selected for cost savings on applications where standard accuracy is sufficient.	**7ME3950-...**	
FSS200 High Precision Sensors Selected for increased performance on steel pipes. They provide the highest accuracy achievable by the meters and therefore should be selected whenever higher accuracy / repeatability is required primarily based on pipe wall thickness.	**7ME3950...**	
FSS200 High Temperature Sensors Selected whenever pipe temperature will exceed 250 °F (120 °C) up to a maximum of 450 °F (232 °C). They are universal type and can therefore be used on any pipe material and are selected by pipe diameter. Constructed in stainless steel. Connection junction box included.	**7ME3950-...**	
Mounting tracks Typically used on smaller pipes for easier and more stable mounting of dedicated universal style sensor size A or B; also available for dedicated high precision sensor size A or B.	**7ME3960-...**	
Mounting Frames These items are useful in simplifying sensor installation. They are strapped to the pipe first and then the sensors are installed, making the installation less cumbersome and more precise. They also enable easy repeated mounting of the sensors assuring alignment to the original sensor positioning. They may be left in place at each measurement location where periodic flow surveys are conducted to simplify subsequent installations and ensure repeatable results.	**7ME3960-...**	
Magnetic mounting frames Magnetic mounting frames are designed to simplify clamp-on sensor installation on pipelines 8 inches (DN 200) and larger by eliminating the need for straps to secure them. They feature powerful magnets to ensure quick and accurate setup. Compatible with all C, D and E universal and high-precision sensors belonging to the SITRANS FSS200 clamp-on family. Magnetic mounting frames are constructed in aluminum for a high level of durability. Ideal use on temporary installations.	**7ME3960-0MD02**	
Test Block Used for checking operation of a meter and sensors prior to a field installation, or as a troubleshooting tool. Selected by sensor size, each block accommodates 2 sensor sizes. Available only for universal sensors.	**7ME3960...**	
Straps Used to fasten sensors or mounting frames to pipe for dedicated meter installations. Stainless steel construction for corrosion resistance.	**7ME3960-...**	

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Accessories (continued)

Description	Article No.	
Cable Gland Cable gland kit for use with SITRANS FST020 transmitters housed in IP65 NEMA 4X wall mount enclosures. Kit contains two single port glands for power and one dual port gland for sensor cables.	**A5E41693895**	
Ultrasonic Couplant Fills any voids between sensor emitting surface and pipe wall to allow maximum energy transfer between sensor and pipe. Several different types of couplants are employed as determined by the application conditions and type of installation (Temporary or permanent).	**7ME3960-...**	
Dry Couplant The dry coupling pad is intended for use in any liquid, clamp-on transit time or Doppler applications that require a more durable coupling material. Installation is easy by simply placing one strip of material between sensor and pipe. Not intended for clamp-on gas where damping material is used. The temperature range is -34 to +200 °C (-30 to +392 °F).	**7ME3960-...**	
Termination Kit (Flow Sensors) Termination kit for one pair of sensor cables. These can be provided in cases where users will be purchasing bulk cable directly and cutting to length at site, or when existing cable length is to be altered. Selected by cable type.	**7ME3960-...**	
FST020 Transmitter module Main transmitter module for FST020 including SD-card and firmware load	**A5E41693884**	
FST020 Transmitter module cover AC Cover for FST020 Main transmitter module for AC powered units; includes label and screws	**A5E41693888**	
FST020 Transmitter module cover DC Cover for FST020 Main transmitter module for DC powered units; includes label and screws	**A5E41693889**	
FST020 Enclosure cover Enclosure lid for FST020; includes display module, connection label and screws	**A5E38846901**	
FST020 Power Supply AC Power supply module for FST020, AC power	**7ML1830-1MD**	
FST020 Power Supply DC Power supply module for FST020, DC power	**7ML1830-1ME**	
SensorFlash SD-card 4 GB micro SD card -40 °C ... +85 °C for FST020 or FST030 for data storage, firmware and back-up	**A5E38288507**	
Hardware kit Various nuts, screws, and grounding strap for FST020 transmitter	**A5E41944763**	

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Accessories (continued)

Description	Article No.	
Sensor cable pair, 5 m Sensor cable for connection between FSS200 sensors and FST020 transmitter, 5 meters in length	A5E39669934031	
Sensor cable pair, 10 m Sensor cable for connection between FSS200 sensors and FST020 transmitter, 10 meters in length	A5E39669934032	
Sensor cable pair, 20 m Sensor cable for connection between FSS200 sensors and FST020 transmitter, 20 meters in length	A5E39669934033	
Enclosure mounting kit Mounting kit to fix enclosure on a 2" stanchion pipe	QCB:1012NMB1	

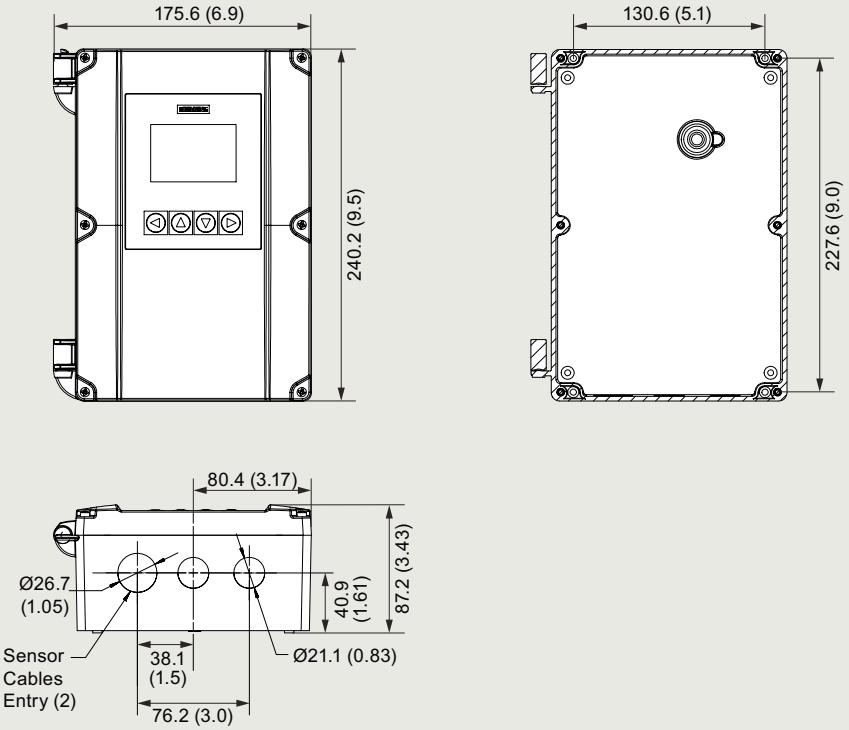
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Technical specifications

SITRANS FS220	
Rangeability	
Flow range	±12 m/s (±40 ft/s), depending on pipe size higher or lower
Flow direction	bi-diretional
Flow sensitivity	0.001 m/s (0.003 ft/s) flow rate independent
Digital inputs	
Totalizer Hold	Optically isolated diode Activated On: Input voltage: 2 ... 10 V DC
Totalizer Reset	Optically isolated diode Activated On: Input voltage: 2 ... 10 V DC
Output	
Current	4 ... 20 mA (isolated) Externally powered 10 ... 30 V DC
Passive	30 V DC, 3 V AC max. Relay: 41.6 ms ... 5 s pulse duration Frequency: 0 ... 12.5 kHz (50 % duty cylce)
Pulse	Optically isolated transistor 10 mA, 30 V DC max.
Accuracy	For velocities above 0.3 m/s (1 ft/s), ±1.0 % of flow
Repeatability	± 0.25 % (according to ISO 11631)
Zero Drift	0.1 % of rate; < ±0.001 m/s (±0.003 ft/s)
Data refresh rate	100 Hz
Transmitter conditions	
Operating temperature	-10 ... +50 °C (14 ... 122 °F)
Storage temperature	-20 ... +60 °C (-4 ... +140 °F)
Degree of protection	IP65, NEMA 4X
Design	
Weight	1.4 kg (3.0 lb)
Dimensions (W x H x D)	176 x 240 x 87 mm (6.9 x 9.5 x 3.4 inch)
Enclosure material	Polycarbonate
Power supply	100 ... 240 V AC @ 20 VA or 11.5 ... 28.5 V DC @ 10 W
Certificates and approvals	
Unclassified locations	
• General Safety	UL, cUL, CE

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Dimensional drawings



SITRANS FST020 IP65 (NEMA 4X), wall mount enclosure, dimensions in mm (inch)

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Overview



The SITRANS FST020 is the basic device for simple and cost-effective clamp-on applications. As a single-path device, it is suitable for flow measurement on liquids that do not require temperature or viscosity consideration and where highest accuracies are not required.

Historically, the FST020 comes from the clamp-on family of analog FUS1010 transmitters. Since the revision in 2017, the updated transmitter is now part of a digital platform based on the latest developments within Digital Signal Processing (DSP) technology - engineered for high measuring performance, fast response to step changes in flow, high immunity against process noise and simplicity in installation, commissioning and maintenance.

The FST020 transmitter delivers standard parameter measurements i.e. volume flow, flow speed or sound velocity by analog outputs and Modbus communication.

Process values

- Volume flow
- Flow velocity
- Sound velocity
- Totalizer 1

Benefits

Flow calculation and measurement

- Dedicated volume flow calculation with DSP technology
- 100 Hz update rate for all primary process values
- Maximum data age from sensor to output is 20 ms
- Independent low flow cut-off settings for volume flow and velocity
- Zero-point adjustment on command from discrete input or host system

Operation and display

- User-configurable operation display
  - Fully graphical display 240 x 160 pixel display with up to 6 programmable views
  - Self-explaining alarm handling/log in clear text
  - Help text for all parameters appears automatically in the configuration menu
- SensorFlash technology stores production specific system documentation and provides removable memory of all flowmeter setups and functions
  - Calibration certificates (with ordered calibration)
  - Non-volatile memory backup of operational data
  - Transfer of user configuration to other flowmeters
  - 4 GB SD card for storage and data logging
  - Audit trail of all parameter changes
  - Alarm logging

Alarms and safety

- Advanced diagnosis and service menu enhances troubleshooting and meter validation
- Configurable upper and lower alarm and warning limits for all process values

Outputs and control

- Monitoring comprised of 1 individually configurable totalizer
- Single parameter outputs that can be assigned individually to any of the following parameters:
  - Volume flow
  - Flow velocity
  - Sound velocity
  - Flow direction

Channel 1 is 4 to 20 mA analog output. The current signal can be configured for passive volume flow.

Relay output(s) can be user configured to Alarm status or warning.

Modbus RTU RS 485 comes as standard.

Signal input

The signal input can be user-configured for:

- Totalizer reset functions
- Forcing outputs or freezing process values
- Initiating automatic zero point adjustment

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Benefits (continued)

Approvals and certificates
The SITRANS FST020 transmitter was designed to comply with or exceed the requirements of international standards and regulations.

Design

- Field clamp-on (non-intrusive)
- Single path, for only one pair of sensors on one pipe
- IP65 (NEMA 4X) wall mount housing, constructed of polycarbonate
- Available AC or DC power, 100 to 240 V AC, 11.5 to 28.5 V DC

Function

- 240 x 160 pixel graphical display with 4 key navigation and backlight
- 6 user programmable views for individual process and diagnostic information
- Modbus RTU communication
- 100 Hz update rate for all primary process value
- Independent low flow cut-off settings for volume and flow velocity
- Fully compatible with Siemens PDM version 8.2 service pack 1 or higher
- Bidirectional flow operation
- Menus available in English and German

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Selection and ordering data

Transmitter SITRANS FST020 (Basic), IP65 (NEMA 4X)				Article No. 7ME3570-			4	0	-	0				Order code			
				●	●	●					●	●	●		●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.																	
Number of ultrasonic paths																	
Single path				1													
Flowmeter functions and I/O configurations																	
With display, keypad, 1× 4 ... 20 mA, 1× relay, 1× pulse/frequency, 2× digital input, Modbus RTU					J												
Meter power options																	
100 ... 240 V AC						A											
11.5 ... 28.5 V DC						B											
Sensor FSS200[1] When ordering a flow system, sensors always come automatically with suitable mounting equipment. Smaller sensor sizes A & B come with mounting tracks, while sensor sizes C, D & E are supplied with frames and spacer bars. Straps provided are for the indicated maximum OD listed below.Strap kits are available to accommodate larger pipes (refer to "Sensor Selection Charts" to find the most suitable sensors for specific pipe sizes and wall thicknesses.																	
No sensor											A						
For the following Universal sensors, temperature range is -40 ... +121 °C (-40 ... +250 °F), FSS200 Universal: select according to outer pipe diameter																	
FSS200 Universal	A2	12.7 ... 50 mm (0.5 ... 2")	Track mount and straps provided up to 75 mm (3")								B						
FSS200 Universal	B3	19 ... 127 mm (0.75 ... 5")	Track mount and straps provided up to 125 mm (5")								C						
FSS200 Universal	C3	51 ... 305 mm (2 ... 12")	Mounting frame, straps and spacer bar provided up to 330 mm (13")								D						
FSS200 Universal	D3	203 ... 610 mm (8 ... 24")	Mounting frame and straps and spacer bar provided up to 600 mm (24")								E						
FSS200 Universal	E2	304 ... 9144 mm (12 ... 360")	Mounting frame and straps and spacer bar provided up to 1200 mm (47")								F						
For the following High Precision sensors T1, temperature range is -40 ... +120 °C (-40 ... +248 °F), FSS200 High Precision: select according to pipe wall thickness																	
FSS200 HP	A1H	0.6 ... 1.0 mm (0.025 ... 0.4")	Track mount and straps provided up to 75 mm (3")								G						
FSS200 HP	A2H	1.0 ... 1.5 mm (0.04 ... 0.06")	Track mount and straps provided up to 75 mm (3")								H						
FSS200 HP	A3H	1.5 ... 2.0 mm (0.06 ... 0.08")	Track mount and straps provided up to 75 mm (3")								J						
FSS200 HP	B1H	2.0 ... 3.0 mm (0.08 ... 0.12")	Track mount and straps provided up to 125 mm (5")								K						
FSS200 HP	B2H	3.0 ... 4.1 mm (0.12 ... 0.16")	Track mount and straps provided up to 125 mm (5")								L						
FSS200 HP	C1H	4.1 ... 5.8 mm (0.16 ... 0.23")	Mounting frame, straps and spacer bar up to 600 mm (24")								M						
FSS200 HP	C2H	5.8 ... 8.1 mm (0.23 ... 0.32")	Mounting frame, straps and spacer bar up to 600 mm (24")								N						
FSS200 HP	D1H	8.1 ... 11.2 mm (0.32 ... 0.44")	Mounting frame and straps provided up to 1200 mm (47")[1]								P						
FSS200 HP	D2H	11.2 ... 15.7 mm (0.44 ... 0.62")	Mounting frame and straps provided up to 1200 mm (47")[1]								Q						
FSS200 HP	D4H	15.7 ... 31.8 mm (0.62 ... 1.25")	Mounting frame and straps provided up to 1200 mm (47")[1]								R						
For the following High Temperature sensors, temperature range is -40 ... +230 °C (-40 ... +446 °F), FSS200 High Temperature: select according go outer diameter																	
FSS200 HT	Size 2	30 ... 200 mm (1 ... 8")	Mounting track and straps provided up to 250 mm (10")								Z				P	1	A

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Selection and ordering data (continued)

Transmitter SITRANS FST020 (Basic), IP65 (NEMA 4X)				Article No. 7ME3570-											Order code		
				●	●	●	4	0	-	0	●	●	●		●	●	●
FSS200 HT	Size 3	150 ... 610 mm (6 ... 24")	Mounting track and straps provided up to 650 mm (26")								Z				P	2	A
FSS200 HT	Size 4	400 ... 1200 mm (16 ... 47")	Mounting track and straps provided bar provided up to 1250 mm (49")								Z				P	3	A
Sensor cable (pair - terminated)																	
No sensor cable												A					
Sensor cable, HDPE jacket, submersible, length																	
• 5 m (16.4 ft)												P					
• 10 m (32.8 ft)												Q					
• 20 m (65.6 ft)												R					
• 30 m (98.4 ft)												S					
• 60 m (196.8 ft)												T					
• 100 m (328 ft)												U					
Approvals																	
UL, ULc, CE														1			

1) Supplied spacer bar supports pipes up to 1050 mm (42"). For pipes larger than 1050 mm (42") purchase also, spare part 7ME3960-0MS40 (1012BN-4).
2) Made of stainless steel construction.

Further designs	Order code
Please add "-**Z**" to Article No. and specify Order code(s).	
Cable termination kit for customer supplied sensor cable pair	
Sensor cable termination for standard and plenum cable	**T01**
Mass storage	
Enable mass storage function or SD-card (not available for USA)	**S30**
Tag and name plates	
Tag plate for transmitter	**Y15**
Tag plate for sensor	**Y18**

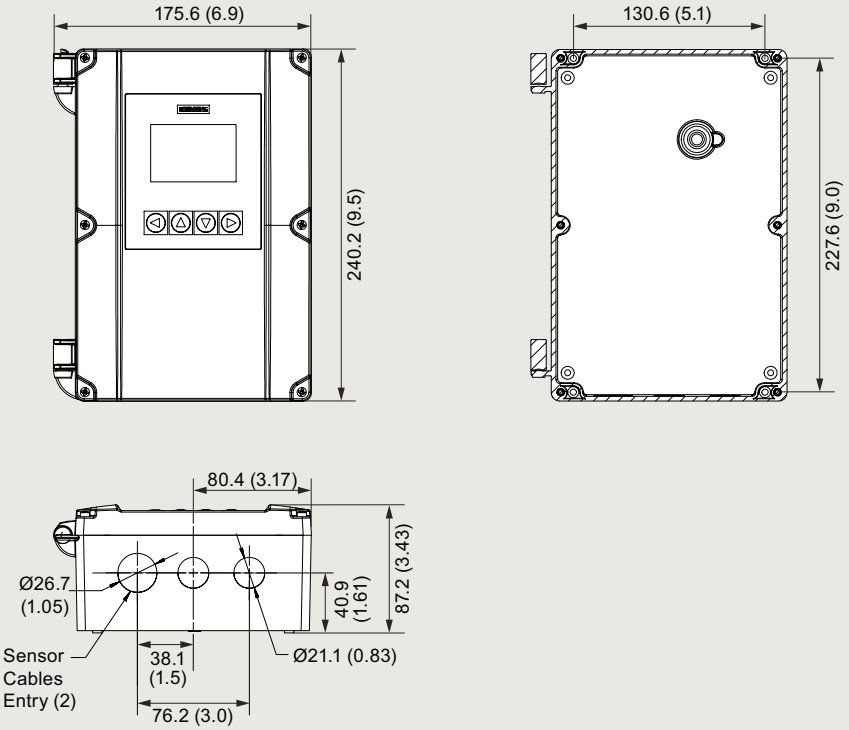
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Technical specifications

SITRANS FST020	
Input	
Flow range	± 12 m/s (± 40 ft/s), depending on pipe size higher or lower
Flow direction	bi-directional
Flow sensitivity	0.0003 m/s (0.001 ft/s) flow rate independent
Digital inputs	
Totalizer Hold	Optically isolated diode Activated ON: Input voltage: 2 ... 10 V DC
Totalizer Reset	Opticall isolated diode Activated ON: Input voltage: 2 ... 10 V DC
Output	
Current	4 ... 20 mA (isolated) Externally powered 10 ... 30 V DC
Passive	30 V DC, 3 VA AC max.
Pulse	Optically isolated transistor 10 mA, 30 V DC max Relay: 41.6 ms ... 5 s pulse duration Frequency: 0 ... 12.5 kHz (50 % duty cylce)
Accuracy	
Accuracy	For velocities above 0.3 m/s (1 ft/s), ±1.0 % of flow
Repeatability	± 0.25 % (according to ISO 11631)
Zero Drift	0.1 % of rate; < ±0.001 m/s (±0.003 ft/s)
Data refresh rate	100 Hz
Rated operation conditions	
Operating temperature	-10 ... +50 °C (14 ... +122 °F)
Storage temperature	-20 ... +60 °C (-4 ... +140 °F)
Degree of protection	IP65/NEMA 4X
Design	
Weight	1.4 kg (3.0 lbs)
Dimensions (W x H x D)	176 x 240 x 87 mm (6.9 x 9.5 x 3.4 inch)
Enclosure material	Polycarbonate
Power supply	100 ... 240 V AC @ 20 VA or 11.5 ... 28.5 V DC @ 10 W
Certificates and approvals	
Unclassified locations	
• General safety	UL, cUL, CE

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Dimensional drawings



SITRANS FST020 IP65 (NEMA 4X), wall mount enclosure, dimensions in mm (inch)

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Overview



SITRANS FST090 clamp-on ultrasonic flowmeter

The portable clamp-on ultrasonic flow measurement system SITRANS FS290 is formed by the SITRANS FST090 portable clamp-on flowmeter with FSS200 sensors.

This system represents the next generation of digital flow measurement which allows you to easily measure or check flows in pipes.

Benefits

The SITRANS FST090 transmitter is based on the innovative technology of the FST020 and FST030 and is therefore identical in use and operation. The FST090 transmitter is flexible, versatile, practical: in conjunction with the SITRANS FSS200 clamp-on sensors, it is up to practically any challenge.

The main benefits at a glance:

- Easy installation: just clamp it on, with no need to cut pipe or stop flow
- Minimal maintenance: sensors do not require upkeep or cleaning
- No moving parts to foul or wear
- No pressure drop or energy loss
- Wide turn-down ratio
- Precise single path measuring

Application



The SITRANS FS290 is often used for temporary checks in water supply and disposal. Cooling or hot water, reference quantities or leaks can be checked quickly in this way. A typical example is the monitoring and testing of fire protection systems or other emergency applications where there is flow.

The portable device is also versatile in the temporary use of measured values for stationary when measuring devices that have been removed for repair or calibration. In fact, the FS290 can be used almost anywhere liquid ultrasonic flow measurement is needed: such as check metering, i.e. the periodic checking of built-in clamp on sensors.

The SITRANS FS290 can be used to measure flow in many different material pipes. However, cement pipes and special plastic composite pipes cannot be used though due to their physical properties.

Inner coatings or liners are stored in the device and are taken into account when entering.

The SITRANS FS290 is suitable for pipes up to 5000 mm (200 inches) and for pipe wall thicknesses up to 50 mm (2.0 inches).

The recommended medium temperature range is from -40 °C to +121 °C. (-40 °F to 250 °F). For higher temperatures Siemens offers high temperature sensors up to maximum 230 °C (446 °F).

The transmitter comes supplied with a liquid table with all common material data for easy media selection. Relevant data can be easily and quickly adopted.

The SITRANS FS290 is not suitable for gases, steam and inhomogeneous liquids.

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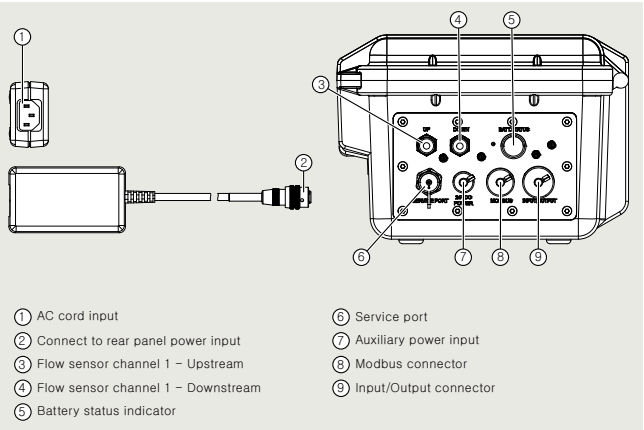
Design



The precision electronics of the SITRANS FST090 portable ultrasonic transmitter are housed in a robust weather proof case. The case protects the electronics under harshest of field conditions. The process and control connections are accessed on the top of the device, with industrial connectors, that can be quickly and securely employed. The system can be powered with an swappable rechargeable battery, providing power for 24 hours or more as well as via mains power with the system's Vac power adapter, for a more permeant installation.

The transmitter reads the measured process values from the transducers and calculates derived values, that are converted into flow values that are then displayed. The FST090 provides Modbus communications, as well as a 4-20 mA output, a single relay and two digital inputs for totalizer start/stop and reset. Additionally there is also a pulse/frequency output an USB service port, and a local multi functional display. The system provides easy to use totalizers, access control, diagnostics, and menu driven system configuration.

Connecting plate



SITRANS FST090, AC power and connections

Easy sensor installation

Mounting rails are ideal for small sensors of sizes A and B. For the larger sensors C, D and E, mounting frames with spacers are suitable. Both rails and frames can be easily attached to the pipe using tension chains without tools. The correct sensor distance is made using calculated index points. The sensors are then clamped exactly there. The distance ruler supplied as standard helps with alignment and specifies the index distance. There is no need to measure the sensor distance on the pipe for the best possible

Design (continued)

current signal, the sensors are always on optimally aligned for every possible condition.

Magnetic frames can be used universally for all sensor sizes C, D and E. Industrial magnets ensure a strong hold on steel pipes. They can also be used on plastic pipes, with the use of tightening straps that are required for this application. A spacer bar ensures easy sensor positioning.

Mode of operation

The SITRANS FST090 calculates the optimal sensor distance based on the calculation of pipe material, size and wall thickness, taking into account the liquid to be measured. The distance is given as an LTN value and as an index value to a reference point. The LTN value allows the distance between the sensors to be checked precisely.

Each measuring path is formed by two coordinated sensors that transmit ultrasonic signals back and forth through the pipe. Using the time difference between the two signals, the transmitter calculates the resulting measurement.

The transmitter performs analog signal processing for the sensor pair and digitalizes the generated measurements for display. The data measured is periodically recorded on the inserted SD storage card. Data output can be user-defined or take place via either analog signal or Modbus RTU.

Users can install clamp-on sensors on the pipe during ongoing operation, which means the pipe is not cut open and the flow does not need to be stopped.

High-tech reduces transmitter errors below 0.15%

The SITRANS FST090 is based on the technology of the industry leading transmitter SITRANS FST030. The analog data acquisition is digitized immediately, thus enabling signal processing in real time. The electronics of the SITRANS FST090 have been developed in so that the transmitter error is less than 0.15% under ideal measuring conditions. For normal use under good conditions, a measurement inaccuracy of 1% or less is realistic.

Measurement errors in ultrasonic flow measurements are often caused by anomalies in the inlet area. Insufficient distance to a 90° or room bend (3D double bend) causes flow profile disturbances that a clamp-on measuring device cannot easily compensate for. In portable applications, the built in patented anomaly tool helps to improve measurement accuracy under these challenging conditions.

Long battery life, easy battery change

An improved energy manager allows battery operation for at least twenty four hours at full load.

A battery change during operation is possible without any problems. As an ideal supplement to existing stationary measurements, the SITRANS FST090 can also be programmed with Siemens Process Device Manager (PDM) software via the USB interface and then integrated into control systems.

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Mode of operation (continued)



SITRANS FST090 transmitter with battery

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Selection and ordering data

SITRANS FS290 clamp-on flowmeter	7ME374 ● - ● ● ● ● ● - ● ● ● ●
Click on the Article No. for the online -configuration in the PIA Life Cycle Portal	
Transmitter model	
Transmitter FST090 portable clamp-on	**5**
FSS200 sensor pair clamp-on for portable use, incl. suitable pipe mounting material	
No sensors	**0 A**
Universal: for all pipe materials; temperature -40 ... +120 °C (-40 ... +250 °F)	
FSS200 universal size A2, for pipes 12.7 ... 50 mm (0.5 ... 2") supplied with portable mounting tracks for pipes up to 130 mm (5")	**0 B**
FSS200 universal size B3, for pipes 19 ... 127 mm (0.75 ... 5") supplied with portable mounting tracks for pipes up to 130 mm (5")	**0 C**
FSS200 universal size C3, for pipes 51 ... 305 mm (2 ... 12") supplied with portable frame set for pipes up to 330 mm (13")	**0 D**
FSS200 universal size D3, for pipes 203 ... 610 mm (8 ... 24") supplied with portable frame set for pipes up to 330 mm (13")	**0 E**
FSS200 universal size E2, for pipes 304 ... 6000 mm (12 ... 240") supplied with portable frame set for pipes up to 600 mm (24")	**0 F**
High Precision: ideal for steel pipes; temperature -40 ... +121 °C (-40 ... +250 °F)	
FSS200 high precision size A1H, for steel pipes with wall thickness 0.6 ... 1 mm (0.03 ... 0.4") supplied with portable mounting tracks for pipes up to 130 mm (5")	**0 G**
FSS200 high precision size A2H, for steel pipes with wall thickness 1 ... 1.5 mm (0.04 ... 0.6") supplied with portable mounting tracks for pipes up to 130 mm (5")	**0 H**
FSS200 high precision size A3H, for steel pipes with wall thickness 1.5 ... 2 mm (0.06 ... 0.8") supplied with portable mounting tracks for pipes up to 130 mm (5")	**0 J**
FSS200 high precision size B1H, for steel pipes with wall thickness 2 ... 3 mm (0.08 ... 0.12") supplied with portable mounting tracks for pipes up to 130 mm (5")	**0 K**
FSS200 high precision size B2H, for steel pipes with wall thickness 3 ... 4.1 mm (0.12 ... 0.16") supplied with portable mounting tracks for pipes up to 130 mm (5")	**0 L**
FSS200 high precision size C1H, for steel pipes with wall thickness 4.1 ... 5.8 mm (0.16 ... 0.23") supplied with portable frame sets for pipes up to 610 mm (24")	**0 M**
FSS200 high precision size C2H, for steel pipes with wall thickness 5.8 ... 8.1 mm (0.23 ... 0.32") supplied with portable frame sets for pipes up to 610 mm (24")	**0 N**
FSS200 high precision size D1H, for steel pipes with wall thickness 8.1 ... 11.2 mm (0.32 ... 0.44") supplied with portable frame sets for pipes up to 1200 mm (48")	**0 P**
FSS200 high precision size D2H, for steel pipes with wall thickness 11.2 ... 15.7 mm (0.44 ... 0.62") supplied with portable frame sets for pipes up to 1200 mm (48")	**0 Q**
FSS200 high precision size D4H, for steel pipes with wall thickness 15.7 ... 31.8 mm (0.62 ... 1.25") supplied with portable frame sets for pipes up to 1200 mm (48")	**0 R**
Universal high temperature (HT): for all pipe materials; -40 ... +230 °C (-40 ... +446 °F)	
FSS200 Universal HT size 1, for pipes 10 ... 100 mm (0.47 ... 3.95") supplied with mounting tracks for pipes up to 150 mm (6")	**1 A**
FSS200 Universal HT size 2, for pipes 30 ... 200 mm (1.5 ... 8") -supplied with mounting tracks for pipes up to 250 mm (10")	**1 B**
FSS200 Universal HT size 3, for pipes 150 ... 610 mm (6 ... 25") -supplied with mounting tracks for pipes up to 650 mm (26")	**1 C**
FSS200 Universal HT size 4, for pipes 400 ... 1200 mm (16 ... 48") supplied with mounting tracks for pipes up to 1200 mm (48")	**1 D**
Sensor bundle ... check meter kit with magnet frames, straps and spacer bar	
Standard Performance, for any pipe material:	
• Small pipe check meter kit – Standard Performance, for diameters 12 ... 400 mm (0.5 ... 16"). Includes universal sensors B3, C3, D3, with tracks, magnet frames, straps, and spacer bar	**2 K**
• Complete pipe check meter kit – Standard Performance, for diameters 8 ... 6100 mm (0.38 ... 240"). Includes universal sensors A2, B3, C3, D3, E2 with tracks, magnet frames, straps, and spacer bar	**2 L**
High performance, for steel or plastic pipes, suitable for in-situ verification of flow instruments and flow surveys on critical applications in all industries:	
• Medium pipe check meter kit – High Performance, for steel or plastic pipe material with wall thickness 4.1 mm ... 11.2 mm (0.160 ... 0.440") and any homogeneous liquid. Includes high precision sensors sizes C1H, C2H, D1H	**2 M**
• Extended pipe check meter kit – High Performance, for steel or plastic pipe material with wall thickness 4.1 ... 15.7 mm (0.16 ... 620"). Includes high precision sensors C1H, C2H, D1H, D2H	**2 N**
• Complete pipe range check meter kit – High Performance, for steel or plastic pipe material with wall thickness 3 ... 15.7 mm (0.12 ... 620"). Includes high precision sensors B2H, C1H, C2H, D1H, D2H, with mounting tracks, magnet frames, straps, and spacer bar	**2 P**
Fast charger for rechargeable battery pack	
No charger	**A**
Charger type A for Europe (CEE7/7)	**B**
Charger type C for Australia (AS3112)	**C**
Charger type D for U.K. (BS1363)	**D**
Charger type J for Japan (JIS8303)	**E**
Charger type K for U.S. (NEMA 5-15P)	**F**
Charger type L for Switzerland (SEV1011)	**G**

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Selection and ordering data (continued)

SITRANS FS290 clamp-on flowmeter	7ME374 ● - ● ● ● ● ● - ● ● ● ●
Akku-Pack Lithium-Ion for battery use	
No battery	0
One battery pack rechargeable	1
Two battery pack rechargeable	2
Three battery pack rechargeable	3
Output signals and Modbus usage	
Without connection terminal box	0
Connection terminal box, with connection terminals for quick connection to the FST090 multi-connector, for Modbus (8) and the inputs and outputs (9)	1
Number of ultrasonic paths	
One path (default value 1)	1
Default Value B	
Polycarbonate portable enclosure (default value B)	B
Digital sensor link	
Sensor link integrated in transmitter (default value B)	B
External power supply unit	
Without power supply unit	0
Power adaptor type A plug for Europe (CEE7/7)	1
Power adaptor type C plug for Australia (AS3112)	2
Power adaptor type D plug for U.K. (BS1363)	3
Power adaptor type J plug for Japan (JIS8303)	4
Power adaptor type K plug for U.S. (NEMA 5-15P)	5
Power adaptor type L plug for Switzerland (SEV1011)	6

Portable clamp-on sensors	Artikel-Nr.
The portable sensors for the SITRANS FST090 have an BNC connector, or it is a standard sensor with an adapter from the F connection to BNC.	
High Temperature sensors	
FSS200, Uni, Port, Hi-Temp, Size 2, Liquid Ultrasonic transit time sensor clamp-on, Universal Very-Hi-Temp, portable Size 2, paired, any pipe materials, Liquid, Pipe Diameter range 30 ... 200 mm (1 ... 8 in), Temperature -40 ... +230 °C (-40 ... +446 °F) Housing Stainless Steel corrosion resistant, incl. Couplant 7ME39600UC32 and sanding block for FST090	**7ME3951-0LA23**
FSS200, Uni, Port, Hi-Temp, Size 2A, Liquid Ultrasonic transit time sensor clamp-on, Universal Very-Hi-Temp, portable Size 2A, paired, any pipe materials, Liquid, Pipe Diameter range 30 ... 200 mm (1 ... 8 in), Temperature -40 ... +230 °C (-40 ... +446 °F) Housing Stainless Steel corrosion resistant, incl. Couplant 7ME39600UC32 and sanding block for FST090	**7ME3951-0LA33**
FSS200, Uni, Port, Hi-Temp, Size 3, Liquid Ultrasonic transit time sensor clamp-on, Universal Very-Hi-Temp, portable Size 3, paired, any pipe materials, Liquid, Pipe Diameter range 150 ... 610 mm (6 ... 24 in), Temperature -40 ... +230 °C (-40 ... +446 °F) Housing Stainless Steel corrosion resistant, incl.Couplant 7ME39600UC32 and sanding block for FST090	**7ME3951-0LA43**
FSS200, Uni, Port, Hi-Temp, Size 3A, Liquid Ultrasonic transit time sensor clamp-on, Universal Very-Hi-Temp, portable Size 3A, paired, any pipe materials, Liquid, Pipe Diameter range 150 ... 610 mm (6 ... 24 in), Temperature -40 ... +230 °C (-40 ... +446 °F) Housing Stainless Steel corrosion resistant, incl. Couplant 7ME39600UC32 and sanding block for FST090	**7ME3951-0LA63**
FSS200, Uni, Port, Hi-Temp, Size 4, Liquid Ultrasonic transit time sensor clamp-on, Universal Very-Hi-Temp, portable Size 4, paired, any pipe materials, Liquid, Pipe Diameter range 400 ... 1200 mm (16 ... 47 in), Temperature -40 ... +230 °C (-40 ... +446 °F) Housing Stainless Steel corrosion resistant, incl. Couplant 7ME39600UC32 and sanding block for FST090	**7ME3951-0LA73**

Portable clamp-on sensors	Artikel-Nr.
FSS200, Uni, Port, Hi-Temp, Size 4A, Liquid Ultrasonic transit time sensor clamp-on, Universal Very-Hi-Temp, portable Size 4A, paired, any pipe materials, Liquid, Pipe Diameter range 400 ... 1200 mm (16 ... 47 in), Temperature -40 ... +230 °C (-40 ... +446 °F) Housing Stainless Steel corrosion resistant, incl. Couplant 7ME39600UC32 and sanding block for FST090	**7ME3951-0LA83**
Universal sensors	
FSS200, Uni, Port, Size A2, Liquid Ultrasonic transit time sensor clamp-on, Universal Size A2, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 12.7 ... 50 mm (0.5 ... 2 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LB00**
FSS200, Uni, Port, Size A1, Liquid Ultrasonic transit time sensor clamp-on, Universal Size A1, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 5,8 ... 50 mm (0.23 ... 2 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LB10**
FSS200, Uni, Port, Size B3, Liquid Ultrasonic transit time sensor clamp-on, Universal Size B3, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 19 ... 127 mm (0.75 ... 5 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LC00**
FSS200, Uni, Port, Size B1, Liquid Ultrasonic transit time sensor clamp-on, Universal Size B1, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 12,7 ... 76 mm (0.5 ... 3 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LC10**
FSS200, Uni, Port, Size B2, Liquid Ultrasonic transit time sensor clamp-on, Universal Size B2 paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 12.7 ... 50 mm (0.5 ... 2 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LC20**

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Selection and ordering data (continued)

Portable clamp-on sensors	Artikel-Nr.
FSS200, Uni, Port, Size C3, Liquid Ultrasonic transit time sensor clamp-on, Universal Size C3, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 51 ... 305 mm (2 ... 12 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LD00**
FSS200, Uni, Port, Size C1, Liquid Ultrasonic transit time sensor clamp-on, Universal Size C1, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 51 ... 254 mm (2 ... 10 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LD10**
FSS200, Uni, Port, Size C2, Liquid Ultrasonic transit time sensor clamp-on, Universal Size C2, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 51 ... 254 mm (2 ... 10 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LD20**
FSS200, Uni, Port, Size D3, Liquid Ultrasonic transit time sensor clamp-on, Universal Size D3, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 203 ... 610 mm (8 ... 24 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LE00**
FSS200, Uni, Port, Size D1, Liquid Ultrasonic transit time sensor clamp-on, Universal Size D1, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 102 ... 508 mm (4 ... 20 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LE10**
FSS200, Uni, Port, Size D2, Liquid Ultrasonic transit time sensor clamp-on, Universal Size D2, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 152 ... 610 mm (6 ... 24 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LE20**
FSS200, Uni, Port, Size E2, Liquid Ultrasonic transit time sensor clamp-on, Universal Size E2, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 304 ... 9144 mm (12 ... 360 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LF00**
FSS200, Uni, Port, Size E1, Liquid Ultrasonic transit time sensor clamp-on, Universal Size E1, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 254 ... 3048 mm (10 ... 120 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LF10**
FSS200, Uni, Port, Size E3, Liquid Ultrasonic transit time sensor clamp-on, Universal Size E3, paired, Portabel-BNC any pipe materials, Liquid, Pipe Diameter range 254 ... 6096 mm (10 ... 240 in), Temperature -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/StSt corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LF20**
High Precision Sensors	
FSS200, HP, Port, Size A1H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size A1H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 0,6 ... 1,0 mm (0.025 ... 0.04 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LG00**
FSS200, HP, Port, Size A2H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size A2H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 1 ... 1,5 mm (0.04 ... 0.06 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LH00**
FSS200, HP, Port, Size A3H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size A3H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 1,5 ... 2 mm (0.06 ... 0.08 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LJ00**

Portable clamp-on sensors	Artikel-Nr.
FSS200, HP, Port, Size B1H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size B1H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 2,0 ... 3,0 mm (0.08 ... 0.12 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu noncorrosion, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LK00**
FSS200, HP, Port, Size B2H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size B2H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 3,0 ... 4,1 mm (0.12 ... 0.16 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu noncorrosion, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LL00**
FSS200, HP, Port, Size C1H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size C1H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 4,1 ... 5,8 mm (0.16 ... 0.23 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu noncorrosion, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LM00**
FSS200, HP, Port, Size C2H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size C2H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 5,8 ... 8,1 mm (0.23 ... 0.32 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu noncorrosion, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LN00**
FSS200, HP, Port, D1H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size D1H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 8,1 ... 11,2 mm (0.32 ... 0.44 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LP00**
FSS200, HP, Port, Size D2H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size D2H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 11,2 ... 15,7 mm (0.44 ... 0.62 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LQ00**
FSS200, HP, Port, Size D4H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size D4H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 15,7 ... 31,8 mm (0.62 ... 1.25 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LR00**
FSS200, HP, Port, Size B3H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size B3H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 2,7 ... 3,3 mm (0.106 ... 0.128 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LT00**
FSS200, HP, Port, Size D3H, Liquid Ultrasonic transit time sensor clamp-on, High Precision, Size D3H, paired, Portable with BNC adapter for steel pipe, Liquid, Pipe wall thickness from 7,4 ... 9,0 mm (0.293 ... 0.354 in), Temperature max. -40 ... +121 °C (-40 ... +250 °F) Housing Polyetherimide/Alu corrosion resistant, incl. Couplant 7ME39600UC20 and sanding block for FST090	**7ME3951-0LU00**

	Order code
Options Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Sensor cable set pair, complete	
2 × 6 m (20 ft) PVC coaxial cable FST090 to the sensor with BNC connection	**K21**
2 × 15 m (50 ft) PVC coaxial cable FST090 to the sensor with BNC connection	**K22**
Mass storage	
Mass storage device function (outside USA mandatory)	**S30**

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Selection and ordering data (continued)

	Artikel-Nr.
Accessories	
Sensor cable set pair, complete	
Sensor cable 6 m (20 ft) for FST090	**A5E51114688**
Sensor cable 15 m (50 ft) for FST090	**A5E51114689**
External power supply unit	
Power adaptor type A plug for Europe (CEE7/7)	**7ME39403PR00**
Power adaptor type C plug for Australia (AS3112)	**7ME39403PS00**
Power adaptor type D plug for U.K. (BS1363)	**7ME39403PT00**
Power adaptor type J plug for Japan (JIS8303)	**7ME39403PQ00**
Power adaptor type K plug for U.S. (NEMA 5-15P)	**7ME39403PU00**
Power adaptor type L plug for Switzerland (SEV1011)	**7ME39403PV00**
Akku-Pack Lithium-Ion for battery use	
Replacement battery	**A5E50949498**
Fast charger for rechargeable battery pack	
Charger type A for Europe (CEE7/7)	**7ME39404PR00**

	Artikel-Nr.
Charger type C for Australia (AS3112)	**7ME39404PS00**
Charger type D for U.K. (BS1363)	**7ME39404PT00**
Charger type J for Japan (JIS8303)	**7ME39404PQ00**
Charger type K for U.S. (NEMA 5-15P)	**7ME39404PU00**
Charger type L for Switzerland (SEV1011)	**7ME39404PV00**
Junction box	
Junction box with terminal connection for fast connection to the SITRANS FS290, inclusive mounted I/O and Modbus cable for direct connection	**A5E42404770**
Cable	
I/O cable with plug for the FST090 (connector 9)	**A5E51100281**
Cable for Modbus with plug for the FST090 (connector 8)	**A5E51100285**
Connector adapter F/BNC	
"F" connector to BNC adapter (order 2 pcs per transducer set)	**CQO:1012NFPA**

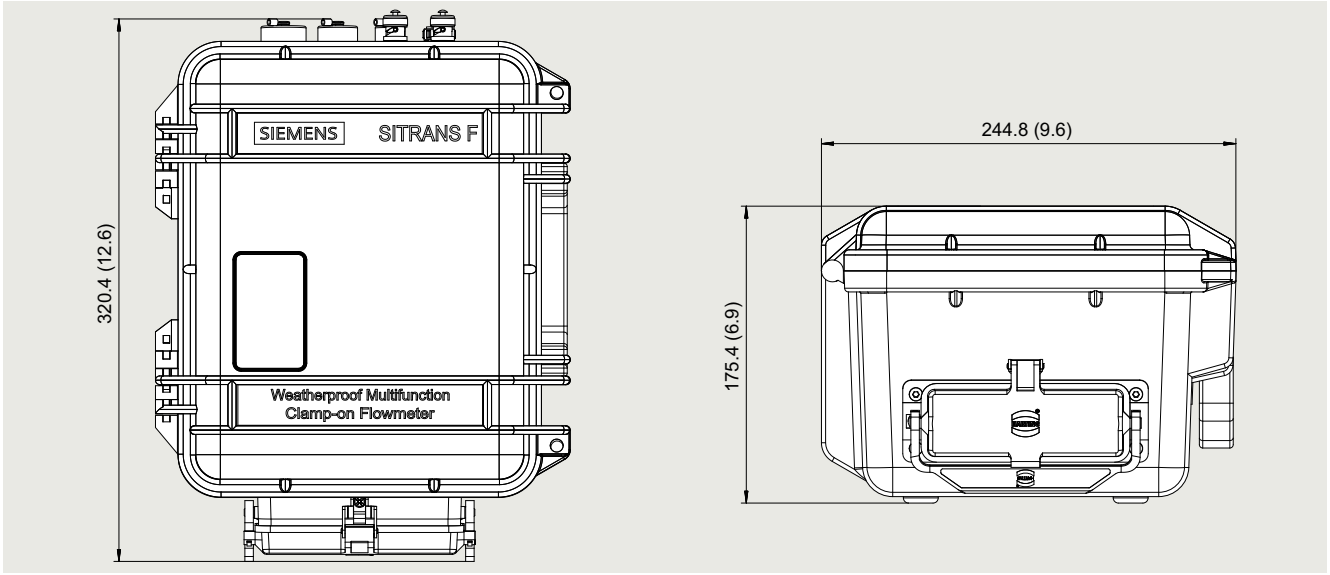
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Technical specifications

SITRANS FST090	
Design	
Dimension (L × B × H)	320.4 × 244.8 × 175.4 mm (12.6 × 9.6 × 6.9 inch)
Weight	2.8 kg (6.0 lb)
Housing material	Polypropylene (weatherproof)
Architecture	
Input / display	4 pushbuttons, illuminated graphic display, 240 × 160 pixels
Programming	Menu assistant, free input, 50 measuring locations can be saved
Language selection	Switchable, with 14 languages available (English, German, Italian, French, Spanish, Portuguese, Danish, Swedish, Finnish, Dutch, Chinese, Japanese, Russian, Polish)
Sensors	FSS200 clamp-on sensors portable, compatible with older FUP1010 sensors
Sensor cable	PVC length 6 m (19.6 ft)/ 15 m (49 ft) with connector
Power	Transmitter power: DC 11.5 ... 28.5 V at 10 W
External power supply	External power supply 100 ... 240 V AC / 24 V DC, 10 W
Battery pack	Lithium-ion battery (99 Wh), 24 V DC with operation of up to 24 hours per battery charge. Swapping between battery and power pack possible without interrupting the flow measurement
Charger for battery pack	Battery carger with quick charge function: 19 ... 26 V DC -2.8 A max. External battery charger AC-Adapter: 100 ... 240 V AC 50-60 Hz, 1.7 A
Adjustable measuring range	
Flow rate range	± 12 m/s (± 40 ft/s), depending on the pipe width larger or smaller
Flow direction	Bidirectional
Flow sensitivity	0.001 m/s (0.003 ft/s), independent from the flow rate
Input/output connector	
Digital inputs	
• Stop counter	Optocoupler Enabled ON: Input voltage: DC 2 ... 10 V
• Reset counter	Optocoupler Activated ON: Input voltage: DC 2 ... 10 V
Output option	
• Current	4 ... 20 mA (isolated) External current 10 ... 30 V DC
• Relay	DC 30 V, AC 3 V max. pulse: 41.6 ms ... 5 s Pulse duration Frequency: 0 ... 12.5 kHz (50% load cycle)
• Pulse rate	Optical transistor 10 mA, DC 30 V max.
Communication	Modbus RTU RS 485
Diagnostic option	Logger, alarms and events, separated in table shape
USB service connection	USB - SIMATIC PDM / internal memory External memory 4 GB (possible up to 32 GB) for years of recording
Accuracy	At speeds above 0.3 m/s (1 ft/s), ±1.0% of flow rate
Repeatability	±0.25% (according to ISO 11631)
Zero drift	0.1% of the flow; < ±0.001 m/s (±0.003 ft/s)
Data repetition rate	100 Hz
Environmental conditions	
Operating temperature	-10 ... +50 °C (14 ... 122 °F)
Storage temperature	-20 ... +60 °C (-4 ... +140 °F)
Protection class	• IP65 with lid closed • IP67 with lid open
Certificates and approvals	
General safety	UL, ULc, CE
Corea	KC

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Dimensional drawings

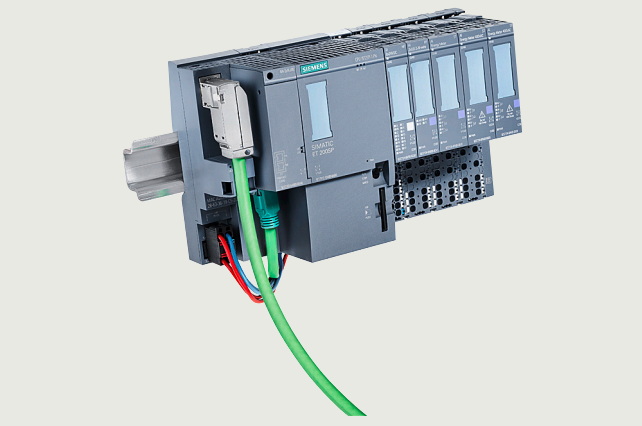


SITRANS FST090, net weight 4.1 Kg (9.038 lb), dimensions in mm (inch)

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Overview





The technology module SITRANS FST070 is an ultrasonic clamp-on flowmeter transmitter for the SIMATIC ET200SP.

The TM SITRANS FST070 flow transmitter can be operated directly in the SIMATIC PCS 7 or in TIA Portal with the FST070 faceplates. SITRANS FST070 offers real-time data processing and the display of all measuring and status data of the Ultrasonic flowmeter.

The TM FST070 can work with all Siemens ultrasonic clamp-on flowmeters. It can be connected to the FS DSL with FSS200 clamp-on sensors.



SITRANS FS DSL with FSS200 clamp-on sensors

Benefits

- Easy integration into automation process control as TIA portal and PCS7 (SIMATIC)
- Easy selection and integration of flowmeters via TIA selector
- Precast face plates for TIA portal and PCS7
- No additional transmitter between automation and clamp-on sensors required
- Cost effective integration of clamp-on flowmeters for water treatments, control rooms with PCS7
- SITRANS FST070 ET 200SP technology module can combined with all other SIMATIC ET200 modules
- Fast and trouble-free communication between the flowmeter and the PLC through digital data communication with up to 10 ms update rate
- SITRANS FST070 and ET 200SP have the ATEX Zone 2 Class 1 Div 2 approvals. With the barrier SITRANS I300 the flowmeters sensor can be used in Ex Zone 1/0 Class 1 Div 1 approval

Application

SITRANS FST070 can be used for machine builders, in the chemical industry or water treatments. The meters are suitable for measuring on liquid, hydrocarbon and gas. With ET 200SP the SITRANS FST070 can be installed decentralized in small stations, with fast communication to the control room. The faceplates for TIA portal and PCS 7 offer the direct full remote access to the flowmeter. The main industries for the SITRANS FST070 transmitter:

- Chemical
- Pharmaceutical
- District Energy
- Water and waste water
- Oil
- Gas

Design

The SITRANS FST070 is designed as ET200 SP module and can directly installed with other ET200 SP modules. The FS DSL cable is directly mounted to the ET 200SP base unit is providing the supply voltage and the data communication. The SITRANS FSS200 clamp-on sensors with FS DSL can be connected directly to the SITRANS FST070.

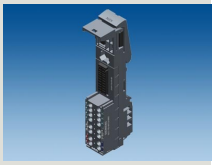
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Function

The following key functionalities are available:

- Volume flow rate, mass flow, flow velocity, density, temperature, pressure. kinematic viscosity, standard volume flow (hydrocarbon)
- Three built-in totalizers which can freely be set for counting volume flow, mass flow
- Two digital inputs
- Two digital outputs
- Low flow cut-off
- Zero point adjustment
- Configurable upper and lower alarm and warning limits for all process values
- Comprehensive status and error reporting

Selection and ordering data

Description	Article No.	
SITRANS FST070 – Transmitter for ET 200SP	**7ME3448-6AA00-0BB1**	
BU20-P12+A0+4B, PU1 – BaseUnit plate for ET 200SP	**6ES7193-6BP20-0BB1**	
SITRANS FS DSL M12-SSL cable and FSS200 clamp-on sensors	**7ME3720-.....-1N..**	Configuration with the SIEMENS PIA selector SITRANS FS230 ultrasonic clamp-on
SITRANS FS DSL SSL terminal connection and FSS200 clamp-on sensors	**7ME3720-.....-1Q..**	Configuration with the SIEMENS PIA selector SITRANS FS230 ultrasonic clamp-on

Description	Article No.
SITRANS FST070 system manual • English • German	**A5E49982949-AA**

Technical specifications

SITRANS FST070	
Measurement of	Volume flow rate, mass flow, flow velocity, density, temperature, pressure. kinematic viscosity, standard volume flow (hydrocarbon)
Measurement functions	
• Totalizer 1	Volume flow, mass flow, standard volume flow
• Totalizer 2	Volume flow, mass flow; standard volume flow
• Totalizer 3	Volume flow, mass flow; standard volume flow
General information	
Product type designation	Technology module TM FST070
FW update possible	Yes
Usable BaseUnits	BU 20 type B1
ET 200SP	Yes
Engineering with	• STEP 7 TIA Portal configurable/integrated as of version V17 or higher • STEP 7 configurable/integrated as of version V5.6 SP4 and higher • PCS 7 V9.1 or higher • PROFINET as of GSD version/GSD revision GSDML V2.35
Cable	
Maximum cable length to FS DSL	75 m (max. 150 m)
Supply voltage	
Load voltage L+	24 V DC
Rated value (DC)	24 V NEC-Class II
Permissible range, lower limit (DC)	19.2 V
Permissible range, upper limit (DC)	28.8 V
Short-circuit protection	Yes
Reverse polarity protection	Yes; against destruction
Input current	
Current consumption, max.	500 mA
Power loss	
Typical power loss, max.	1.7 W
Protection class	
IP protection	IP20
EMV	• Electrostatic discharge according to IEC 61000-4-2: 2008 • Field-related interference according to IEC 61000-4-3: 2006 • Bursted interference due to burst according to IEC 61000-4-4: 2012 • Conducted interference by surge according to IEC 61000-4-5: 2014 • Conducted interference by high-frequency radiation according to IEC 61000-4-6: 2013
Decentralized operation	
• to SIMATIC S7-300	Yes
• to SIMATIC S7-400	Yes
• to SIMATIC S7-1200	Yes
• to SIMATIC S7-1500	Yes
• to standard PROFINET controller	Yes
Usable with the following flowmeters	SITRANS FS DSL with FSS200
Digital inputs 1 and 2	
Free usable inputs 1 and 2	• Start/stop totalizer 1, 2 or 3 • Reset totalizer 1, 2 or 3 • Zero adjust • Force outputs • Freeze process values
High signal	• Nominal voltage: 24 V DC • Upper limit: +30 V DC • Lower limit: +11 V DC • Current: max 35 mA
Low signal	• Nominal voltage: 0 V DC • Lower limit: -30 V DC • Upper limit: +5 V DC • Current: max 35 mA

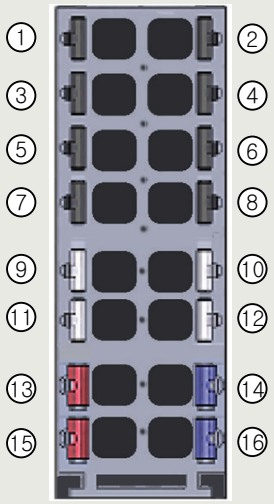
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Technical specifications (continued)

SITRANS FST070	
Potential separation	• Module and backplane bus • Short circuit protection
Isolation test	707 V DC
Cable length	• Max. 50 m shielded • Max. 25 m unshielded
Digital outputs 1 and 2	
Free useable outputs 1 and 2	• Alarm acknowledgment • Out of specification • Failure sensor measuring • Function check • Flow direction
Low signal	Max. 1 V
High signal	Min 23.2 V
Switching capacity	300 mA signal high
On lamp load	8 W
Load resistance	80 ... 10 kΩ
Between diffrenet circuits	Electronic/thermal
Potential separation	Module and backplane bus
Isolation test	707 V DC
Cable length	• Max. 50 m shielded • Max. 25 m unshielded
Environment	
Ambient temperature during operation	
Minimum installation	-25 °C
Horizontal installation, max.	60 °C; observe derating
Vertical installation, max.	50 °C; observe derating
Ambient temperature during storage/transport	
Storage, min.	-40 °C
Storage, max.	70 °C
Transport, min.	-40 °C
Transport, max.	70 °C
Relative humidity	
Operation, min.	5 %
Operation, max.	95 %; no condensation
Height in operation	
Ambient air pressure altitude (relative to sea level)	T_{min} ... T_{max} at 1 080 hPa ... 795 hPa (-1 000 ... +2 000 m)
EMC performance	
Emission	• EN 61000-6-4
Electromagnetic compatibilty	• IEC 61000-6-2: 2016 • IEC 61000-6-4: 2018
Emission of radio interference	Class A industrial environment: • IEC 61000-6-4: 2018 • IEC/CISPR 16-2-3: 2008 • EN 55016-2-3: 2006
Emission on power supply cables	Class A Industrial environment: • IEC 61000-6-4: 2018 • IEC/CISPR 16-2-1: 2010 • EN 55016-2-1: 2009
Certification	
CE mark	Low voltage directive RoHS
UL	ANSI / ISA 12.12.01
CAN/CSA	CSA C22.2 No. 213-M1987 Class I, Div. 2 Group A.B.C.D T4
ATEX	II 3 G Ex ec IIC T4 Gc
IECEx	Ex ec IIC T4 Gc
Tick	Yes
KCC	Yes
RoHS	Yes
FM	Class I, Div. 2, Group A.B.C.D T4
Communication	
Digital Sensor Link	460.8 kBits/s
Cable length FST070 to FC DSL Sensor	75 m (150 m)
Power supply FS sensors	The operating voltage of the sensors is supplied via the sensor cable directly from the FST070

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Circuit diagrams



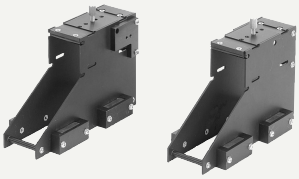
Pin assignment of the BaseUnit BU20-P12+A0+4B

Naming	Configuration	PIN
Digital input	DI0	1
Digital output	DQ0	2
Digital input	DI1	3
Digital output	DQ1	4
+24 V DC supply voltage for digital inputs	DI_L+	5
-	nc	6
Ground for digital outputs	M	7
Ground for digital outputs	M	8
RS 485 data line B for SEN communication	SEN_B	9
+24 V DC supply voltage for SEN	SEN_L+	10
RS 485 data line A for SEN communication	SEN_A	11
GND for SEN supply	SEN_M	12
+24 V DC supply voltage for SEN	L+	13
Ground for supply voltage	M	14
+24 V DC supply voltage for SEN	L+	15
Ground for supply voltage	M	16

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Overview

Accessories / Spare parts for clamp-on ultrasonic flowmeters

Description	Article No.	Symbol
Universal portable sensors Selected generally for portable systems where a wide variety of pipes are to be measured. Since they are selected based on diameter only, a wide range of pipe sizes and materials can be covered with a minimum number of sensors. These can also be selected as a cost savings on applications where standard accuracy is sufficient.	**7ME3951-...**	
High precision sensors Selected generally for dedicated meters since the need to cover a range of pipes is not a requirement. They provide the highest accuracy achievable by the meters and therefore should be selected whenever higher accuracy/repeatability is required. They are only applicable to steel pipes but no other metals, and are selected solely by wall thickness.	**7ME3950-...**	
High temperature sensors Are selected whenever pipe temperature will exceed 250 °F (120 °C) up to a maximum of 450 °F (232 °C). They are universal type and can therefore be used on any pipe material and are selected by pipe diameter.	**7ME3950-...**	
High precision mount These provide the most secure and strongest mounting of the flow sensors. They are generally selected for "High End" meter types where maximum performance criteria applies. They accommodate high precision sensors designed to mount inside these enclosures. May be welded to the pipe if so desired by the customer. They come in 2-piece or 1-piece configurations depending upon the application pipe size and type (Liquid/Gas).	**7ME3960-...**	
Mounting tracks Typically used on smaller pipes for easier and more stable mounting for dedicated universal style sensor size A or B, also available for dedicated high precision sensor size A or B.	**7ME3960-...**	
Magnetic mounting frames Magnetic mounting frames are designed to simplify clamp-on sensor installation on pipelines 8 inches (DN200) and larger by eliminating the need for straps to secure them.They feature powerful magnets to ensure quick and accurate setup.Compatible with all C, D and E universal and high-precision sensors belonging to the SITRANS F US clamp-on family, magnetic mounting frames can be installed on any carbon steel pipe and are constructed in aluminum for a high level of durability.	**7ME3960-0MD02**	
Mounting frames These items are useful in simplifying sensor installation. They are strapped to the pipe first then the sensors are installed, making the installation less cumbersome and more precise. They also enable easy repeated mounting of the sensors assuring conformation to the original sensor positioning. They may be left in place at each measurement location where periodic flow surveys are conducted to simplify subsequent installations and ensure repeatable results.	**7ME3960-...**	
Spacer bars Sensors are required to be mounted at a set distance from each other as determined by pipe size and medium being measured. The spacer bar simplifies this requirement by eliminating the need to undertake a precise dimensional measurement. The flowmeter will specify a specific spacing index which is easily accommodated with the marked indices on the bar.	**7ME3960-...**	

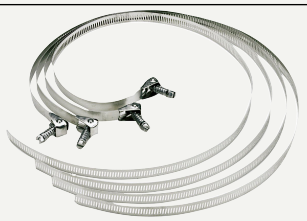
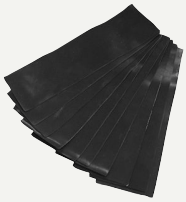
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Overview (continued)

Description	Article No.	Symbol
Clamp-on RTD's 1000 W platinum RTD's for use where temperature is required. Used with Energy Meters to record supply/return temperature. For this purpose precision matched pairs (to 0.02 °C) are supplied. Single RTD's are also used with FUH and FUG meters to enable live calculations of "Liquident" and Standard Volume Correction.	**7ME3950-...**	
Insert RTD's SITRANS FST030 is suitable for PT100, PT500 and PT1000. Please select best appropriate RTD and thermowell in SIEMENS product family SITRANS TS500	**7MC7500-...** **7MT2351-...**	
Standard cable (flow sensor or RTD) Selected for general purpose installations where no special application requirements exist.	**7ME3960-...**	
Submersible cable (flow sensor) Polyethylene jacketed, for locations that experience periodical or continual submersion of the flow sensors.	**7ME3960-...**	
Plenum cable (flow sensor or RTD) For temperatures above 180 °F. Teflon jacketed to withstand high temperatures, is used when high temp sensors are specified.	**7ME3960-...**	
Armored cable (flow sensor) Double shielded cable, selected when cable will not be installed in conduit between meter and sensors.	**7ME3960-...**	

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Overview (continued)

Description	Article No.	Symbol
Temperature sensor cable Cable to connect field installed RTD to flowmeter, available in Teflon wrapped, plenum or submersible grade. Typically used for FUE, FUH and FUG series meters where a temperature sensor is employed.	**7ME3960-...**	
Straps Used to fasten sensors or mounting frames to pipe for dedicated meter installations. Stainless steel construction for corrosion resistance.	**7ME3960-...**	
Chains (EZ clamps) Used to fasten portable sensors or mounting frames to pipe. Thumbscrews eliminate need for hand tools when mounting sensors, and allow for easy on/off operations.	**7ME3960-...**	
Ultrasonic couplant Fills any voids between sensor emitting surface and pipe wall to allow maximum energy transfer between sensor and pipe. Several different types of couplants are employed as determined by the application conditions and type of installation (Temporary or permanent).	**7ME3960-...**	
Dry couplant The dry coupling pad is intended for use in any liquid, clamp-on transit time or Doppler applications that require a more durable coupling material. Installation is easy by simply placing one strip of material between sensor and pipe. Not intended for clamp-on gas where damping material is used. The temperature range is -34 to +200 °C (-30 to +392 °F).	**7ME3960-...**	
Damping material Used with gas meters, and required as part of their sensor installation. This material absorbs excess ultrasonic energy from the pipe wall to enable the meter to detect and operate with low amplitude sensor signals normally associated with Clamp-on Gas applications.	**7ME3960-...**	

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Overview (continued)

Description	Article No.	Symbol
Test block Used for checking operation of a meter and sensors prior to a field installation, or as a troubleshooting tool. Selected by sensor size, each block accommodates 2 sensor sizes. Available only for universal sensors.	**7ME3960-...**	
Termination kit (flow sensor or RTD) Provides the connectors, labels and shrink tubing or other associated hardware to complete the termination of a specific cable type. These can be provided in cases where users will be purchasing bulk cable directly and cutting to length at their site, or when existing cable length is to be altered. Selected by cable type.	**7ME3960-...**	
Cable gland kit Cable gland kit for use with SITRANS FUS1010, FUH1010 and FUG1010 Ultrasonic Flowmeters housed in IP65 NEMA 4X wall mount enclosures. Kit contains a total of 5 glands to manage and seal the exit and entry of wires and cables to ancillary devices.	**A5E32834162**	

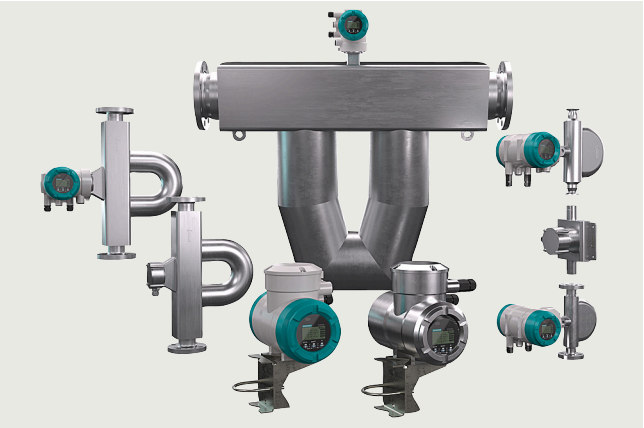
Selection and ordering data

RTD cable selection chart (Dedicated, each)

RTD cable codes for length and type				
Cable length m (ft)	Standard -40 ... +200 °C (-40 ... +392 °F)	Submersible -40 ... +200 °C (-40 ... +392 °F)	for insert RTD -40 ... +200 °C (-40 ... 392 °F)	for submersible insert RTD -40 ... +200 °C (-40 ... 392 °F)
	Order code			
6 (20)	**R01**	**R11**	**R21**	**R31**
15 (50)	**R02**	**R12**	**R22**	**R32**
30 (100)	**R03**	**R13**	**R23**	**R33**
46 (150)	**R04**	**R14**	**R24**	**R34**
61 (200)	**R05**	**R15**	**R25**	**R35**
91 (300)	**R06**	**R16**	**R26**	**R36**

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Overview



SITRANS FC is the range of Siemens Coriolis mass flowmeters that provides high performance process measurements. The extensive portfolio provides multi-parameter measurement solutions for all fluid types, including liquids, gases and multi-phase fluids.

Primary measurements of mass flow, density and temperature are available immediately on device start-up.

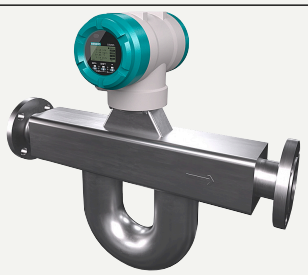
SITRANS FC also calculates multiple secondary measurements including:

- Fraction (or concentration)
- Liquid volume flow
- Normal (standard) volume flow of gases
- Viscosity (requires external input)
- Thermal energy

Siemens measurement experts are available globally. They provide application guidance to optimize the whole life value of SITRANS FC multi-parameter instruments, across all process industry sectors.

Diligence in the design, carried through manufacturing and calibration, is evident in the solution-specific range of sensors and transmitters, described on the following pages.

Product overview

SITRANS FC sensors		
SITRANS FCS100		**Precision sensors for low flow applications** • Alloy 22 measuring tubes • Process connection: flange, thread or hygienic clamp • Nominal sizes: DN 1, DN 2, DN 4, DN 6, DN 8 • Connection sizes: DN 6 ... 40 (¼ ... 1½") • Nominal flow: 21 ... 950 kg/h (46 ... 2 094 lb/h)
SITRANS FCS500		**Universal sensors for standard applications** • Wetted parts: stainless steel 316L • Process connections: flange or thread • Nominal sizes: DN 10, DN 15, DN 25, DN 50, DN 80 • Connection sizes: DN 8 ... 125 (⅜ ... 5") • Nominal flow: 1 600 ... 170 000 kg/h (3 527 ... 374 786 lb/h) **Hygienic sensors with 3A and EHEDG approvals** • Wetted parts: stainless steel 316L • Process connection: hygienic, thread or clamp • Nominal sizes: DN 10, DN 15, DN 25, DN 50 • Connection sizes: DN 25 ... 80 (1 ... 3") • Nominal flow: 1 600 ... 51 000 kg/h (3 527 ... 112 436 lb/h)
SITRANS FCS600		**Resistant sensors for extreme conditions** • Resistant to high temperature, up to 350 °C (662 °F) • Resistant to high pressure, up to 700 bar (10 153 psi) (gauge) • Resistant to corrosive fluids • Wetted parts: stainless steel 316L or alloy 22 • Process connection: flange or thread • Nominal sizes: DN 2, DN 4, DN 15, DN 25, DN 40, DN 65 • Connection sizes: DN 8 ... 125 (⅜ ... 5") • Nominal flow: 45 ... 100 000 kg/h (99 ... 220 462 lb/h)

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Overview (continued)

SITRANS FC sensors		
SITRANS FCS700		**Grand sensors for high flow applications** • Wetted parts: stainless steel 316L or alloy 22 • Process connection: flange • Nominal sizes: DN 100, DN 150, DN 200 • Connection sizes: DN 100 ... 250 (4 ... 10") • Nominal flow: 250 000 kg/h ... 900 000 kg/h (551 156 ... 1 984 160 lb/h)

SITRANS FC transmitters		
SITRANS FCT020		**Standard transmitter for routine applications** • Mass flow accuracy: ±0.2% (of rate) • Density accuracy: ±4 kg/m³ (±0.25 lb/ft³) • Easy setup wizard, microSD card, self-verification • Digital communication: HART, Modbus
SITRANS FCT040		**Advanced transmitter with extended functionality** • Mass flow accuracy: ±0.1% (of rate) • Density accuracy: ±0.5 kg/m³ (±0.03 lb/ft³) • Easy setup wizard, microSD card, self-verification • Batch control, viscosity measurement • Fraction (percent concentration), e.g. API, Brix, ABV • Thermal energy calculation • Digital communication: HART, Modbus, PROFIBUS PA, Profinet over APL Ethernet

Each SITRANS FC Coriolis mass flowmeter system comprises one sensor and one transmitter. The FCS100 precision sensors for low flow are compatible with remote mounted transmitters only. The user can select either compact or remote mounted transmitters in the specification of all other sensor types.

Transmitter	Compact	Remote	Ex	Sensor
FCT020 (standard)	Yes	Yes	Yes	FCS500
	No	Yes	Yes	FCS100
	Yes	Yes	Yes	FCS600
	Yes	Yes	Yes	FCS700
FCT040 (advanced)	Yes	Yes	Yes	FCS500
	No	Yes	Yes	FCS100
	Yes	Yes	Yes	FCS600
	Yes	Yes	Yes	FCS700

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Benefits

	User value targets	SITRANS FC features and solutions
Engineering and project management	• Reduce engineering investment • Cut specification effort • Minimize project expenditure • Decrease the spending on each measurement point • Eliminate function duplication • Reduce number of suppliers	• Siemens project teams offer complimentary evaluation of customer specifications, provided by regional and HQ experts • Simple product selection using intuitive sizing software • One SITRANS FC device can typically provide 3 to 6 individual measurements, all transmitted via digital communication, when planned during pre-project design • Added value functions: batch control, viscosity, thermal energy, concentration measurement (Fraction) of two-component solutions, and pressure compensation
Installation	• Reduce footprint and transport outlay of OEM machinery • Lower installation complexity • Avoid costly modifications of existing plant	• Can be installed in horizontal or vertical (self-draining) pipes • Twin tube bend design delivers strong signal to noise characteristic resistant to external influence, so install in tight spaces with no inlet and outlet restrictions • Adaptable to existing pipes: typically, 3 or 4 connection sizes for each sensor size • Flexible selection of traditional inputs, outputs, and digital communications
Configuration and commissioning	• Shorter commissioning schedules with lower costs • Faster start-up with reduced outgoings	• Easy setup wizard delivers working meters straight after start-up • microSD card stores sensor calibration data and default setup • Simple configuration using Process Device Manager (PDM) • Siemens device-specific faceplates simplify operation in plantwide control systems
Efficient plant operation	• Improve finished product consistency to reduce waste • Keep process performance when scaling production up or down • Optimize process control • Improve finished product quality enabling higher levels of profit • Reduce downtime with fast resolution of process upsets • Improve asset performance	• SITRANS FC meters are calibrated in rigs accredited to EN/ISO 17025 to ensure consistently high performance of flow, density, and concentration measurements • First-class zero-point quality maintains high accuracy into the low flow region • High sensitivity and intelligent dynamic range keeps the measurement active in demanding high fluid damping cases • Designed-in resilience to process extremes • Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout or solid deposits building up in the tubes • Diagnostic data via local menu or PDM is backed by Siemens applications experts • Intelligent Siemens SITRANS IQ apps for continuing asset evaluation
Maintenance and asset management	• Optimize technician training • Reduce cost of spare parts • Increase predictive maintenance • Reduce production downtime and associated costs • Decrease unplanned maintenance • Maximize asset value	• Simple product design with interchangeable modular parts • microSD card loads sensor-specific data to deliver fast service exchange • Self-verification: tube health check monitors key diagnostics, including tube stiffness, driver and pickups; the user defines verification frequency and alarm behavior • Verification results indicate whether preventive maintenance action is required • Siemens SIMATIC Maintenance Station uses cyclical acquisition to provide life cycle reports and intelligent preventive maintenance strategies
Industry compliance	• Cut effort required to comply with Industry-specific demands • Reduce resource needed to maintain regulatory compliance	• Food and beverage sector covered with EHEDG and 3-A approvals, polished tubes • Global hazardous area approvals for international plant duplications • Common and emerging digital networks covered: HART, PROFIBUS PA, PROFINET over Ethernet-APL • Class-leading safety: SIL2/SIL3, secondary containment, PED, NAMUR NE95

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Application

The SITRANS FC Coriolis family provides flexibility to the user including

- Choice of sizes from DN 1 to DN 250
- Choice of performance levels
- Optionally selectable functions, approvals and certification
- Selection of sensor types, process connections and materials to suit specific application demands
- Resistance to extreme process conditions where necessary

This flexibility and extensive range of options means an excellent value solution is available for routine and challenging applications alike, with no industry sector excluded.

Generic measurement and application examples found in all industry sectors

- Mass flow rate, density and temperature of liquids, gases, and mixed phase fluids
- Bulk volume flow rate of all fluid types
- Concentration measurement (fraction) of two-component slurries, solutions and mixtures
- Fractional mass flow rate of each component in a two-component fluid (net flow)
- Fractional volume flow rate of each component in a two-component fluid (net flow)
- Single or two stage batch control
- Viscosity measurement (requires differential pressure via analog input or digital communication)
- Thermal energy measurement
- Accumulated (totalized) mass and volume values of the bulk fluid and each fractional component
- Finished product filling and dosing into appropriate containers

During the selection of any SITRANS FC Coriolis flow meter it is important to obtain sufficient application data. The application checklist below provides guidance on what to look out for.

Application checklist

- Name of fluid?
- What type of fluid are you measuring – gas, liquid, slurry, other?
- Fluid properties and operating conditions – density, viscosity, temperature, pressure?
- Measurement(s) required: mass flow, volume flow, density, concentration, temperature?
- Expected flow rates – minimum, normal, maximum?
- Any hazardous area or corrosive properties?
- Adjacent pipe layout, disturbances (e.g. valves, bends)?
- What are the priorities – accuracy, installation and running costs, approvals?
- Power supply and outputs – analog, digital network?
- Will periodic verification or re-calibration be required – consider isolation valves, and bypass?

Application (continued)

Application examples for SITRANS FC multi-parameter meters across diverse industry sectors

Industry sector	Application
Chemical and petrochemical Bulk chemicals Industrial gases Polymers Agrochemicals Fine chemicals Aroma chemicals	• Transfer, loading and unloading of bulk chemicals • Concentration control of acids and alkalis (process optimization) • Accurate mass or volume flow of feed chemicals to in-line blending systems • Accurate mass flow and density (quality) of reactor fluid feeds catalyst • Chemical recovery • Mass balance optimization • Compressed and cryogenic gases • Lubricating oil blending and dosing • High-accuracy measurement of critical fluid components • Low flow control in pilot plants and R&D facilities
Food and beverage Food processing Dairies Breweries Distilleries Confectionary Soft drinks Animal feed plants OEM	• Accurate bulk transfer (mass or volume) of all dairy products: milk, cream, whey and yoghurt • Fat concentration in cream • Flow, density, temperature, and concentration (Plato) during all fermentation processes • Flow, density, temperature, and sugar concentration (Brix) in soft drink processing • Distilled spirits – % alcohol by volume (ABV), liters of pure alcohol, volume transfer, blending, batch and column still optimization and energy management, cask filling, tanker loading • Flow and density of fruit juices and pulps • Mixing and inventory control of confectionary ingredients, e.g. chocolate, syrup, oils, flavors • Metering pump control • Oils, fat enzymes dosing in animal feed plants • CO_2 dosing • CIP liquids • Bottling of beer, spirits, wine, soft drinks, etc. • Bulk sugar processing – molasses, sugar slurries, density, Brix of finished product
Oil and gas Offshore, onshore Upstream, downstream Pipelines Distribution networks Refineries Skid manufacturers	• Loading/unloading of hydrocarbons (e.g. crude oil, bitumen) from/to ship, road tanker, rail car • High-pressure chemical injection • High-pressure low flow gas • Net oil computing • Gas void fraction • Filling of gas bottles • Furnace control • Test separators • LPG, natural gas hydration • Well-head water-cut monitoring • All hydrocarbon fluids in refineries • Metrology, custody transfer • Drilling mud • Oil well cementing and hydrofracturing
Life sciences Pharmaceutical Bio	• High-accuracy flow and batching of bioreactor feeds • Solvent flow rate, density and batching • Flow of demineralized and deionized water • Solvents and fish oils used in high grade omega 3 oils • Precision coatings • Vacuum thin film coating
Household and personal care Detergents Cosmetics	• Blending and batching of detergent ingredients • Tanker loading and unloading • Salt concentration • Reliable measurement of aerated liquids

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Application (continued)

Industry sector	Application
Automotive and aeronautical Vehicle manufacturing Paint Engine testing OEM	• Fuel injection nozzle and pump testing • Filling of under bonnet fluid reservoirs, air conditioning, coolant • Fuel flow and density measurement in engine test beds • Checking for air in oil using high-accuracy density measurement • Paint spray robots – requires accurate and fast measurements • Aircraft fuel loading (kerosene) • High pressure flow used in turbine blade manufacture
Power and energy Renewable Hydrogen	• Boiler fuel flow and burner control • Turbine fuel flow • Glycol flow and concentration • Bioethanol
Marine OEM Shipbuilders	• Fuel consumption management • Boiler control • Bunkering management • Density used to indicate fuel quality
Pulp, paper and textiles	• Accurate dosing of dyes and chemicals
Water and environmental	• Dosing of chemicals for water treatment • Chemical concentration for water quality control

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Design

Each SITRANS FC Coriolis mass flowmeter is built from one SITRANS FCS sensor and one SITRANS FCT transmitter. FCS sensors have a common twin tube U-shaped design.

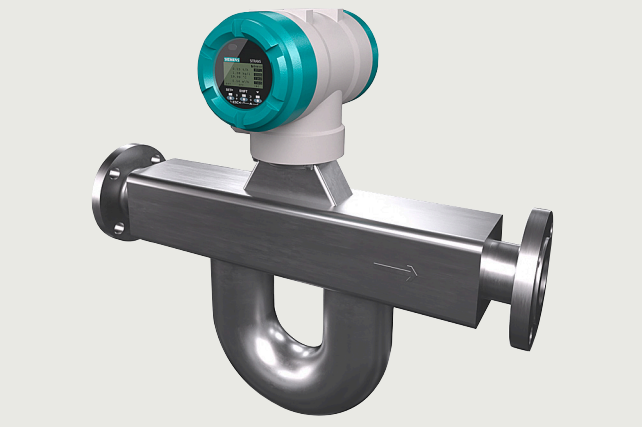
The four available sensor types are defined by size, wetted part materials, pressure and temperature rating, and process connection type. Generally, sensors can be combined with compact or remote mounted transmitters.

Two transmitter versions, FCT020 standard and FCT040 advanced, provide a choice of performance, measurement functions, housing material and output types.

Examples

Compact mount

FCS600 resistant sensor with FCT020 standard transmitter becomes a complete FC620 Coriolis flowmeter. Specification of sensor size, transmitter and process connections is required.

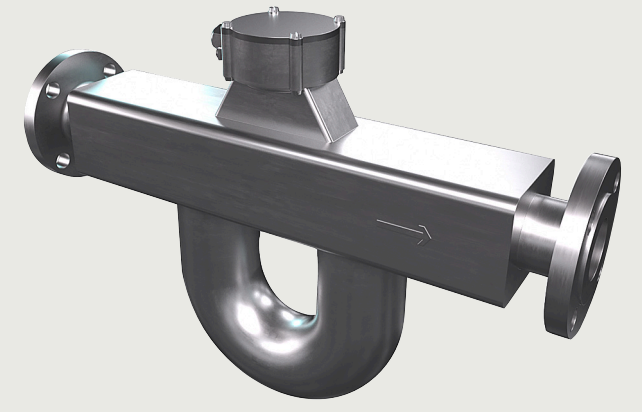


FC620 Coriolis flowmeter

Remote mount

FCS600 resistant sensor with FCT040 advanced transmitter becomes a complete FC640 Coriolis flowmeter.

Specification of sensor size, terminal housing design, transmitter, process connections and cable are required.



FCS600 sensor

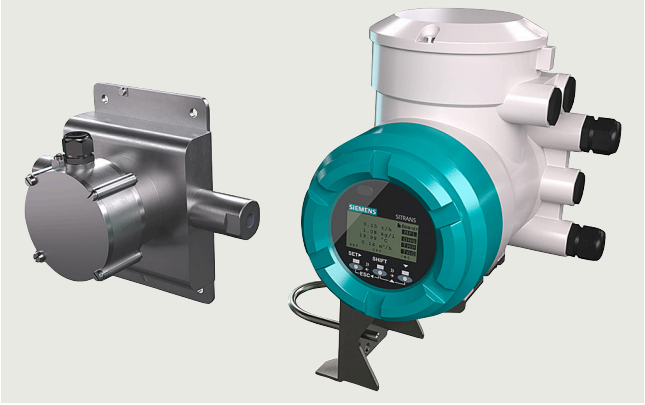


FCT040 transmitter

FCS100 precision sensors (sizes DN 1 to DN 8) are compatible with remote mounted transmitters only.

Other example

FCS100 precision sensor with remote FCT020 standard transmitter becomes a complete FC120 Coriolis flowmeter.

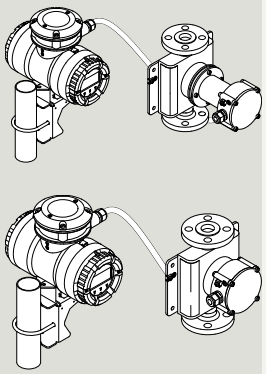
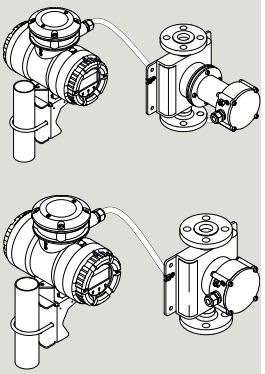
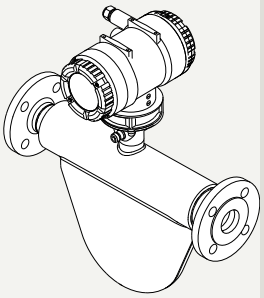
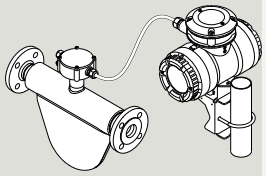
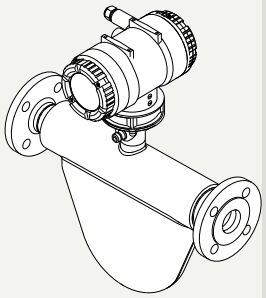
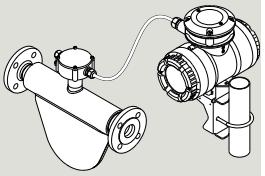
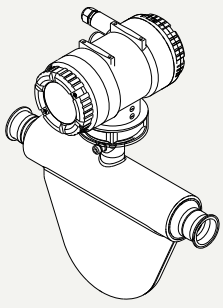
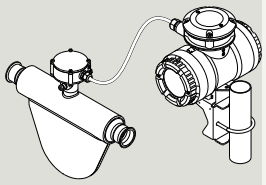
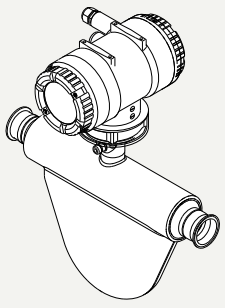
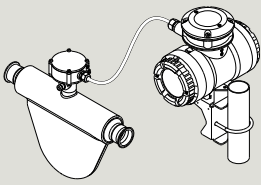


The following table shows a more complete interpretation of available combinations and the compatibility between sensors and transmitters.

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Design (continued)

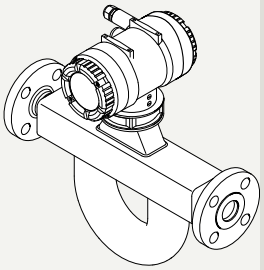
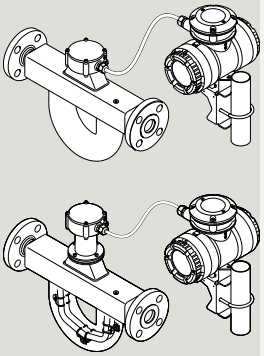
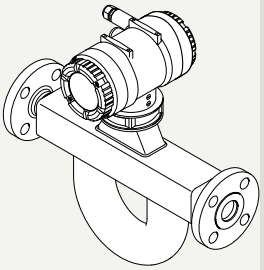
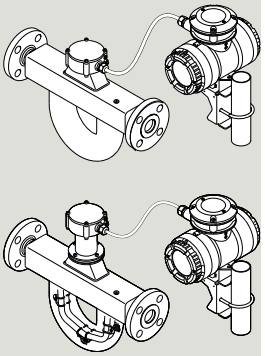
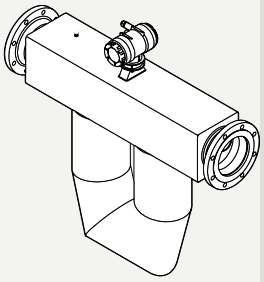
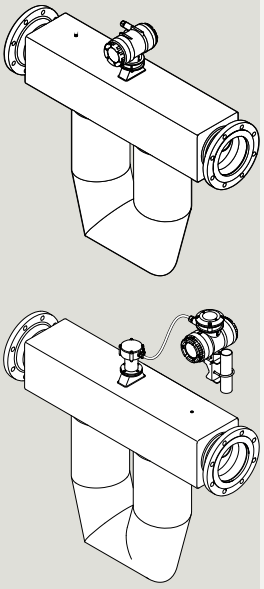
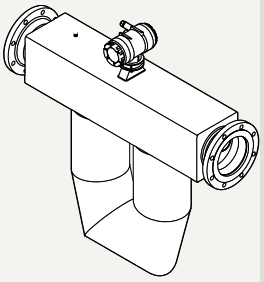
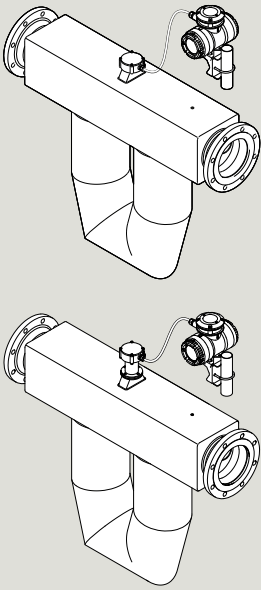
Overview of the available combinations and compatibility between sensors and transmitters

	Transmitter FCT020 Standard • Accuracy 0.2% • Easy setup wizard, microSD card, tube health check, up to 4 × I/O • HART, Modbus • Mass, density, temperature, volume		**Transmitter FCT040 Advanced** • Accuracy 0.1% • Easy setup wizard, microSD card, tube health check, up to 4 × I/O • HART, Modbus, PROFIBUS PA, PROFINET over Ethernet-APL • Mass, density, temperature, volume • Fraction, batch, viscosity, net oil	
Sensors	**Compact** Aluminum alloy	**Remote** Aluminum alloy or CF 8M	**Compact** Aluminum alloy	**Remote** Aluminum alloy or CF 8M
FCS100 • DN 1 to DN 8 • Alloy 22 or 316L ss • max. 260 °C (500 °F) (long neck) • max. 285 bar (4 134 psi) • Ex, PED, SIL2/3 • NACE, Marine, CT	Not available	FC120 	Not available	FC140 
FCS500 non hygienic • DN 10 to DN 80 • 316L ss • max. 200 °C (392 °F) (remote) • max. 100 bar (1450 psi) • Ex. PED. SIL2/3 • NACE, Marine, CT	FC520 	FC520 	FC540 	FC540 
FCS500 hygienic • DN 10 to DN 50 • 316L ss, polished • max. 140 °C (284 °F) • max. 40 bar (580 psi) • Ex. PED. SIL2/3 • EHEDG, 3A	FC520 	FC520 	FC540 	FC540 

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Design (continued)

Overview of the available combinations and compatibility between sensors and transmitters

FCS600 • DN 15 to DN 80 • Alloy 22 or 316L ss • -196 °C ... +350 °C (-321 ... +662 °F) • Max. 700 bar (10 153 psi) • Ex, PED, SIL2/3 • NACE, Marine, CT • EHEDG, 3A	FC620 	FC620 	FC640 	FC640 
FCS700 • DN 100 to DN 200 • Alloy 22 or 316L ss • Max. 350 °C (662 °F) • Max. 100 bar (1 450 psi) • Ex, PED, SIL2/3 • NACE, Marine, CT	FC720 	FC720 	FC740 	FC740 

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Design (continued)

Selection Guide



	FCS100 sensors		FCS500 sensors		FCS600 sensors		FCS700 sensors	
	FC120	FC140	FC520	FC540	FC620	FC640	FC720	FC740
	7ME4412	7ME4414	7ME4452	7ME4454	7ME4462	7ME4464	7ME4472	7ME4474
Design								
Compact			●	●	●	●	●	●
Remote	●	●	●	●	●	●	●	●
Flow accuracy (liquids)								
Mass flow 0.1%		●[1)]		●		●		●
Mass flow 0.2%	●		●		●		●	
Density accuracy (liquids)								
Density 0.5 kg/m³		●[2)]		●[2)]		●[2)]		
Density 2 kg/m³								●
Density 4 kg/m³	●[3)]		●		●[3)]		●	
Flow accuracy (gases)								
Mass flow: 0.35%				●		●[4)]		●[4)]
Mass flow: 0.5%		●						
Mass flow: 0.75%	●		●		●		●	
Transmitter enclosure								
IP66/IP67	●	●	●	●	●	●	●	●
Cast aluminum Standard coating	●	●	●	●	●	●	●	●
Cast aluminum Corrosion protection coating	●	●	●	●	●	●	●	●
Stainless steel (remote only)	●	●	●	●	●	●	●	●
Inputs and outputs								
Up to 4 input and output channels (passive or active)	●	●	●	●	●	●	●	●
Analog output	●	●	●	●	●	●	●	●
Pulse or status output	●	●	●	●	●	●	●	●
Pulse or status input	●	●	●	●	●	●	●	●
Analog input		●		●		●		●
Communication								
HART	●	●	●	●	●	●	●	●
PROFIBUS PA		●		●		●		●
MODBUS	●	●	●	●	●	●	●	●
PROFINET over Ethernet-APL		●		●		●		●
Supply voltage								
24 V DC	●	●	●	●	●	●	●	●
115/230 V AC	●	●	●	●	●	●	●	●
Sensor size								
DN 1	●	●						
DN 2	●	●			●	●		
DN 4	●	●			●	●		
DN 6	●	●						
DN 8	●	●						
DN 10			●	●				
DN 15			●	●	●	●		
DN 25			●	●	●	●		
DN 40					●	●		
DN 50			●	●				
DN 65					●	●		
DN 80			●	●				

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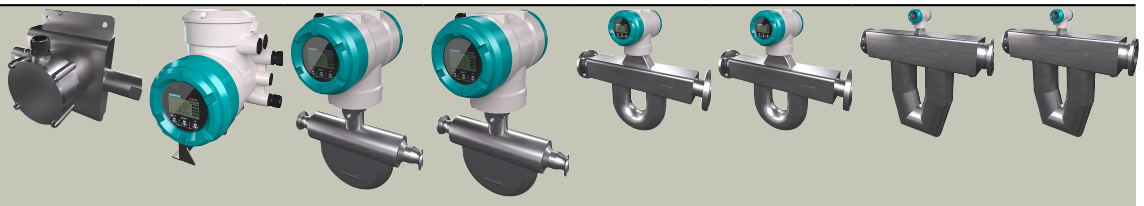
Design (continued)



	FCS100 sensors		FCS500 sensors		FCS600 sensors		FCS700 sensors	
	FC120	FC140	FC520	FC540	FC620	FC640	FC720	FC740
	7ME4412	7ME4414	7ME4452	7ME4454	7ME4462	7ME4464	7ME4472	7ME4474
DN 100							●	●
DN 150							●	●
DN 200							●	●
Pipe thread connections								
Internal G (BSPP)	●	●	● DN 10/15 only	● DN 10/15 only	● DN 15 only	● DN 15 only		
Internal NPT	●	●	● DN 10/15 only	● DN 10/15 only	● DN 15 only	● DN 15 only		
Flange connections								
ASME B15.5	●	●	●	●	●	●	●	●
EN 1092-1	●	●	●	●	●	●	●	●
JIS B 2220	●	●	●	●	●	●	● DN 100 only	● DN 100 only
Hygienic connections								
DIN 32676 clamp	●	●	●	●	●	●		
ISO 2852 clamp			●	●	● not DN 65	● not DN 65		
DIN 11851 thread			●	●				
SMS 1145 thread			●	●				
Wetted part materials								
Alloy 22/2.4602 and 316L/1.4404	●	●						
316L ss/1.4404			●	●	●	●	●	●
Alloy 22/2.4602					●	●	● DN 100 only	● DN 100 only
Maximum pressure								
100 bar g [5]			●	●			●	●
260 bar g [5]					●	●		
285 bar g [5]	●	●						
700 bar g [5]					●			
Temperature range compact								
Standard -50 ... +150 °C (-58 ... +302 °F)			● [6], [7]	● [6], [7]	● [6], [7]	● [6], [7]	●	●
Temperature range remote								
Standard -50 ... +150 °C (-58 ... +302 °F)	● [7]	● [7]						
Standard -70 ... +200 °C (-94 ... +392 °F)			● [6], [7]	● [6], [7]				
Standard -70 ... +150 °C (-94 ... +302 °F)					● [6],[7]	● [8], [9]	●	●
Medium -50 ... +260 °C (-58 ...+500 °F)	● [8], [9]	● [8], [9]						
Medium -70 ... +230 °C (-94 ... +446 °F)					● [8],[9]	● [8], [9]	● [8]	● [8]
High 0 ... 350 °C (32 ... 662 °F)					● [8],[9]	● [8], [9]	● [8]	● [8]
Low -196 ... +150 °C (-321 ... +302 °F)					● [8],[9]	● [8], [9]		
Sensor features								
Cleaning for oxygen service	●	●	●	●	●	●	●	●

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Design (continued)



	FCS100 sensors		FCS500 sensors		FCS600 sensors		FCS700 sensors	
	FC120	FC140	FC520	FC540	FC620	FC640	FC720	FC740
	7ME4412	7ME4414	7ME4452	7ME4454	7ME4462	7ME4464	7ME4472	7ME4474
Insulation and heat tracing	●	●			●	●	●	●
Polished surface Ra ≤ 0.8 µm			●	●	●	●		
Rupture disk					●	●	●	●
Customer defined built-in length	●	●	●	●	●	●	●	●
Namur NE132 built-in length	●	●	●	●	●	●	●	●
Software functions								
Thermal energy		●		●		●		●
Fraction		●		●		●		●
Viscosity		●		●		●		●
Batching		●		●		●		●
Net oil computing		●		●		●		●
Tube health check	●	●	●	●	●	●	●	●
Hazardous area (Ex) approvals								
ATEX	●	●	●	●	●	●	●	●
IECEx	●	●	●	●	●	●	●	●
FM	●	●	●	●	●	●	●	●
EAC Ex	●	●	●	●	●	●	●	●
NEPSI	●	●	●	●	●	●	●	●
Korea Ex	●	●	●	●	●	●	●	●
INMETRO	●	●	●	●	●	●	●	●
Hygienic approvals								
3-A certificate Ra ≤ 0.8 µm			●	●	●	●		
EHEDG certificate Ra ≤ 0.8 µm			●	●	●	●		
Marine approvals (Classes 2 and 3)								
Det Norske Veritas	●	●	●	●	●	●	●	●
Lloyds Register	●	●	●	●	●	●	●	●
Bureaux Veritas	●	●	●	●	●	●	●	●
American Bureaux of Shipping	●	●	●	●	●	●	●	●
Korean Register	●	●	●	●	●	●	●	●
Additional approvals								
NACE MR0175, MR0103	●	●	●	●	●	●	●	●
Pressure Equipment Directive	●	●	●	●	●	●	●	●
Functional Safety SIL 2/3	●	●	●	●	●	●	●	●
Custody Transfer (NTEP accuracy class 0.3)	●	●	●	●	●	●	●	●
NAMUR NE 21, NE 95	●	●	●	●	●	●	●	●
EMC	●	●	●	●	●	●	●	●
Low voltage	●	●	●	●	●	●	●	●
RoHS	●	●	●	●	●	●	●	●

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Design (continued)

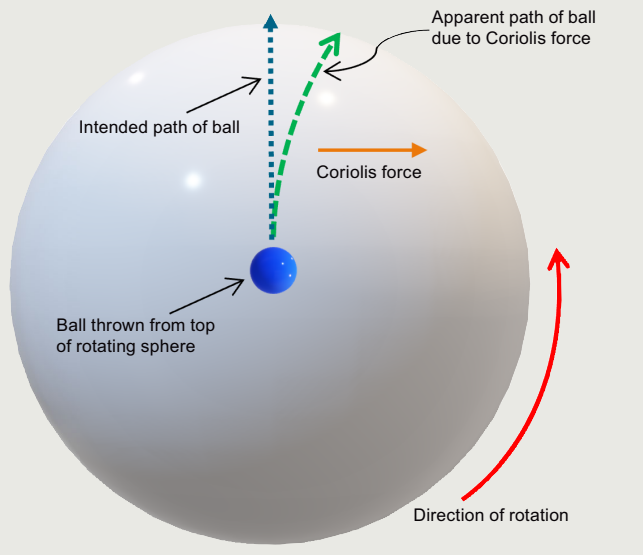
● = Available
1) FC140 meters in sizes DN 1 and DN 2 have 0.2% liquid mass flow accuracy.
2) Some sensor sizes do not have 0.5 kg/m³ (0,03 lb/ft³) density accuracy with FCT040 transmitters. Refer to technical specifications for more details.
3) Some sensor sizes do not have 4 kg/m³ (0,25 lb/ft³) density accuracy with FCT020 transmitters. Refer to technical specifications for more details.
4) Some sensor sizes do not have 0.35% gas mass flow accuracy with FCT040 transmitters. Refer to technical specifications for more details.
5) Maximum pressure ratings may be lower than shown, depending on the type of process connection (fitting) selected. Refer to the technical specifications for more details.
6) With hygienic thread fittings temperature range is -50 ... +140 °C (-58 ... +284 °F).
7) With hygienic clamp fittings temperature range is -10 ... +140 °C (14 ... 284 °F).
8) Long neck sensor option is mandatory for low (cryogenic), medium and high temperature ranges.
9) Hygienic fittings cannot be selected with low (cryogenic), medium and high temperature ranges.

Mode of operation

The Coriolis Effect

Gaspar-Gustave de Coriolis (1792–1843) was a French mathematician, mechanical engineer and scientist. His work explained the supplementary forces detected in a rotating frame of reference, one of which would eventually bear his name.

Imagine that the rotating sphere in the sketch below is the earth, with the viewer looking down from above. When a ball is thrown from the top of the sphere (north pole) several forces act upon it including centrifugal force and gravity. Our focus is on the Coriolis force which acts perpendicular to the flight of the ball and opposite to the direction of rotation. The path of the ball is shifted to the right, away from its intended path due to the Coriolis effect.

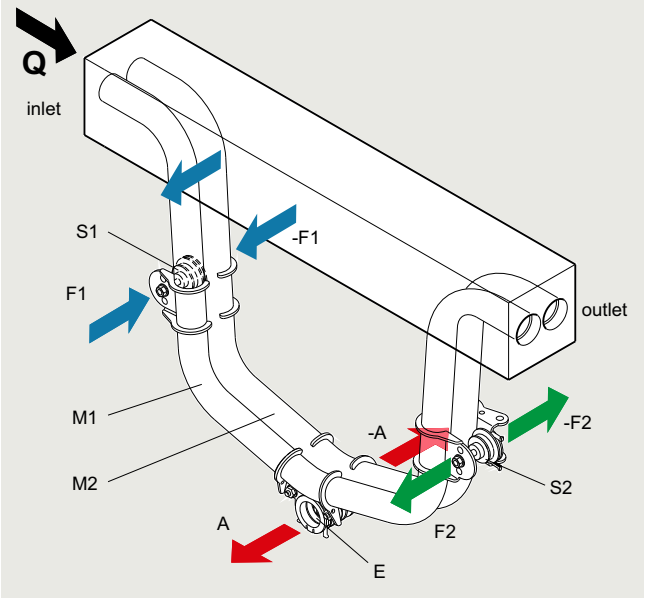


Coriolis force: effect on the direction of rotation

Inside the Coriolis flowmeter an oscillating system is used in place of continuous rotation.

SITRANS FC sensors are energized by an electromagnetic driver which causes the twin measuring tubes to oscillate at their resonant frequency. The oscillation generates back and forth rotation at the tube ends, close to the electromagnetic pickups S1 and S2.

Mode of operation (continued)



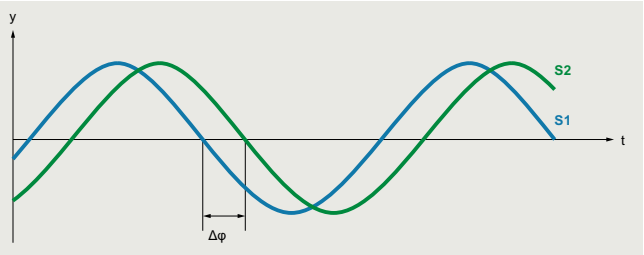
M1, M2	Measuring tubes
S1, S2	Pick-offs
F1, F2	Coriolis forces
E	Driver system
A	Direction of measuring tube vibration
Q	Direction of fluid flow

When the fluid in the rotating system is not flowing, there is no Coriolis force. As fluid starts to flow, Coriolis forces are generated (*F1* and *F2*), together with a phase shift (time difference) between the output of pickups.

The phase shift is directly proportional to the **mass flow rate** of the flowing fluid, and it can be measured with high accuracy.

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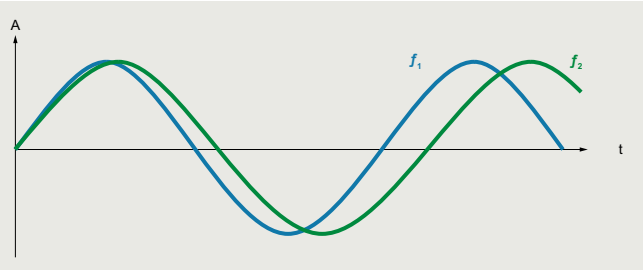
Mode of operation (continued)



Mass flow rate proportional to phase shift

Δφ	Phase shift
t	Time
S1, S2	Pick-offs

Fluid density becomes the second primary measurement, achieved using the inverse relationship between fluid density and tube resonant frequency. Fluid 2 frequency f_2 is lower than fluid 1 frequency f_1, therefore fluid 2 has a greater density than fluid 1.



Density inversely proportional to frequency

A	Measuring tube displacement
t	Time
f_1	Resonance frequency with fluid 1
f_2	Resonance frequency with fluid 2

The third primary measurement, **temperature**, is made using a PT1000 temperature sensor.

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Function

Before making out your order for Coriolis flowmeters, why not let Siemens measurement experts help with the planning and specification of your new plant or existing process upgrade. Coriolis meters can be expensive, but not when you use the proven multi-measurement power to get real value from your investment by loading all the potential functionality into a single device.

Primary measurements

Make use of the three independent primary process variables, measured simultaneously and continuously.

Mass flow rate with liquid accuracy up to 0.1% of actual flow

Directly proportional to the phase shift measured between the two pickups mounted at either end of the oscillating tubes – the shift is created by the naturally occurring Coriolis forces acting on the tubes whenever fluid flows through.

In-line fluid density with choice of accuracies to suit your application

Inversely proportional to the oscillating system's resonant frequency. The tubes are driven to resonance with an electromagnetic driver circuit flexible enough to allow the tubes to find their natural resonant frequency, defined by the density of the fluid passing through.

Process temperature

Provided by the process industries' go to high resolution device, a PT1000 resistance temperature detector (RTD).

Secondary measurement possibilities

No need to stop at three measurements, but instead take advantage of the computing ability of the SITRANS FCT020 or FCT040 transmitters to make secondary measurements.

Volume flow rate

Both transmitters, FCT020 standard and FCT040 advanced, calculate volume flow from mass flow and density using the simple school physics formula: density = mass / volume.

FCT040 secondary measurements

Measurements below are available only with the SITRANS FCT040 advanced transmitter.

Standard concentration

Used for concentration measurements of emulsions or suspensions when fluid density depends largely on temperature.

The standard concentration measurement can be used for many low-concentration solutions if there is only minor interaction between the liquids or if the miscibility is negligible.

Fraction (advanced concentration)

Up to four pre-configured fraction ranges can be selected using the SITRANS FC option order codes from the table below.

Order code	Fraction description	Type	Range	Unit	Temperature range
G01	Sugar / water (sucrose solution)	Mass fraction	0 ... 85	°Bx	0 ... 80 °C (32 ... 176 °F)
G02	NaOH / water (sodium hydroxide solution)	Mass fraction	2 ... 50	%	0 ... 100 °C (32 ... 212 °F)
G03	KOH / water (potassium hydroxide solution)	Mass fraction	0 ... 60	%	54 ... 100 °C (129 ... 212 °F)
G04	NH_4NO_3 / water (ammonium nitrate solution)	Mass fraction	1 ... 50	%	0 ... 80 °C (32 ... 176 °F)
G05	NH_4NO_3 / water (ammonium nitrate solution)	Mass fraction	20 ... 70	%	20 ... 100 °C (68 ... 212 °F)
G06	HCl / water (hydrochloric acid)	Mass fraction	22 ... 34	%	20 ... 40 °C (68 ... 104 °F)
G07	HNO_3 / water (nitric acid)	Mass fraction	50 ... 67	%	10 ... 60 °C (50 ... 140 °F)
G09	H_2O_2 / water (hydrogen peroxide)	Mass fraction	30 ... 75	%	4 ... 44 °C (39 ... 111 °F)
G10	Ethylene glycol / water (homogenous mixture)	Mass fraction	10 ... 50	%	-20 ... +40 °C (-4 ... +104 °F)
G11	Amylum (starch) / water (paste-like suspension)	Mass fraction	33 ... 43	%	35 ... 45 °C (95 ... 113 °F)
G12	Methanol / water (homogenous mixture)	Mass fraction	35 ... 60	%	0 ... 40 °C (32 ... 104 °F)
G20	Alcohol / water (homogenous mixture)	Volume fraction	55 ... 100	%	10 ... 40 °C (50 ... 104 °F)
G21	Sugar / water (sucrose solution)	Mass fraction	40 ... 80	°Bx	75 ... 100 °C (167 ... 212 °F)
G30	Alcohol / water (homogenous mixture)	Mass fraction	66 ... 100	%	15 ... 40 °C (59 ... 104 °F)
G37	Alcohol / water (homogenous mixture)	Mass fraction	66 ... 100	%	10 ... 40 °C (50 ... 104 °F)

Fraction A & B volume flow rate (net flow computing)

Example: In an alcohol application the net volume flow rate of each component of the mixture can be displayed and transmitted. So, volume flow of ethanol (fraction A) and volume flow of water (fraction B) are both available.

Fraction A & B mass flow rate (net flow computing)

Like the volume example but with mass flow units for each fraction.

Petroleum measurement function / Net oil computing (NOC)

The NOC function provides real-time measurements of water cut and includes American Petroleum Institute (API) correction according to API MPMS Chapter 11.1.

Oil sometimes contains entrained gas. SITRANS FC meters measure the density of the combined emulsion oil and gas, which is lower than the oil density. The NOC function includes a Gas Void Fraction (GVF) parameter to be set.

Viscosity measurement

Viscosity is sometimes used as reference value to activate other processes like fluid heating systems.

The viscosity estimation is calculated based on a comparison between measured pressure loss and a calculated value between two points of the pipe. A differential pressure transmitter is required to use this function. Its output is connected to the analog input of the

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Function (continued)

FCT040. Based on an iteration process, a viscosity value is determined.

Thermal energy calculation (heat quantity measurement)

Either a constant value of the calorific value of the fluid can be used, or an additional device like a gas chromatograph can provide the instantaneous calorific value via the analog input of the FCT040 transmitter.

Based on the fluid flow, the total calorific energy of the fluid is calculated.

Additional functions available with SITRANS FC Coriolis flowmeters

Tube health check

This feature is available in both transmitters, FCT020 and FCT040.

Tube health check monitors key diagnostics, including tube stiffness, driver and pickups. Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout, or solid deposits building up in the tubes. The user defines verification frequency and alarm behavior. Verification results indicate whether preventive maintenance action is required.

Six totalizers

A maximum of six totalizers can be used on the device to provide accumulation of process flow variables, including:

- Mass flow
- Volume flow
- Corrected volume flow
- Energy

When a concentration option has been selected in the order code, additional variables can be assigned to the totalizers:

- Net mass flow, component A or B
- Net volume flow, component A or B
- Net corrected volume flow

Universal power supply

Single power supply compatible with DC and AC supply voltage

Easy Setup Wizard

For the most important functions, there is a wizard menu to help set up common parameters used in many applications, such as date, installation, display, outputs and totalizers.

Event Management

According to NAMUR NE107

Batch control

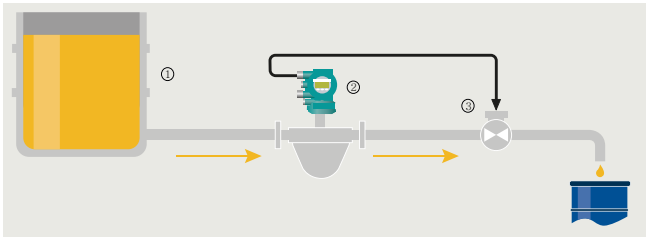
Batching and filling processes are found in many industries: food and beverage, cosmetic, pharmaceutical, oil and gas, and chemical.

SITRANS FCT040 transmitters offer an integrated batching function to carry out the task. A self-learning algorithm optimizes the process to provide accurate and reliable results.

The function supports two filling modes:

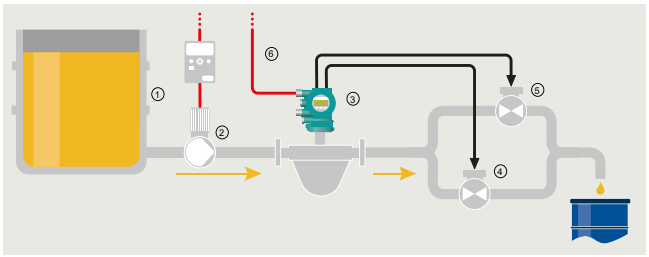
- Single-stage batch control with single valve
- Two-stage batching to control two valves for more accurate filling

The error management function allows the user to set alarms and warnings according to the application.



Example diagram for 1-stage batching

1	Storage tank
2	SITRANS FC
3	Valve



Example diagram for 2-stage batching

1	Storage tank
2	Pump
3	SITRANS FC
4	Valve A
5	Valve B
6	HART

For questions regarding a specific application, contact your regional Siemens Measurement Intelligence team.

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Technical specifications

Mass flow rate of liquids

The mass flow rate characteristics of SITRANS FC meters are defined by the values of zero stability, Q_{flat}, Q_{nom} and Q_{max}.

Zero stability is the maximum allowable flow rate value that can be displayed at zero flow under reference conditions. It is a good indicator of the meter performance as flow rates reduce, and approach zero.

Q_{flat} is the mass flow rate above which the base accuracy is maintained (0.1% when using FCT040 transmitters).

Q_{nom} is the nominal mass flow rate of water at reference conditions that would result in a pressure drop of 1 bar (15 psi).

Q_{max} is the recommended maximum mass flow rate for each sensor size.

FCS100: the precision sensor for low flow rates

Nominal size	Zero stability		Q_{flat}		Q_{nom}		Q_{max}	
	kg/h	lb/h	kg/h	lb/min	kg/h	lb/min	kg/h	lb/min
DN 1	0.003	0.007	2.52	0.092	21.0	0.0771	40.0	1.47
DN 2	0.005	0.011	4.50	0.165	45.0	1.65	94.0	3.45
DN 4	0.009	0.020	14.0	0.514	170	6.24	300	11.0
DN 6	0.019	0.042	30.0	1.10	370	13.6	600	22.0
DN 8	0.048	0.106	79.0	2.90	950	34.9	1 500	55.1

FCS500: the universal sensor for standard and hygienic applications

Nominal size	Zero stability		Q_{flat}		Q_{nom}		Q_{max}	
	kg/h	lb/h	kg/h	lb/min	kg/h	lb/min	kg/h	lb/min
DN 10	0.032	0.070	80.0	2.94	1 600	58.7	2 300	84.4
DN 15	0.090	0.198	235	8.62	4 700	172	7 000	257
DN 25	0.400	0.880	1 000	36.7	20 000	734	29 000	1 064
DN 50	2.55	5.61	2 550	93.6	51 000	1872	76 000	2 789
DN 80	8.50	18.7	8 500	312	170 000	6239	255 000	9 359

FCS600: the resistant sensor for high pressure, high temperature, cryogenic and corrosive liquids

Nominal size	Zero stability		Q_{flat}		Q_{nom}		Q_{max}	
	kg/h	lb/h	kg/h	lb/min	kg/h	lb/min	kg/h	lb/min
DN 2	0.005	0.011	4.00	0.147	45.0	1.65	94.0	3.45
DN 4	0.018	0.040	14.0	0.514	170	6.24	300	11.0
DN 15	0.150	0.330	250	9.18	3 000	110	5 000	184
DN 25	0.500	1.10	830	30.5	10 000	367	17 000	624
DN 40	1.60	3.52	2 670	98.0	32 000	1 174	50 000	1 835
DN 65	5.00	11.0	8 330	306	100 000	3 670	170 000	6 239

FCS700: the grande sensor for high flow rates

Nominal size	Zero stability		Q_{flat}		Q_{nom}		Q_{max}	
	kg/h	lb/h	kg/h	lb/min	kg/h	lb/min	kg/h	lb/min
DN 100	13.0	28.6	20 000	734	250 000	9 175	300 000	11 010
DN 150	25.0	55.0	38 000	1 395	500 000	18 350	600 000	22 020
DN 200	27.0	59.4	45 000	1 652	900 000	33 030	1 100 000	40 370

Volumetric liquid flow characteristics and gas flow capability

When measuring volume flow rate and gas flow rates, fluid properties will influence the selection of sensor type and size. Please contact your regional Siemens Measurement Intelligence team for further assistance. Based on your application details, they will be able to provide suitable sizing and selection advice.

Mass flow calibration and density adjustment for liquids

Siemens SITRANS FC Coriolis meters are calibrated in rigs accredited according to the international standard DIN EN ISO/IEC 17025:2018. Each flowmeter comes with a standard calibration certificate.

Mass flow calibration takes place at reference conditions. Specific values are listed in the standard calibration certificate.

Mass flow calibration reference conditions	
Fluid	Water
Density	900 ... 1 100 kg/m³ (56 ... 69 lb/ft³)
Fluid temperature	10 ... 35 °C (50 ... 95 °F), average temperature: 22.5 °C (72.5 °F)
Ambient temperature	10 ... 35 °C (50 ... 95 °F)
Process pressure	1 ... 5 bar (15 ... 73 psi)

Liquid density calibration is performed when density accuracy of 0.5 kg/m³ (0.03 lb/ft³) is selected in the model code.

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Technical specifications (continued)

Density calibration reference conditions	
Flow condition	Fully developed flow profile
Fluid densities used to obtain density calibration constants	700 kg/m³ (44 lb/ft³) 1 000 kg/m³ (62 lb/ft³) 1 650 kg/m³ (103 lb/ft³)
Fluid temperature	20 °C (68 °F)
Determination of temperature compensation coefficients	20 ... 80 °C (68 ... 176 °F)

Performance specifications

SITRANS FCS100: the precision sensor for low flow applications

Sensor size			DN 1	DN 2	DN 4	DN 6	DN 8
Mass flow (liquids)							
Accuracy	% (of rate)	FCT020	±0.2	±0.2	±0.2	±0.2	±0.2
	% (of rate)	FCT040	±0.2	±0.2	±0.1	±0.1	±0.1
Zero stability	kg/h (lb/h)		±0.003 (0.007)	±0.005 (0.011)	±0.009 (0.02)	±0.019 (0.042)	±0.048 (0.106)
Density (liquids)							
Accuracy	kg/m³ (lb/ft³)	FCT020	±20 (1.25)	±8 (0.5)	±4 (0.25)	±4 (0.25)	±4 (0.25)
	kg/m3 (lb/ft³)	FCT040	±20 (1.25)	±8 (0.5)	±1 (0.06)	±0.5 (0.03)	±0.5 (0.03)
Mass flow (gases)							
Accuracy	% (of rate)	FCT020	±0.75	±0.75	±0.75	±0.75	±0.75
	% (of rate)	FCT040	±0.5	±0.5	±0.5	±0.5	±0.5
Temperature							
Accuracy	°C (°F)		±0.5 (0.9)	±0.5 (0.9)	±0.5 (0.9)	±0.5 (0.9)	±0.5 (0.9)

SITRANS FCS500: the universal sensor for routine and hygienic applications

Sensor size			DN 10	DN 15	DN 25	DN 50	DN 80
Mass flow (liquids)							
Accuracy	% (of rate)	FCT020	±0.2	±0.2	±0.2	±0.2	±0.2
	% (of rate)	FCT040	±0.1	±0.1	±0.1	±0.1	±0.1
Zero stability	kg/h (lb/h)		±0.032 (0.07)	±0.09 (0.198)	±0.4 (0.88)	±2.55 (5.61)	±8.5 (18.7)
Density (liquids)							
Accuracy	kg/m³ (lb/ft³)	FCT020	±4 (0.25)	±4 (0.25)	±4 (0.25)	±4 (0.25)	±4 (0.25)
	kg/m³ (lb/ft³)	FCT040	±0.5 (0.03)	±0.5 (0.03)	±0.5 (0.03)	±0.5 (0.03)	±1 (0.06)
Mass flow (gases)							
Accuracy	% (of rate)	FCT020	±0.75	±0.75	±0.75	±0.75	±0.75
	% (of rate)	FCT040	±0.35	±0.35	±0.35	±0.35	±0.35
Temperature							
Accuracy	°C (°F)		±1 (1.8)	±1 (1.8)	±1 (1.8)	±1 (1.8)	±1 (1.8)

SITRANS FCS600: the resistant sensor for high pressure, high temperature, cryogenic and corrosive liquids

Sensor size			DN 2	DN 4	DN 15	DN 25	DN 40	DN 65
Mass flow (liquids)								
Accuracy	% (of rate)	FCT020	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2
	% (of rate)	FCT040	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1
Zero stability	kg/h (lb/h)		±0.005 (0.011)	±0.018 (0.44)	±0.15 (0.33)	±0.5 (1.1)	±1.6 (3.52)	±5 (11)
Density (liquids)								
Accuracy	kg/m³ (lb/ft³)	FCT020	±8 (0.5)	±4 (0.25)	±4 (0.25)	±4 (0.25)	±4 (0.25)	±4 (0.25)
	kg/m3 (lb/ft³)	FCT040	±8 (0.5)	±1 (0.06)	±0.5 (0.03)	±0.5 (0.03)	±0.5 (0.03)	±0.5 (0.03)
Mass flow (gases)								
Accuracy	% (of rate)	FCT020	±0.75	±0.75	±0.75	±0.75	±0.75	±0.75
	% (of rate)	FCT040	±0.5	±0.5	±0.35	±0.35	±0.35	±0.35
Temperature								
Accuracy	°C (°F)		±0.5 (0.9)	±0.5 (0.9)	±0.5 (0.9)	±0.5 (0.9)	±0.5 (0.9)	±0.5 (0.9)

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Technical specifications (continued)

FCS700: the grande sensor for high flow rates

Sensor size			DN 100	DN 150	DN 200
Mass flow (liquids)					
Accuracy	% (of rate)	FCT020	±0.2	±0.2	±0.2
	% (of rate)	FCT040	±0.1	±0.1	±0.1
Zero stability	kg/h (lb/h)		±13 (28.6)	±25 (55)	±27 (59.4)
Density (liquids)					
Accuracy	kg/m³ (lb/ft³)	FCT020	±4 (0.25)	±4 (0.25)	±4 (0.25)
	kg/m³ (lb/ft³)	FCT040	±2 (0.12)	±2 (0.12)	±2 (0.12)
Mass flow (gases)					
Accuracy	% (of rate)	FCT020	±0.75	±0.75	±0.75
	% (of rate)	FCT040	±0.35	±0.35	±0.5
Temperature					
Accuracy	°C (°F)		±1 (1.8)	±1 (1.8)	±1 (1.8)

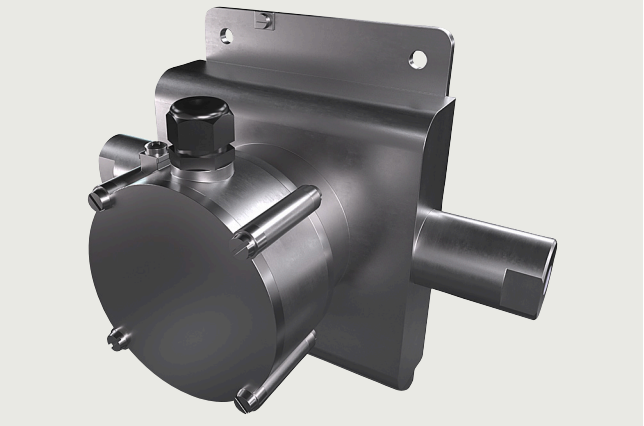
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Overview

SITRANS FCS100 sensor is the precision Coriolis flow sensor for low flow applications.

Features:

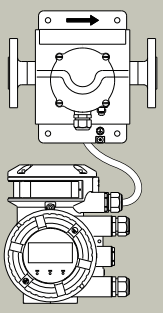
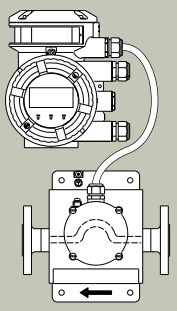
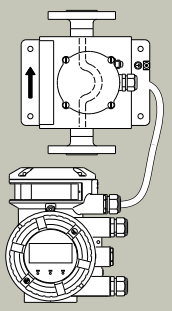
- Possibly the most compact dual curve Coriolis flow sensor
- Nominal sizes: DN 1 to DN 8
- Process connection: flange, thread, or hygienic clamp
- Install in tight spaces with no inlet and outlet restrictions
- Sizes to suit pilot plants, R&D labs, and high value fluid additives
- FCS100 sensors always combine with a remote transmitter via a connecting cable
- Installation of sensor and transmitter in different locations



FCS100 sensor

Design

Sensor installation position related to type of fluid

Installation position	Fluid	Description
Position 1 	Liquid	• Horizontal • Measuring tubes below process pipe • Avoids accumulation of entrained gas
Position 2 	Gas	• Horizontal • Measuring tubes above process pipe • Accumulation of liquid or condensate is less likely
Position 3 	Gas / Liquid	• Vertical • Upwards direction of flow • In liquid application accumulation of entrained gas is avoided • This position allows self-draining in liquid flow

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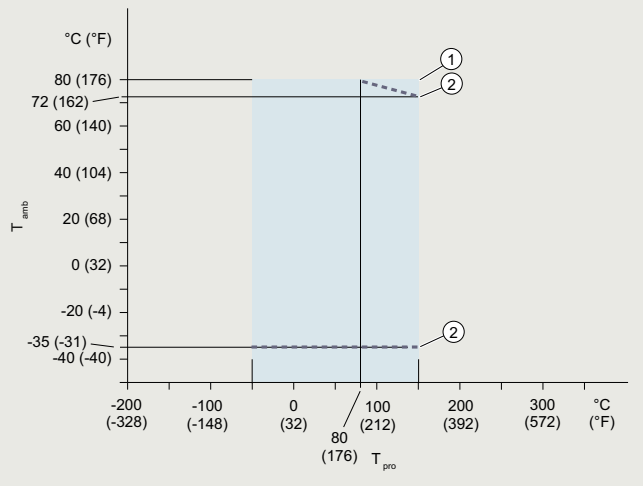
Technical specifications

Allowed ambient temperature for FCS100 sensors

The allowed combinations of process fluid and ambient temperature for the sensor are illustrated as light areas in the diagrams below.

Standard temperature specification, remote type

(except versions with hygienic clamp process connections)

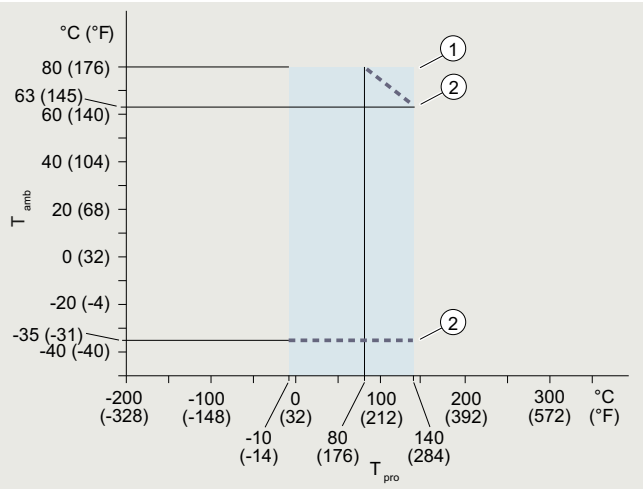


Allowed process fluid and ambient temperatures, remote type (except hygienic clamp process connections)

1	Standard cable option
2	Limitation for fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Standard temperature specification, remote type

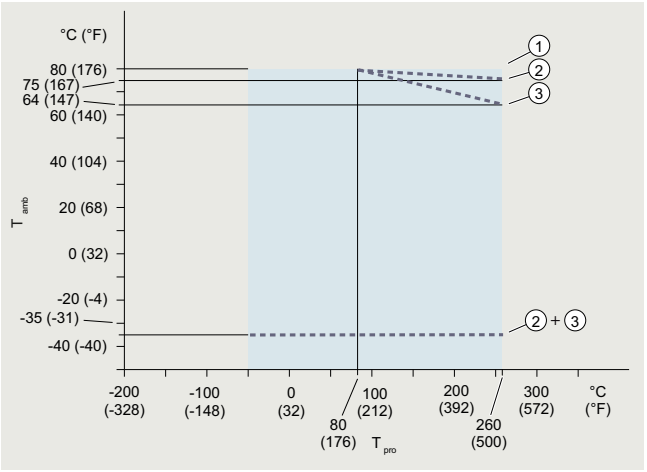
(versions with hygienic clamp process connection versions only)



Allowed process fluid and ambient temperatures, remote type (hygienic clamp process connections only)

1	Standard cable option
2	Limitation for fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Medium temperature specification, remote type



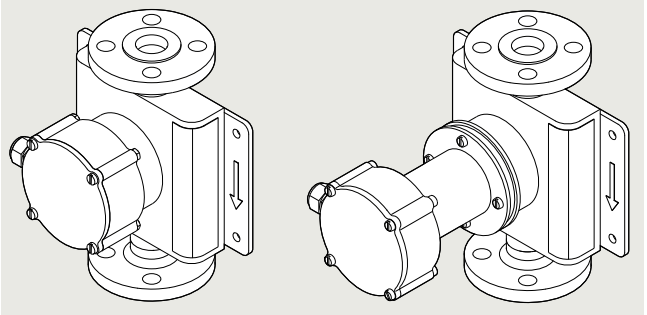
Allowed process fluid and ambient temperatures

1	Standard cable option
2	Fire retardant cable without insulation options
3	Fire retardant cable with insulation options *JXX*
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Mechanical specifications of FCS100 sensors

The FCS100 sensor is available in standard neck and long neck designs. The neck can also be described as the pedestal connecting the sensor body to the terminal housing.

When configuring FCS100 sensors with medium range temperature specification (up to 260 °C (500 °F)), it is compulsory to select long neck options. Order code position 14 (Mounting style, Transmitter housing and material) includes the neck options.



FCS100 sensor with standard neck and long neck designs

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Technical specifications (continued)

Materials

Material specifications		
Wetted parts[1]		
Process connections	AISI 316L stainless steel, mat. no. 1.4404	
Measuring tubes	alloy 22/2.4602	
Sensor housing		
Junction box	AISI 316L stainless steel	Mat. no. 1.4404
Neck	similar to ASTM CF-8 cast stainless steel	Mat. no. 1.4308
Body	AISI 304 stainless steel	Mat. no. 1.4301 (order code option B01)
	AISI 316L stainless steel	Mat. no. 1.4404 (order code option B02)
Nameplates[2]	**Process temperature range**	**Material**
Sensor with AISI 304 stainless steel housing	Standard, up to 150 °C (302 °F)	Polyester film
Sensor with AISI 304 stainless steel housing	Medium, up to 260 °C (500 °F)	AISI 316L ss
Sensor with AISI 316L stainless steel housing	All	AISI 316L ss

1) The user is responsible to ensure chemical compatibility of the material of the wetted parts with the measured process fluid.
2) Nameplate material depends on the materials selected for SITRANS FC sensors.

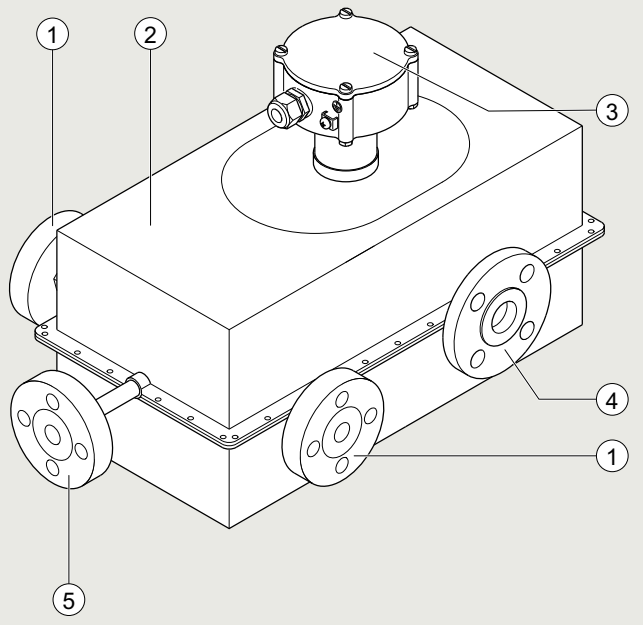
Secondary containment

Some applications or environment conditions require secondary containment retaining the process pressure for increased safety. SITRANS FCS100 sensors have a secondary containment filled with inert gas.

Typical burst pressure at room temperature for sizes	65 bar (942 psi)

Insulation and heat tracing

In cases where fluid temperature deviates more than 80 °C from ambient temperature, sensor insulation is recommended to avoid negative effects from temperature fluctuations.



Configuration of FCS100 sensor with insulation and heat tracing

1	Heating tracing connection
2	Insulation
3	Sensor terminal box
4	Process connection
5	Purging connection

Maximum temperature of heat carrier

Order code position 12	Process temperature range	Temperature range of heat carrier
1	Standard, up to 150 °C (302 °F)	0 ... 150 °C (32 ... 302 °F)
2	Medium, up to 260 °C (500 °F)	0 ... 200 °C (32 ... 392 °F)

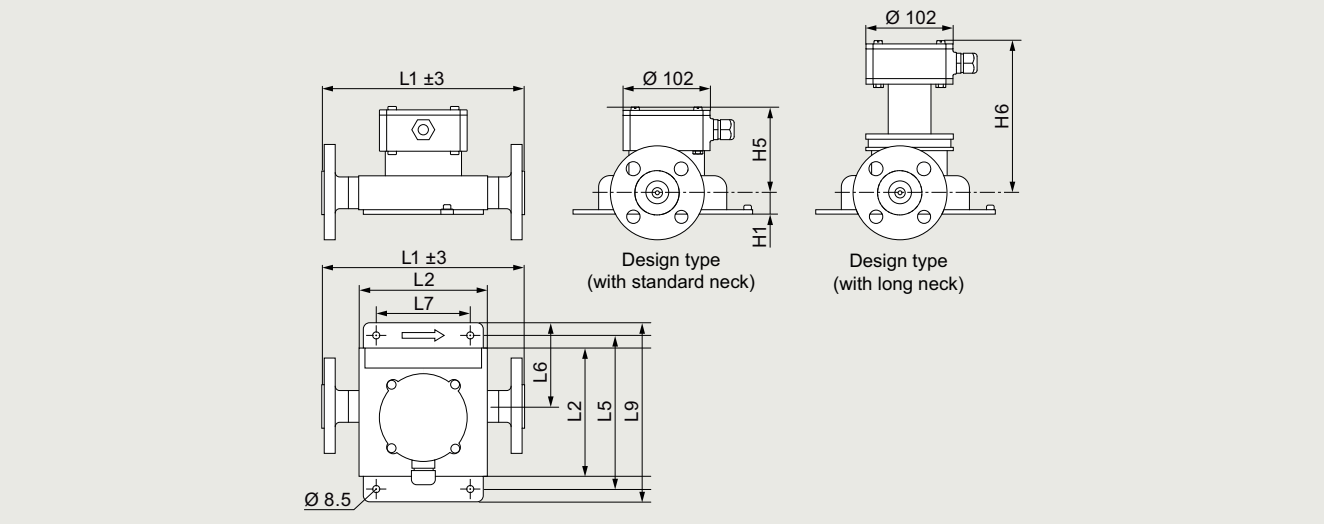
Insulation and heat tracing may be installed by the user but not in hazardous areas and the following must be noted:

- Do not insulate sensor terminal box.
- Do not expose transmitters to ambient temperatures exceeding 60 °C (140 °F)
- The preferred insulation is 60 mm (2.36 inch) thick with a heat transfer coefficient of 0.4 W/m² K (0.07 Btu/ ft² °F)

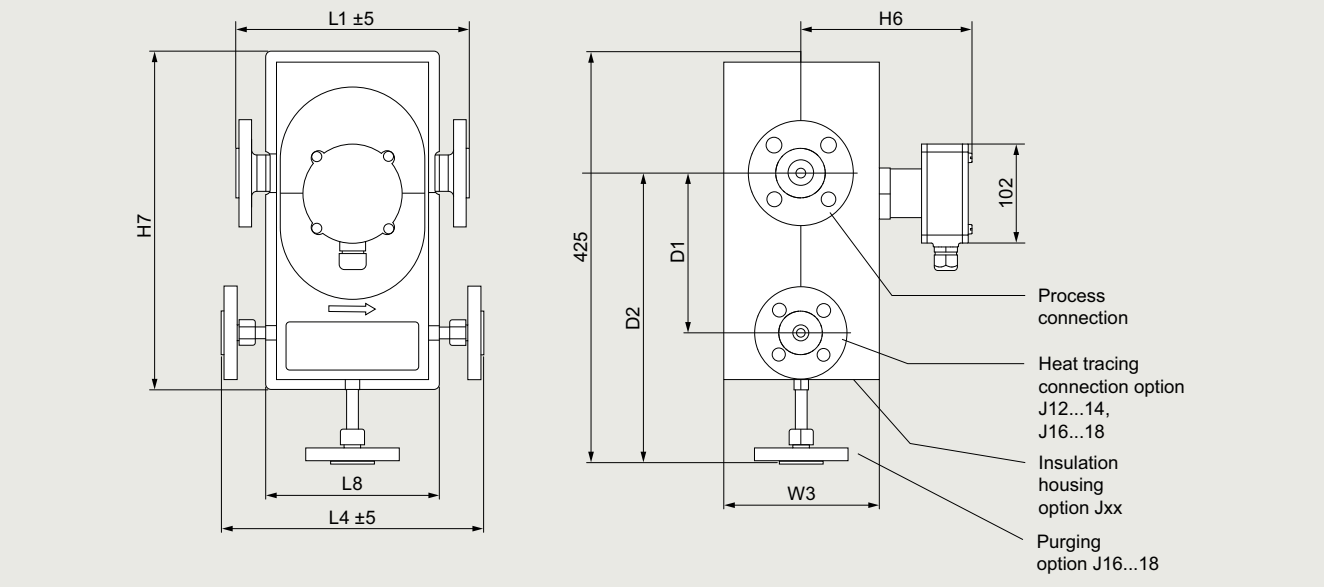
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Dimensional drawings

Drawings, dimensions and weight for FCS100 sensors



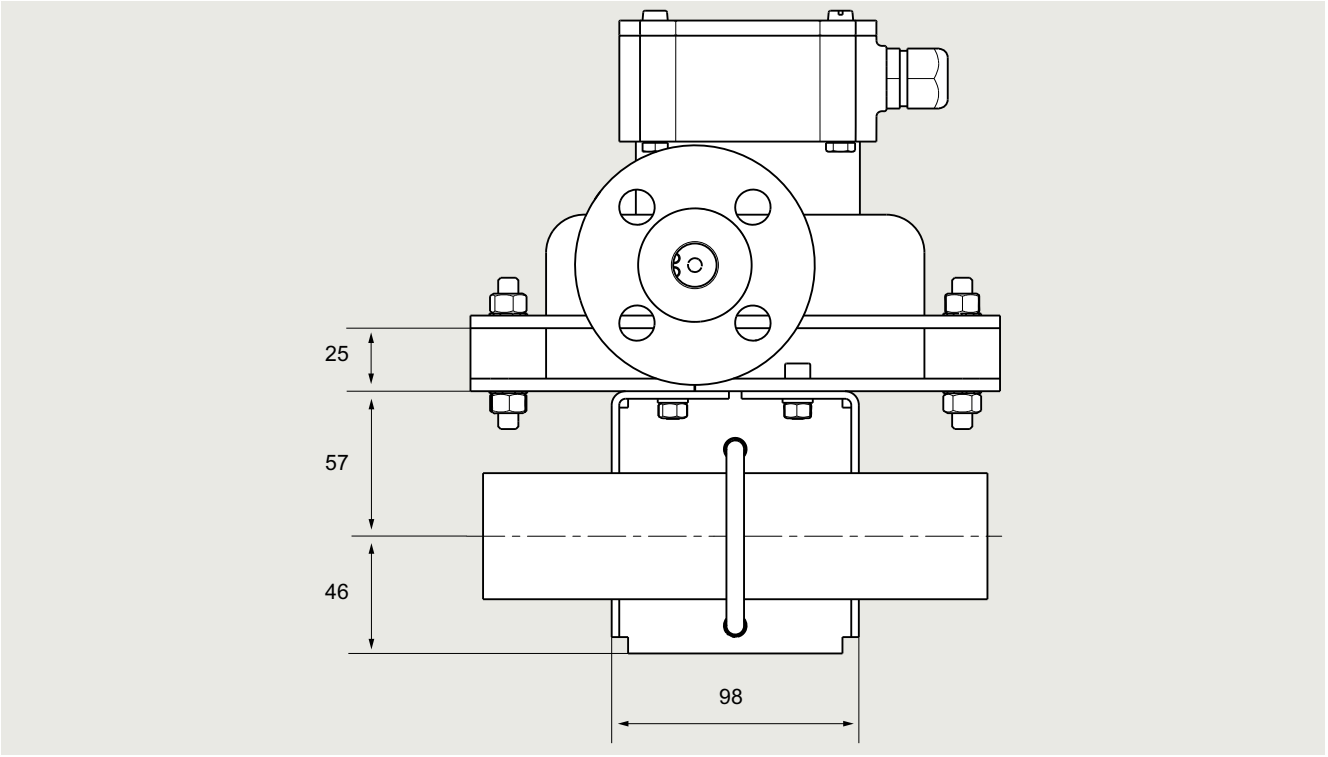
FCS100 sensor, dimensions in mm



FCS100 with insulation housing, dimensions in mm

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Dimensional drawings (continued)



FCS100 with optional pipe mounting bracket, dimensions in mm

FCS100 sensor dimensions

Nominal size	L2	L4	L5	L6	L7	L8	L9
	Dimensions in mm (inch)						
DN 1	150 (5.9)	270 (10.6)	180 (7.1)	111 (4.4)	110 (4.3)	180 (7.1)	210 (8.3)
DN 2	150 (5.9)	270 (10.6)	180 (7.1)	111 (4.4)	110 (4.3)	180 (7.1)	210 (8.3)
DN 4	150 (5.9)	270 (10.6)	180 (7.1)	99 (3.9)	110 (4.3)	180 (7.1)	210 (8.3)
DN 6	150 (5.9)	270 (10.6)	180 (7.1)	89 (3.5)	110 (4.3)	180 (7.1)	210 (8.3)
DN 8	150 (5.9)	270 (10.6)	180 (7.1)	55 (2.2)	110 (4.3)	180 (7.1)	210 (8.3)

Nominal size	H1	H3	H5	H6	H7	W3	D1	D2
	Dimensions in mm (inch)							
DN 1	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 2	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 4	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 6	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 8	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to ASME B16.5 (ISI 216 / AISI 316L)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 150, raised face (RF)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)
ASME ½" class 300, raised face (RF)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)
ASME ½" class 600, raised face (RF)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)
ASME ½" class 600, ring joint (RJ)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)
ASME ½" class 900, raised face (RF)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)
ASME ½" class 900, ring joint (RJ)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)
ASME ½" class 1500, raised face (RF)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)
ASME ½" class 1500, ring joint (RJ)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)
ASME 1" class 150, raised face (RF)	n/a	n/a	240 (9.4)	7.1 (16)	240 (9.4)	7.1 (16)	240 (9.4)	7.1 (16)	240 (9.4)	7.1 (16)
ASME 1" class 300, raised face (RF)	n/a	n/a	240 (9.4)	8.1 (18)	240 (9.4)	8.1 (18)	240 (9.4)	8.1 (18)	240 (9.4)	8.1 (18)
ASME 1" class 600, raised face (RF)	n/a	n/a	260 (10.2)	8.5 (19)	260 (10.2)	8.5 (19)	260 (10.2)	8.5 (19)	260 (10.2)	8.5 (19)
ASME 1" class 600, ring joint (RJ)	n/a	n/a	260 (10.2)	8.6 (19)	260 (10.2)	8.6 (19)	260 (10.2)	8.6 (19)	260 (10.2)	8.6 (19)
ASME 1" class 900, raised face (RF)	n/a	n/a	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)
ASME 1" class 900, ring joint (RJ)	n/a	n/a	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)
ASME 1" class 1500, raised face (RF)	n/a	n/a	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)
ASME 1" class 1500, ring joint (RJ)	n/a	n/a	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)
ASME 1½" class 150, raised face (RF)	n/a	n/a	250 (9.8)	8 (18)	250 (9.8)	8 (18)	250 (9.8)	8 (18)	250 (9.8)	8 (18)
ASME 1½" class 300, raised face (RF)	n/a	n/a	250 (9.8)	10.3 (23)	250 (9.8)	10.3 (23)	250 (9.8)	10.3 (23)	250 (9.8)	10.3 (23)
ASME 1½" class 600, raised face (RF)	n/a	n/a	270 (10.6)	11.7 (26)	270 (10.6)	11.7 (26)	270 (10.6)	11.7 (26)	270 (10.6)	11.7 (26)
ASME 1½" class 600, ring joint (RJ)	n/a	n/a	270 (10.6)	11.6 (26)	270 (10.6)	11.6 (26)	270 (10.6)	11.6 (26)	270 (10.6)	11.6 (26)
ASME 1½" class 900, raised face (RF)	n/a	n/a	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)
ASME 1½" class 900, ring joint (RJ)	n/a	n/a	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)
ASME 1½" class 1500, raised face (RF)	n/a	n/a	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)
ASME 1½" class 1500, ring joint (RJ)	n/a	n/a	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)

L1 dimension and weight with process connections according to EN 1092-1 (AISI 316L)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 40 type B1, raised face (RF)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)
EN DN 15 PN 40 type D, with groove	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)
EN DN 15 PN 40 type E, with spigot	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)
EN DN 15 PN 40 type F, with recess	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)
EN DN 15 PN 100 type B1, raised face (RF)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)
EN DN 15 PN 100 type D, with groove	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)
EN DN 15 PN 100 type E, with spigot	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)

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Dimensional drawings (continued)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 100 type F, with recess	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)
EN DN 25 PN 40 type B1, raised face (RF)	n/a	n/a	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)
EN DN 25 PN 40 type D, with groove	n/a	n/a	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)
EN DN 25 PN 40 type E, with spigot	n/a	n/a	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)
EN DN 25 PN 40 type F, with recess	n/a	n/a	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)
EN DN 25 PN 100 type B1, raised face (RF)	n/a	n/a	260 (10.2)	10.3 (23)	260 (10.2)	10.3 (23)	260 (10.2)	10.3 (23)	260 (10.2)	10.3 (23)
EN DN 25 PN 100 type D, with groove	n/a	n/a	260 (10.2)	10.2 (22)	260 (10.2)	10.2 (22)	260 (10.2)	10.2 (22)	260 (10.2)	10.2 (22)
EN DN 25 PN 100 type E, with spigot	n/a	n/a	260 (10.2)	9.7 (21)	260 (10.2)	9.7 (21)	260 (10.2)	9.7 (21)	260 (10.2)	9.7 (21)
EN DN 25 PN 100 type F, with recess	n/a	n/a	260 (10.2)	10.1 (22)	260 (10.2)	10.1 (22)	260 (10.2)	10.1 (22)	260 (10.2)	10.1 (22)
EN DN 40 PN 40 type B1, raised face (RF)	n/a	n/a	240 (9.4)	9.2 (20)	240 (9.4)	9.2 (20)	240 (9.4)	9.2 (20)	240 (9.4)	9.2 (20)
EN DN 40 PN 40 type D, with groove	n/a	n/a	240 (9.4)	9.1 (20)	240 (9.4)	9.1 (20)	240 (9.4)	9.1 (20)	240 (9.4)	9.1 (20)
EN DN 40 PN 40 type E, with spigot	n/a	n/a	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)
EN DN 40 PN 40 type F, with recess	n/a	n/a	240 (9.4)	9.0 (20)	240 (9.4)	9.0 (20)	240 (9.4)	9.0 (20)	240 (9.4)	9.0 (20)
EN DN 40 PN 100 type B1, raised face (RF)	n/a	n/a	320 (12.6)	13.7 (30)	320 (12.6)	13.7 (30)	320 (12.6)	13.7 (30)	320 (12.6)	13.7 (30)
EN DN 40 PN 100 type D, with groove	n/a	n/a	320 (12.6)	13.6 (30)	320 (12.6)	13.6 (30)	320 (12.6)	13.6 (30)	320 (12.6)	13.6 (30)
EN DN 40 PN 100 type E, with spigot	n/a	n/a	320 (12.6)	13.2 (29)	320 (12.6)	13.2 (29)	320 (12.6)	13.2 (29)	320 (12.6)	13.2 (29)
EN DN 40 PN 100 type F, with recess	n/a	n/a	320 (12.6)	13.5 (30)	320 (12.6)	13.5 (30)	320 (12.6)	13.5 (30)	320 (12.6)	13.5 (30)

L1 dimension and weight with process connections according to JIS B 2220 (AISI 316 / AISI 316L)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 15 10K	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)
JIS DN 15 20K	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)
JIS DN 25 10K	n/a	n/a	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)
JIS DN 25 20K	n/a	n/a	240 (9.4)	8 (18)	240 (9.4)	8 (18)	240 (9.4)	8 (18)	240 (9.4)	8 (18)
JIS DN 40 10K	n/a	n/a	240 (9.4)	8.4 (19)	240 (9.4)	8.4 (19)	240 (9.4)	8.4 (19)	240 (9.4)	8.4 (19)
JIS DN 40 20K	n/a	n/a	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)

L1 dimension and weight with process connections according to NPT internal thread

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
¼" NPT	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
⅜" NPT	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
½" NPT	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
¾" NPT	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to G internal thread

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ¼ inch	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
G ⅜ inch	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
G ½ inch	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
G ¾ inch	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)

L1 dimension and weight with hygienic clamp process connections according to DIN 32676 series A

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series A DN 15	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)
DIN 32676 series A DN 25	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)
DIN 32676 series A DN 40	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)

L1 dimension and weight with hygienic clamp process connections according to DIN 32676 series C (Tri-clamp)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series C ½ inch	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)
DIN 32676 series C 1 inch	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)
DIN 32676 series C 1½ inch	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)

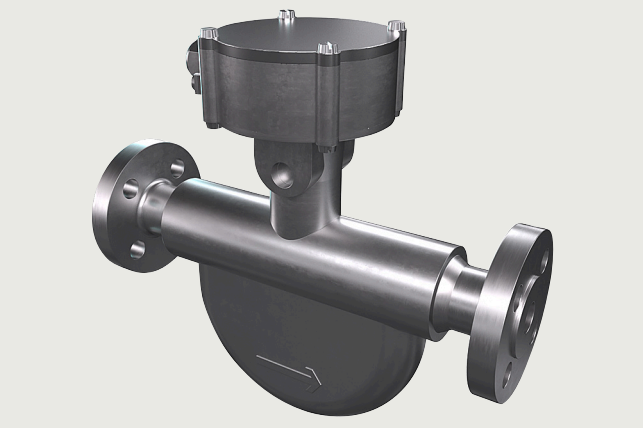
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Overview

SITRANS FCS500 sensor is the universal Coriolis flow sensor for routine and hygienic applications.

Features:

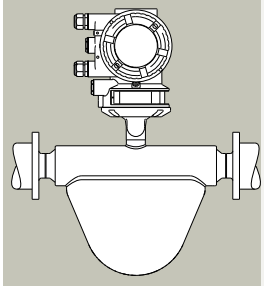
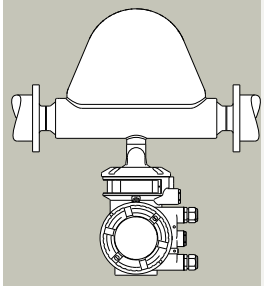
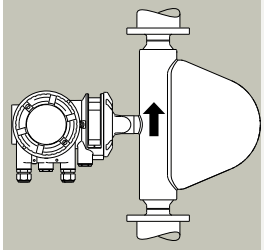
- Dual curved AISI 316L stainless steel tubes with polished option
- Nominal sizes: DN 10 to DN 80
- Process connection: flange, thread, or a selection of hygienic fittings
- Hygienic approvals for food, beverage, and pharmaceutical sectors
- Versatile solution with superior turndown and low pressure loss
- Combination with compact or remote transmitters



FCS500 sensor

Design

Sensor installation position related to type of fluid

Installation position	Fluid	Description
Position 1 	Liquid	• Horizontal • Measuring tubes below process pipe • Avoids accumulation of entrained gas
Position 2 	Gas	• Horizontal • Measuring tubes above process pipe • Accumulation of liquid or condensate is less likely
Position 3 	Gas / Liquid	• Vertical • Upwards direction of flow • In liquid application accumulation of entrained gas is avoided • This position allows self-draining in liquid flow

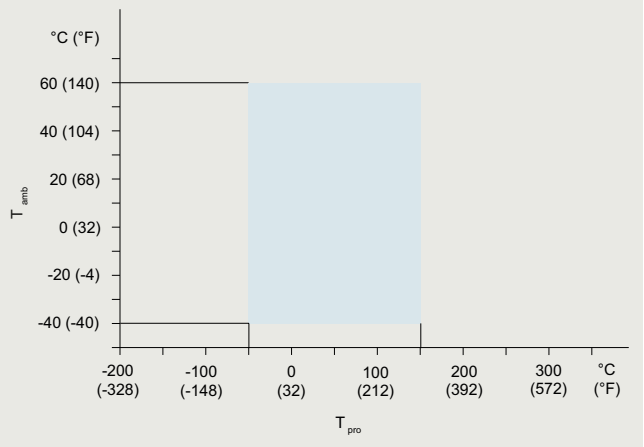
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Technical specifications

Allowed ambient temperature for FCS500 sensors

The allowed combinations of process fluid and ambient temperature for the sensor are illustrated as light areas in the diagrams below.

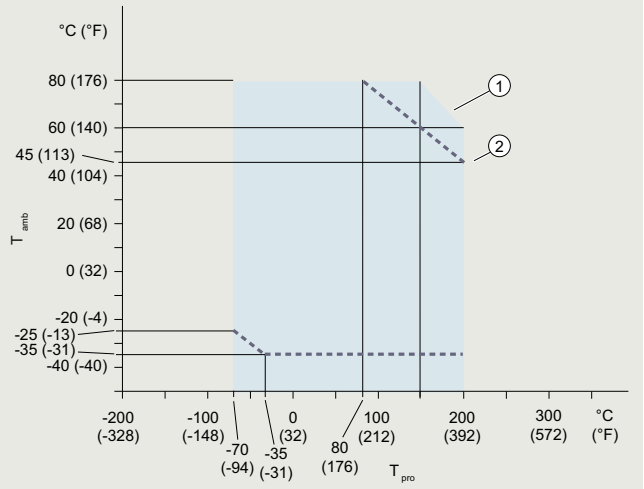
Standard temperature specification, non-hygienic version, compact transmitter



Allowed process fluid and ambient temperatures, compact type

T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

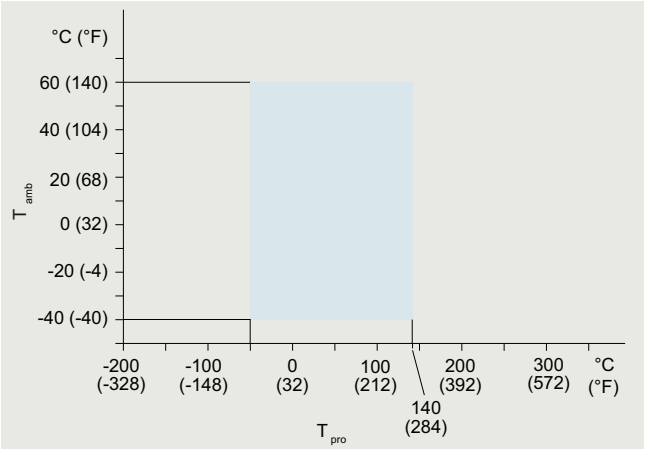
Standard temperature specification, non-hygienic version, remote transmitter



Allowed process fluid and ambient temperatures, non-hygienic, remote transmitter style

1	Standard cable option
2	Limitation for fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

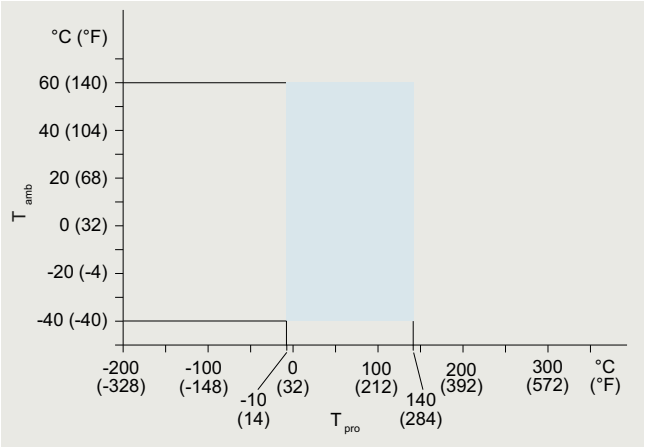
Standard temperature specification, hygienic version with threaded connections, compact transmitter



Allowed process fluid and ambient temperatures, threaded hygienic connections, compact transmitter

T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Standard temperature specification, hygienic version with clamp connections, compact transmitter



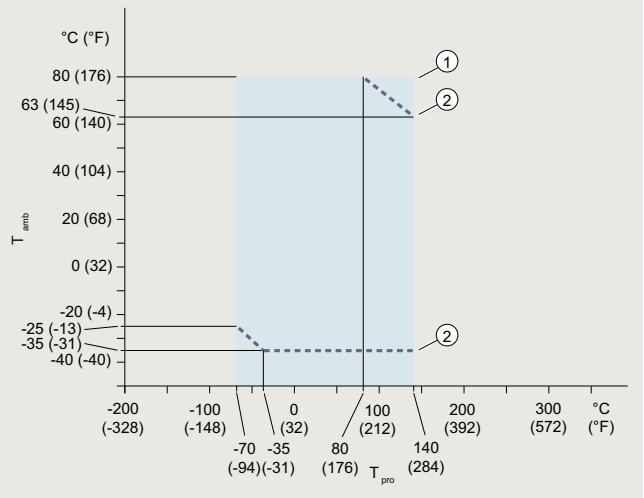
Allowed process fluid and ambient temperatures, clamp hygienic connections, compact transmitter

T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

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Technical specifications (continued)

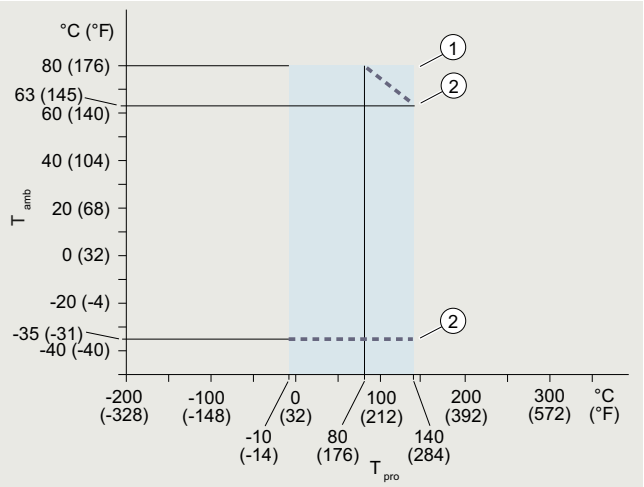
Standard temperature specification, hygienic version with threaded connections, remote transmitter



Allowed process fluid and ambient temperatures, threaded hygienic connections, remote transmitter

1	Standard cable option
2	Limitation for fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Standard temperature specification, hygienic version with clamp connections, remote transmitter

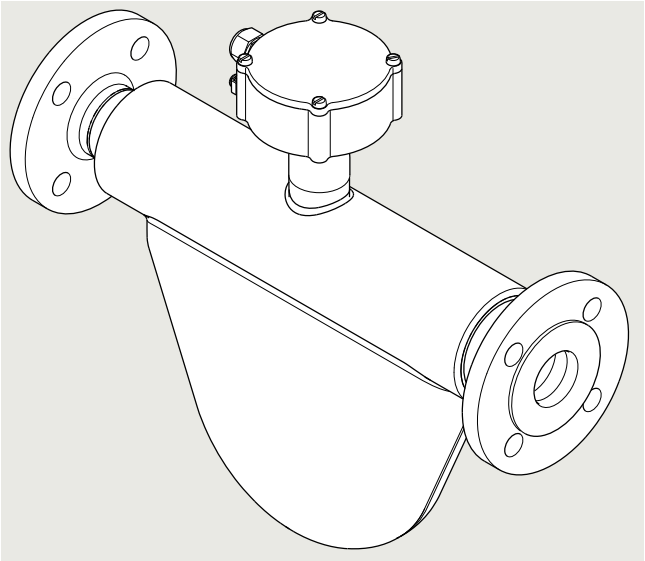


Allowed process fluid and ambient temperatures, hygienic clamp connections, remote transmitter

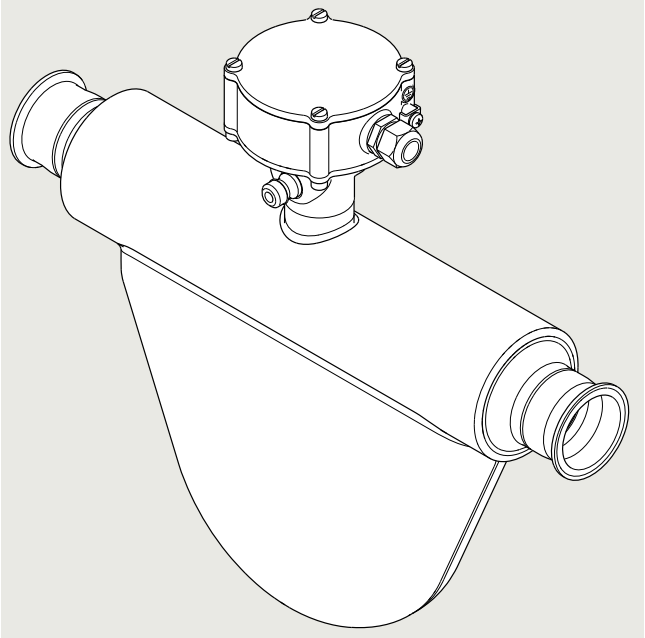
1	Standard cable option
2	Limitation for fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Mechanical specifications of FCS500 sensors

FCS500 sensors are available only with the standard neck design and can be combined with compact or remote transmitters. The neck can also be described as the pedestal connecting the sensor body to the transmitter or terminal housing.



FCS500 sensor (for remote transmitter) with standard neck, non hygienic version



FCS500 sensor (for remote transmitter) with standard neck, hygienic version

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Technical specifications (continued)

Material specifications		
Wetted parts[3]		
Measuring tubes (for sensors with hygienic process connections)	Surface roughness Ra ≤ 0.8 µm[1]	
Process connections	AISI 316L stainless steel, mat. no. 1.4404	
Sensor housing		
Junction box	AISI 316L stainless steel	Mat. no. 1.4404
Neck	similar to ASTM CF-8 cast stainless steel	Mat. no. 1.4308
Body	AISI 304 stainless steel	Mat. no. 1.4301
Nameplates[2]	**Process temperature range**	**Material**
Sensor with AISI 304 stainless steel housing	Standard, up to 150 °C (302 °F)	Polyester film

1) Other parts including the flow divider and process connections exhibit the same roughness.
2) Nameplate material depends on the materials selected for SITRANS FC sensors.
3) The user is responsible to ensure chemical compatibility of the material of the wetted parts with the measured process fluid.

Secondary containment

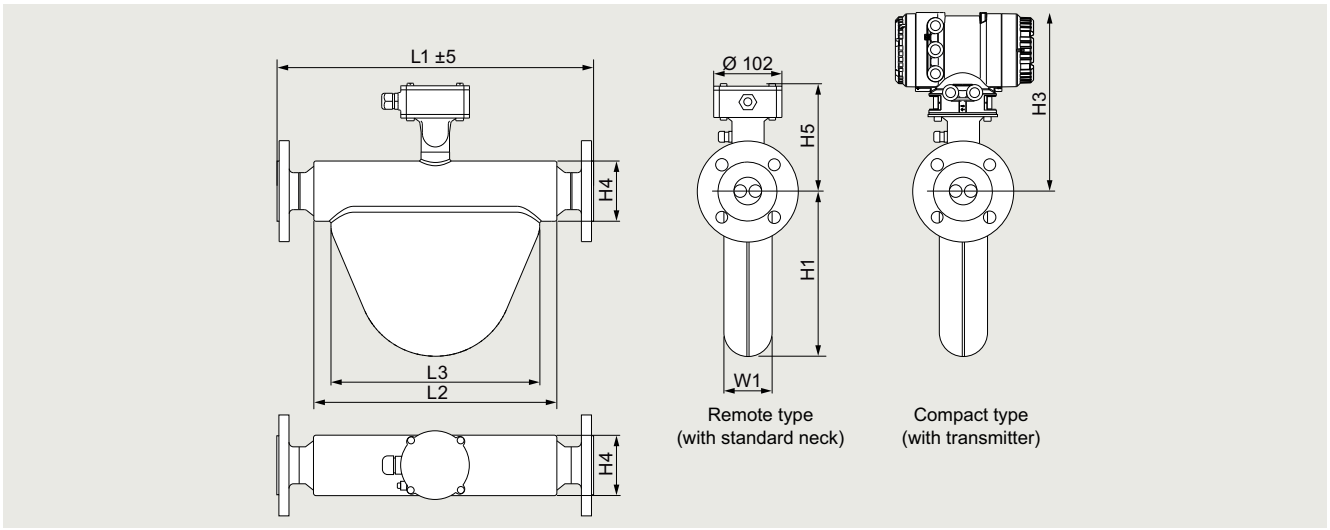
Some applications or environment conditions require secondary containment retaining the process pressure for increased safety. SITRANS FCS500 sensors have a secondary containment filled with inert gas.

Typical burst pressure at room temperature for sizes DN 10, DN 15, DN 25, and DN 50	49 bar (710 psi)
Typical burst pressure at room temperature for size DN 80	30 bar (435 psi)

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Dimensional drawings

Drawings, dimensions and weight for FCS500 sensors (non-hygienic versions)



FCS500 sensor non hygienic, dimensions in mm

FCS500 sensor dimensions (non-hygienic versions)

Nominal size	L2	L3	H1	H3	H4	H5	W1
	Dimensions in mm (inch)						
DN 10	190 (7.5)	165 (6.5)	117 (4.6)	268 (10.6)	56 (2.2)	138 (5.4)	42 (1.7)
DN 15	227 (8.9)	195 (7.7)	145 (5.7)	277 (10.9)	71 (2.8)	148 (5.8)	50 (2)
DN 25	361 (14.2)	310 (12.2)	245 (9.6)	289 (11.4)	90 (3.5)	159 (6.3)	72 (2.8)
DN 50	455 (17.9)	400 (15.7)	333 (13.1)	296 (11.7)	102 (4)	167 (6.6)	96 (3.8)
DN 80	682 (26.9)	620 (24.4)	482 (19)	330 (13)	168 (6.6)	201 (7.9)	150 (5.9)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb)

L1 dimension and weight with process connections according to ASME B16.5 (AISI 316/AISI 316L)

Process connection size and type	FCS500 sensor nominal size									
	DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 150, raised face (RF)	280 (11)	6 (13)	320 (12.6)	8 (18)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 300, raised face (RF)	280 (11)	6.4 (14)	320 (12.6)	8.4 (18)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, raised face (RF)	290 (11.4)	6.7 (15)	330 (13)	8.7 (19)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, ring joint (RJ)	290 (11.4)	6.6 (15)	330 (13)	8.6 (19)	n/a	n/a	n/a	n/a	n/a	n/a
ASME 1" class 150, raised face (RF)	280 (11)	6.9 (15)	320 (12.6)	8.9 (20)	490 (19.3)	15.7 (35)	n/a	n/a	n/a	n/a
ASME 1" class 300, raised face (RF)	280 (11)	7.9 (17)	320 (12.6)	9.9 (22)	490 (19.3)	16.7 (37)	n/a	n/a	n/a	n/a
ASME 1" class 600, raised face (RF)	300 (11.8)	8.3 (18)	340 (13.4)	10.3 (23)	500 (19.7)	17 (38)	n/a	n/a	n/a	n/a
ASME 1" class 600, ring joint (RJ)	300 (11.8)	8.4 (19)	340 (13.4)	10.4 (23)	500 (19.7)	17.2 (38)	n/a	n/a	n/a	n/a
ASME 1½" class 150, raised face (RF)	290 (11.4)	7.8 (17)	330 (13)	9.8 (22)	470 (18.5)	16.5 (36)	620 (24.4)	25.7 (57)	n/a	n/a
ASME 1½" class 300, raised face (RF)	290 (11.4)	10.1 (22)	330 (13)	12.1 (27)	480 (18.9)	19 (42)	620 (24.4)	28.1 (62)	n/a	n/a
ASME 1½" class 600, raised face (RF)	310 (12.2)	11.5 (25)	350 (13.8)	13.5 (30)	500 (19.7)	20 (44)	630 (24.8)	28.9 (64)	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 1½" class 600, ring joint (RJ)	310 (12.2)	11.4 (25)	350 (13.8)	13.4 (30)	500 (19.7)	20 (44)	630 (24.8)	29.1 (64)	n/a	n/a
ASME 2" class 150, raised face (RF)	n/a	n/a	n/a	n/a	480 (18,9)	18.1 (40)	580 (22.8)	26.8 (59)	n/a	n/a
ASME 2" class 300, raised face (RF)	n/a	n/a	n/a	n/a	480 (18,9)	19.7 (43)	580 (22.8)	28.3 (62)	n/a	n/a
ASME 2" class 600, raised face (RF)	n/a	n/a	n/a	n/a	510 (20.1)	21.3 (47)	610 (24)	30.5 (67)	n/a	n/a
ASME 2" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	510 (20.1)	21.8 (48)	610 (24)	30.3 (67)	n/a	n/a
ASME 2½" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	29.8 (66)	n/a	n/a
ASME 2½" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	31.3 (69)	n/a	n/a
ASME 2½" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	610 (24)	33.4 (74)	n/a	n/a
ASME 2½" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	610 (24)	33.8 (74)	n/a	n/a
ASME 3" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	580 (23.3)	30.9 (68)	870 (34.3)	71.2 (157)
ASME 3" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	590 (22.8)	34.5 (76)	880 (34.6)	75 (165)
ASME 3" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	630 (24.8)	37.8 (83)	900 (35.4)	77.7 (171)
ASME 3" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	610 (24)	38.4 (85)	900 (35.4)	78.3 (173)
ASME 4" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	74.4 (164)
ASME 4" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	81.8 (180)
ASME 4" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	94 (207)
ASME 4" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	94.6 (209)
ASME 5" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	77 (170)
ASME 5" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	890 (35)	89.4 (197)
ASME 5" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	114.2 (252)
ASME 5" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	114.9 (253)

L1 dimension and weight with process connections according to EN 1092-1 (AISI 316L)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 40 type B1, raised face (RF)	280 (11)	6.6 (14)	320 (12.6)	8.6 (19)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type D, with groove	280 (11)	6.4 (14)	320 (12.6)	8.4 (18)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type E, with spigot	280 (11)	6.3 (14)	320 (12.6)	8.3 (18)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type F, with recess	280 (11)	6.5 (14)	320 (12.6)	8.5 (19)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type B1, raised face (RF)	290 (11.4)	7.4 (16)	330 (13)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN15 PN100 type D, with groove	290 (11.4)	7.4 (16)	330 (13)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type E, with spigot	290 (11.4)	7.1 (16)	330 (13)	9.1 (20)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type F, with recess	290 (11.4)	7.3 (16)	330 (13)	9.3 (21)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type B1, raised face (RF)	280 (11)	7.5 (17)	320 (12.6)	9.5 (21)	490 (19.3)	16.4 (36)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type D, with groove	280 (11)	7.5 (17)	320 (12.6)	9.5 (21)	490 (19.3)	16.3 (36)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type E, with spigot	280 (11)	7.2 (16)	320 (12.6)	9.2 (20)	490 (19.3)	16.1 (35)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 25 PN 40 type F, with recess	280 (11)	7.4 (67)	320 (12.6)	9.4 (21)	490 (19.3)	16.3 (36)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type B1, raised face (RF)	300 (10.1)	10.1 (22)	340 (13.4)	12.1 (27)	490 (19.3)	18.8 (41)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type D, with groove	300 (10.1)	10 (22)	340 (13.4)	12 (26)	490 (19.3)	18.7 (41)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type E, with spigot	300 (10.1)	9.5 (21)	340 (13.4)	11.5 (25)	490 (19.3)	18.3 (40)	n/a	n/a	n/a	n/a
EN DN 25 PN100 type F, with recess	300 (10.1)	9.9 (22)	340 (13.4)	11.9 (26)	490 (19.3)	18.7 (41)	n/a	n/a	n/a	n/a
EN DN 40 PN40 type B1, raised face (RF)	280 (11)	9.1 (20)	320 (12.6)	11.1 (24)	470 (18.5)	17.7 (39)	610 (24)	26.9 (59)	n/a	n/a
EN DN 40 PN 40 type D, with groove	280 (11)	8.9 (20)	320 (12.6)	10.9 (24)	470 (18.5)	17.6 (39)	610 (24)	26.8 (59)	n/a	n/a
EN DN 40 PN 40 type E, with spigot	280 (11)	8.6 (19)	320 (12.6)	10.6 (23)	470 (18.5)	17.4 (38)	610 (24)	26.5 (58)	n/a	n/a
EN DN 40 PN 40 type F, with recess	280 (11)	8.8 (19)	320 (12.6)	10.8 (24)	470 (18.5)	17.5 (39)	610 (24)	26.7 (59)	n/a	n/a
EN DN 40 PN 100 type B1, raised face (RF)	360 (14.2)	13.5 (30)	400 (15.7)	15.5 (34)	500 (19.7)	21.5 (47)	610 (24)	30.5 (67)	n/a	n/a
EN DN 40 PN 100 type D, with groove	360 (14.2)	13.4 (30)	400 (15.7)	15.4 (34)	500 (19.7)	21.4 (47)	610 (24)	30.4 (67)	n/a	n/a
EN DN 40 PN 100 type E, with spigot	360 (14.2)	13 (29)	400 (15.7)	15 (33)	500 (19.7)	21.1 (46)	610 (24)	30 (66)	n/a	n/a
EN DN 40 PN 100 type F, with recess	360 (14.2)	13.3 (29)	400 (15.7)	15.3 (34)	500 (19.7)	21.3 (47)	610 (24)	30.3 (67)	n/a	n/a
EN DN 50 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	470 (18.5)	19.1 (42)	580 (22.8)	27.8 (61)	n/a	n/a
EN DN 50 PN 40 type D, with groove	n/a	n/a	n/a	n/a	470 (18.5)	18.9 (42)	580 (22.8)	27.7 (61)	n/a	n/a
EN DN 50 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	470 (18.5)	18.6 (41)	580 (22.8)	27.4 (60)	n/a	n/a
EN DN 50 PN 40 type F, with recess	n/a	n/a	n/a	n/a	470 (18.5)	18.8 (41)	580 (22.8)	27.6 (61)	n/a	n/a
EN DN 50 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	540 (21.3)	25.4 (56)	610 (24)	33.5 (74)	n/a	n/a
EN DN 50 PN 100 type D, with groove	n/a	n/a	n/a	n/a	540 (21.3)	25.3 (56)	610 (24)	33.4 (74)	n/a	n/a
EN DN 50 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	540 (21.3)	24.8 (55)	610 (24)	32.9 (72)	n/a	n/a
EN DN 50 PN 100 type F, with recess	n/a	n/a	n/a	n/a	540 (21.3)	25.2 (56)	610 (24)	33.2 (73)	n/a	n/a
EN DN 80 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	31.5 (69)	870 (34.2)	71.6 (158)
EN DN 80 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	31.3 (69)	870 (34.2)	71.1 (157)
EN DN 80 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	30.9 (68)	870 (34.2)	70.7 (156)
EN DN 80 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	31.1 (69)	870 (34.2)	70.9 (156)
EN DN 80 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	40 (88)	890 (35)	79.1 (174)
EN DN 80 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	39.8 (88)	890 (35)	78.9 (174)
EN DN 80 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	39.2 (86)	890 (35)	78.3 (173)
EN DN 80 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	39.6 (87)	890 (35)	78.7 (173)
EN DN 100 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.8 (163)
EN DN 100 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.6 (162)
EN DN 100 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73 (161)
EN DN 100 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.3 (162)
EN DN 100 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	85.2 (188)
EN DN 100 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	84.8 (187)
EN DN 100 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	84 (185)

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Dimensional drawings (continued)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 100 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	84.5 (186)
EN DN125 PN40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	78.5 (173)
EN DN 135 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	78.1 (172)
EN DN 125 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	77.4 (171)
EN DN 125 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	77.7 (171)
EN DN 125 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	98 (216)
EN DN 125 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	97.6 (215)
EN DN 125 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	96.3 (212)
EN DN 125 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	97.1 (214)

L1 dimension and weight with process connections according to JIS B 2220 (AISI 316/AISI 316L)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 15 10 K	280 (11)	6.3 (14)	320 (12.6)	8.3 (18)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 15 20 K	280 (11)	6.5 (14)	320 (12.6)	8.5 (19)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 25 10 K	280 (11)	7.4 (16)	320 (12.6)	9.4 (21)	490 (19.3)	16.3 (36)	n/a	n/a	n/a	n/a
JIS DN 25 20 K	280 (11)	7.8 (17)	320 (12.6)	9.8 (22)	490 (19.3)	16.6 (37)	n/a	n/a	n/a	n/a
JIS DN 40 10 K	280 (11)	8.2 (18)	320 (12.6)	10.2 (23)	470 (18.5)	16.9 (37)	620 (24.4)	26.1 (58)	n/a	n/a
JIS DN 40 20 K	280 (11)	8.6 (19)	320 (12.6)	10.6 (23)	470 (18.5)	17.3 (38)	620 (24.4)	26.5 (58)	n/a	n/a
JIS DN 50 10 K	n/a	n/a	n/a	n/a	470 (18.5)	17.5 (39)	600 (23.6)	26.6 (59)	n/a	n/a
JIS DN 50 20 K	n/a	n/a	n/a	n/a	470 (18.5)	17.7 (39)	600 (23.6)	26.7 (59)	n/a	n/a
JIS DN 80 10 K	n/a	n/a	n/a	n/a	n/a	n/a	570 (22.4)	27.9 (62)	880 (34.6)	68.7 (151)
JIS DN 80 20 K	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	30.4 (67)	880 (34.6)	71 (156)
JIS DN 100 10 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	69.8 (154)
JIS DN 100 20 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.4 (162)
JIS DN 125 10 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.5 (162)
JIS DN 125 20 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	79.7 (176)

L1 dimension and weight with process connections according to NPT internal thread

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
⅜" NPT	300 (11.8)	5.4 (12)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
½" NPT	300 (11.8)	5.4 (12)	340 (13.4)	7.4 (16)	n/a	n/a	n/a	n/a	n/a	n/a
¾" NPT	300 (11.8)	5.3 (12)	340 (13.4)	7.3 (16)	n/a	n/a	n/a	n/a	n/a	n/a

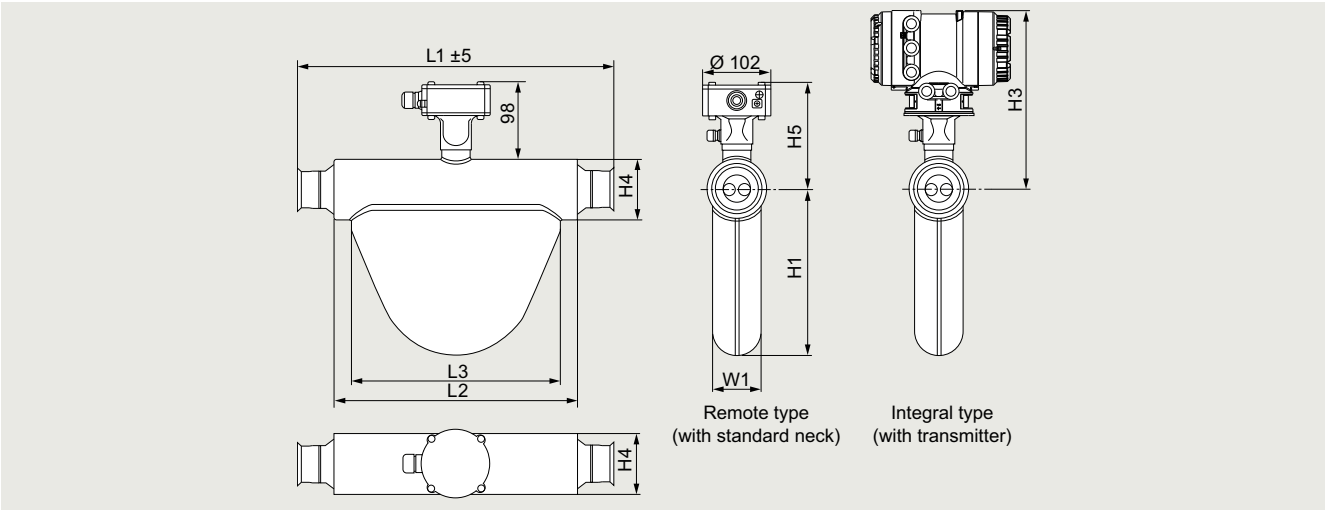
L1 dimension and weight with process connections according to G internal thread

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ⅜"	300 (11.8)	5.4 (12)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
G ½"	300 (11.8)	5.4 (12)	340 (13.4)	7.4 (16)	n/a	n/a	n/a	n/a	n/a	n/a
G ¾"	300 (11.8)	5.3 (12)	340 (13.4)	7.3 (16)	n/a	n/a	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

Drawings, dimensions and weight for FCS500 sensors (hygienic versions)



Dimensions in mm

FCS500 sensor dimensions (hygienic versions)

Nominal size	L2	L3	H1	H3	H4	H5	W1
	Dimensions in mm (inch)						
DN 10	190 (7.5)	165 (6.5)	117 (4.6)	268 (10.6)	56 (2.2)	138 (5.4)	42 (1.7)
DN 15	227 (8.9)	195 (7.7)	145 (5.7)	277 (10.9)	71 (2.8)	148 (5.8)	50 (2)
DN 25	361 (14.2)	310 (12.2)	245 (9.6)	289 (11.4)	90 (3.5)	159 (6.3)	72 (2.8)
DN 50	455 (17.9)	400 (15.7)	333 (13.1)	296 (11.7)	102 (4)	167 (6.6)	96 (3.8)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb)

L1 dimension and weight with threaded hygienic process connections according to DIN 11851

Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 11851, DN 25	280 (11)	5.4 (12)	320 (12.6)	7.4 (16)	n/a	n/a	n/a	n/a
DIN 11851, DN 40	290 (11.4)	5.5 (12)	330 (13)	7.5 (17)	490 (19.3)	14.3 (32)	n/a	n/a
DIN 11851, DN 50	n/a	n/a	n/a	n/a	480 (18.9)	14.4 (32)	610 (24)	23.4 (52)
DIN 11851, DN 65	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23.4 (52)
DIN 11851, DN 80	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23.8 (52)

L1 dimension and weight with hygienic clamp process connections according to DIN 32676 Series A

Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series A, DN 25	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	n/a	n/a	n/a	n/a
DIN 32676 series A, DN 40	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	470 (18.5)	14 (31)	n/a	n/a
DIN 32676 series A, DN 50	n/a	n/a	n/a	n/a	470 (18.5)	14 (31)	600 (23.6)	22.9 (50)
DIN 32676 series A, DN 65	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23 (51)
DIN 32676 series A, DN 80	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23.1 (51)

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Dimensional drawings (continued)

L1 dimension and weight with hygienic clamp process connections according to DIN 32676 Series C (Tri-clamp)

Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series C, 1"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	n/a	n/a	n/a	n/a
DIN 32676 series C, 1½"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	480 (18.9)	14 (31)	n/a	n/a
DIN 32676 series C, 2"	n/a	n/a	n/a	n/a	470 (18.5)	14 (31)	600 (23.6)	22.9 (50)
DIN 32676 series C, 2½"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.8 (50)
DIN 32676 series C, 3"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.9 (50)

L1 dimension and weight with hygienic clamp process connections according to JIS/ISO 2852

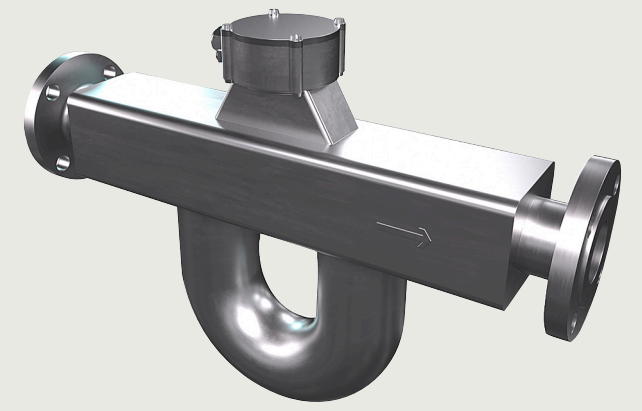
Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS/ISO 2852, 1"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	n/a	n/a	n/a	n/a
JIS/ISO 2852, 1½"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	480 (18.9)	14 (31)	n/a	n/a
JIS/ISO 2852, 2"	n/a	n/a	n/a	n/a	470 (18.5)	14 (31)	600 (23.6)	22.9 (50)
JIS/ISO 2852, 2½"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.8 (50)
JIS/ISO 2852, 3"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.9 (50)

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Overview

SITRANS FCS600 sensor is the resistant Coriolis flow sensor for extreme conditions and corrosive fluids.
Features:

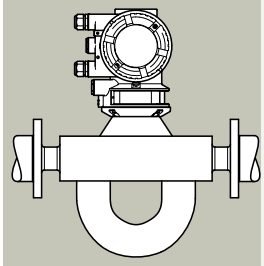
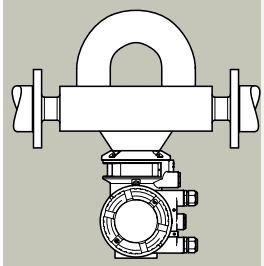
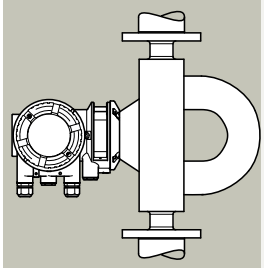
- Dual curved AISI 316L or alloy 22 tubes with optimum decoupling from external influences
- Nominal sizes from DN 2 to DN 65
- Process connection: flange, thread, or high pressure autoclave
- Temperatures from -196 °C (for cryogenic fluids), up to +350 °C
- Insulation and heat tracing options for viscous and molten liquids
- Combination with compact or remote transmitters.



FCS600 sensor

Design

Sensor installation position related to type of fluid

Installation position	Fluid	Description
Position 1 	Liquid	• Horizontal • Measuring tubes below process pipe • Avoids accumulation of entrained gas
Position 2 	Gas	• Horizontal • Measuring tubes above process pipe • Accumulation of liquid or condensate is less likely
Position 3 	Gas / Liquid	• Vertical • Upwards direction of flow • In liquid application accumulation of entrained gas is avoided • This position allows self-draining in liquid flow

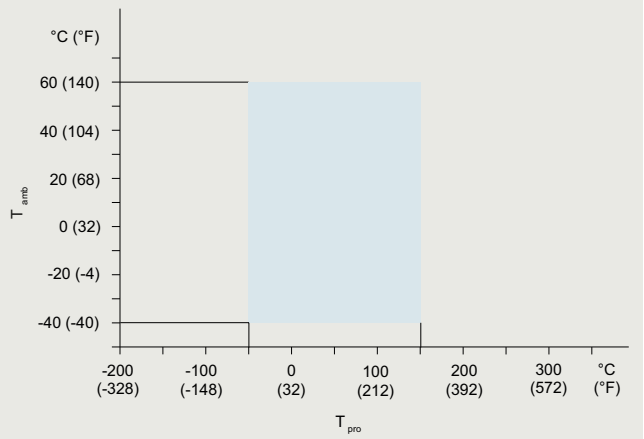
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Technical specifications

Allowed ambient temperature for FCS600 sensors

The allowed combinations of process fluid and ambient temperature for the sensor are illustrated as light areas in the diagrams below.

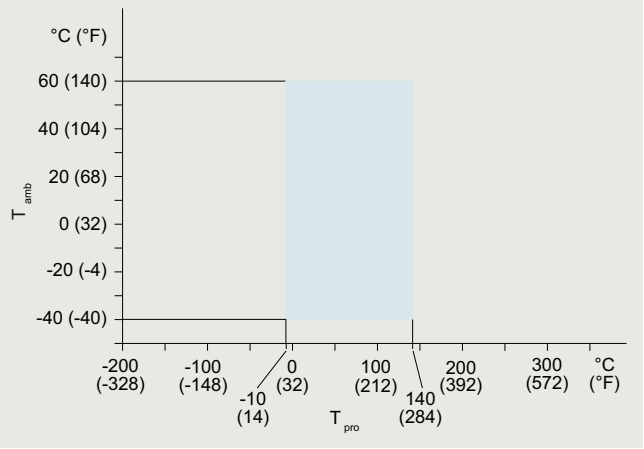
Standard temperature specification, compact transmitter



Allowed process fluid and ambient temperatures, compact transmitter

T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

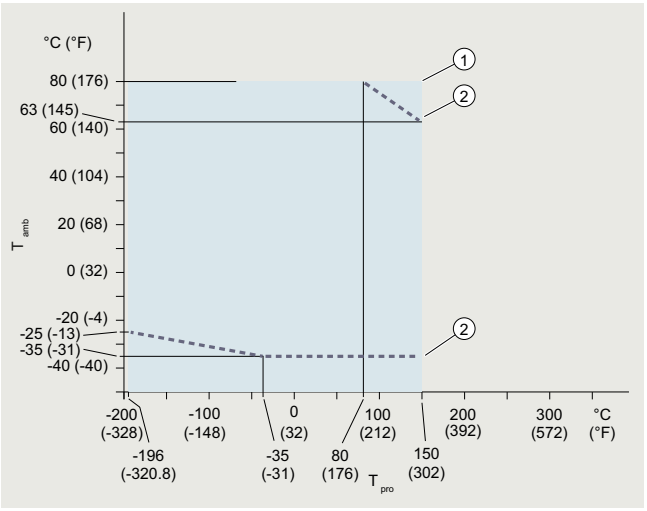
Standard temperature specification with hygienic clamp connections, compact transmitter



Allowed process fluid and ambient temperatures, hygienic clamp connections, compact transmitter

T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

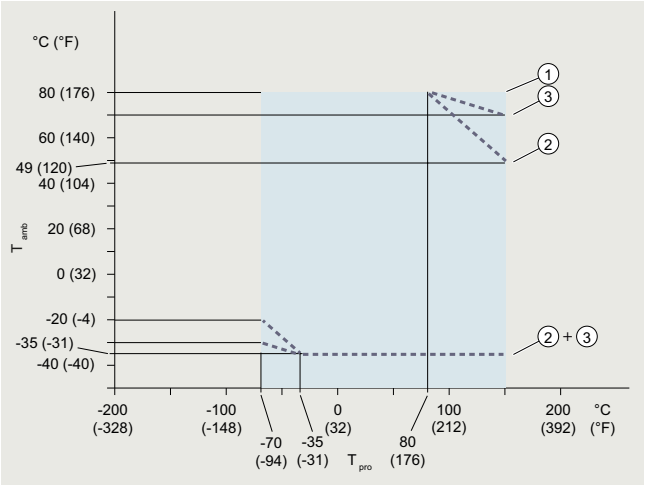
Low temperature specification, remote transmitter



Allowed process fluid and ambient temperatures, remote transmitter

1	Standard cable option
2	Limitation for fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Standard temperature specification, remote transmitter



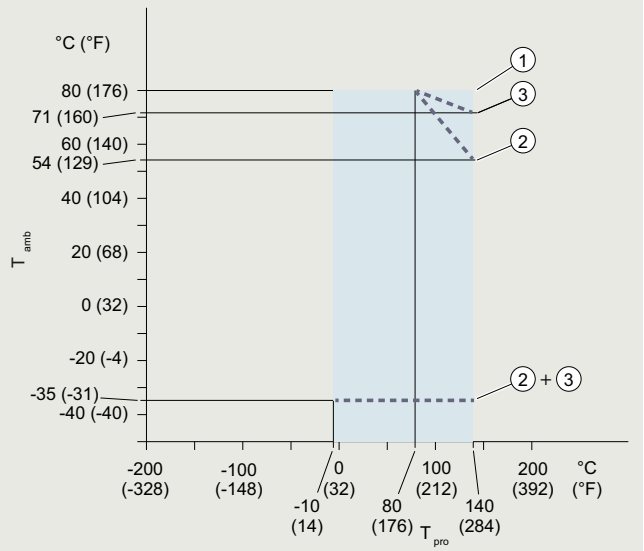
Allowed process fluid and ambient temperatures, remote transmitter

1	Standard cable option
2	Limitation for fire retardant cable option and standard neck
3	Limitation for fire retardant cable option and long neck
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

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Technical specifications (continued)

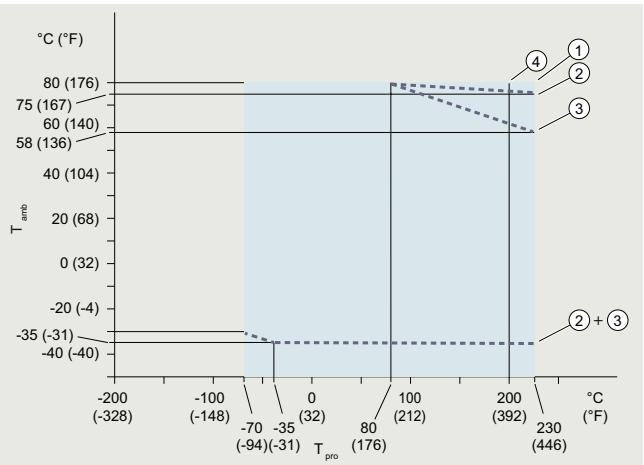
Standard temperature specification with hygienic clamp connections, remote transmitter



Allowed process fluid and ambient temperatures, hygienic clamp connections, remote transmitter

1	Standard cable option
2	Limitation for fire retardant cable option and standard neck
3	Limitation for fire retardant cable option and long neck
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

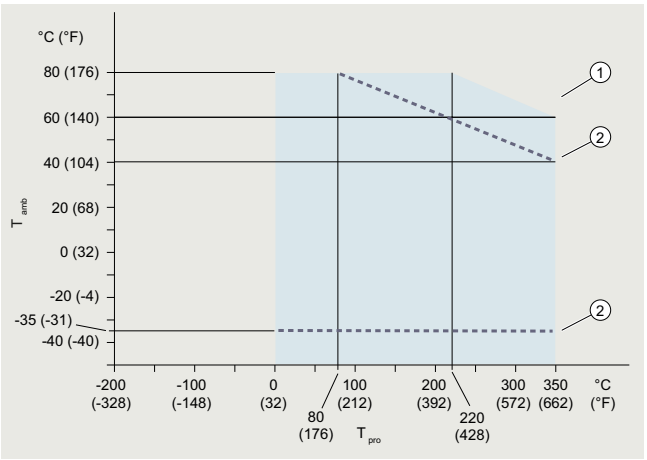
Medium temperature specification, remote transmitter



Allowed process fluid and ambient temperatures, remote transmitter

1	Standard cable option
2	Limitation for fire retardant cable without insulation/tracing option
3	Limitation for fire retardant cable option with insulation/tracing option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

High temperature specification, remote transmitter

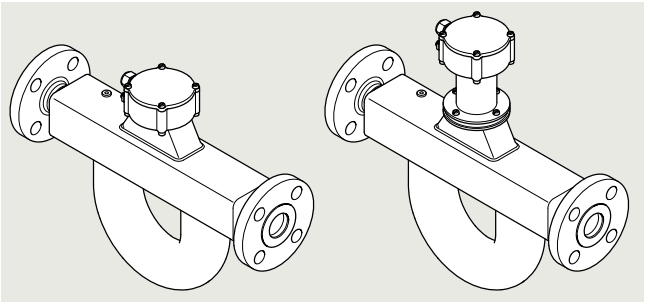


Allowed process fluid and ambient temperatures, remote transmitter

1	Standard cable option
2	Limitation for fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Mechanical specifications of FCS600 sensors

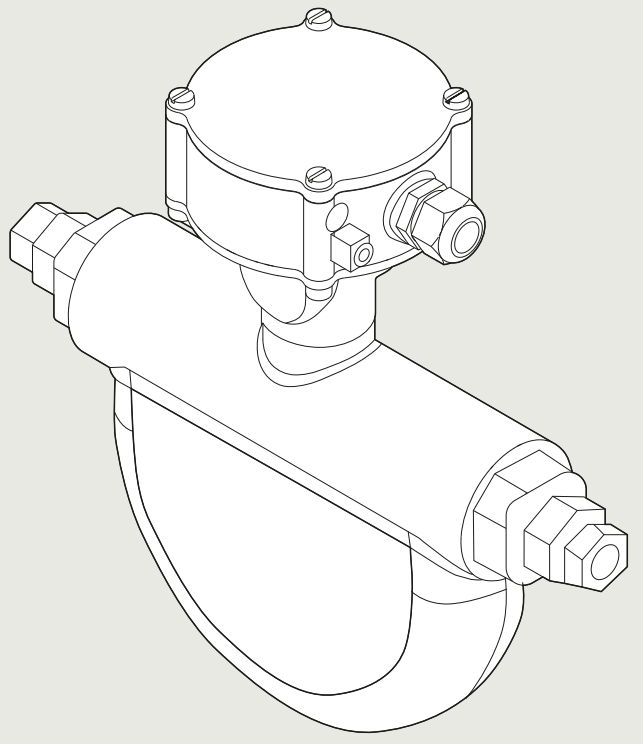
FCS600 sensors are available with standard neck or long neck design and can be combined with compact or remote transmitters. The neck can also be described as the pedestal connecting the sensor body to the transmitter or terminal housing.



FCS600 sensors (for remote transmitter) in sizes DN 15, DN 25, DN 40 and DN 65, standard neck and long neck

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Technical specifications (continued)



FCS600 sensors (for remote transmitter) in sizes DN 2 and DN 4 standard neck

Material specifications		
Wetted parts[1]		
Sensor size DN 2	Alloy 22 dual measuring tubes with AISI 316L stainless steel process connections	
Sensor size DN 4	Alloy 22 dual measuring tubes with AISI 316L stainless steel process connections	
Sensor size DN 15	AISI 316L stainless steel or alloy 22	
Sensor size DN 25	AISI 316L stainless steel or alloy 22	
Sensor size DN 40	AISI 316L stainless steel or alloy 22	
Sensor size DN 65	AISI 316L stainless steel	
Sensor housing		
Junction box	AISI 316L stainless steel	All sensors with remote transmitters
Neck (pedestal)	ASTM A351 CF3M stainless steel	DN 2 and DN 4 sensors only (short neck)
Neck (pedestal)	AISI 316L stainless steel	All sensors, except sizes DN 2 and DN 4
Body (outer casing)	AISI 304 stainless steel	All versions, except sizes DN 2 and DN 4
Body (outer casing)	AISI 316L stainless steel	All versions
Nameplates[2]	**Process temperature range**	**Material**
Sensor with AISI 304 stainless steel housing	Standard, up to 150 °C (302 °F)	Polyester film
Sensor with AISI 304 stainless steel housing	Low, medium or high	AISI 316L ss
Sensor with AISI 316L stainless steel housing	All versions	AISI 316L ss

1) The user is responsible to ensure chemical compatibility of the material of the wetted parts with the measured process fluid.
2) Nameplate material depends on the materials selected for SITRANS FC sensors.

Secondary containment

Some applications or environment conditions require secondary containment retaining the process pressure for increased safety. SITRANS FCS600 sensors have a secondary containment filled with inert gas.

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Technical specifications (continued)

Typical burst pressure at room temperature for sizes DN 2 and DN 4	49 bar (710 psi)
Typical burst pressure at room temperature for sizes DN 15, DN 25 and DN 40: 120 bar (1 740 psi)	120 bar (1 740 psi)
Typical burst pressure at room temperature for size DN 65	80 bar (1 160 psi)

Insulation and heat tracing (not available for sizes DN 2 and DN 4)

In cases where fluid temperature deviates more than 80 °C (176 °F) from ambient temperature, sensor insulation is recommended to avoid negative effects from temperature fluctuations.

Maximum temperature of heat carrier

Process temperature range	Temperature range of heat carrier
Standard, up to 150 °C (302 °F)	0 ... 150 °C (32 ... 302 °F)
Medium, up to 260 °C (500 °F)	0 ... 230 °C (32 ... 446 °F)[1)]
High, up to 350 °C (662 °F)	0 ... 350 °C (32 ... 662 °F)

1) With Ex Approval 0 ... 220 °C (32 ... 428 °F)

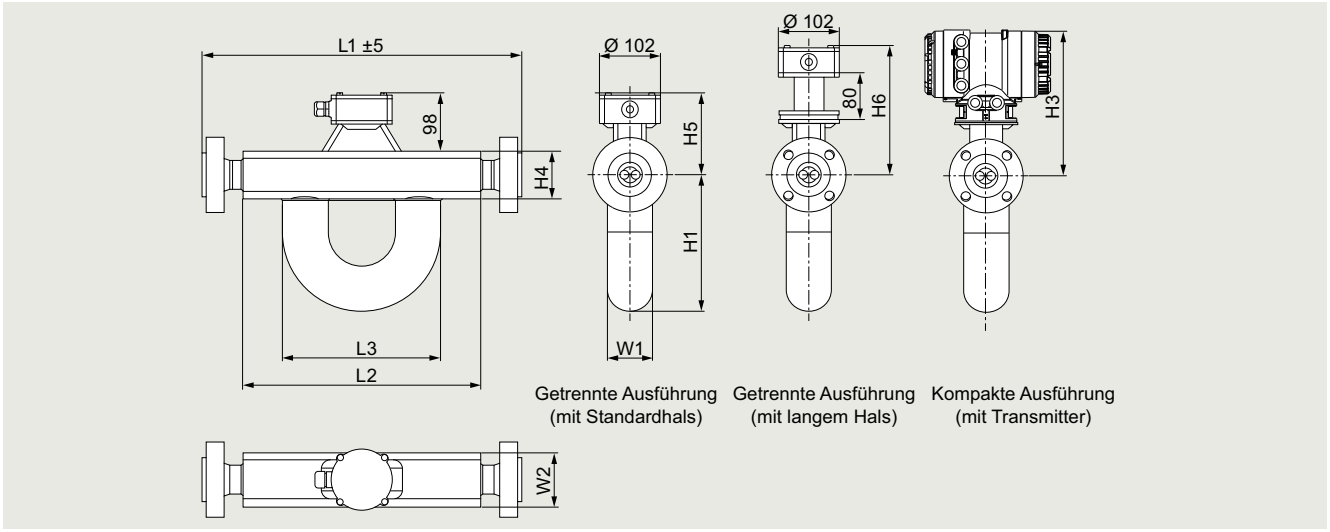
Insulation and heat tracing may be installed by the user but not in hazardous areas and the following must be noted:

- Do not insulate sensor terminal box.
- Do not expose transmitters to ambient temperatures exceeding 60 °C (140 °F).
- The preferred insulation is 60 mm (2.36") thick with a heat transfer coefficient of 0.4 W/m² K (0.07 Btu/ft² °F).

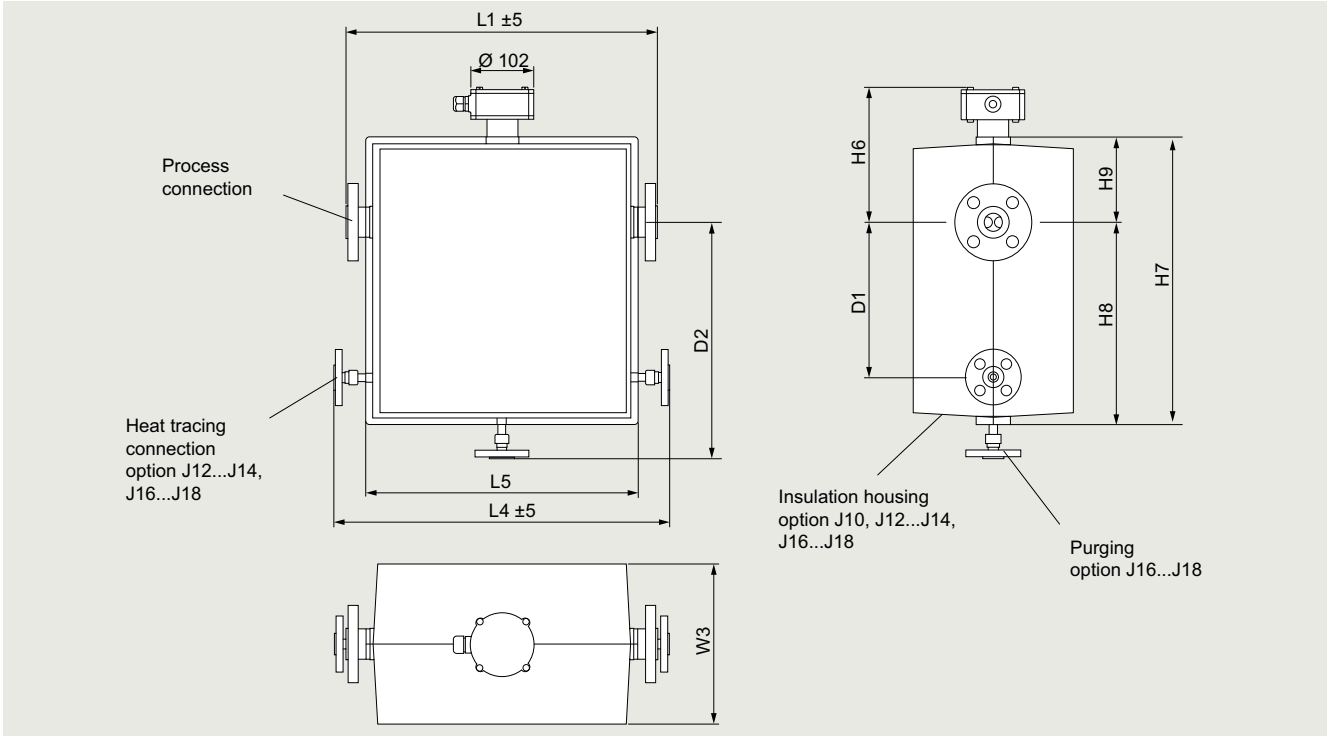
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Dimensional drawings

Drawings, dimensions and weight for FCS600 sensors
FCS dimensions and weight (excluding high pressure versions)



Dimensions in mm



Dimensions in mm (with insulation and heating options)

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Dimensional drawings (continued)

FCS600 sensor dimensions without L1

Nominal size	L2	L3	L4	L5	W1	W2	W3	D1	D2
	Dimensions in mm (inch)								
DN 15	272 (10.7)	212 (8.3)	420 (16.5)	310 (12.2)	60 (2.4)	80 (3.1)	240 (9.4)	200 (7.9)	330 (13)
DN 25	400 (15.7)	266 (10.5)	540 (21.3)	439 (17.3)	76 (3)	90 (3.5)	260 (10.2)	250 (9.8)	380 (15)
DN 40	490 (19.3)	267 (10.5)	640 (25.2)	530 (20.9)	89 (3.5)	110 (4.3)	260 (10.2)	250 (9.8)	430 (16.9)
DN 65	850 (33.5)	379 (14.9)	1000 (39.4)	894 (35.2)	129 (5.1)	160 (6.3)	302 (11.9)	350 (13.8)	545 (21.5)

Nominal size	H1	H3	H4	H5	H6	H7	H8	H9
	Dimensions in mm (inch)							
DN 15	177 (7)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	411 (16.2)	273 (10.7)	138 (5.4)
DN 25	230 (9.1)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	464 (18.3)	326 (12.8)	138 (5.4)
DN 40	268 (10.6)	277 (10.9)	100 (3.9)	148 (5.8)	228 (9)	524 (20.6)	376 (14.8)	148 (5.8)
DN 65	370 (14.6)	294.5 (11.6)	135 (5.3)	165 (6.5)	246 (9.7)	668 (26.3)	503 (19.8)	165 (6.5)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb).

L1 dimension and weight with process connections according to ASME B16.5, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 150, raised face (RF)	370 (14.6)	10 (22)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 300, raised face (RF)	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, raised face (RF)	380 (15)	10.6 (23)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, ring joint (RJ)	380 (15)	10.6 (23)	n/a	n/a	n/a	n/a	n/a	n/a
ASME 1" class 150, raised face (RF)	370 (14.6)	10.8 (24)	500 (19.7)	14.8 (33)	n/a	n/a	n/a	n/a
ASME 1" class 300, raised face (RF)	370 (14.6)	11.8 (26)	500 (19.7)	15.8 (35)	n/a	n/a	n/a	n/a
ASME 1" class 600, raised face (RF)	390 (15.4)	12.2 (27)	520 (20.5)	16.2 (36)	n/a	n/a	n/a	n/a
ASME 1" class 600, ring joint (RJ)	390 (15.4)	12.4 (27)	520 (20.5)	16.2 (36)	n/a	n/a	n/a	n/a
ASME 1½" class 150, raised face (RF)	380 (15)	11.8 (26)	500 (19.7)	15.8 (35)	600 (23.6)	25 (56)	n/a	n/a
ASME 1½" class 300, raised face (RF)	380 (15)	14.2 (31)	510 (20.1)	18.2 (40)	600 (23.6)	27.2 (60)	n/a	n/a
ASME 1½" class 600, raised face (RF)	400 (15.7)	15.4 (34)	530 (20.9)	19.2 (42)	620 (24.4)	28.2 (62)	n/a	n/a
ASME 1½" class 600, ring joint (RJ)	400 (15.7)	15.4 (34)	530 (20.9)	19.4 (43)	620 (24.4)	28.2 (62)	n/a	n/a
ASME 2" class 150, raised face (RF)	n/a	n/a	510 (20.1)	17.4 (38)	600 (23.6)	26.4 (58)	n/a	n/a
ASME 2" class 300, raised face (RF)	n/a	n/a	510 (20.1)	19 (42)	600 (23.6)	28 (62)	n/a	n/a
ASME 2" class 600, raised face (RF)	n/a	n/a	540 (21.3)	20.8 (46)	630 (24.8)	29.8 (66)	n/a	n/a
ASME 2" class 600, ring joint (RJ)	n/a	n/a	540 (21.3)	21.2 (47)	630 (24.8)	29.8 (66)	n/a	n/a
ASME 2½" class 150, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	29.6 (65)	n/a	n/a
ASME 2½" class 300, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	31 (68)	n/a	n/a
ASME 2½" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	33.4 (74)	n/a	n/a
ASME 2½" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	640 (25.2)	34.4 (76)	n/a	n/a
ASME 3" class 150, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	30.6 (67)	1 000 (39.4)	60.2 (133)
ASME 3" class 300, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	34.6 (76)	1 000 (39.4)	63.4 (140)

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Dimensional drawings (continued)

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 3" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	38 (84)	1 000 (39.4)	65.8 (145)
ASME 3" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	640 (25.2)	38.6 (85)	1 000 (39.4)	65.8 (145)
ASME 4" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	64 (141)
ASME 4" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	71.4 (157)
ASME 4" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	82.6 (182)
ASME 4" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	82.8 (183)
ASME 5" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	66 (146)
ASME 5" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	78.4 (173)
ASME 5" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	102.8 (227)
ASME 5" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	103.6 (228)

L1 dimension and weight with process connections according to ASME B16.5, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 1" class 150, raised face (RF)	390 (15.4)	11.4 (25)	n/a	n/a	n/a	n/a
ASME 1" class 300, raised face (RF)	390 (15.4)	12.6 (28)	n/a	n/a	n/a	n/a
ASME 1" class 600, raised face (RF)	390 (15.4)	12.4 (27)	n/a	n/a	n/a	n/a
ASME 1½" class 150, raised face (RF)	390 (15.4)	12.6 (28)	520 (20.5)	16.5 (35)	n/a	n/a
ASME 1½" class 300, raised face (RF)	390 (15.4)	15.4 (34)	520 (20.5)	19.1 (42)	n/a	n/a
ASME 1½" class 600, raised face (RF)	400 (15.7)	15.6 (34)	530 (20.9)	19.6 (43)	n/a	n/a
ASME 2" class 150, raised face (RF)	390 (15.4)	14.8 (33)	520 (20.5)	18.5 (41)	620 (24.4)	27.3 (60)
ASME 2" class 300, raised face (RF)	390 (15.4)	16 (35)	520 (20.5)	20.5 (45)	620 (24.4)	29.1 (64)
ASME 2" class 600, raised face (RF)	410 (16.1)	17.6 (39)	540 (21.3)	21.6 (48)	630 (24.8)	29.7 (66)
ASME 2½" class 150, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	30.9 (68)
ASME 2½" class 300, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	32.5 (72)
ASME 2½" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	33.9 (75)
ASME 3" class 150, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	32.8 (72)
ASME 3" class 300, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	36.6 (81)
ASME 3" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	38.9 (86)

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to EN 1092-1, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 40 type B1, raised face (RF)	370 (14.6)	10.6 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type D, with groove	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type E, with spigot	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type F, with recess	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type B1, raised face (RF)	380 (15)	11.4 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type D, with groove	380 (15)	11.4 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type E, with spigot	380 (15)	11.2 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type F, with recess	380 (15)	11.4 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type B1, raised face (RF)	370 (14.6)	11.6 (26)	500 (19.7)	15.6 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type D, with groove	370 (14.6)	11.4 (25)	500 (19.7)	15.4 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type E, with spigot	370 (14.6)	11.2 (25)	500 (19.7)	15.2 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type F, with recess	370 (14.6)	11.4 (25)	500 (19.7)	15.4 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type B1, raised face (RF)	390 (15.4)	14 (31)	520 (20.5)	18.2 (40)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type D, with groove	390 (15.4)	14 (31)	520 (20.5)	18 (40)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type E, with spigot	390 (15.4)	13.6 (30)	520 (20.5)	17.6 (39)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type F, with recess	390 (15.4)	14 (31)	520 (20.5)	18 (40)	n/a	n/a	n/a	n/a
EN DN 40 PN 40 type B1, raised face (RF)	370 (14.6)	13 (29)	500 (19.7)	17 (37)	600 (23.6)	26.2 (58)	n/a	n/a
EN DN 40 PN 40 type D, with groove	370 (14.6)	13 (29)	500 (19.7)	17 (37)	600 (23.6)	26 (57)	n/a	n/a
EN DN 40 PN 40 type E, with spigot	370 (14.6)	12.6 (28)	500 (19.7)	16.6 (37)	600 (23.6)	25.8 (57)	n/a	n/a
EN DN 40 PN 40 type F, with recess	370 (14.6)	12.8 (29)	500 (19.7)	16.8 (37)	600 (23.6)	26 (57)	n/a	n/a
EN DN 40 PN 100 type B1, raised face (RF)	450 (17.7)	17.6 (39)	560 (22)	21.2 (47)	620 (24.4)	29.8 (66)	n/a	n/a
EN DN 40 PN 100 type D, with groove	450 (17.7)	17.4 (38)	560 (22)	21.2 (47)	620 (24.4)	29.6 (65)	n/a	n/a
EN DN 40 PN 100 type E, with spigot	450 (17.7)	17 (37)	560 (22)	20.8 (46)	620 (24.4)	29.2 (64)	n/a	n/a
EN DN 40 PN 100 type F, with recess	450 (17.7)	17.4 (38)	560 (22)	21 (46)	620 (24.4)	29.6 (65)	n/a	n/a
EN DN 50 PN 40 type B1, raised face (RF)	n/a	n/a	500 (19.7)	18.4 (41)	600 (23.6)	27.4 (60)	n/a	n/a
EN DN 50 PN40 type D, with groove	n/a	n/a	500 (19.7)	18.2 (40)	600 (23.6)	27.4 (60)	n/a	n/a
EN DN 50 PN 40 type E, with spigot	n/a	n/a	500 (19.7)	18 (40)	600 (23.6)	27 (60)	n/a	n/a
EN DN 50 PN 40 type F, with recess	n/a	n/a	500 (19.7)	18.2 (40)	600 (23.6)	27.2 (60)	n/a	n/a
EN DN 50 PN 63 type B1, raised face (RF)	n/a	n/a	520 (20.5)	21.6 (48)	620 (24.4)	30.6 (67)	n/a	n/a
EN DN 50 PN 63 type D, with groove	n/a	n/a	520 (20.5)	21.4 (47)	620 (24.4)	30.4 (67)	n/a	n/a
EN DN 50 PN 63 type E, with spigot	n/a	n/a	520 (20.5)	21 (46)	620 (24.4)	30 (66)	n/a	n/a
EN DN 50 PN 63 type F, with recess	n/a	n/a	520 (20.5)	21.2 (47)	620 (24.4)	30.2 (67)	n/a	n/a
EN DN 50 PN 100 type B1, raised face (RF)	n/a	n/a	590 (23.2)	25.2 (56)	660 (26)	33.6 (74)	n/a	n/a
EN DN 50 PN 100 type D, with groove	n/a	n/a	590 (23.2)	25 (55)	660 (26)	33.4 (74)	n/a	n/a
EN DN 50 PN 100 type E, with spigot	n/a	n/a	590 (23.2)	24.4 (54)	660 (26)	33 (73)	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 50 PN 100 type F, with recess	n/a	n/a	590 (23.2)	24.8 (56)	660 (26)	33.4 (74)	n/a	n/a
EN DN 80 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	31 (68)	1 000 (39.4)	60.4 (133)
EN DN 80 PN 40 type D, with groove	n/a	n/a	n/a	n/a	610 (24)	30.8 (68)	1 000 (39.4)	60.2 (133)
EN DN 80 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	610 (24)	30.4 (67)	1 000 (39.4)	59.8 (132)
EN DN 80 PN 40 type F, with recess	n/a	n/a	n/a	n/a	610 (24)	30.6 (67)	1 000 (39.4)	60 (132)
EN DN 80 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	34.4 (76)	1 000 (39.4)	63.4 (140)
EN DN 80 PN 63 type D, with groove	n/a	n/a	n/a	n/a	620 (24.4)	34.2 (75)	1 000 (39.4)	63.2 (139)
EN DN 80 PN 63 type E, with spigot	n/a	n/a	n/a	n/a	620 (24.4)	33.6 (74)	1 000 (39.4)	62.8 (138)
EN DN 80 PN 63 type F, with recess	n/a	n/a	n/a	n/a	620 (24.4)	33.8 (75)	1 000 (39.4)	63 (139)
EN DN 80 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	730 (28.7)	41.8 (92)	1 000 (39.4)	67.2 (148)
EN DN 80 PN 100 type D, with groove	n/a	n/a	n/a	n/a	730 (28.7)	41.6 (92)	1 000 (39.4)	67 (148)
EN DN 80 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	730 (28.7)	41 (90)	1 000 (39.4)	66.4 (146)
EN DN 80 PN 100 type F, with recess	n/a	n/a	n/a	n/a	730 (28.7)	41.4 (91)	1 000 (39.4)	66.6 (147)
EN DN 100 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	63.6 (140)
EN DN 100 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	63.2 (139)
EN DN 100 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	62.4 (138)
EN DN 100 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	62.6 (138)
EN DN 100 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	68 (150)
EN DN 100 PN 63 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.8 (149)
EN DN 100 PN 63 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67 (148)
EN DN 100 PN 63 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.4 (149)
EN DN 100 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	76.6 (169)
EN DN 100 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	76.2 (168)
EN DN 100 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	75.4 (166)
EN DN 100 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	75.8 (167)
EN DN 125 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.6 (149)
EN DN 125 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.2 (148)
EN DN 125 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	66.4 (146)
EN DN 125 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	66.6 (147)
EN DN 125 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	77.8 (172)
EN DN 125 PN 63 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	77.4 (171)
EN DN 125 PN 63 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	76.4 (168)
EN DN 125 PN 63 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	76.8 (169)
EN DN 125 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	93.2 (205)
EN DN 125 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	92.8 (205)
EN DN 125 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	91.4 (202)

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Dimensional drawings (continued)

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 125 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	92.4 (204)

L1 dimension and weight with process connections according to EN 1092-1, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 25 PN 40, type B1, raised face (RF)	390 (15.4)	11.7 (26)	520 (20.5)	15.7 (35)	n/a	n/a
EN DN 40 PN 40, type B1, raised face (RF)	390 (15.4)	13.7 (30)	520 (20.5)	17.5 (39)	n/a	n/a
EN DN 50 PN 40, type B1, raised face (RF)	n/a	n/a	520 (20.5)	19.3 (43)	620 (24.4)	28 (62)
EN DN 80 PN 40, type B1, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	32.6 (72)

L1 dimension and weight with process connections according to JIS B 2220, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 15 10 K	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 15 20 K	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 25 10 K	370 (14.6)	11.4 (25)	500 (19.7)	15.6 (34)	n/a	n/a	n/a	n/a
JIS DN 25 20 K	370 (14.6)	11.8 (26)	500 (19.7)	15.8 (35)	n/a	n/a	n/a	n/a
JIS DN 40 10 K	370 (14.6)	12.2 (27)	500 (19.7)	16.2 (36)	600 (23.6)	25.4 (56)	n/a	n/a
JIS DN 40 20 K	370 (14.6)	12.6 (28)	500 (19.7)	16.6 (37)	600 (23.6)	25.8 (57)	n/a	n/a
JIS DN 50 10 K	n/a	n/a	500 (19.7)	17 (37)	600 (23.6)	26 (57)	n/a	n/a
JIS DN 50 20 K	n/a	n/a	500 (19.7)	17.2 (38)	600 (23.6)	26.2 (58)	n/a	n/a
JIS DN 80 10 K	n/a	n/a	n/a	n/a	600 (23.6)	27.8 (61)	1 000 (40.2)	57.8 (127)
JIS DN 80 20 K	n/a	n/a	n/a	n/a	610 (24)	30.4 (67)	1 000 (40.2)	60 (132)
JIS DN 100 10 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	59 (130)
JIS DN 100 20 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	63 (139)
JIS DN 125 10 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	62.8 (138)
JIS DN 125 20 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	69 (152)

L1 dimension and weight with process connections according to JIS B 2220, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 25 10 K	390 (15.4)	12.1 (27)	n/a	n/a	n/a	n/a
JIS DN 25 20 K	390 (15.4)	12.5 (28)	n/a	n/a	n/a	n/a
JIS DN 40 10 K	390 (15.4)	13.6 (30)	520 (20.5)	17.4 (38)	n/a	n/a
JIS DN 40 20 K	390 (15.4)	14 (31)	520 (20.5)	17.6 (39)	n/a	n/a
JIS DN 50 10 K	n/a	n/a	520 (20.5)	18.6 (41)	620 (24.4)	27.3 (60)
JIS DN 50 20 K	n/a	n/a	520 (20.5)	18.8 (41)	620 (24.4)	27.3 (60)
JIS DN 80 10 K	n/a	n/a	n/a	n/a	620 (24.4)	30.8 (68)
JIS DN 80 20 K	n/a	n/a	n/a	n/a	620 (24.4)	33.3 (73)

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Dimensional drawings (continued)

L1 dimension and weight with G threaded process connections, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ⅜"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
G ½"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
G ¾"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a

L1 dimension and weight with NPT threaded process connections, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
⅜" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
½" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
¾" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a

L1 dimension and weight with hygienic clamp process connections to DIN 32676 Series A, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series A, DN 25	370 (14.8)	9.2 (20)	n/a	n/a	n/a	n/a	n/a	n/a
DIN 32676 series A, DN 40	370 (14.8)	9.2 (20)	500 (19.7)	13.2 (29)	n/a	n/a	n/a	n/a
DIN 32676 series A, DN 50	n/a	n/a	500 (19.7)	13.2 (29)	600 (23.6)	22.4 (49)	n/a	n/a
DIN 32676 series A, DN 65	n/a	n/a	n/a	n/a	600 (23.6)	22.5 (50)	n/a	n/a
DIN 32676 series A, DN 100	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	52.1 (115)

L1 dimension and weight with hygienic clamp process connections to DIN 32676 Series C (Tri-clamp), AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series C, 1"	370 (14.8)	9.2 (20)	n/a	n/a	n/a	n/a	n/a	n/a
DIN 32676 series C, 1½"	370 (14.8)	9.2 (20)	500 (19.7)	13.2 (29)	n/a	n/a	n/a	n/a
DIN 32676 series C, 2"	n/a	n/a	500 (19.7)	13.2 (29)	600 (23.6)	22.4 (49)	n/a	n/a
DIN 32676 series C, 3"	n/a	n/a	n/a	n/a	600 (23.6)	22.5 (50)	n/a	n/a
DIN 32676 series C, 4"	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	52.2 (115)

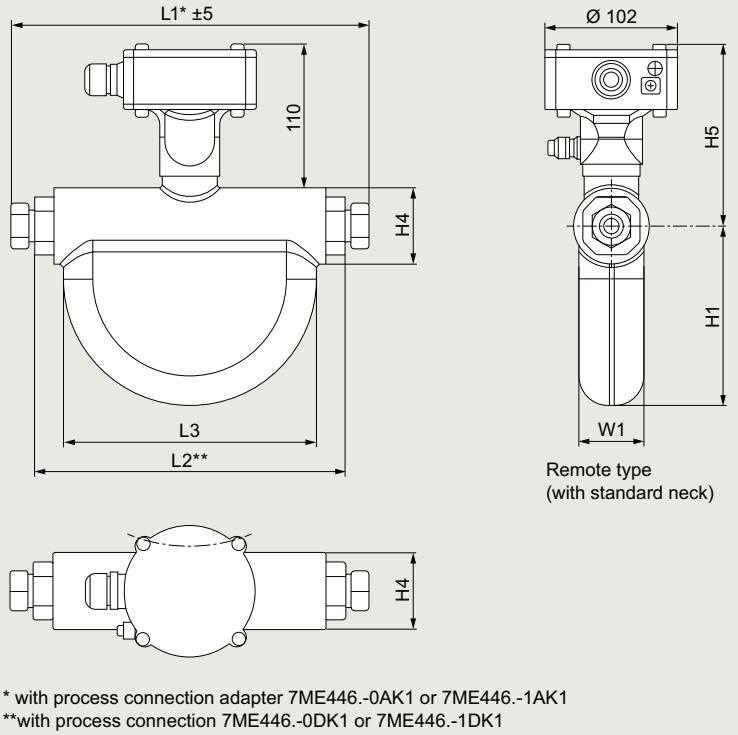
L1 dimension and weight with hygienic clamp process connections to JIS/ISO 2852, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS/ISO 2852, 1"	370 (14.8)	9.2 (20)	n/a	n/a	n/a	n/a	n/a	n/a
JIS/ISO 2852, 1½"	370 (14.8)	9.2 (20)	500 (19.7)	13.2 (29)	n/a	n/a	n/a	n/a
JIS/ISO 2852, 2"	n/a	n/a	500 (19.7)	13.3 (29)	600 (23.6)	22.4 (49)	n/a	n/a
JIS/ISO 2852, 3"	n/a	n/a	n/a	n/a	600 (23.6)	22.5 (50)	n/a	n/a

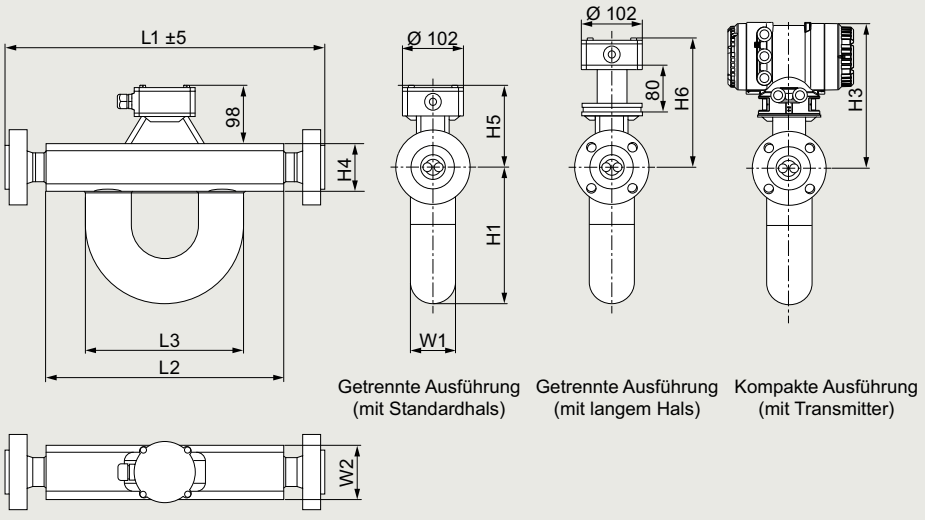
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Dimensional drawings (continued)

FCS600 dimensions and weight (high pressure versions)



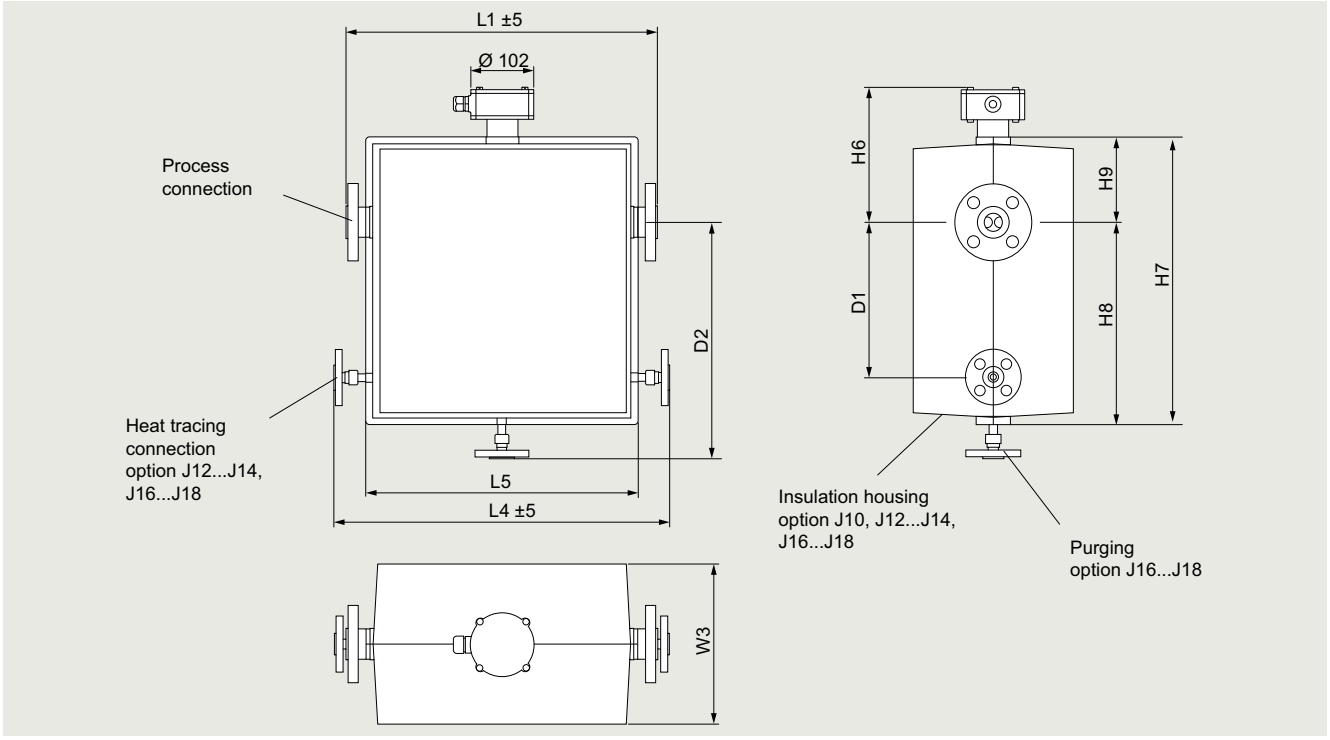
Dimensions in mm for sizes DN 2 and DN 4



Dimensions in mm for sizes DN 15, DN 25 and DN 40

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Dimensional drawings (continued)



Dimensions in mm, version with insulation housing for sizes DN 15, DN 25 and DN 40 only

Dimensions without length L1

Nominal size	L2	L3	L4	L5	W1	W2	W3	D1	D2
	Dimensions in mm (inch)								
DN 2	240 (9.5)	195 (7.7)			50 (2.0)				
DN 4	240 (9.5)	195 (7.7)			50 (2.0)				
DN 15	272 (10.7)	212 (8.3)	420 (16.5)	310 (12.2)	60 (2.4)	80 (3.1)	240 (9.4)	200 (7.9)	330 (13)
DN 25	400 (15.7)	266 (10.5)	540 (21.3)	439 (17.3)	76 (3)	90 (3.5)	260 (10.2)	250 (9.8)	380 (15)
DN 40	490 (19.3)	267 (10.5)	640 (25.2)	530 (20.9)	89 (3.5)	110 (4.3)	260 (10.2)	250 (9.8)	430 (16.9)

Nominal size	H1	H3	H4	H5	H6	H7	H8	H9
	Dimensions in mm (inch)							
DN 2	138 (5.4)		59 (2.3)	140 (5.5)				
DN 4	138 (5.4)		59 (2.3)	140 (5.5)				
DN 15	177 (7)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	411 (16.2)	273 (10.7)	138 (5.4)
DN 25	230 (9.1)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	464 (18.3)	326 (12.8)	138 (5.4)
DN 40	268 (10.6)	277 (10.9)	100 (3.9)	148 (5.8)	228 (9)	524 (20.6)	376 (14.8)	148 (5.8)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb).

L1 dimension and weight for medium pressure autoclave process connections

Wetted parts AISI 316L stainless steel and alloy 22

Process connection size and type	FCS600 sensor nominal size DN 2 L1 in mm (inch)	Weight in kg (lb)	DN 4 L1 in mm (inch)	Weight in kg (lb)
Autoclave 9/16" adapter	275 (10.8)	7 (15.4)	275 (10.8)	7 (15.4)
Autoclave ¾"	240 (9.5)	7 (15.4)	240 (9.5)	7 (15.4)

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Dimensional drawings (continued)

L1 dimension and weight for process connections compatible to ASME B16.5, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 900, raised face (RF)	400 (15.7)	12.6 (28)	n/a	n/a	n/a	n/a
ASME ½" class 900, ring joint (RJ)	400 (15.7)	13 (29)	n/a	n/a	n/a	n/a
ASME ½" class 1 500, raised face (RF)	400 (15.7)	12.6 (28)	n/a	n/a	n/a	n/a
ASME ½" class 1 500, ring joint (RJ)	400 (15.7)	13 (29)	n/a	n/a	n/a	n/a
ASME 1" class 900, raised face (RF)	450 (17.7)	16.4 (36)	540 (21.3)	20.6 (45)	n/a	n/a
ASME 1" class 900, ring joint (RJ)	450 (17.7)	16.6 (37)	540 (21.3)	20.4 (45)	n/a	n/a
ASME 1" class 1500, raised face (RF)	450 (17.7)	16.4 (36)	n/a	n/a	n/a	n/a
ASME 1" class 1500, ring joint (RJ)	450 (17.7)	16.6 (37)	n/a	n/a	n/a	n/a
ASME 2" class 900, raised face (RF)	n/a	n/a	660 (26)	35.2 (78)	720 (28.3)	43 (95)
ASME 2" class 900, ring joint (RJ)	n/a	n/a	660 (26)	35.6 (78)	720 (28.3)	43.4 (96)

L1 dimension and weight for process connections compatible to ASME B16.5, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 1" class 900, raised face (RF)	400 (15.7)	16.4 (36)	n/a	n/a	n/a	n/a
ASME 1" class 900, ring joint (RJ)	n/a	n/a	580 (23)	21 (46)	n/a	n/a
ASME 1" class 1 500, raised face (RF)	400 (15.7)	16.4 (36)	n/a	n/a	n/a	n/a
ASME 1" class 1 500, ring joint (RJ)	n/a	n/a	580 (23)	21 (46)	n/a	n/a
ASME 2" class 900, raised face (RF)	n/a	n/a	580 (23)	34 (75)	710 (28)	44 (97)
ASME 2" class 900, ring joint (RJ)	n/a	n/a	580 (23)	36 (80)	710 (28)	44 (97)
ASME 2" class 1 500, ring joint (RJ)	n/a	n/a	580 (23)	36 (80)	710 (28)	44 (97)
ASME 3" class 900, raised face (RF)	n/a	n/a	n/a	n/a	710 (28)	50 (110)
ASME 3" class 900, ring joint (RJ)	n/a	n/a	n/a	n/a	710 (28)	52 (115)

L1 dimension and weight for process connections with internal thread G

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ⅜"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
G ½"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
G ¾"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

L1 dimension and weight for process connections with internal thread NPT

Process connection size and type	FCS600 sensor nominal size DN 15 L1 in mm (inch)	Weight in kg (lb)	DN 25 L1 in mm (inch)	Weight in kg (lb)	DN 40 L1 in mm (inch)	Weight in kg (lb)
⅜" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
½" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
¾" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a

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Overview

SITRANS FCS700 sensor is the grande Coriolis flow sensor for large pipes and high flows.

Features:

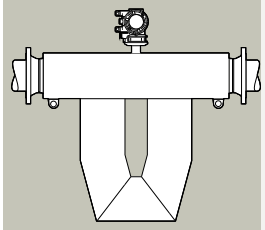
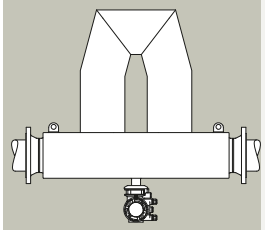
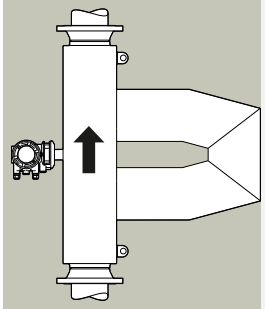
- Dual curved AISI 316L stainless steel or alloy 22 tubes with optimum decoupling from external influences
- Nominal sizes: DN 100 to DN 200
- Process connection: flanges
- Energy efficient low pressure loss design with short tube paths and large tube diameter
- High power tube driver for dependable measurements in high damping applications
- Combination with compact or remote transmitters



FCS700 sensor

Design

Sensor installation position related to type of fluid

Installation position	Fluid	Description
Position 1 	Liquid	• Horizontal • Measuring tubes below process pipe • Avoids accumulation of entrained gas
Position 2 	Gas	• Horizontal • Measuring tubes above process pipe • Accumulation of liquid or condensate is less likely
Position 3 	Gas / liquid	• Vertical • Upwards direction of flow • In liquid application accumulation of entrained gas is avoided • This position allows self-draining in liquid flow

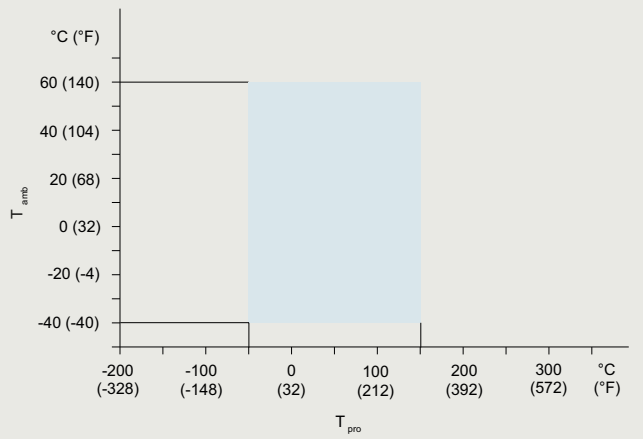
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Technical specifications

Allowed ambient temperature for FCS700 sensors

The allowed combinations of process fluid and ambient temperature for the sensor are illustrated as light areas in the diagrams below.

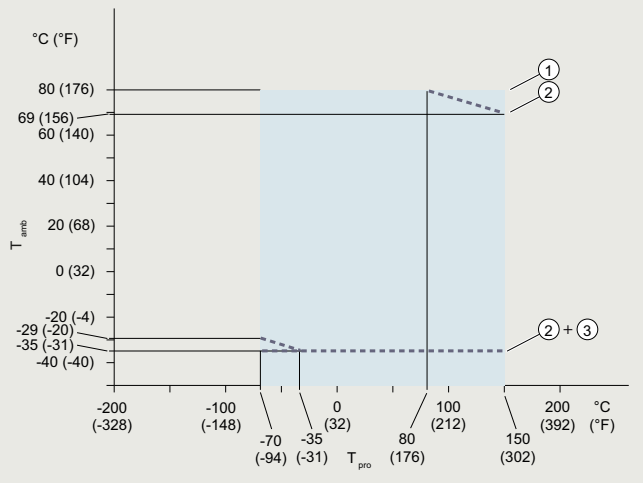
Standard temperature specification, compact transmitter



Allowed process fluid and ambient temperatures, compact transmitter

T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

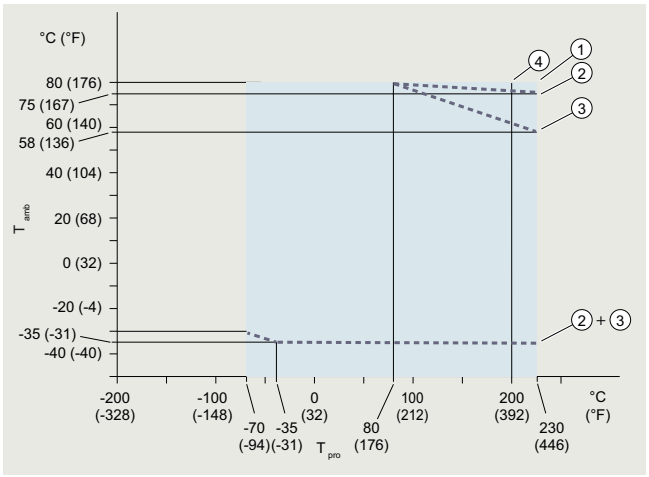
Standard temperature specification, remote transmitter



Allowed process fluid and ambient temperatures, remote transmitter

1	Standard cable option
2	Fire retardant cable standard neck or long neck with insulation and heating options
3	Fire retardant cable long neck without insulation and heating options
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

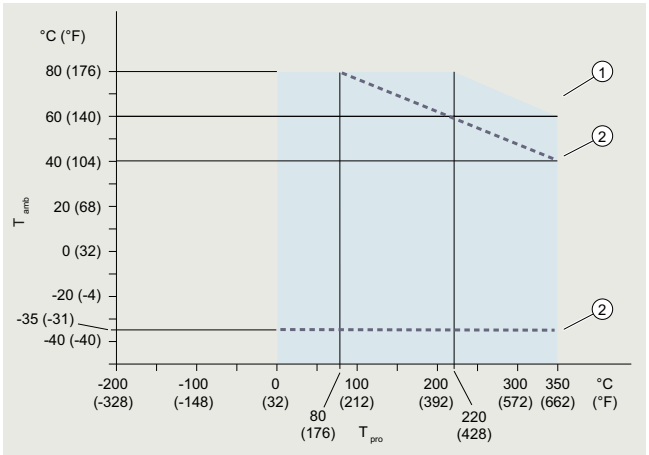
Medium temperature specification, remote transmitter



Allowed process fluid and ambient temperatures, compact transmitter

1	Standard cable option
2	Fire retardant cable without insulation and heating options
3	Fire retardant cable with insulation and heating options
4	For FCS700 DN 200 medium temperature range is limited to 200 °C (392 °F)
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

High temperature specification, remote transmitter



Allowed process fluid and ambient temperatures, remote transmitter

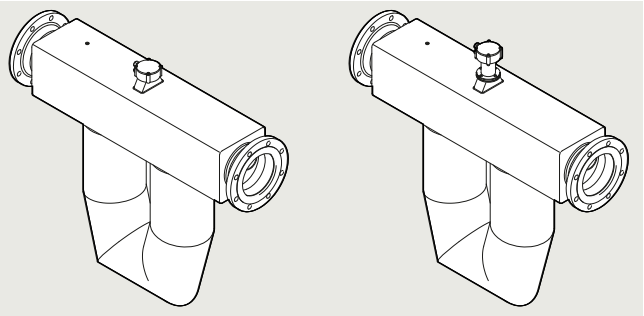
1	Standard cable option
2	Fire retardant cable option
T_{amb}	Ambient temperature
T_{pro}	Process fluid temperature

Mechanical specifications of FCS700 sensors

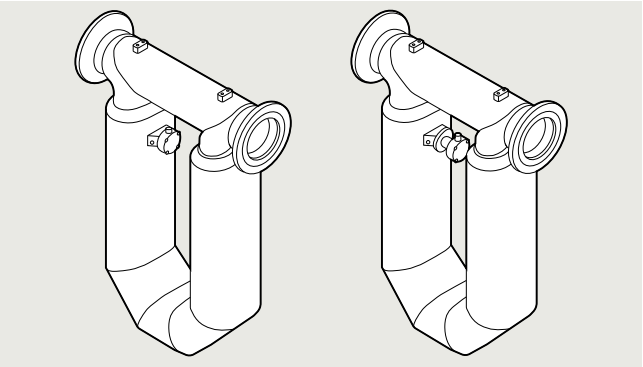
FCS700 sensors are available in standard neck and long neck designs and can be combined with compact or remote transmitters. The neck can also be described as the pedestal connecting the sensor body to the transmitter or terminal housing.

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Technical specifications (continued)



FCS700 sensors DN 100 and DN 150 (for remote transmitter) with standard neck, and long neck version shown to the right



FCS700 sensors DN 200 (for remote transmitter) with standard neck, and long neck version shown to the right

Material specifications		
Wetted parts[1]		
Sensor size DN 100	AISI 316L stainless steel or alloy 22	
Sensor size DN 150	AISI 316L stainless steel or alloy 22	
Sensor size DN 200	AISI 316L stainless steel with ASTM A351 CF3M stainless steel flow separator	
Sensor housing		
Junction box	AISI 316L stainless steel	All sensors with remote transmitters
Neck (pedestal)	AISI 316L stainless steel	All versions
Body (outer casing)	AISI 304 stainless steel	Versions with housing code B01
Body (outer casing)	AISI 316L stainless steel	Versions with housing codes B02, B03 and B04
Nameplates[2]	**Process temperature range**	**Material**
Sensor with AISI 304 stainless steel housing	Standard, up to 150 °C (302 °F)	Polyester film
Sensor with AISI 304 stainless steel housing	Medium or high	AISI 316L ss
Sensor with AISI 316L stainless steel housing	All versions	AISI 316L ss

1) The user is responsible to ensure chemical compatibility of the material of the wetted parts with the measured process fluid.
2) Nameplate material depends on the materials selected for SITRANS FC sensors.

Secondary containment

Some applications or environment conditions require secondary containment retaining the process pressure for increased safety. SITRANS FCS700 sensors have a secondary containment filled with inert gas.

Typical burst pressure at room temperature for size DN 100	65 bar (942 psi)
Typical burst pressure at room temperature for size DN 150	50 bar (725 psi)
Typical burst pressure at room temperature for size DN 200	30 bar (435 psi)

Insulation and heat tracing (not available for sizes DN 150 and DN 200)

In cases where fluid temperature deviates more than 80 °C (176 °F) from ambient temperature, sensor insulation is recommended to avoid negative effects from temperature fluctuations.

Maximum temperature of heat carrier

Process temperature range	Temperature range of heat carrier
Standard, up to 150 °C (302 °F)	0 ... 150 °C (32 ... 302 °F)
Medium, up to 260 °C (500 °F)	0 ... 230 °C (32 ... 446 °F)[1]
High, up to 350 °C (662 °F)	0 ... 350 °C (32 ... 662 °F)

1) With Ex Approval 0 ... 220 °C (32 ... 428 °F)

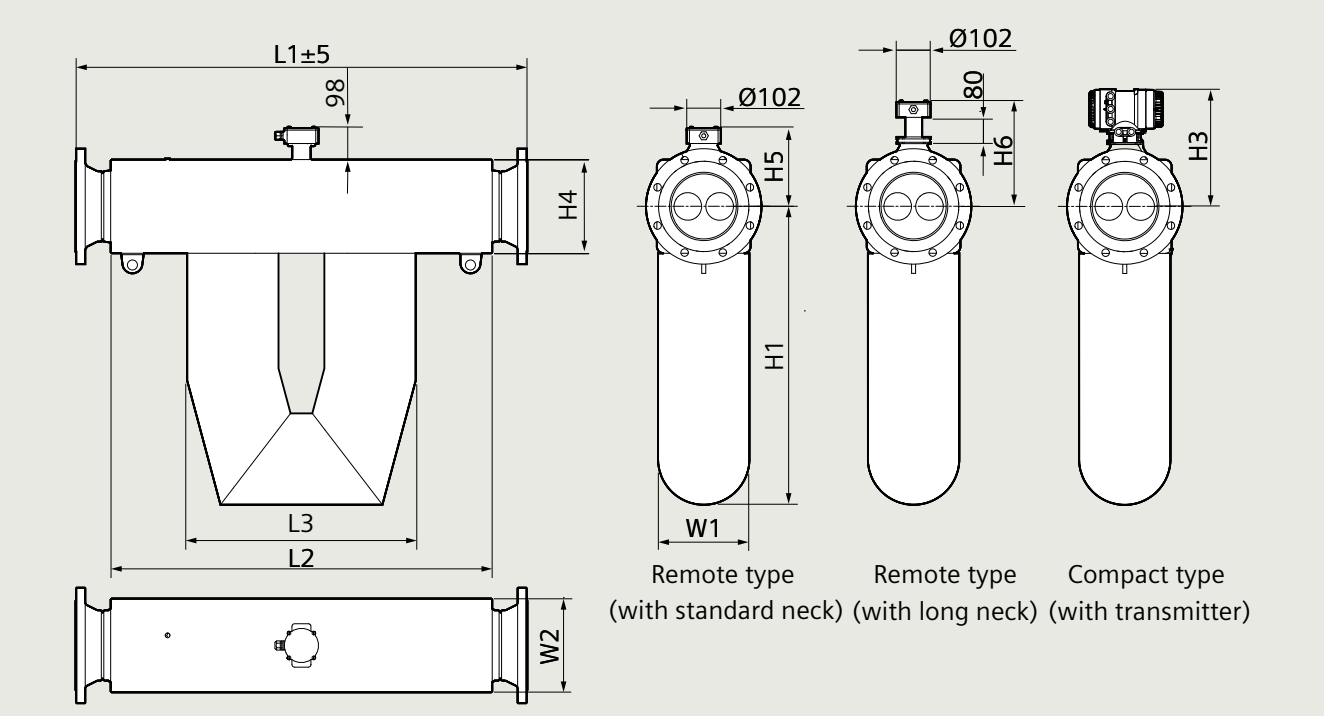
Insulation and heat tracing may be installed by the user but not in hazardous areas, and the following must be noted:

- Do not insulate sensor terminal box.
- Do not expose transmitters to ambient temperatures exceeding 60 °C (140 °F).
- The preferred insulation is 60 mm (2.36") thick with a heat transfer coefficient of 0.4 W/m² K (0.07 Btu/ ft² °F).

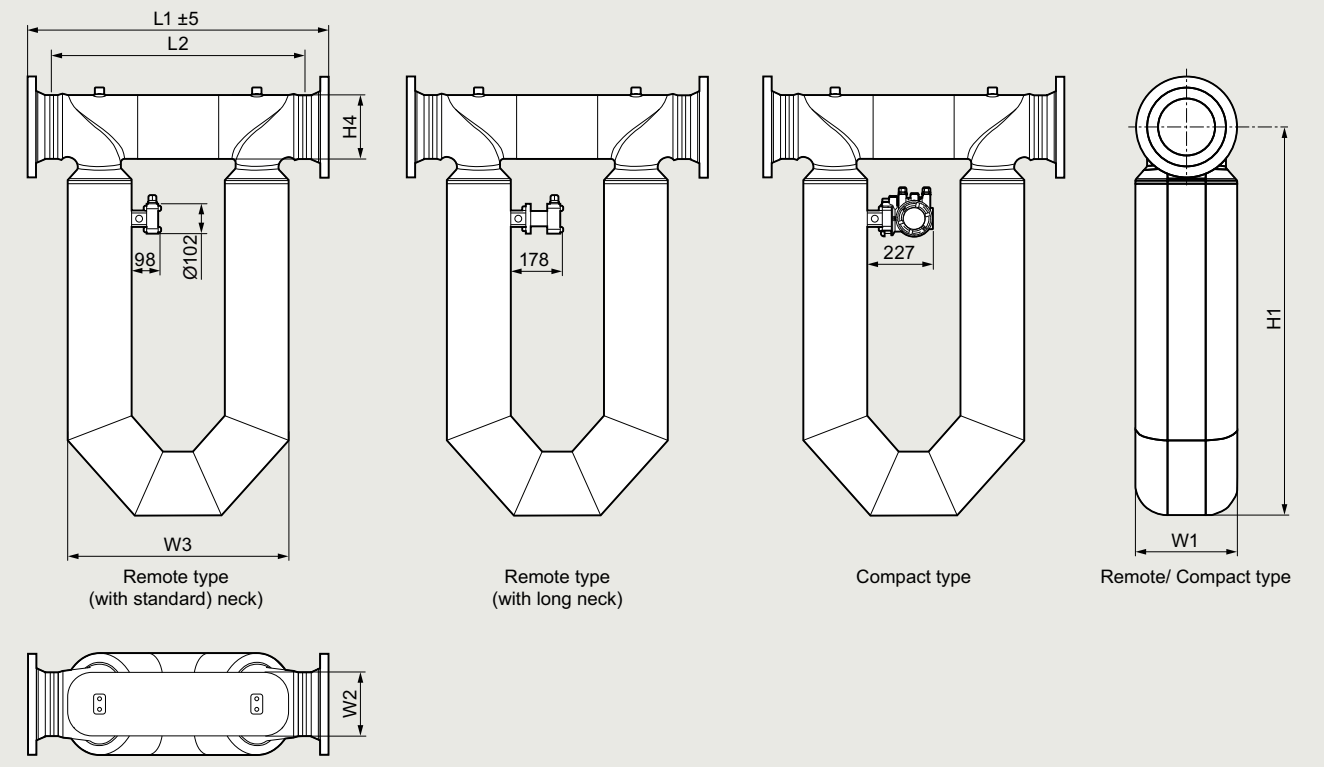
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Dimensional drawings

Drawings, dimensions and weight for FCS700 sensors



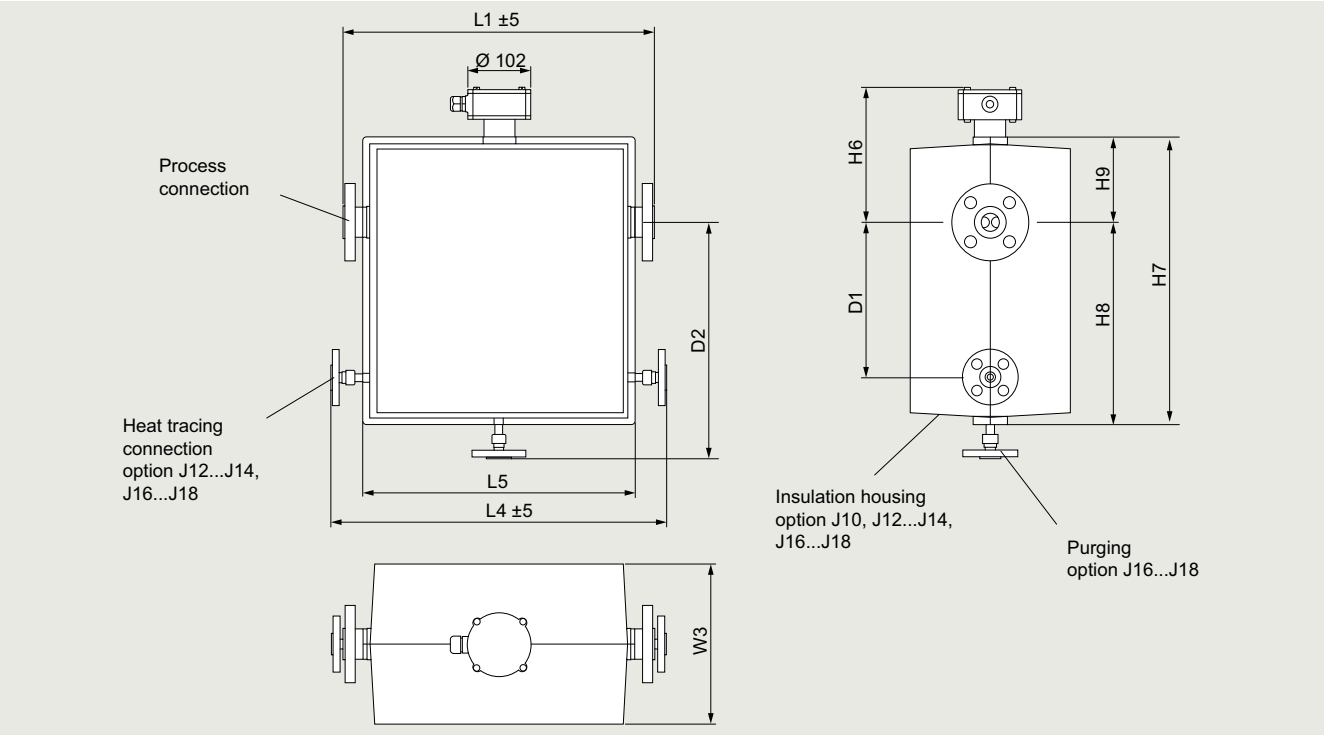
Dimensions in mm, sizes DN 100 and DN 150



Dimensions in mm, sizes DN 200

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Dimensional drawings (continued)



Dimensions in mm (with insulation and heating options)

FCS700 sensor dimensions without L1

Nominal size	L2	L3	L4	L5	W1	W2	W3	D1	D2
	Dimensions in mm (inch)								
DN 100	892 (35.1)	691 (27.2)	1050 (41.3)	944 (37.2)	168 (6.6)	176 (6.9)	342 (13.5)	350 (13.8)	677 (26.7)
DN 150	1 140 (44.9)	683 (26.9)	n/a	n/a	273 (10.7)	280 (11)	n/a	n/a	n/a
DN 200	870 (34.3)	759 (29.9)	n/a	n/a	350 (13.8)	350 (13.8)	n/a	n/a	n/a

Nominal size	H1	H3	H4	H5	H6	H7	H8	H9
	Dimensions in mm (inch)							
DN 100	556 (21.9)	315 (12.4)	176 (6.9)	186 (7.3)	266 (10.5)	824 (32.4)	628 (24.7)	196 (7.7)
DN 150	891 (35.1)	367 (14.5)	280 (11)	238 (9.4)	320 (12.6)	n/a	n/a	n/a
DN 200	1 335 (52.6)	n/a	219 (8.6)	n/a	n/a	n/a	n/a	n/a

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 b).

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to ASME B16.5, AISI 316L wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
ASME 4" class 150, raised face (RF)	1 100 (43.3)	95 (210)	n/a	n/a	n/a	n/a
ASME 4" class 300, raised face (RF)	1 100 (43.3)	103 (227)	n/a	n/a	n/a	n/a
ASME 4" class 600, raised face (RF)	1 100 (43.3)	112 (246)	n/a	n/a	n/a	n/a
ASME 4" class 600, ring joint (RJ)	1 100 (43.3)	112 (246)	n/a	n/a	n/a	n/a
ASME 5" class 150, raised face (RF)	1 100 (43.3)	97 (214)	n/a	n/a	n/a	n/a
ASME 5" class 300, raised face (RF)	1 100 (43.3)	109 (239)	n/a	n/a	n/a	n/a
ASME 5" class 600, raised face (RF)	1 160 (45.7)	136 (299)	n/a	n/a	n/a	n/a
ASME 5" class 600, ring joint (RJ)	1 160 (45.7)	136 (299)	n/a	n/a	n/a	n/a
ASME 6" class 150, raised face (RF)	1 100 (43.3)	101 (223)	1 350 (53.1)	290 (639)	n/a	n/a
ASME 6" class 300, raised face (RF)	1 100 (43.3)	118 (259)	1 350 (53.1)	307 (677)	n/a	n/a
ASME 6" class 600, raised face (RF)	1 200 (47.2)	149 (329)	1 390 (54.7)	332 (732)	n/a	n/a
ASME 6" class 600, ring joint (RJ)	1 200 (47.2)	150 (331)	1 390 (54.7)	333 (733)	n/a	n/a
ASME 8" class 150, raised face (RF)	n/a	n/a	1 350 (53.1)	302 (666)	1 030 (40.6)	299 (659)
ASME 8" class 300, raised face (RF)	n/a	n/a	1 350 (53.1)	324 (714)	1 050 (41.3)	323 (712)
ASME 8" class 600, raised face (RF)	n/a	n/a	1 440 (56.7)	371 (818)	1 120 (44.1)	368 (811)
ASME 8" class 600, ring joint (RJ)	n/a	n/a	1 440 (56.7)	372 (821)	1 120 (44.1)	369 (814)
ASME 10" class 150, raised face (RF)	n/a	n/a	n/a	n/a	1 090 (42.9)	318 (701)
ASME 10" class 300, raised face (RF)	n/a	n/a	n/a	n/a	1 140 (44.9)	363 (800)
ASME 10" class 600, raised face (RF)	n/a	n/a	n/a	n/a	1 220 (48)	451 (994)
ASME 10" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	1 220 (48)	453 (999)

L1 dimension and weight with process connections according to ASME B16.5, alloy 22 wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
ASME 5" class 150, raised face (RF)	1 100 (43.3)	99 (219)	n/a	n/a	n/a	n/a
ASME 5" class 300, raised face (RF)	1 100 (43.3)	111 (245)	n/a	n/a	n/a	n/a
ASME 5" class 600, raised face (RF)	1 110 (43.7)	133 (293)	n/a	n/a	n/a	n/a
ASME 6" class 150, raised face (RF)	1 100 (43.3)	106 (235)	n/a	n/a	n/a	n/a
ASME 6" class 300, raised face (RF)	1 100 (43.3)	123 (270)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to EN 1092-1, AISI 316L wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
EN DN 100 PN 16 type B1, raised face (RF)	1 100 (43.3)	92 (202)	n/a	n/a	n/a	n/a
EN DN 100 PN 16 type D, with groove	1 100 (43.3)	91 (201)	n/a	n/a	n/a	n/a
EN DN 100 PN 16 type E, with spigot	1 100 (43.3)	91 (201)	n/a	n/a	n/a	n/a
EN DN 100 PN 16 type F, with recess	1 100 (43.3)	91 (201)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type B1, raised face (RF)	1 100 (43.3)	95 (210)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type D, with groove	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type E, with spigot	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type F, with recess	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type B1, raised face (RF)	1 100 (43.3)	100 (220)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type D, with groove	1 100 (43.3)	99 (219)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type E, with spigot	1 100 (43.3)	98 (217)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type F, with recess	1 100 (43.3)	99 (219)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type B1, raised face (RF)	1 100 (43.3)	106 (233)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type D, with groove	1 100 (43.3)	105 (232)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type E, with spigot	1 100 (43.3)	104 (230)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type F, with recess	1 100 (43.3)	105 (232)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type B1, raised face (RF)	1 100 (43.3)	95 (209)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type D, with groove	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type E, with spigot	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type F, with recess	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type B1, raised face (RF)	1 100 (43.3)	99 (218)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type D, with groove	1 100 (43.3)	99 (218)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type E, with spigot	1 100 (43.3)	98 (216)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type F, with recess	1 100 (43.3)	98 (216)	n/a	n/a	n/a	n/a
EN DN125 PN63 type B1, raised face (RF)	1 100 (43.3)	109 (240)	n/a	n/a	n/a	n/a
EN DN 125 PN 63 type D, with groove	1 100 (43.3)	108 (239)	n/a	n/a	n/a	n/a
EN DN 125 PN 63 type E, with spigot	1 100 (43.3)	107 (237)	n/a	n/a	n/a	n/a
EN DN 125 PN 63 type F, with recess	1 100 (43.3)	108 (239)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
EN DN 125 PN 100 type B1, raised face (RF)	1 140 (44.9)	121 (267)	n/a	n/a	n/a	n/a
EN DN 125 PN 100 type D, with groove	1 140 (44.9)	121 (267)	n/a	n/a	n/a	n/a
EN DN 125 PN 100 type E, with spigot	1 140 (44.9)	119 (263)	n/a	n/a	n/a	n/a
EN DN 125 PN 100 type F, with recess	1 140 (44.9)	120 (265)	n/a	n/a	n/a	n/a
EN DN 150 PN 16 type B1, raised face (RF)	1 100 (43.3)	98 (216)	1 350 (53.1)	288 (634)	n/a	n/a
EN DN 150 PN 16 type D, with groove	1 100 (43.3)	98 (216)	1 350 (53.1)	287 (632)	n/a	n/a
EN DN150 PN16 type E, with spigot	1 100 (43.3)	97 (214)	1 350 (53.1)	286 (631)	n/a	n/a
EN DN 150 PN 16 type F, with recess	1 100 (43.3)	97 (214)	1 350 (53.1)	287 (632)	n/a	n/a
EN DN 150 PN 40 type B1, raised face (RF)	1 100 (43.3)	105 (231)	1 350 (53.1)	294 (648)	n/a	n/a
EN DN 150 PN 40 type D, with groove	1 100 (43.3)	104 (230)	1 350 (53.1)	293 (647)	n/a	n/a
EN DN 150 PN 40 type E, with spigot	1 100 (43.3)	103 (228)	1 350 (53.1)	293 (647)	n/a	n/a
EN DN 150 PN 40 type F, with recess	1 100 (43.3)	104 (230)	1 350 (53.1)	293 (647)	n/a	n/a
EN DN 150 PN 63 type B1, raised face (RF)	1 140 (44.9)	124 (274)	1 350 (53.1)	311 (685)	n/a	n/a
EN DN 150 PN 63 type D, with groove	1 140 (44.9)	124 (274)	1 350 (53.1)	310 (684)	n/a	n/a
EN DN 150 PN 63 type E, with spigot	1 140 (44.9)	122 (269)	1 350 (53.1)	309 (681)	n/a	n/a
EN DN 150 PN 63 type F, with recess	1 140 (44.9)	123 (272)	1 350 (53.1)	310 (684)	n/a	n/a
EN DN 150 PN 100 type B1, raised face (RF)	1 180 (46.5)	138 (303)	n/a	n/a	n/a	n/a
EN DN 150 PN 100 type D, with groove	1 180 (46.5)	137 (302)	n/a	n/a	n/a	n/a
EN DN 150 PN 100 type E, with spigot	1 180 (46.5)	136 (299)	n/a	n/a	n/a	n/a
EN DN 150 PN 100 type F, with recess	1 180 (46.5)	137 (301)	n/a	n/a	n/a	n/a
EN DN 200 PN 16 type B1, raised face (RF)	n/a	n/a	1 350 (53.1)	294 (649)	1 010 (39.8)	290 (639)
EN DN 200 PN 16 type D, with groove	n/a	n/a	1 350 (53.1)	294 (649)	n/a	n/a
EN DN 200 PN 16 type E, with spigot	n/a	n/a	1 350 (53.1)	293 (646)	n/a	n/a
EN DN 200 PN 16 type F, with recess	n/a	n/a	1 350 (53.1)	293 (646)	n/a	n/a
EN DN200 PN40 type B1, raised face (RF)	n/a	n/a	1 350 (53.1)	311 (685)	1 030 (40.6)	308 (679)
EN DN 200 PN 40 type D, with groove	n/a	n/a	1 350 (53.1)	310 (683)	n/a	n/a
EN DN 200 PN 40 type E, with spigot	n/a	n/a	1 350 (53.1)	308 (680)	n/a	n/a
EN DN 200 PN 40 type F, with recess	n/a	n/a	1 350 (53.1)	309 (682)	n/a	n/a
EN DN 200 PN 63 type B1, raised face (RF)	n/a	n/a	1 350 (53.1)	333 (733)	1 060 (41.7)	332 (732)

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Dimensional drawings (continued)

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
EN DN 200 PN 63 type D, with groove	n/a	n/a	1 350 (53.1)	332 (732)	n/a	n/a
EN DN 200 PN 63 type E, with spigot	n/a	n/a	1 350 (53.1)	330 (728)	n/a	n/a
EN DN 200 PN 63 type F, with recess	n/a	n/a	1 350 (53.1)	331 (730)	n/a	n/a
EN DN 200 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 100 (43.3)	362 (798)
EN DN 250 PN 16 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 080 (42.5)	306 (675)
EN DN 250 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 130 (44.5)	343 (756)
EN DN 250 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 150 (45.3)	370 (816)
EN DN 250 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 150 (45.3)	433 (955)

L1 dimension and weight with process connections according to EN 1092-1, alloy 22 wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
EN DN 125 PN 16, type B1, raised face (RF)	1 100 (43.3)	96 (212)	n/a	n/a	n/a	n/a
EN DN 125 PN 40, type B1, raised face (RF)	1 100 (43.3)	101 (222)	n/a	n/a	n/a	n/a
EN DN 150 PN 16, type B1, raised face (RF)	1 100 (43.3)	103 (227)	n/a	n/a	n/a	n/a
EN DN 150 PN 40, type B1, raised face (RF)	1 100 (43.3)	110 (241)	n/a	n/a	n/a	n/a

L1 dimension and weight with process connections according to JIS B 2220, AISI 316L wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
JIS DN 100 10 K	1 100 (43.3)	91 (200)	n/a	n/a	n/a	n/a
JIS DN 100 20 K	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
JIS DN 125 10 K	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
JIS DN 125 20 K	1 100 (43.3)	101 (222)	n/a	n/a	n/a	n/a

L1 dimension and weight with process connections according to JIS B 2220, alloy 22 wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
JIS DN 125 10 K	1 100 (43.3)	97 (213)	n/a	n/a	n/a	n/a
JIS DN 125 20 K	1 100 (43.3)	103 (228)	n/a	n/a	n/a	n/a

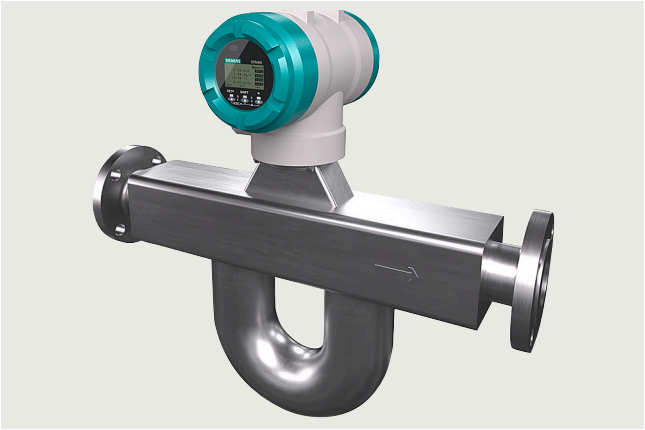
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Overview

FCT020 is the standard transmitter, suitable for general purpose applications. It delivers accurate and precise measurements of mass flow rate, density, temperature and volume flow rate.

The FCT020 transmitter is available in compact or remote design and can be combined with all SITRANS FC sensors. The selection is made within the complete SITRANS FC ordering code.

Spare transmitters are selected using the SITRANS FC ordering code, but with no sensor selected.



Example of SITRANS FCT transmitter mounted on SITRANS FCS600



FCT transmitter and SITRANS FCS100

Following features are available in the FCT020 transmitter:

• Tube health check

Tube health check

(software functions option code: S12)

Tube health check monitors key diagnostics, including tube stiffness, driver and pickups. Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout, or solid deposits building up in the tubes. The user defines verification frequency and alarm behavior. Verification results indicate whether preventive maintenance action is required.

Overview (continued)

Specification overview of SITRANS FCT020	
Typical measurement performance	• Mass flow accuracy: ± 0.2% (of rate) • Density accuracy: ± 4 kg/m³ (0.25 lb/ft³)
Features and functions	• Easy setup wizard • microSD card • Tube health check • Self-verification
Available measurements	• Mass flow • Density • Temperature • Volume flow
Digital communication options	• HART • MODBUS

Function

Tube health check

• Order code: **S12**

Tube health check monitors key diagnostics, including tube stiffness, driver and pickups. Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout, or solid deposits building up in the tubes. The user defines verification frequency and alarm behavior. Verification results indicate whether preventive maintenance action is required.

Overview of functions and features

Overview of the main functions and features of FCT020 transmitter	
Primary measurements	• Mass flow rate liquids (0.2% accuracy) • Mass flow rate gases (0.75% accuracy) • Density (accuracy 4 kg/m³ (0.25 lb/ft³)) • Temperature
Secondary measurements	• Volume flow rate liquids • Actual volume flow rate gases • Normal (standard) volume flow rate gases
Configuration and diagnostics	• microSD card (transmitter with display) • Easy setup wizard • Tube health check (self-verification) • Event management to NAMUR NE107
Inputs and outputs	• Up to 4 combined inputs and outputs
Inputs	• Status input
Outputs	• Analog output • Pulse (frequency) or status output • Status output • Option for internal pull-up resistor
Digital communications	• HART • MODBUS
Enclosure options	• Aluminum alloy with standard powder coating • Aluminum alloy with corrosion resistant coating • Stainless steel CF-8M (remote only)
Power supply	• Universal (AC and DC)

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Configuration

Overview of available inputs, outputs and digital communications

The table below provides a matrix of all available combinations for FCT020 transmitters.

Each combination is defined by a blend of two order code options:

- Ch 1 codes in the form "**E..**" define the required type of digital communication.
- Ch 2-4 codes in the form "**F..**" define the required combination of conventional inputs and outputs.

Abbreviations used in the table:

- Pulse or status output is abbreviated to "P/S output".
- Status only output is abbreviated to "S output".
- Status input is abbreviated to "S input".

Ch 1 code	Ch 2-4 code	I/O 1 (Channel 1)	I/O 2 (Channel 2)	I/O 3 (Channel 3)	I/O 4 (Channel 4)
E00	**F00**	none	none	none	none
E07 [1]	**F01**	passive mA HART output	passive P/S output	passive mA output	none
E07 [1]	**F02**	passive mA HART output	passive P/S output	passive mA output	passive P/S output
E07 [1]	**F03**	passive mA HART output	passive P/S output NAMUR	passive mA output	none
E07 [1]	**F04**	passive mA HART output	passive P/S output NAMUR	passive mA output	passive P/S output NAMUR
E06	**F11**	active mA HART output	passive P/S output	none	none
E06	**F12**	active mA HART output	passive P/S output	passive S output	passive P/S output
E06	**F13**	active mA HART output	passive P/S output	volt free S input	passive P/S output
E06	**F20**	active mA HART output	passive P/S output	volt free S input	active P/S output
E06	**F21**	active mA HART output	passive P/S output	volt free S input	active P/S output and pull-up
E06	**F22**	active mA HART output	passive P/S output	passive P/S output	active mA output
E06	**F23**	active mA HART output	passive P/S output	volt free S input	active mA output
E14	**F31**	none	passive P/S output	MODBUS C	MODBUS A & B
E14	**F32**	passive P/S output	passive P/S output	MODBUS C	MODBUS A & B
E14	**F35**	active P/S output	passive P/S output	MODBUS C	MODBUS A & B
E14	**F36**	active P/S output and pull-up	passive P/S output	MODBUS C	MODBUS A & B
E14	**F37**	active mA output	passive P/S output	MODBUS C	MODBUS A & B

[1] Any combinations with passive mA HART output on Channel are only possible with Ex approval. All outputs in these combinations are intrinsically safe.

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Technical specifications

Mechanical specifications

Material specifications			
Housing material options	**Coating**	**Design**	**Order code position 14**
Cast aluminum alloy Al-Si10Mg(Fe)	Standard coating[1)]	Remote transmitter	C or D
Cast aluminum alloy Al-Si10Mg(Fe)	Corrosion resistant coating[2)]	Remote transmitter	E or F
ASTM CF8M stainless steel	None	Remote transmitter	G or H
Display			
Material of the lid window	Glass		
Mounting bracket[3)]			
Material	AISI 316L stainless steel	Mat. no. 1.4404	
Nameplates[4)]	**Process temperature range**	**Nameplate material**	
Transmitter with cast aluminum housing	Not applicable	Foil	
Transmitter with ASTM CF8M stainless steel housing	Not applicable	AISI 316L ss	

1) Standard coating is urethane cured polyester powder coating.
2) Corrosion protection coating is a three-layer coating with high chemical resistance (polyurethane coating on two layers of epoxy).
3) Only the remote transmitters are supplied with a mounting bracket.
4) Nameplate material depends on the materials selected for SITRANS FC sensors.

Electrical specifications

Power supply	
Alternating current voltage (rms)	nominal 24 V AC (-15% ... +10%), or 100 ... 240 V AC (-20% ... +10%)
Frequency	47 ... 63 Hz
Direct current voltage	nominal 24 V DC (-15% ... +20%) or 100 ... 120 V DC (-10% ... +8.3%)
Power consumption	P ≤ 10 W (including sensor)

Notes:

- For DNV approval option supply voltage is limited to 24 V.
- NAMUR NE21 testing specifies the range 24 V DC ±20% under NE21 test conditions.

Power supply failure

In the event of a power failure, the flowmeter data are backed up on a non-volatile internal memory. In case of devices with display, the characteristic sensor values, such as nominal diameter, serial number, calibration constants, zero point and the error history are also stored on a microSD card.

Galvanic isolation

All circuits for inputs, outputs and power supply are galvanically isolated from each other.

Analog inputs and outputs

Analog input

FCT020 transmitters cannot be specified with analog current input.

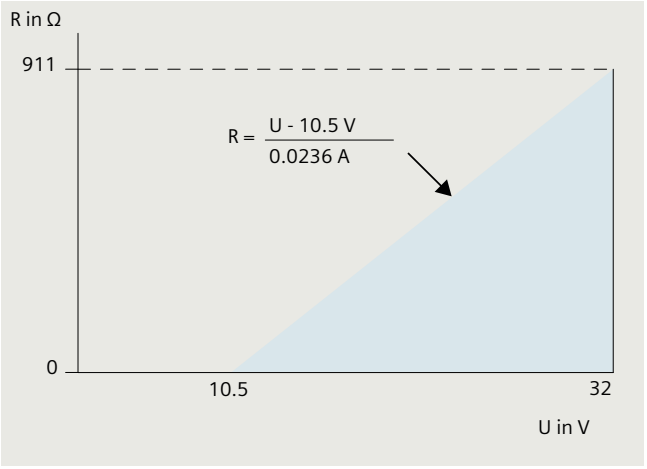
Analog output

Up to 2 analog outputs can be selected at time of ordering. The analog outputs can be configured to represent the following measured values:

- Flow rate (mass, volume, net partial component flow of a mixture)
- Density
- Temperature
- Pressure
- Concentration

HART communication, when selected, is supplied on channel 1 (I/O 1). The current output may be operated in compliance with the NAMUR NE43 standard.

Analog outputs	
Active output	
Nominal output current range	4 ... 20 mA
Maximum output current range	2.4 ... 21.6 mA
Load resistance	≤ 750 Ω
Load resistance for secure HART communication	230 ... 600 Ω
Passive output	
Nominal output current range	4 ... 20 mA
Maximum output current range	2.4 ... 21.6 mA
External power supply	10.5 ... 32 VDC
Load resistance for secure HART communication	230 ... 600 Ω
Load resistance at current output	≤ 911 Ω



Maximum load resistance as a function of an external power supply voltage

Digital inputs and outputs

Digital inputs (status)

Do not connect a signal source with electric voltage.

The status input is provided for use of voltage-free contacts with the following specification:

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Technical specifications (continued)

Resistance when closed	< 200 Ω
Resistance when open	> 100 kΩ

Digital outputs

Digital outputs	
Active pulse output available on Pulse/Status output, connection of an electronic counter[1)]	
Load resistance	> 1 kΩ
Internal power supply	24 V DC ±20%
Maximum pulse rate	10 000 pulses/s
Frequency range	0 ... 12.5 kHz
Active pulse output available on Pulse/Status output, connection of an electromechanical counter	
Maximum current	150 mA
Average current	≤ 30 mA
Internal power supply	24 V DC ±20%
Maximum pulse rate	2 pulses/s
Pulse width	20, 33, 50, or 100 ms
Active pulse output available on Pulse/Status output, with internal pull-up resistor	
Internal power supply	24 V DC ±20%
Internal pull-up resistor	2.2 kΩ
Maximum pulse rate	10 000 pulses/s
Frequency range	0 ... 12.5 kHz
Passive pulse output available on Pulse/Status output[1)]	
Maximum load current	≤ 200 mA
External power supply	≤ 30 V DC
Maximum pulse rate	10 000 pulses/s
Frequency range	0 to 12.5 kHz
Active status output available on Pulse/Status output[2)]	
Load resistance	> 1 kΩ
Internal power supply	24 V DC ±20%
Active status output available on Pulse/Status output, with internal pull-up resistor[3)]	
Internal pull-up resistor	2.2 kΩ
Internal power supply	24 V DC ±20%
Passive status output available on Pulse/Status output, or Status output	
Output current	≤ 200 mA
External power supply	≤ 30 V DC
Passive pulse or status output available on Pulse/Status output (NAMUR)	Output signals according to EN 60947-5-6 (previously NAMUR, worksheet NA001)

1) Maximum voltage and correct polarity must be observed for wiring.
2) Since this is a transistor contact, maximum allowed current as well as polarity and level of output voltage must be observed during wiring.
3) A relay must be connected in series to switch alternating voltage.

Digital communications

Each transmitter is configured with one default digital communication interface, selectable in the SITRANS FC order code.

HART

- When selected, HART communication is supplied on the output terminal pair I/O 1.
- Up to 3 further input/output options can be configured for output terminal pairs I/O 2, I/O 3, and I/O 4.
- HART is available with either non-intrinsically safe or intrinsically safe outputs.

PROFIBUS PA

- When selected, PROFIBUS PA communication is supplied on the output terminal pair I/O 1.
- PROFIBUS PA interface is available with and without intrinsic safety.
- PROFIBUS PA digital communication signal is in accordance with IEC 61158/61784.
- Maximum voltage and correct polarity must be observed for wiring.
- Power supply: 9 ... 32 V DC
- Current draw: 15 mA (maximum)
- Compliance with PA profile revision 3.02 supporting: Condensed Status (NE107)
- Device identification number (IDENT_NUMBER) adaption

Summary of available function blocks – PROFIBUS PA

Function block	Code	Description
Transducer block	FTB	Flow
	CTB	Concentration
	LTB	LCD Indicator
	MTB	Maintenance
	SDBT	Advanced diagnostics
Analog input block [1)]	AI1	Mass flow
	AI2	Density
	AI3	Temperature
	AI4	Volume flow
	AI5	Reference density
	AI6	Corrected (normal/standard) volume flow
Totalizer block [1)]	TOT1	Mass
	TOT2	Volume
	TOT3	Corrected (normal/standard) volume
Analog output block [1)]	AO	Pressure

1) Factory default setting. Assignment can be changed by parameter "channel".

Available function blocks are also influenced by the type of device description file (GSD) being used. For further details, please contact your regional Siemens Measurement Intelligence team.

MODBUS

- The MODBUS interface is available with up to two additional input/output options.
- When selected, MODBUS communication is supplied on the terminal pairs I/O 3 and I/O 4.
- The digital MODBUS communication signal is in accordance with EIA-485 standard (RS 485).

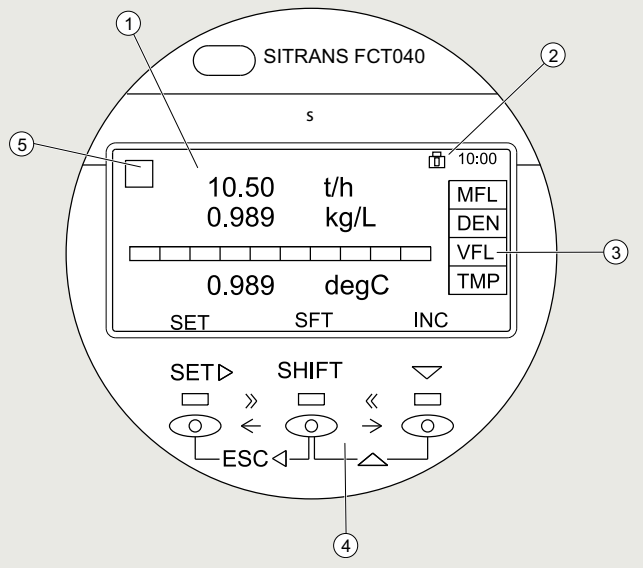
PROFINET over Ethernet-APL

Display attributes	
Type	4-line dot-matrix display
Resolution	128 × 64 (W × H) dots
Size	64.6 × 31.2 mm (2.54" × 1.23")
Control	via IR switches

Numerical values entered via the display are limited to six digits for process variables and eight digits for totalizer.

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Technical specifications (continued)



Display layout

1	Measured quantities and units
2	Status icon and time
3	Measured quantity abbreviation
4	IR switches
5	Alarm symbol

The controls on the display are IR switches. They respond as soon as an object, such as a finger, is in proximity. It is not necessary to apply pressure to the display surface.

The display unit includes a slot for the microSD card.

microSD card specifications	
Type	Industrial Grade microSD card, compliant with SD specification version 2.0
Physical dimension	15 × 11 × 1.0 mm (± 0.1 mm) (0.6 × 0.4 × 0.04 inch (± 0.004 inch))
Capacity	1 GB
Sequential throughput (read)	24.01 MB/s
Sequential throughput (write)	17.96 MB/s

It is recommended to use the microSD card included with the SITRANS FCT transmitter. Functionality of the device cannot be guaranteed if other cards are used.

Cable specifications

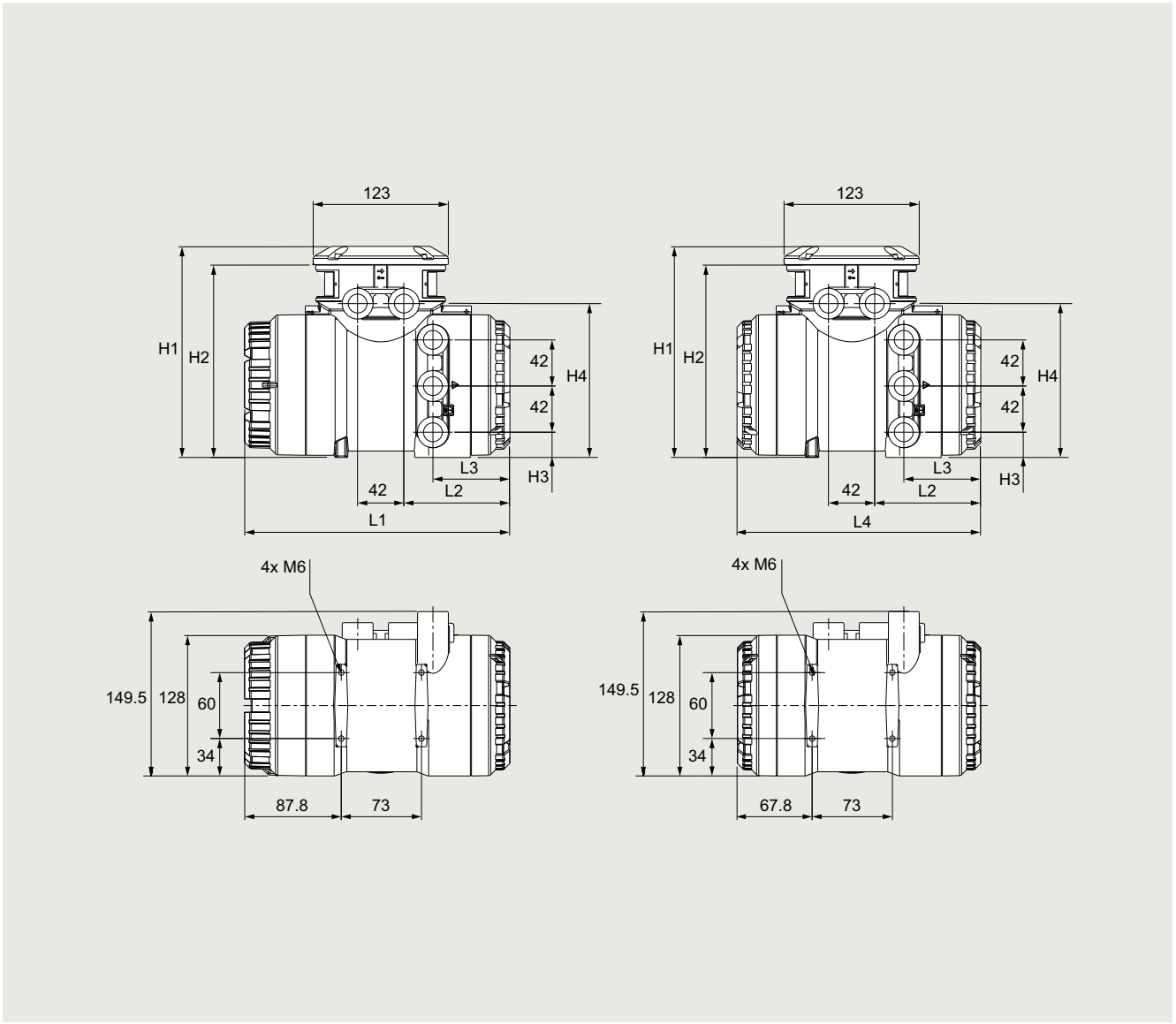
For remote type devices, an interconnecting cable must be used to connect the sensor to the transmitter. The device specifications, stated in this document, are valid only if one of the original SITRANS FC interconnecting cables is used.

Standard cable length options are specified up to 30 m are specified in the order code to maintain the stated specifications. Cables longer than 30 m (98 ft) are available but must be ordered as separate items. For further details, please contact your regional Siemens Measurement Intelligence team.

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Dimensional drawings

SITRANS FCT020 transmitter dimensions



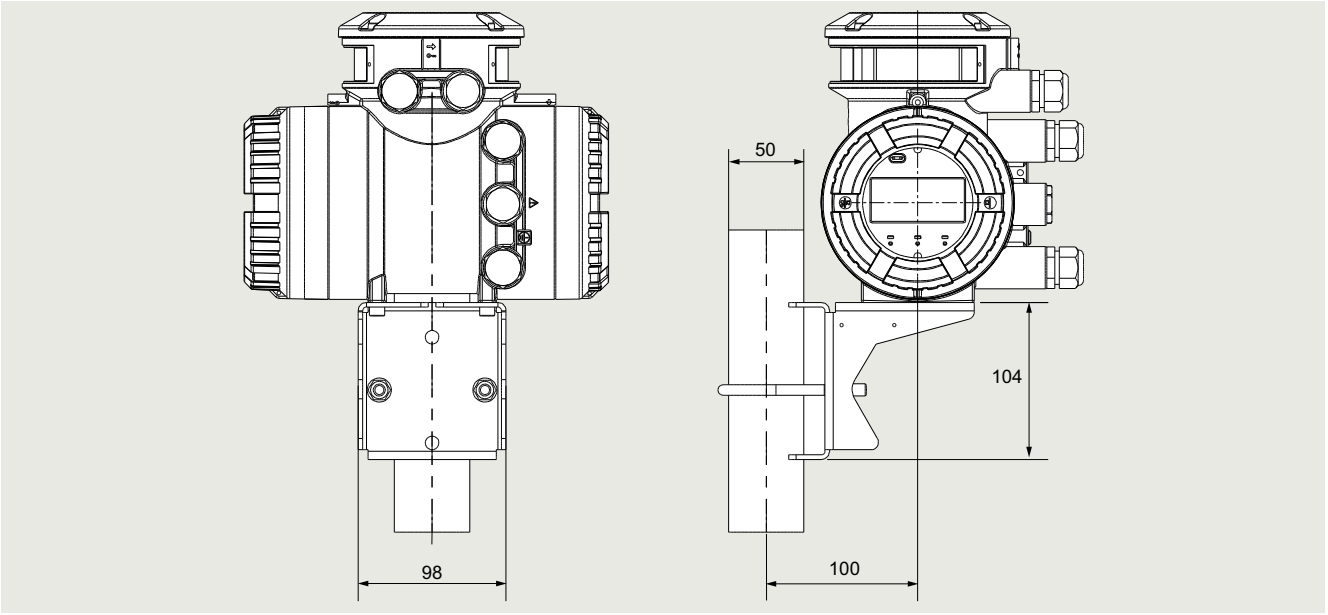
Dimensions of FCT020 transmitter in mm. Transmitter with display shown on the left. Transmitter without display shown on the right.

Dimensions L1 to L4 and H1 to H4 (material options: stainless steel, aluminum)

Material	L1 in mm (inch)	L2 in mm (inch)	L3 in mm (inch)	L4 in mm (inch)	H1 in mm (inch)	H2 in mm (inch)	H3 in mm (inch)	H4 in mm (inch)
Stainless steel	255.5 (10.06)	110.5 (4.35)	69 (2.72)	235 (9.25)	201 (7.91)	184 (7.24)	24 (0.94)	150.5 (5.93)
Aluminum	241.5 (9.51)	96.5 (3.8)	70 (2.76)	221 (8.7)	192 (7.56)	175 (6.89)	23 (0.91)	140 (5.51)

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Dimensional drawings (continued)



Dimensions of transmitter in mm, attached to mounting bracket

Transmitter weights

Design type	Transmitter enclosure material	Weight in kg (lb)
Remote	Cast aluminum	4.2 (9.3)
	CF-8M stainless steel	12.5 (27.6)

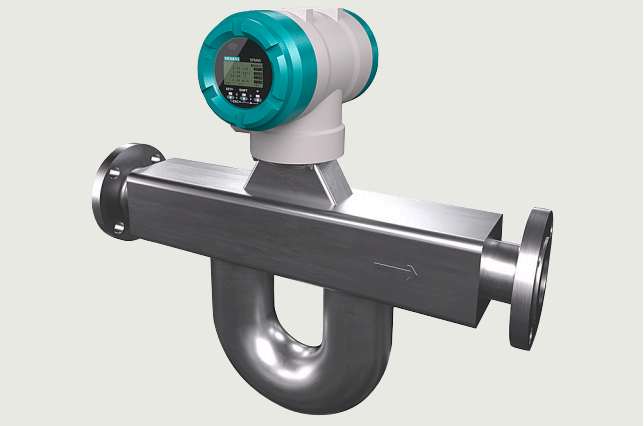
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Overview

FCT040 is the advanced transmitter, offering a wider range of application solutions with improved performance. The user can select additional measurements and functions at time of ordering to include concentration (fraction), viscosity, batch control and heat calculation.

The FCT040 transmitter is available in compact or remote design and can be combined with all SITRANS FC sensors. The selection is made within the complete SITRANS FC ordering code.

Spare transmitters are selected using the SITRANS FC ordering code, but with no sensor selected.



Example of SITRANS FCT transmitter mounted on SITRANS FCS600



FCT transmitter and SITRANS FCS100

Following features are available in the FCT040 transmitter:

- Tube health check
- Standard concentration measurement
- Petroleum measurement function
- Fraction (advanced concentration) measurement
- Viscosity function
- Batching function

Overview (continued)

Specification overview of SITRANS FCT040	
Typical measurement performance	• Mass flow accuracy: ± 0.1% (of rate) • Density accuracy: ± 0.5 kg/m³ (0.03 lb/ft³)
Features and functions	• Easy setup wizard • microSD card • Tube health check • Self-verification • Batch control
Available measurements	• Mass flow • Density • Temperature • Volume flow • Concentration (fraction) • Viscosity • Heat (thermal) energy
Digital communication options	• HART • MODBUS • PROFIBUS PA • PROFINET over Ethernet-APL

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Function

Measurement of heat quantity

• Order code: **S11**

This function calculates the total fuel calorific value of the measured fluid. Either a constant value of the calorific value of the fluid can be used, or an additional device like a gas chromatograph can provide the instantaneous calorific value via the analog input of the FCT040 transmitter. Based on the fluid flow, the total calorific energy of the fluid is calculated.

For questions regarding a specific application, contact your regional Siemens Measurement Intelligence team.

Tube health check

• Order code: **S12**

Tube health check monitors key diagnostics, including tube stiffness, driver and pickups. Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout, or solid deposits building up in the tubes. The user defines verification frequency and alarm behavior. Verification results indicate whether preventive maintenance action is required.

Petroleum measurement function

• Order code: **S14**

The Net Oil Computing (NOC) function provides real-time measurements of water cut and includes American Petroleum Institute (API) correction according to API MPMS Chapter 11.1.

Oil sometimes contains entrained gas. SITRANS FC flowmeters measure the density of the combined emulsion oil and gas, which is lower than the oil density. The NOC function includes a Gas Void Fraction (GVF) parameter to be set.

Viscosity function

• Order code: **S15**

Viscosity is sometimes used as reference value to activate other processes like fluid heating systems.

The viscosity estimation is calculated based on a comparison between measured pressure loss and a calculated value between two points of the pipe. A differential pressure transmitter is required to use this function. Its output is connected to the analog input of the FCT040. Based on an iteration process, a viscosity value is determined.

Standard concentration measurement

• Order code: **S16**

Used for concentration measurements of emulsions or suspensions when density of the fluid involved depends only on temperature.

The standard concentration measurement can be used for many low-concentration solutions if there is only minor interaction between the liquids, or if the miscibility is negligible.

Fraction measurement (advanced concentration)

Up to four pre-configured fraction ranges can be selected using the SITRANS FC option order codes from the table below.

Order code	Fraction description	Type	Range	Units	Temperature range
G01	Sugar / water (sucrose solution)	Mass fraction	0 ... 85	°Bx	0 ... 80 °C (32 ... 176 °F)
G02	NaOH / water (sodium hydroxide solution)	Mass fraction	2 ... 50	%	0 ... 100 °C (32 ... 212 °F)
G03	KOH / water (potassium hydroxide solution)	Mass fraction	0 ... 60	%	54 ... 100 °C (129 ... 212 °F)
G04	NH_4NO_3 / water (ammonium nitrate solution)	Mass fraction	1 ... 50	%	0 ... 80 °C (32 ... 176 °F)
G05	NH_4NO_3 / water (ammonium nitrate solution)	Mass fraction	20 ... 70	%	20 ... 100 °C (68 ... 212 °F)
G06	HCl / water (hydrochloric acid)	Mass fraction	22 ... 34	%	20 ... 40 °C (68 ... 104 °F)
G07	HNO_3 / water (nitric acid)	Mass fraction	50 ... 67	%	10 ... 60 °C (50 ... 140 °F)
G09	H_2O_2 / water (hydrogen peroxide)	Mass fraction	30 ... 75	%	4 ... 44 °C (39 ... 111 °F)
G10	Ethylene glycol / water (homogenous mixture)	Mass fraction	10 ... 50	%	-20 ... +40 °C (-4 ... +104 °F)
G11	Amylum (starch) / water (paste-like suspension)	Mass fraction	33 43	%	35 ... 45 °C (95 ... 113 °F)
G12	Methanol / water (homogenous mixture)	Mass fraction	35 ... 60	%	0 ... 40 °C (32 ... 104 °F)
G20	Alcohol / water (homogenous mixture)	Volume fraction	55 ... 100	%	10 ... 40 °C (50 ... 104 °F)
G21	Sugar / water (sucrose solution)	Mass fraction	40 ... 80	°Bx	75 ... 100 °C (167 ... 212 °F)
G30	Alcohol / water (homogenous mixture)	Mass fraction	66 ... 100	%	15 ... 40 °C (59 ... 104 °F)
G37	Alcohol / water (homogenous mixture)	Mass fraction	66 ... 100	%	10 ... 40 °C (50 ... 104 °F)

The user is responsible to ensure chemical compatibility of the wetted parts material in combination with the measured chemicals. For strong acids or oxidizers, a variant with wetted parts made of alloy 22/2.4602 is advised.

Batching function

Batching and filling processes are found in many industries: food and beverage, cosmetic, pharmaceutical, oil and gas and chemical.

SITRANS FCT040 transmitters offer an integrated batching function to carry out the task. A self-learning algorithm optimizes the process to provide accurate and reliable results.

The function supports two filling modes:

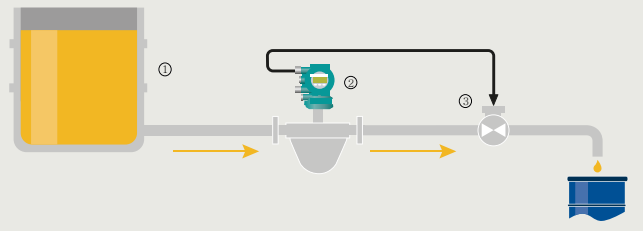
• Single-stage batch control with single valve

• Two-stage batching to control two valves for more accurate filling

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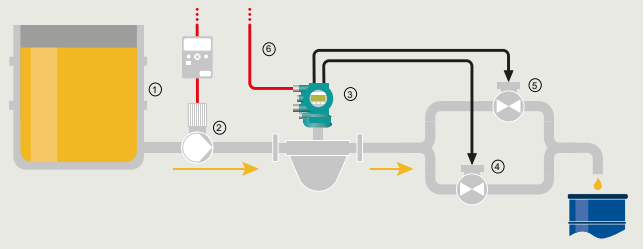
Function (continued)

The error management function allows the user to set alarms and warnings according to the application.



Example diagram for 1-stage batching

1	Storage tank
2	SITRANS FC
3	Valve



Example diagram for 2-stage batching

1	Storage tank
2	Pump
3	SITRANS FC
4	Valve A
5	Valve B
6	HART

Overview of functions and features

Overview of the main functions and features of FCT040 transmitter	
Primary measurements	• Mass flow rate liquids (0.1% accuracy) • Mass flow rate gases (0.5% accuracy) • Density (accuracy 0.5 kg/m³ (0.03 lb/ft³)) • Temperature
Secondary measurements	• Volume flow rate liquids • Actual volume flow rate gases • Normal (standard) volume flow rate gases • Standard concentration • Net oil computing • Fraction (up to 4 default ranges) • Fraction (customer specified) • Fraction A & B net mass flow rate • Fraction A & B net volume flow rate
Additional functions	• Heat (thermal energy) calculation • Viscosity calculation (liquids) • Batching and filling • NTEP custody transfer
Configuration and diagnostics	• microSD card (transmitter with display) • Easy setup wizard • Tube health check (self-verification) • Event management to NAMUR NE107
Inputs and outputs	• Up to 4 combined inputs and outputs
Inputs	• Analog input • Status input
Outputs	• Analog output • Pulse (frequency) or status output • Status output • Option for internal pull-up resistor
Digital communications	• HART • MODBUS • PROFIBUS PA • PROFINET over Ethernet-APL
Enclosure options	• Aluminum alloy with standard powder coating • Aluminum alloy with corrosion resistant coating • Stainless steel CF-8M (remote only)
Power supply	• Universal (AC and DC)

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Configuration

Overview of available inputs, outputs and digital communications

The table below provides a matrix of all available combinations for the FCT040 transmitter.

Each combination is defined by a blend of two order code options:

- Ch 1 codes in the form "**E..**" define the required type of digital communication.
- Ch 2-4 codes in the form "**F..**" define the required combination of conventional inputs and outputs.

Abbreviations used in the table:

- Pulse or status output is abbreviated to "P/S output".
- Status only output is abbreviated to "S output".
- Status input is abbreviated to "S input".

Ch 1 code	Ch 2-4 code	I/O 1 (Channel 1)	I/O 2 (Channel 2)	I/O 3 (Channel 3)	I/O 4 (Channel 4)
E00	**F00**	none	none	none	none
E07 [1]	**F01**	passive mA HART output	passive P/S output	passive mA output	none
E07 [1]	**F02**	passive mA HART output	passive P/S output	passive mA output	passive P/S output
E07 [1]	**F03**	passive mA HART output	passive P/S output NAMUR	passive mA output	none
E07 [1]	**F04**	passive mA HART output	passive P/S output NAMUR	passive mA output	passive P/S output NAMUR
E06	**F11**	active mA HART output	passive P/S output	none	none
E06	**F12**	active mA HART output	passive P/S output	passive S output	passive P/S output
E06	**F13**	active mA HART output	passive P/S output	volt free S input	passive P/S output
E06	**F14**	active mA HART output	passive P/S output	passive P/S output	active mA input
E06	**F15**	active mA HART output	passive P/S output	passive P/S output	passive mA input
E06	**F16**	active mA HART output	passive P/S output	passive mA output	active mA input
E06	**F17**	active mA HART output	passive P/S output	passive mA output	passive mA input
E06	**F18**	active mA HART output	passive P/S output	volt free S input	active mA input
E06	**F19**	active mA HART output	passive P/S output	volt free S input	passive mA input
E06	**F20**	active mA HART output	passive P/S output	volt free S input	active P/S output
E06	**F21**	active mA HART output	passive P/S output	volt free S input	active P/S output and pull-up
E06	**F22**	active mA HART output	passive P/S output	passive P/S output	active mA output
E06	**F23**	active mA HART output	passive P/S output	volt free S input	active mA output
E14	**F31**	none	passive P/S output	MODBUS C	MODBUS A & B
E14	**F32**	passive P/S output	passive P/S output	MODBUS C	MODBUS A & B
E14	**F33**	active mA input	passive P/S output	MODBUS C	MODBUS A & B
E14	**F34**	passive mA input	passive P/S output	MODBUS C	MODBUS A & B
E14	**F35**	active P/S output	passive P/S output	MODBUS C	MODBUS A & B
E14	**F36**	active P/S output and pull-up	passive P/S output	MODBUS C	MODBUS A & B
E14	**F37**	active mA output	passive P/S output	MODBUS C	MODBUS A & B
E10	**F41**	PROFIBUS PA	passive pulse output	none	none
E10	**F42**	PROFIBUS PA (IS)	passive pulse output (IS)	none	none
E15	**F50**	PROFINET over Ethernet-APL (IS)	none	1 passive pulse output (IS)	none

[1] Any combinations with passive mA HART output on Channel are only possible with Ex approval. All outputs in these combinations are intrinsically safe.

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Technical specifications

Mechanical specifications

Material specifications			
Housing material options	**Coating**	**Design**	**Order code position 14**
Cast aluminum alloy Al-Si10Mg(Fe)	Standard coating[1)]	Remote transmitter	C or D
Cast aluminum alloy Al-Si10Mg(Fe)	Corrosion resistant coating[2)]	Remote transmitter	E or F
ASTM CF8M stainless steel	None	Remote transmitter	G or H
Display			
Material of the lid window	Glass		
Mounting bracket[3)]			
Material	AISI 316L stainless steel	Mat. no. 1.4404	
Nameplates[4)]	**Process temperature range**	**Nameplate material**	
Transmitter with cast aluminum housing	Not applicable	Foil	
Transmitter with ASTM CF8M stainless steel housing	Not applicable	AISI 316L ss	

1) Standard coating is urethane cured polyester powder coating.
2) Corrosion protection coating is a three-layer coating with high chemical resistance (polyurethane coating on two layers of epoxy).
3) Only the remote transmitters are supplied with a mounting bracket.
4) Nameplate material depends on the materials selected for SITRANS FC sensors.

Electrical specifications

Power supply	
Alternating current voltage (rms)	nominal 24 V AC (-15% ... +10%), or 100 ... 240 V AC (-20% ... +10%)
Frequency	47 ... 63 Hz
Direct current voltage	nominal 24 V DC (-15% ... +20%) or 100 ... 120 V DC (-10% ... +8.3%)
Power consumption	P ≤ 10 W (including sensor)

Notes:

- For DNV approval option supply voltage is limited to 24 V.
- NAMUR NE21 testing specifies the range 24 V DC ±20% under NE21 test conditions.

Power supply failure

In the event of a power failure, the flowmeter data are backed up on a non-volatile internal memory. In case of devices with display, the characteristic sensor values, such as nominal diameter, serial number, calibration constants, zero point and the error history are also stored on a microSD card.

Galvanic isolation

All circuits for inputs, outputs and power supply are galvanically isolated from each other.

Analog inputs and outputs

Analog input

Analog inputs	
Active current input[1)]	
Nominal input current range	4 ... 20 mA
Maximum input current range	2.4 ... 21.6 mA
Internal power supply	24 V DC ±20%
Internal load resistance	≤ 160 Ω
Passive current input[2)]	
Nominal input current range	4 ... 20 mA
Maximum input current range	2.4 ... 21.6 mA
External power supply	10.5 ... 32 V DC
Internal load resistance	≤ 160 Ω

1) The active current input is provided for connecting a two-wire transmitter with an output signal of 4 ... 20 mA.
2) The passive current input is provided for connecting a four-wire transmitter with an active current output signal.

Note: One analog current input is available for external analog devices.

Analog output

Up to two analog outputs can be selected at time of ordering. The analog outputs can be configured to represent the following measured values:

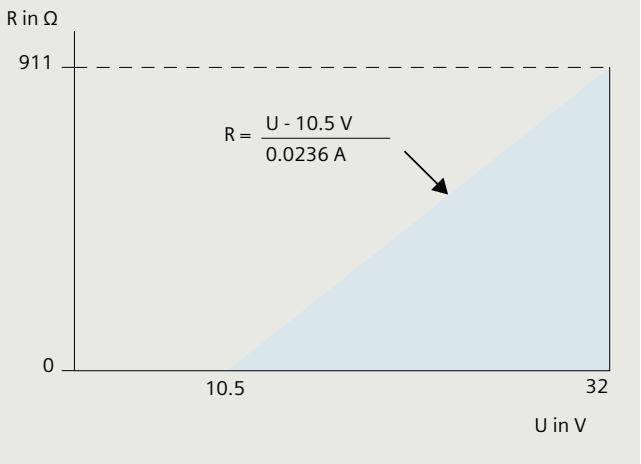
- Flow rate (mass, volume, net partial component flow of a mixture)
- Density
- Temperature
- Pressure
- Concentration

HART communication, when selected, is supplied on channel 1 (I/O 1). The current output may be operated in compliance with the NAMUR NE43 standard.

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Technical specifications (continued)

Analog outputs	
Active current output	
Nominal output current range	4 ... 20 mA
Maximum output current range	2.4 ... 21.6 mA
Load resistance	≤ 750 Ω
Load resistance for secure HART communication	230 ... 600 Ω
Passive current output	
Nominal output current range	4 ... 20 mA
Maximum output current range	2.4 ... 21.6 mA
External power supply	10.5 ... 32 VDC
Load resistance for secure HART communication	230 ... 600 Ω
Load resistance at current output	≤ 911 Ω



Maximum load resistance as a function of an external power supply voltage

1) The active current input is provided for connecting a two-wire transmitter with an output signal of 4 ... 20 mA.
2) The passive current input is provided for connecting a four-wire transmitter with an active current output signal.

Digital inputs and outputs

Digital inputs (status)

Do not connect a signal source with electric voltage.

The status input is provided for use of voltage-free contacts with the following specification:

Resistance when closed	< 200 Ω
Resistance when open	> 100 kΩ

Digital communications

Each transmitter is configured with one default digital communication interface, selectable in the SITRANS FC order code.

HART

When selected, HART communication is supplied on the output terminal pair I/O 1.

Up to three further Input/Output options can be configured for output terminal pairs I/O 2, I/O 3, and I/O 4.

HART is available with either non-intrinsically safe or intrinsically safe outputs.

PROFIBUS PA

- When selected, PROFIBUS PA communication is supplied on the output terminal pair I/O 1.
- PROFIBUS PA interface is available with and without intrinsic safety.
- PROFIBUS PA digital communication signal is in accordance with IEC 61158/61784.
- Maximum voltage and correct polarity must be observed for wiring.
- Power supply: 9 ... 32 V DC
- Current draw: 15 mA (maximum)
- Compliance with PA profile revision 3.02 supporting: Condensed Status (NE107)
- Device identification number (IDENT_NUMBER) adaption

Digital output

Digital outputs	
Active pulse output available on Pulse/Status output, connection of an electronic counter[1]	
Load resistance	> 1 kΩ
Internal power supply	24 V DC ±20%
Maximum pulse rate	10 000 pulses/s
Frequency range	0 ... 12.5 kHz
Active pulse output available on Pulse/Status output, connection of an electromechanical counter	
Maximum current	150 mA
Average current	≤ 30 mA
Internal power supply	24 V DC ±20%
Maximum pulse rate	2 pulses/s
Pulse width	20, 33, 50, or 100 ms
Active pulse output available on Pulse/Status output, with internal pull-up resistor	
Internal power supply	24 V DC ±20%
Internal pull-up resistor	2.2 kΩ
Maximum pulse rate	10 000 pulses/s
Frequency range	0 ... 12.5 kHz
Passive pulse output available on Pulse/Status output[1]	
Maximum load current	≤ 200 mA
External power supply	≤ 30 V DC
Maximum pulse rate	10 000 pulses/s
Frequency range	0 ... 12.5 kHz
Active status output available on Pulse/Status output[2]	
Load resistance	> 1 kΩ
Internal power supply	24 V DC ±20%
Active status output available on Pulse/Status output, with internal pull-up resistor[3]	
Internal pull-up resistor	2.2 kΩ
Internal power supply	24 V DC ±20%
Passive status output available on Pulse/Status output, or Status output	
Output current	≤ 200 mA
External power supply	≤ 30 V DC
Passive pulse or status output available on Pulse/Status output (NAMUR)	Output signals according to EN 60947-5-6 (previously NAMUR, worksheet NA001)

1) Maximum voltage and correct polarity must be observed for wiring.
2) Since this is a transistor contact, maximum allowed current as well as polarity and level of output voltage must be observed during wiring.
3) A relay must be connected in series to switch alternating voltage.

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Technical specifications (continued)

Summary of available function blocks – PROFIBUS PA

Function block	Code	Description
Transducer block	FTB	Flow
	CTB	Concentration
	LTB	LCD Indicator
	MTB	Maintenance
	SDBT	Advanced diagnostics
Analog input block [1]	AI1	Mass flow
	AI2	Density
	AI3	Temperature
	AI4	Volume flow
	AI5	Reference density
	AI6	Corrected (normal/standard) volume flow
Totalizer block [1]	TOT1	Mass
	TOT2	Volume
	TOT3	Corrected (normal/standard) volume
Analog output block [1]	AO	Pressure

[1] Factory default setting. Assignment can be changed by parameter "channel".

Available function blocks are also influenced by the type of device description file (GSD) being used. For further details, please contact your regional Siemens Measurement Intelligence team.

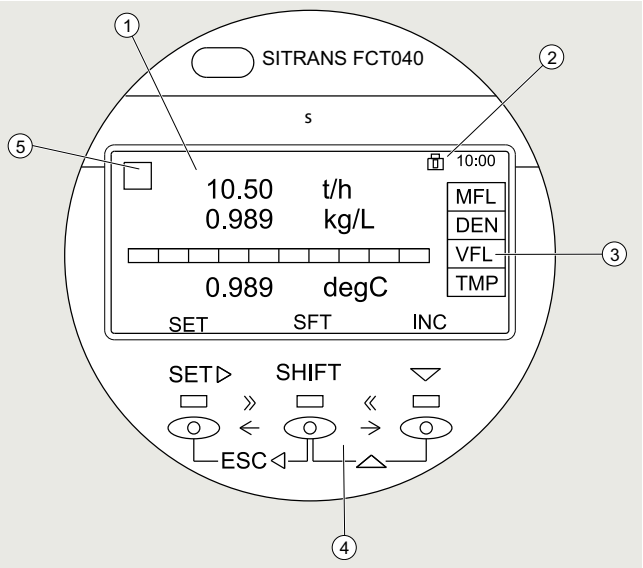
MODBUS

- The MODBUS interface is available with up to two additional Input/Output options.
- When selected, MODBUS communication is supplied on the terminal pairs I/O 3 and I/O 4.
- The digital MODBUS communication signal is in accordance with EIA-485 standard (RS 485).

PROFINET over Ethernet-APL

Display attributes	
Type	4-line dot-matrix display
Resolution	128 × 64 (W × H) dots
Size	64.6 × 31.2 mm (2.54 × 1.23 inch)
Control	via IR switches

Numerical values entered via the display are limited to six digits for process variables and eight digits for totalizer.



Display layout

1	Measured quantities and units
2	Status icon and time
3	Measured quantity abbreviation
4	IR switches
5	Alarm symbol

The controls on the display are IR switches. They respond as soon as an object, such as a finger, is in proximity. It is not necessary to apply pressure to the display surface.

The display unit includes a slot for the microSD card.

microSD card specifications	
Type	Industrial Grade microSD card, compliant with SD specification version 2.0
Physical dimension	15 × 11 × 1.0 mm (± 0.1 mm) (0.6 × 0.4 × 0.04 inch (± 0.004"))
Capacity	1 GB
Sequential throughput (read)	24.01 MB/s
Sequential throughput (write)	17.96 MB/s

It is recommended to use the microSD card included with the SITRANS FCT transmitter. Functionality of the device cannot be guaranteed if other cards are used.

Cable specifications

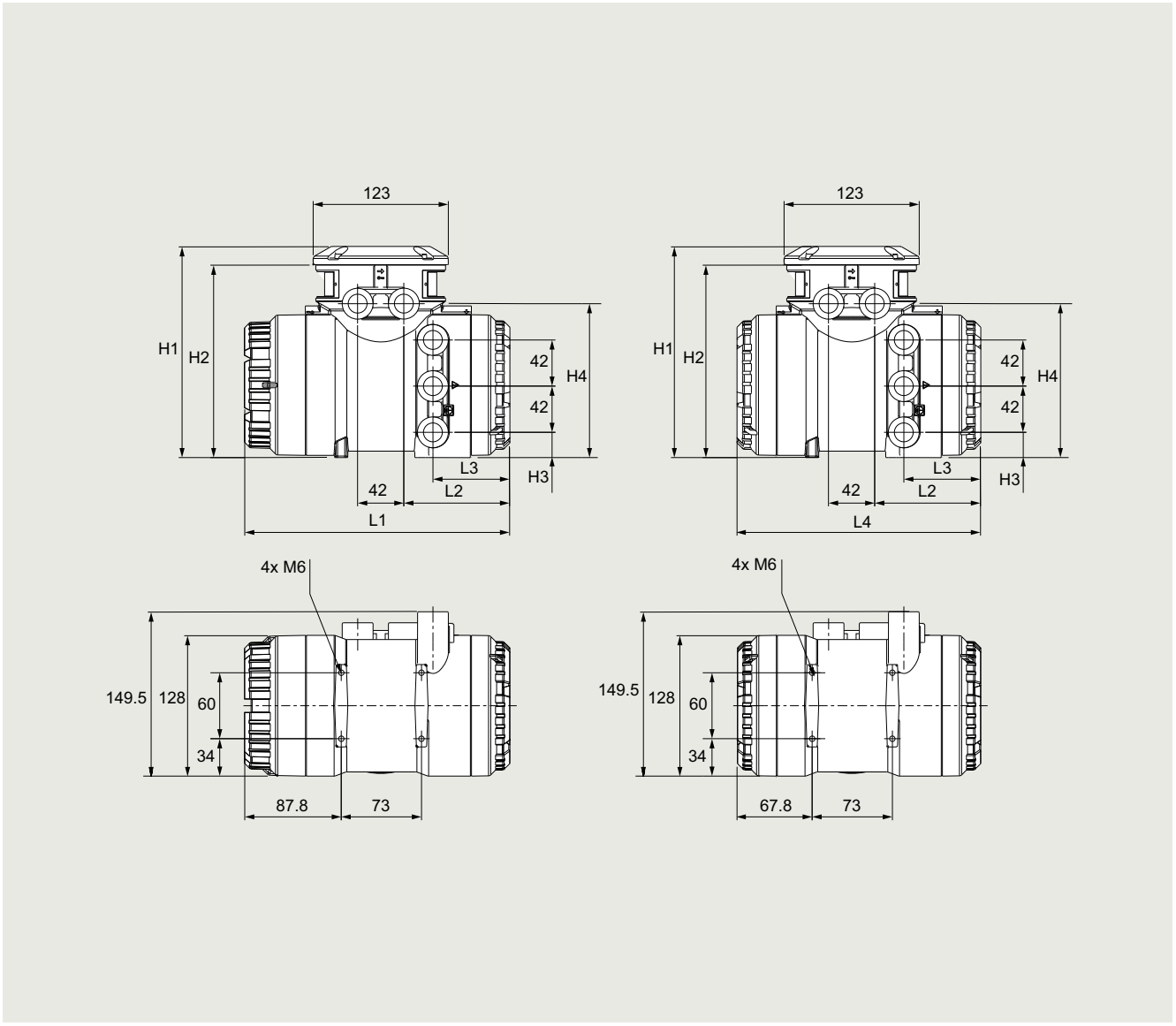
For remote type devices, an interconnecting cable must be used to connect the sensor to the transmitter. The device specifications, stated in this document, are valid only if one of the original SITRANS FC interconnecting cables is used.

Standard cable length options are specified up to 30 m are specified in the order code to maintain the stated specifications. Cables longer than 30 m (98 ft) are available but must be ordered as separate items. For further details, please contact your regional Siemens Measurement Intelligence team.

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Dimensional drawings

SITRANS FCT040 transmitter dimensions



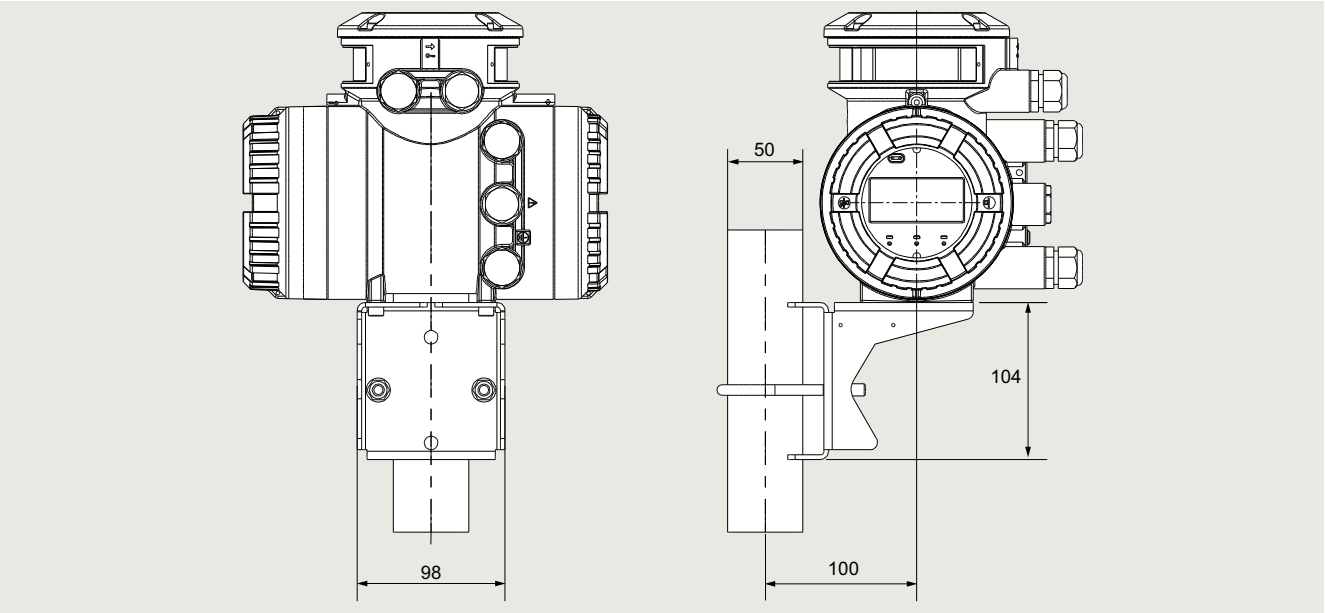
Dimensions of FCT040 transmitter in mm. Transmitter with display shown on the left. Transmitter without display shown on the right.

Dimensions L1 to L4 and H1 to H4 (material options: stainless steel, aluminum)

Material	L1 in mm (inch)	L2 in mm (inch)	L3 in mm (inch)	L4 in mm (inch)	H1 in mm (inch)	H2 in mm (inch)	H3 in mm (inch)	H4 in mm (inch)
Stainless steel	255.5 (10.06)	110.5 (4.35)	69 (2.72)	235 (9.25)	201 (7.91)	184 (7.24)	24 (0.94)	150.5 (5.93)
Aluminum	241.5 (9.51)	96.5 (3.8)	70 (2.76)	221 (8.7)	192 (7.56)	175 (6.89)	23 (0.91)	140 (5.51)

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Dimensional drawings (continued)



Dimensions of transmitter in mm, attached to mounting bracket

Transmitter weights

Design type	Transmitter enclosure material	Weight in kg (lb)
Remote	Cast aluminum	4.2 (9.3)
	CF-8M stainless steel	12.5 (27.6)

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Overview

The flowmeter systems of the SITRANS FC100 series are the precision Coriolis multi-parameter flowmeter for low flow applications.

They are formed by one FCS100 sensor and one FCT transmitter:

- SITRANS FC120 is the combination of the FCS100 sensor and the FCT020 transmitter
- SITRANS FC140 is the combination of the FCS100 sensor and the FCT040 transmitter

Features:

- Compact dual curved alloy 22 measuring tubes
- Process connection: flange, thread or hygienic clamp
- Nominal sizes: DN 1 to DN 8
- Connection sizes: DN 6 to DN 40 (¼" to 1½")
- Nominal flow rates: 21 kg/h to 950 kg/h (46 lb/h to 2 094 lb/h)
- FCS100 sensors always combine with a remote transmitter via a connecting cable
- Installation of sensor and transmitter in different locations



FCS100 sensor and FCT020/040 transmitter

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Benefits

Product features aligned to user value targets

	User value targets	SITRANS FC features and solutions
Engineering and project management	• Reduce engineering investment • Cut specification effort • Minimize project expenditure • Decrease the spending on each measurement point • Eliminate function duplication • Reduce number of suppliers	• Siemens project teams offer complimentary evaluation of customer specifications, provided by regional and HQ experts • Simple product selection using intuitive sizing software • One SITRANS FC device can typically provide three to six individual measurements, all transmitted via digital communication, when planned during pre-project design • Added value functions: batch control, viscosity, thermal energy, concentration measurement (Fraction) of two-component solutions and pressure compensation
Installation	• Reduce footprint and transport outlay of OEM machinery • Lower installation complexity • Avoid costly modifications of existing plant	• Can be installed in horizontal or vertical (self-draining) pipes • Twin tube bend design delivers strong signal to noise characteristic resistant to external influence, so install in tight spaces with no inlet and outlet restrictions • Adaptable to existing pipes: typically, three or four connection sizes for each sensor size • Flexible selection of traditional inputs, outputs and digital communications
Configuration and commissioning	• Shorter commissioning schedules with lower costs • Faster start-up with reduced outgoings	• Easy setup wizard delivers working meters straight after start-up • microSD card stores sensor calibration data and default setup • Simple configuration using Process Device Manager (PDM) • Siemens device-specific faceplates simplify operation in plantwide control systems
Efficient plant operation	• Improve finished product consistency to reduce waste • Keep process performance when scaling production up or down • Optimize process control • Improve finished product quality enabling higher levels of profit • Reduce downtime with fast resolution of process upsets • Improve asset performance	• SITRANS FC meters are calibrated in rigs accredited to EN/ISO 17025 to ensure consistently high performance of flow, density, and concentration measurements • First-class zero-point quality maintains high accuracy into the low flow region • High sensitivity and intelligent dynamic range keeps the measurement active in demanding high fluid damping cases • Designed-in resilience to process extremes • Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout or solid deposits building up in the tubes • Diagnostic data via local menu or PDM is backed by Siemens applications experts • Intelligent Siemens SITRANS IQ apps for continuing asset evaluation
Maintenance and asset management	• Optimize technician training • Reduce cost of spare parts • Increase predictive maintenance • Reduce production downtime and associated costs • Decrease unplanned maintenance • Maximize asset value	• Simple product design with interchangeable modular parts • microSD card loads sensor-specific data to deliver fast service exchange • Self-verification: tube health check monitors key diagnostics, including tube stiffness, driver and pickups; the user defines verification frequency and alarm behavior • Verification results indicate whether preventive maintenance action is required • Siemens SIMATIC Maintenance Station uses cyclical acquisition to provide life cycle reports and intelligent preventive maintenance strategies
Industry compliance	• Cut effort required to comply with Industry-specific demands • Reduce resource needed to maintain regulatory compliance	• Food and beverage sector covered with EHEDG and 3-A approvals, polished tubes • Global hazardous area approvals for international plant duplications • Common and emerging digital networks covered: HART, PROFIBUS PA, MODBUS or PROFINET over APL Ethernet (IS) • Class-leading safety: SIL2/SIL3, secondary containment, PED, NAMUR NE95

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Application

Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Chemical and petrochemical Bulk chemicals Industrial gases Polymers Agrochemicals Fine chemicals Aroma chemicals	• Transfer, loading and unloading of bulk chemicals • Concentration control of acids and alkalis (process optimization) • Accurate mass or volume flow of feed chemicals to in-line blending systems • Accurate mass flow and density (quality) of reactor fluid feeds catalyst • Chemical recovery • Mass balance optimization • Compressed and cryogenic gases • Lubricating oil blending and dosing • High accuracy measurement of critical fluid components • Low flow control in pilot plants and R&D facilities
Food and beverage Food processing Dairies Breweries Distilleries Confectionary Soft drinks Animal feed plants OEM	• Accurate bulk transfer (mass or volume) of all dairy products: milk, cream, whey and yoghurt • Fat concentration in cream • Flow, density, temperature and concentration (Plato) during all fermentation processes • Flow, density, temperature and sugar concentration (Brix) in soft drink processing • Distilled spirits – % alcohol by volume (ABV), liters of pure alcohol, volume transfer, blending, batch and column still optimization and energy management, cask filling, tanker loading • Flow and density of fruit juices and pulps • Mixing and inventory control of confectionary ingredients, e.g. chocolate, syrup, oils, flavors • Metering pump control • Oils, fats enzymes dosing in animal feed plants • CO_2 dosing • CIP liquids • Bottling of beer, spirits, wine, soft drinks, etc. • Bulk sugar processing – molasses, sugar slurries, density, Brix of finished product
Oil and gas Offshore/onshore Upstream/downstream Pipelines Distribution networks Refineries Skid manufacturers	• Loading/unloading of hydrocarbons (e.g. crude oil, bitumen) from/to ship, road tanker, rail car • High pressure chemical injection • High pressure low flow gas • Net oil computing • Gas void fraction • Filling of gas bottles • Furnace control • Test separators • LPG, natural gas hydration • Well-head water-cut monitoring • All hydrocarbon fluids in refineries • Metrology, custody transfer • Drilling mud • Oil well cementing and hydrofracturing
Life sciences Pharmaceutical Bio	• High accuracy flow and batching of bioreactor feeds • Solvent flow rate, density and batching • Flow of demineralized and deionized water • Solvents and fish oils used in high grade omega 3 oils • Precision coatings • Vacuum thin film coating
Household and personal care Detergents Cosmetics	• Blending and batching of detergent ingredients • Tanker loading and unloading • Salt concentration • Reliable measurement of aerated liquids

Application (continued)

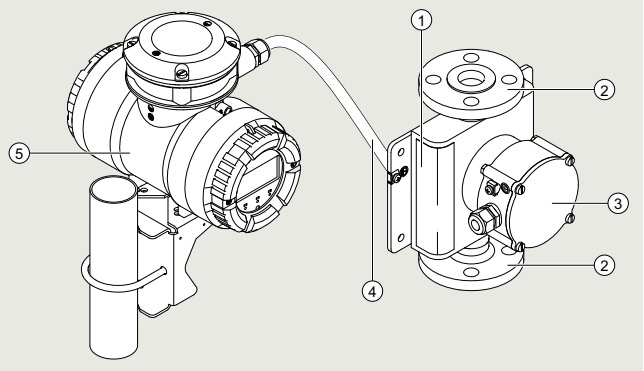
Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Automotive and aeronautical Vehicle manufacturing Paint Engine testing OEM	• Fuel injection nozzle and pump testing • Filling of under bonnet fluid reservoirs, air conditioning, coolant • Fuel flow and density measurement in engine test beds • Checking for air in oil using high accuracy density measurement • Paint spray robots – requires accurate and fast measurements • Aircraft fuel loading (kerosene) • High pressure flow used in turbine blade manufacture
Power and energy Renewable Hydrogen	• Boiler fuel flow and burner control • Turbine fuel flow • Glycol flow and concentration • Bioethanol
Marine OEM Shipbuilders	• Fuel consumption management • Boiler control • Bunkering management • Density used to indicate fuel quality
Pulp, paper and textiles	• Accurate dosing of dyes and chemicals
Water and environmental	• Dosing of chemicals for water treatment • Chemical concentration for water quality control

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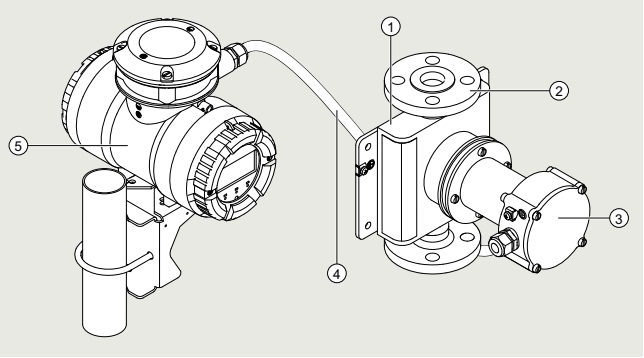
Design

Design options and related temperature range for FC100 series

Design version	Process temperature range
Standard neck	Standard [-50 ... 150 °C (-58 ... 302 °F)]
Long neck	Standard [-50 ... 150 °C (-58 ... 302 °F)] Medium [-50 ... 260 °C (-58 ... 302 °F)]



FCS100 sensor (standard neck version) and remote transmitter



FCS100 sensor (long neck version) and remote transmitter

1	FCS100 sensor
2	Process connection
3	Sensor terminal box
4	Connecting cable
5	Transmitter

Compatible fluids

- Liquids
- Gases
- Mixtures, solutions, emulsions, suspensions and slurries

Primary measured variables

- Mass flow
- Density
- Temperature

Design (continued)

Based on the primary measured quantities, the transmitter also calculates

- Volume flow
- Percent concentration (fraction) of a two-component mixture (FCT040 only)
- Partial component flow rate (net flow) of a mixture consisting of two components (FCT040 only)

The mass flow, volume flow, net flow measurements can be bi-directional.

Measurement variables for NTEP approval

- Mass flow uni-directional
- Volume flow uni-directional

Feature summary

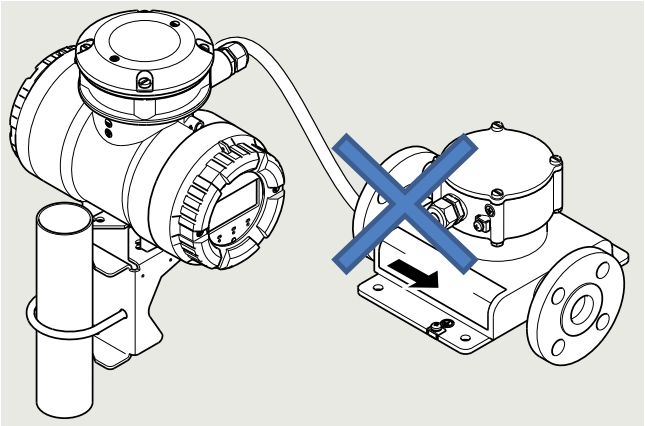
- Possibly the most compact dual curve Coriolis flowmeter for precision measurement, starting at DN 1 nominal size
- Batching function with batch leakage detection and batch control by transmitter for precise dosing
- Accurate density measurement and up to four advanced concentration measurement data sets
- Sizes to suit pilot plants, R&D labs and high value fluid additives
- Wide choice of process connections, starting with DN 6 (¼ inch) for reduced installation efforts

Installation guidelines

FC100 series flow meters can be mounted horizontally, vertically and at an incline. The measuring tubes should be filled with the fluid during flow measurement as entrained gas may result in errors in measurement. Straight pipe runs at inlet or outlet are usually not required.

Avoid the following installation locations and positions:

- Measuring tubes as highest point in piping when measuring liquids
- Measuring tubes as lowest point in piping when measuring gases
- Immediately in front of a free pipe outlet in a downpipe
- Lateral positions



Avoid measuring tubes in sideways position resulting in possible non-homogeneous fluid separation

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Function

Compatible fluids

- Liquids
- Gases
- Mixtures, solutions, emulsions, suspensions and slurries

Primary measured variables

- Mass flow
- Density
- Temperature

Based on the primary measured quantities, the transmitter also calculates

- Volume flow
- Percent concentration (fraction) of a two-component mixture (FCT040 only)
- Partial component flow rate (net flow) of a mixture consisting of two components (FCT040 only)

The mass flow, volume flow, net flow measurements can be bi-directional.

Measurement variables for NTEP approval

- Mass flow uni-directional
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Feature overview

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- Batching function with batch leakage detection and batch control by transmitter for precise dosing
- Accurate density measurement and up to four advanced concentration measurement data sets
- Sizes to suit pilot plants, R&D labs and high value fluid additives
- Wide choice of process connections, starting with DN 6 (¼ inch) for reduced installation efforts

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Selection and ordering data

SITRANS FC120/140 (Low flow)	Article No. 7ME441	● -	● ● ● ● ● -	● ● ● ● -	Order code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Transmitter variant					
None (spare sensor)		0			
Coriolis sensor FCS100 with transmitter FCT020		2			
Coriolis sensor FCS100 with transmitter FCT040		4			
SITRANS FC spare part transmitter, no sensor included		9			G 3 Y
Sensor size / Connector size					
No sensor (SITRANS FCT transmitter as spare part)			0 A		
Sensor size DN 1 with connection size ¼"			1 A		
Sensor size DN 1 with connection size 3/8"			1 B		
Sensor size DN 1 with connection size ½" DN 15			1 C		
Sensor size DN 1 with connection size ¾"			1 D		
Sensor size DN 1 with special connection			1 Y		
Sensor size DN 2 with connection size ¼"			2 A		
Sensor size DN 2 with connection size 3/8"			2 B		
Sensor size DN 2 with connection size ½" DN 15			2 C		
Sensor size DN 2 with connection size ¾"			2 D		
Sensor size DN 2 with connection size 1" DN 25			2 E		
Sensor size DN 2 with connection size 1½" DN 40			2 F		
Sensor size DN 2 with special connection			2 Y		
Sensor size DN 4 with connection size ¼"			3 A		
Sensor size DN 4 with connection size 3/8"			3 B		
Sensor size DN 4 with connection size ½" DN 15			3 C		
Sensor size DN 4 with connection size ¾"			3 D		
Sensor size DN 4with connection size 1" DN 25			3 E		
Sensor size DN 4 with connection size 1½" DN 40			3 F		
Sensor size DN 4 with special connection			3 Y		
Sensor size DN 6 with connection size ¼"			4 A		
Sensor size DN 6 with connection size 3/8"			4 B		
Sensor size DN 6 with connection size ½" DN 15			4 C		
Sensor size DN 6 with connection size ¾"			4 D		
Sensor size DN 6 with connection size 1" DN 25			4 E		
Sensor size DN 6 with connection size 1½" DN 40			4 F		
Sensor size DN 6 with special connection			4 Y		
Sensor size DN 8 with connection size ¼"			5 A		
Sensor size DN 8 with connection size 3/8"			5 B		
Sensor size DN 8 with connection size ½" DN 15			5 C		
Sensor size DN 8 with connection size ¾"			5 D		
Sensor size DN 8 with connection size 1" DN 25			5 E		
Sensor size DN 8 with connection size 1½" DN 40			5 F		
Sensor size DN 8 with special connection			5 Y		
Process connection					
No connection (SITRANS FCT transmitter as spare part)				A 0	
EN flange PN 40, suitable for EN 1092-1 type B1, raised face (RF)				A 1	
EN flange PN 100, suitable for EN 1092-1 type B1, raised face (RF)				A 3	
EN flange PN 40, suitable for EN 1092-1 type D, groove				A 5	
EN flange PN 100, suitable for EN 1092-1 type D, groove				A 7	
EN flange PN 40, suitable for EN 1092-1 type E, spigot				B 1	
EN flange PN 100, suitable for EN 1092-1 type E, spigot				B 3	
EN flange PN 40, suitable for EN 1092-1 type F, recess				B 5	
EN flange PN 100, suitable for EN 1092-1 type F, recess				B 7	
ASME flange class 600, suitable for ASME B16.5, ring joint (RJ)				C 3	

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Selection and ordering data (continued)

SITRANS FC120/140 (Low flow)	Article No. 7ME441 ● - ● ● ● ● ● - ● ● ● ● -	Order code ● ● ●
ASME flange class 900, suitable for ASME B16.5, ring joint (RJ)	C 4	
ASME flange class 1500, suitable for ASME B16.5, ring joint (RJ)	C 5	
ASME flange class 150, suitable for ASME B16.5, raised face (RF)	D 1	
ASME flange class 300, suitable for ASME B16.5, raised face (RF)	D 2	
ASME flange class 600, suitable for ASME B16.5, raised face (RF)	D 3	
ASME flange class 900, suitable for ASME B16.5, raised face (RF)	D 4	
ASME flange class 1500, suitable for ASME B16.5, raised face (RF)	D 5	
Process connection with internal thread G	E 1	
Process connection with internal thread NPT	E 3	
Clamp process connection according to DIN 32676 series A	G 2	
Clamp process connection according to DIN 32676 series C (Tri-Clamp)	G 6	
JIS flange 10K, JIS B 2220	L 2	
JIS flange 20K, JIS B 2220	L 4	
Special design request	Y 1	
Tube material (wetted) Process connection material and operational temperature range		
None (SITRANS FCT transmitter as spare part)	0	
Tube material C22, process connection material 316L, standard: -50 ... 150 °C (-58 ... 302 °F)	1	
Tube material C22, process connection material 316L, mid-range: -50 ... 260 °C (-58 ... 500 °F)	2	
Calibration		
No calibration	0	
Massflow 0.1%, density 0.5 g/l	1	
Massflow 0.1%, density 1 g/l	2	
Massflow 0.1%, density 4 g/l	3	
Massflow 0.1%, density 8 g/l	4	
Massflow 0.15% density 20 g/l	5	
Massflow 0.2%, density 4 g/l	6	
Massflow 0.2%, density 8 g/l	7	
Massflow 0.2%, density 20 g/l	8	
Accuracy for gas please select below	9	
Massflow gas 0.75%		N 1 A
Massflow gas 0.5%		N 2 A
Mounting style, transmitter housing and material		
Remote type with "urethane-cured polyester powder coating" coated aluminum transmitter housing and standard neck sensor	C	
Remote type with "urethane-cured polyester powder coating" coated aluminum transmitter housing and long neck sensor	D	
Remote type with "corrosion protection coating" coated aluminum transmitter housing and standard neck sensor	E	
Remote type with "corrosion protection coating" coated aluminum transmitter housing and long neck sensor	F	
Remote type stainless steel transmitter and standard neck sensor	G	
Remote type stainless steel transmitter and long neck sensor	H	
Ex approvals		
None	A	
ATEX, explosion group IIC and IIIC	B	
ATEX, explosion group IIB and IIIC	C	
IECEx, explosion group IIC and IIIC	D	
IECEx, explosion group IIB and IIIC	E	
EAC Ex, IIC and IIIC	F	
EAC Ex, IIB and IIIC	G	
FM, groups A B C D E F G	H	
FM, groups C D E F G	J	
INMETRO, explosion group IIC and IIIC	K	

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Selection and ordering data (continued)

SITRANS FC120/140 (Low flow)	Article No. 7ME441 ● - ● ● ● ● ● - ● ● ● ● - ● ● ●	Order code
INMETRO, explosion group IIB and IIIC	L	
NEPSI, explosion group IIC and IIIC	M	
NEPSI, explosion group IIB and IIIC	N	
Korea Ex, explosion group IIC and IIIC	P	
Korea Ex, explosion group IIB and for integral type also IIIC	Q	
Local user interface		
Spare sensor without transmitter, no display applied	0	
No display	1	
With display	3	

	Order code
Further designs Please add "**-Z**" to Article No. and specify order code(s).	
Cable entries **(for customer cable gland holes - no cable glands supplied)**	
Metric, no glands (M20)	**A10**
NPT, no glands (1/2")	**A11**
Metric, no glands (M20) steel armored cable	**A20**
NPT, no glands (1/2") steel armored cable	**A21**
Sensor housing material	
None (SITRANS FCT transmitter as spare part)	**B00**
Stainless steel 1.4301/304, 1.4404/316L	**B01**
Stainless steel 1.4404/316L	**B02**
Certificates	
Declaration of compliance with the order 2.1 according to EN 10204	**C11**
Certificate of Marking Transfer and Raw Material Certificates (Inspection Certificate 3.1 according to EN 10204), including IGC and conform to NACE MR0175 and MR0103	**C13**
Positive Material Identification of wetted parts, including certificate (Inspection Certificate 3.1 according to EN 10204)	**C15**
NTEP approval accuracy class 0.3 acc. NIST	**C16**
Hydrostatic Pressure Test Certificate (Inspection Certificate 3.1 according to EN 10204)	**C18**
Delivery to EAEU+KazakPA	**C19**
Functional Safety (IEC 61508) - SIL2/3	**C20**
X-ray inspection of flange weld seam according to DIN EN ISO 17636-1/B, evaluation according to AD 2000 HP 5/3 and DIN EN ISO 5817/C, including certificate	**C33**
X-ray test according to ASME V	**C34**
WPS according to DIN EN ISO 15809-1; WPQR according to DIN EN ISO 15814-1; WQC according to DIN EN 287-1 or DIN EN ISO 8908-4	**C36**
Welding procedures and certificate according to ASME IX	**C37**
Dye penetrant test of process connection weld seams according to DIN EN ISO 3452-1, including certificate	**C38**
Dye penetrant test of flange welding according to ASME V, including certificate	**C39**
Quality Inspection Certificate (Inspection Certificate 3.1 according to EN 10204)	**C40**
Ferrite test for flange welding according to DIN EN ISO 8249	**C50**
Degreasing of wetted surfaces according to ASTM G93-03 (Level C), including test report	**C54**
Combined certificates	
Certification package (C13, C18, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test and Quality inspection certificate	**C80**
Certification package (C13, C15, C40) including Marking Transfer and raw material certificate, Positive material identification and Quality inspection certificate	**C81**

	Order code
Certification package (C13, C18, C38, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, Dye penetration and Quality inspection certificate	**C82**
Certification package (C13, C15, C18, C36, C38, C40) including Marking Transfer and raw material certificate, Positive material identification, Hydrostatic pressure test, Welding certificates, Dye penetration and Quality inspection certificate	**C83**
Certification package (C15, C18, C36) including Positive material identification, Hydrostatic pressure test and Welding certificates	**C84**
Certification package (C34, C37, C39) including X-ray test according ASME V, Welding procedures and Certificates according ASME IX and Dye penetrant test of flange welding according ASME V	**C85**
Certification package (C13, C18, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	**C86**
Certification package (C13, C15, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Positive material identification, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	**C87**
I/O Configuration Ch1	
None (SITRANS FCT transmitter as spare part)	**E00**
4-20 mA HART active	**E06**
4-20 mA HART passive	**E07**
PROFIBUS PA	**E10**
Modbus RTU RS 485	**E14**
PROFINET over Ethernet-APL (IS)	**E15**
I/O Configuration Ch2, Ch3 and Ch4	
Spare sensor without transmitter, all communication types and I/Os apply	**F00**
1 passive current output, 1 passive pulse or status output	**F01**
1 passive current output, 2 passive pulse or status outputs	**F02**
1 passive current output, 1 passive pulse or status outputs, 1 passive NAMUR pulse or status output	**F03**
1 passive current output, 2 passive NAMUR pulse or status outputs	**F04**
1 passive pulse or status output	**F11**
2 passive pulse or status outputs, 1 passive status output	**F12**
2 passive pulse or status outputs, 1 voltage-free status input	**F13**
2 passive pulse or status outputs, 1 active current input	**F14**
2 passive pulse or status outputs, 1 passive current input	**F15**
1 passive pulse or status output, 1 passive current output, 1 active current input	**F16**
1 passive pulse or status output, 1 passive current output, 1 passive current input	**F17**

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Selection and ordering data (continued)

	Order code
1 passive pulse or status output, 1 voltage-free status input, 1 active current input	F18
1 passive pulse or status output, 1 voltage-free status input, 1 passive current input	F19
1 passive pulse or status output, 1 active pulse or status output, 1 voltage-free status input	F20
1 passive pulse or status output, 1 active pulse or status output with pull-up resistor, 1 voltage-free status input	F21
1 active current output, 2 passive pulse or status outputs	F22
1 active current output, 1 passive pulse or status output,1 voltage-free status input	F23
1 passive pulse or status output	F31
2 passive pulse or status outputs	F32
1 passive pulse or status output, 1 active current input	F33
1 passive pulse or status output, 1 passive current input	F34
1 passive pulse or status output, 1 active pulse or status output	F35
1 passive pulse or status output, 1 active pulse or status output with pull-up resistor	F36
1 passive pulse or status output, 1 active current output	F37
1 passive pulse output	F41
Output CH1 intrinsically safe, 1 passive pulse output	F42
Output CH3 intrinsically safe, 1 passive pulse output	F50
Customer selected fraction PIA: Please select four options	
Sugar / Water 0 ... 85 °Bx, 0 ... 80 °C (32 ... 176 °F)	G01
NaOH / Water 2 ... 50 WT%, 0 ... 100 °C (32 ... 212 °F)	G02
KOH / Water 0 ... 60 WT%, 54 ... 100 °C (129 ... 212 °F)	G03
NH_4NO_3 / Water 1 ... 50 WT%, 0 ... 80 °C (32 ... 176 °F)	G04
NH_4NO_3 / Water 20 ... 70 WT%, 20 ... 100 °C (68 ... 212 °F)	G05
HCl / Water 22 ... 34 WT%, 20 ... 40 °C (68 ... 104 °F)	G06
HNO_3 / Water 50 ... 67 WT%, 10 ... 60 °C (50 ... 140 °F)	G07
H_2O_2 / Water 30 ... 75 WT%, 4 ... 44 °C (39 ... 111 °F)	G09
Ethylene Glycol / Water 10 ... 50 WT%, -20 ... +40 °C (-4 ... 104 °F)	G10
Amylum = Starch / Water 33 ... 43 WT%, 35 ... 45 °C (95 ... 113 °F)	G11
Methanol / Water 35 ... 60 WT%, 0 ... 40 °C (32 ... 104 °F)	G12
Alcohol / Water 55 ... 100 VOL%, 10 ... 40 °C (50 ... 104 °F)	G20
Sugar / Water 40 ... 80 °Bx, 75 ... 100 °C (167 ... 212 °F)	G21
Alcohol / Water 66 ... 100 WT%, 15 ... 40 °C (59 ... 104 °F)	G30
Alcohol / Water 66 ... 100 WT%, 10 ... 40 °C (50 ... 104 °F)	G37
Insulation	
Insulation	J10
Insulation and heat tracing, ½" ASME class 150, raised face (RF)	J12
Insulation and heat tracing, ½" ASME class 300, raised face (RF)	J13
Insulation and heat tracing, EN DN 15, PN 40	J14
Insulation, heat tracing with ventilation, ½" ASME class 150, raised face (RF)	J16
Insulation heat tracing with ventilation, ½" ASME class 300, raised face (RF)	J17
Insulation heat tracing with ventilation, EN DN 15, PN 40	J18
Connecting cable type and length	
without standard connecting cable	L50
5 meter (16.4 ft) remote connecting cable terminated standard gray / Ex blue	L51
10 meter (32.8 ft) remote connecting cable terminated standard gray / Ex blue	L54
15 meter (49.2 ft) remote connecting cable terminated standard gray / Ex blue	L57
20 meter (65.6 ft) remote connecting cable terminated standard gray / Ex blue	L60

	Order code
30 meter (98.4 ft) remote connecting cable terminated standard gray / Ex blue	L63
without fire retardant connecting cable	L70
5 meter (16.4 ft) remote fire retardant connecting cable not terminated	L71
10 meter (32.8 ft) remote fire retardant connecting cable not terminated	L74
15 meter (49.2 ft) remote fire retardant connecting cable not terminated	L77
20 meter (65.6 ft) remote fire retardant connecting cable not terminated	L80
30 meter (98.4 ft) remote fire retardant connecting cable not terminated	L83
SW functions	
Heat measurement	S11
Tube health check	S12
Batching and filling function	S13
Netoil computing	S14
Viscosity computing function for liquids	S15
Standard concentration measurement	S16
Advanced concentration	S17
Marine approval	
Marine approved DNV, ABS, KR piping class 2	S22
Marine approved DNV, ABS, KR piping class 3	S23
Marine approved LR, MR, TAC piping class 2	S24
Marine approved LR, MR, TAC piping class 3	S25
Marine approved BV piping class 2	S26
Marine approved BV piping class 3	S27
Mounting	
2" pipe mounting bracket for sensor	S30
Namur built-in length according to NE132	S31
Country specific delivery	
Delivery to China including China RoHS mark	W21
Delivery to Korea including KC mark	W22
Tag name	
Tag name plate, SS (max. 16 characters)	Y11
Tag plate wired (316L)	Y15
HART/MODBUS software tag No. (max. 8 characters)	Y25
HART/MODBUS software tag No. (max. 32 characters)	Y26
PROFIBUS PA NODE ADDRESS (4 characters HEX)	Y28
PROFIBUS PA SOFTWARE TAG (max. 32 characters)	Y29
Customer installation length	
Customer installation length (mm)	Y30
Calibration	
Predefined 6-Point Accredited Calibration: 10%, 20%, 40%, 60%, 80%, 100% of Q_{nom}. Calibrated Output: Frequency	D62
Special versions	
ID-number of special design	Y99

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Technical specifications

Mass flow rate of liquids

The mass flow rate characteristics of SITRANS FC meters are defined by the values of zero stability, Q_{flat}, Q_{nom} and Q_{max}.

Zero stability is the maximum allowable flow rate value that can be displayed at zero flow under reference conditions. It is a good indicator of the meter performance as flow rates reduce and approach zero.

- Q_{flat} is the mass flow rate above which the base accuracy is maintained (0.1% when using FCT040 transmitters).
- Q_{nom} is the nominal mass flow rate of water at reference conditions that would result in a pressure drop of 1 bar (15 psi).
- Q_{max} is the recommended maximum mass flow rate for each sensor size.

For questions regarding expected performance in specific applications, please contact your regional Siemens Measurement Intelligence team.

Flow rate summary by FCS100 sensor size

Nominal size	Zero stability		Q_{flat}		Q_{nom}		Q_{max}	
	kg/h	lb/h	kg/h	lb/min	kg/h	lb/min	kg/h	lb/min
DN 1	0.003	0.007	2.52	0.092	21.0	0.0771	40.0	1.47
DN 2	0.005	0.011	4.50	0.165	45.0	1.65	94.0	3.45
DN 4	0.009	0.020	14.0	0.514	170	6.24	300	11.0
DN 6	0.019	0.042	30.0	1.10	370	13.6	600	22.0
DN 8	0.048	0.106	79.0	2.90	950	34.9	1 500	55.1

Performance summary by FCS100 sensor size and transmitter type

Sensor size			DN 1	DN 2	DN 4	DN 6	DN 8
Mass flow (liquids)							
Accuracy	% (of rate)	FCT020	± 0.2	± 0.2	± 0.2	± 0.2	± 0.2
	% (of rate)	FCT040	± 0.2	± 0.2	± 0.1	± 0.1	± 0.1
Zero stability	kg/h (lb/h)		± 0.003 (0.007)	± 0.005 (0.011)	± 0.009 (0.02)	± 0.019 (0.042)	± 0.048 (0.106)
Density (liquids)							
Accuracy	kg/m³ (lb/ft³)	FCT020	± 20 (1.25)	± 8 (0.5)	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)
	kg/m3 (lb/ft³)	FCT040	± 20 (1.25)	± 8 (0.5)	± 1 (0.06)	± 0.5 (0.03)	± 0.5 (0.03)
Mass flow (gases)							
Accuracy	% (of rate)	FCT020	± 0.75	± 0.75	± 0.75	± 0.75	± 0.75
	% (of rate)	FCT040	± 0.5	± 0.5	± 0.5	± 0.5	± 0.5
Temperature							
Accuracy	°C (°F)		± 0.5 (0.9)	± 0.5 (0.9)	± 0.5 (0.9)	± 0.5 (0.9)	± 0.5 (0.9)

The accuracy values in the table above are based on reference conditions at the time of calibration and represent the combined measurement uncertainties including sensor, electronic and pulse output interface.

Liquid density calibration is performed when density accuracy of 0.5 kg/m³ (0.03 lb/ft³) is selected in the model code.

Mass flow calibration and density adjustment for liquids

Siemens SITRANS FC Coriolis meters are calibrated in rigs accredited according to the international standard DIN EN ISO/IEC 17025:2018. Each flowmeter comes with a standard calibration certificate.

Mass flow calibration takes place at reference conditions. Specific values are listed in the standard calibration certificate.

Mass flow calibration reference conditions	
Fluid	Water
Density	900 ... 1 100 kg/m³ (56 ... 69 lb/ft³)
Fluid temperature	10 ... 35 °C (50 ... 95 °F), average temperature: 22.5 °C (72.5 °F)
Ambient temperature	10 ... 35 °C (50 ... 95 °F)
Process pressure	1 ... 5 bar (15 ... 73 psi)

Density calibration reference conditions	
Flow condition	Fully developed flow profile
Fluid densities used to obtain density calibration constants	700 kg/m³ (44 lb/ft³) 1 000 kg/m³ (62 lb/ft³) 1 650 kg/m³ (103 lb/ft³)
Fluid temperature	20 °C (68 °F)
Determination of temperature compensation coefficients	20 ... 80 °C (68 ... 176 °F)

Analog output performance specification

Typical additional uncertainty when using the analog current output:

± 0.04% at a nominal mid-range current output of 12 mA, which includes the effects of:

Output adjustment, linearity, power supply variation, load resistance variation, short-term and long-term drift for one year and ambient temperature effect on the transmitter in the range 20 °C ± 30 °C (14 ... 122 °F).

Process pressure effect on flow measurement performance

Changes in operating pressure have a small effect on the mass flow measurement performance. When the pressure changes are very large this effect can be corrected by a dynamic pressure input or a fixed process pressure.

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Technical specifications (continued)

Sensor size	Additional flow measurement errors due to change in operating pressure from reference pressure	
	in % of rate per 1 bar variation	in % of rate per 1 psi variation
DN 1	none	none
DN 2	none	none
DN 4	none	none
DN 6	-0.0011	-0.00008
DN 8	-0.0010	-0.00007

Process temperature effect

For mass flow measurement, process fluid temperature effect is defined as the change in sensor flow accuracy due to process fluid temperature change, away from the 20 °C (68 °F) reference condition. Variation in process temperature influences the measuring tube characteristics and this is compensated for using the built-in PT 1000 temperature sensor.

A small flow uncertainty remains in the compensation circuit defined below.

Uncertainty due to process temperature change: ± 0.001% of mass flow rate per °C (± 0.00056% of mass flow rate per °F)

Temperature effect on zero

Temperature effect on the mass flow zero-point quality can be corrected by zeroing at the process fluid temperature.

Process conditions

Process fluid temperature range

Process fluid temperature range	Nominal temperature	Design versions
-50 ... +150 °C (-58 ... +302 °F)	Standard	All process connections except DIN 32676 Class A and C hygienic clamps
-10 ... +140 °C (14 ... 284 °F)	Standard	For process connections DIN 32676 Class A and C hygienic clamps
-50 ... +260 °C (-58 ... +302 °F)	Medium	Only selectable for remote transmitters with long neck sensor: selections D, F, and H in position 14 of the order code

Operating pressure

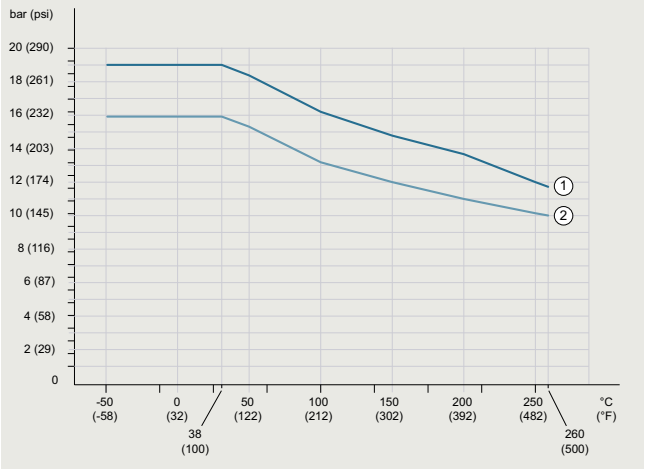
The maximum allowed process pressure depends on the selected process connection and process temperature.

The given process temperature and process pressure ranges are calculated and approved without corrosion or erosion effects.

The following diagrams show the process pressure as a function of process temperature as well as the process connection used (type and size of process connection).

Calculations for ASME flanges are based on ASME B16.5 Material group 2.2 (316/316L dual certified).

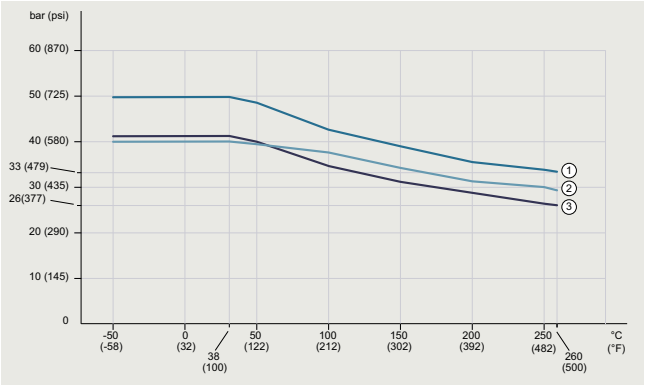
ASME class 150



Allowed process pressure as a function of process connection temperature

1	Process connection compatible to ASME B16.5 class 150
2	Heat tracing connection compatible to ASME B16.5 class 150

ASME class 300, EN PN 40



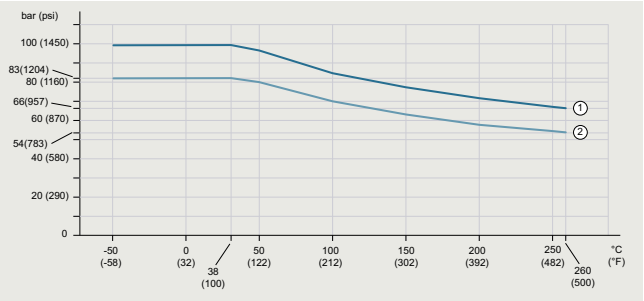
Allowed process pressure as a function of process fluid temperature

1	Process connection compatible to ASME B16.5 class 300
2	Process and heat tracing connection compatible to EN 1092-1 PN 40
3	Heat tracing connection compatible to ASME B16.5 class 300

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Technical specifications (continued)

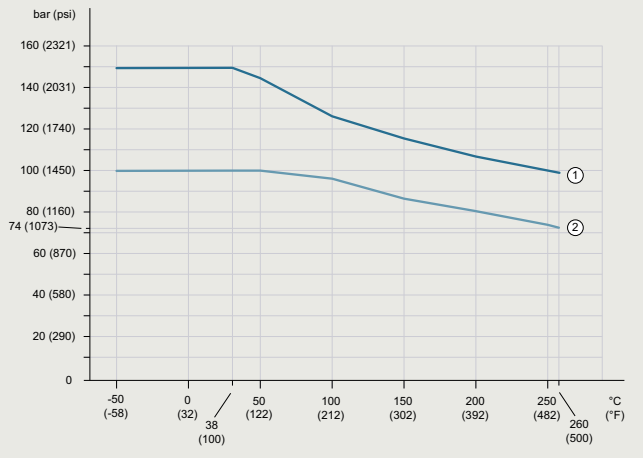
ASME class 600



Allowed process pressure as a function of process connection temperature

1	Process connection compatible to ASME B16.5 class 600
2	Not used for this product

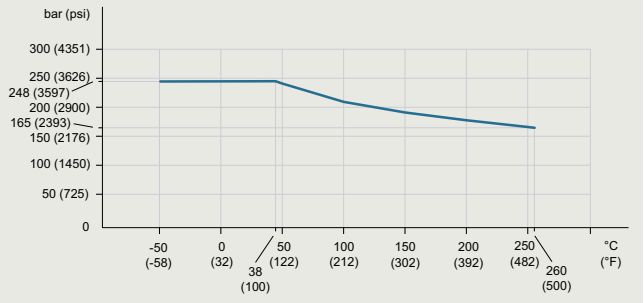
ASME class 900, EN PN100



Allowed process pressure as a function of process connection temperature

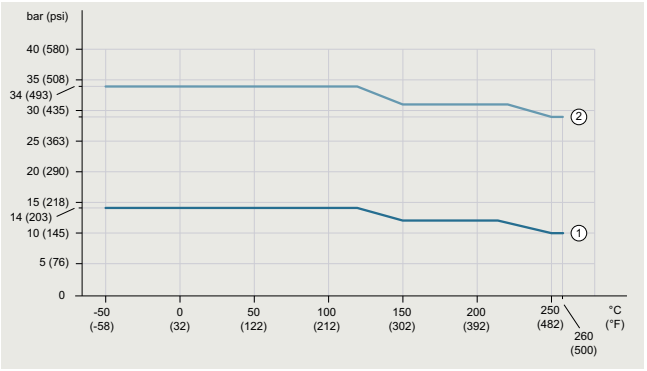
1	Process connection compatible to ASME B16.5 class 900
2	Process connection compatible to EN 1092-1 PN100

ASME class 1500 compatible to flange ASME B16.5



Allowed process pressure as a function of process connection temperature

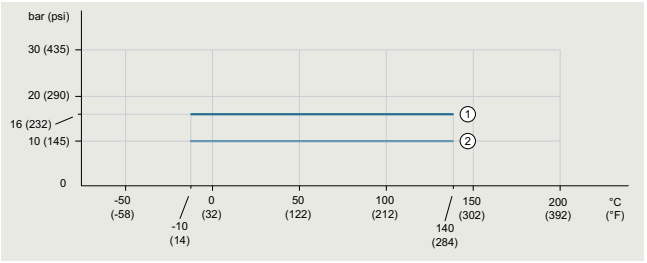
JIS 10K, JIS 20K



Allowed process pressure as a function of process connection temperature

1	Process connection compatible to JIS B 2220 10K
2	Process connection compatible to JIS B 2220 20K

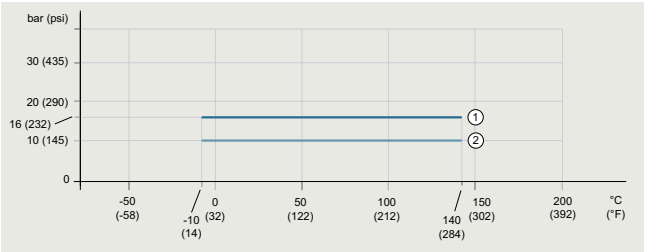
Clamp process connection according to DIN 32676 series A



Allowed process pressure as a function of process fluid temperature

1	Clamp connection compatible to DIN 32676 series A up to DN 50
2	Clamp connection compatible to DIN 32676 series A above DN 50

Clamp process connection according to DIN 32676 series C (Tri-Clamp)



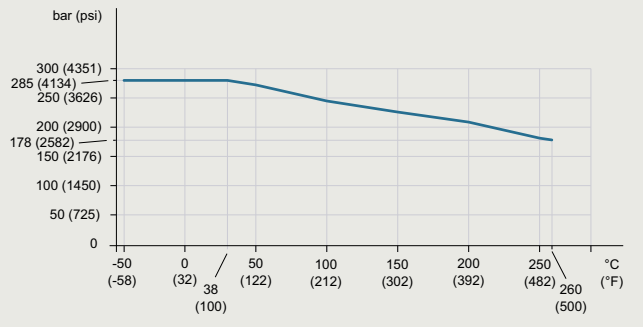
Allowed process pressure as a function of process fluid temperature

1	Clamp connection compatible to DIN 32676 series C up to 2"
2	Clamp connection compatible to DIN 32676 series C above 2"

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Technical specifications (continued)

Process connection with internal thread G and NPT



Allowed process pressure as a function of process fluid temperature

Ambient conditions

Allowed ambient and storage temperature of SITRANS FC100 series is influenced by the temperature specification of FCS100 sensor, FCT0X0 transmitter and the interconnecting cable.

Ambient temperature

Device-surrounding air temperature is considered as ambient temperature. If the device is operating outdoors make sure that the solar irradiation does not increase the surface temperature of the device higher than the allowed maximum ambient temperature. Transmitter display has limited legibility below -20 °C (-4 °F).

The sensor ambient temperature limits may also be influenced by the process fluid temperature, details shown in the chapter "Sensors" (Technical specifications).

Maximum ambient temperature ranges for FC100 series

Cable type	Device	Ambient temperature range
Standard cable	Sensor	-50 ... +80 °C (-58 ... +176 °F)
	Transmitter	-40 ... +60 °C (-40 ... +140 °F)
Fire retardant cable	Sensor	-35 ... +80 °C (-31 ... +176 °F)
	Transmitter	-35 ... +60 °C (-31 ... +140 °F)

Ambient temperature range for NTEP custody transfer approval

Cable type	Device	Ambient temperature range
Standard cable	Sensor	-50 ... +80 °C (-58 ... +176 °F)
	Transmitter	-40 ... +50 °C (-40 ... +122 °F)
Fire retardant cable	Sensor	-35 ... +80 °C (-31 ... +176 °F)
	Transmitter	-35 ... +50 °C (-31 ... +122 °F)

Maximum storage temperature ranges for FC100 series

Cable type	Device	Ambient temperature range
Standard cable	Sensor	-50 ... +80 °C (-58 ... +176 °F)
	Transmitter	-40 ... +60 °C (-40 ... +140 °F)
Fire retardant cable	Sensor	-35 ... +80 °C (-31 ... +176 °F)
	Transmitter	-35 ... +60 °C (-31 ... +140 °F)

Temperature specification of FC100 series Ex versions located in hazardous areas

Please select appropriate equipment in accordance with the laws and regulations of the relevant country/region, when it is used in a location where explosive atmospheres may be present.

The maximum ambient and process fluid temperatures depending on explosion groups and temperature classes can be determined via the SITRANS FC order code together with the Ex code (see the corresponding explosion proof type manual).

Note: The maximum process fluid temperature could be further restricted due to process connection type, refer to curves above under the heading "Allowed ambient temperature for FCS100 sensors".

FCS100 with standard process temperature

Ex approvals:

ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	65 °C (149 °F)	65 °C (149 °F)
T5	90 °C (194 °F)	75 °C (167 °F)	75 °C (167 °F)
T4	130 °C (266 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	72 °C (161 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	72 °C (161 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	72 °C (161 °F)

Ex approvals:

FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	65 °C (149 °F)	65 °C (149 °F)
T5	90 °C (194 °F)	75 °C (167 °F)	70 °C (158 °F)
T4	130 °C (266 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

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Technical specifications (continued)

FCS100 with medium process temperature, long neck

Ex approvals:
ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex

Temperature class	Maximum process temperature	Maximum ambient temperature		
		Standard cable	Fire retardant cable without sensor insulation	Fire retardant cable with all sensor insulation and heating options
T6	65 °C (149 °F)	65 °C (149 °F)	65 °C (149 °F)	65 °C (149 °F)
T5	90 °C (194 °F)	75 °C (167 °F)	75 °C (167 °F)	75 °C (167 °F)
T4	130 °C (266 °F)	80 °C (176 °F)	76 °C (168 °F)	75 °C (167 °F)
T3	180 °C (356 °F)	80 °C (176 °F)	75 °C (167 °F)	71 °C (159 °F)
T2	260 °C (500 °F)	80 °C (176 °F)	73 °C (163 °F)	64 °C (147 °F)
T1	260 °C (500 °F)	80 °C (176 °F)	73 °C (163 °F)	64 °C (147 °F)

Ex approvals:
FM

Temperature class	Maximum process temperature	Maximum ambient temperature		
		Standard cable	Fire retardant cable without sensor insulation	Fire retardant cable with all sensor insulation and heating options
T6	65 °C (149 °F)	65 °C (149 °F)	65 °C (149 °F)	65 °C (149 °F)
T5	90 °C (194 °F)	75 °C (167 °F)	70 °C (158 °F)	70 °C (158 °F)
T4	130 °C (266 °F)	80 °C (176 °F)	70 °C (158 °F)	70 °C (158 °F)
T3	180 °C (356 °F)	80 °C (176 °F)	70 °C (158 °F)	70 °C (158 °F)
T2	260 °C (500 °F)	80 °C (176 °F)	70 °C (158 °F)	64 °C (147 °F)
T1	260 °C (500 °F)	80 °C (176 °F)	70 °C (158 °F)	64 °C (147 °F)

Additional ambient and environmental specifications

Specification	Rating/level of compliance
Relative humidity	0 ... 95%
Ingress protection	IP66 or IP67 with suitable cable glands
Environmental pollution	Pollution degree 4 in accordance with EN 61010-1 whilst in operation
Maximum altitude	2 000 m (6 600 ft) above mean sea level (MSL)
Mechanical load	Transmitter: 10 ... 500 Hz, 1g acc. to IEC 60068-2-6
Electromagnetic (EMC) immunity	• EN IEC 61326-1, Table 2 • EN IEC 61326-2-3 • EN IEC 61326-2-5 • NAMUR NE 21 recommendation • DNV-CG-0339 section 3, chapter 14
Surge immunity emission	• EN IEC 61000-4-5 for lightning protection • EN IEC 61000-3-2, Class A (harmonic current emissions) • EN IEC 61000-3-3, Class A (voltage fluctuations) Immunity assessment criterion: output signal fluctuation is within ±1% of the output span
Overvoltage	Category II according to EN IEC 61010-1

Approvals and certificates – summary

Position in code, type	Order code	Description
15, Ex approval	B	ATEX, explosion group IIC and IIIC
15, Ex approval	C	ATEX, explosion group IIB and IIIC
15, Ex approval	D	IECEx, explosion group IIC and IIIC
15, Ex approval	E	IECEx, explosion group IIB and IIIC
15, Ex approval	H	FM, groups A, B, C, D, E, F, G
15, Ex approval	J	FM, groups C, D, E, F, G
15, Ex approval	K	INMETRO, explosion group IIC and IIIC
15, Ex approval	L	INMETRO, explosion group IIB and IIIC
15, Ex approval	M	NEPSI, explosion group IIC and dust proof
15, Ex approval	N	NEPSI, explosion group IIB and dust proof
15, Ex approval	F	EAC Ex, explosion group IIC and IIIC
15, Ex approval	G	EAC Ex, explosion group IIB and IIIC
15, Ex approval	P	Korea Ex, explosion group IIC and IIIC
15, Ex approval	Q	Korea Ex, explosion group IIB and IIIC
ZS2, Marine approval	S22	Marine approval according DNV, ABS and KR piping class 2
ZS2, Marine approval	S23	Marine approval according DNV, ABS and KR piping class 3
ZS2, Marine approval	S24	Marine approval according LR MR TAC piping class 2
ZS2, Marine approval	S25	Marine approval according LR MR TAC piping class 3
ZS2, Marine approval	S26	Marine approved BV piping class 2
ZS2, Marine approval	S27	Marine approved BV piping class 3
ZC1, Certificate	C11	Compliance with the order 2.1 EN 10204
ZC1, Certificate	C13	3.1 EN 10204 + IGC + NACE MR0175, MR0103
ZC1, Certificate	C15	PMI 3.1 according to EN 10204
ZC1, Certificate	C16	NTEP approval, accuracy class 0.3 acc. NIST Handbook 44
ZC1, Certificate	C18	Pressure Test Certificate 3.1 EN 10204

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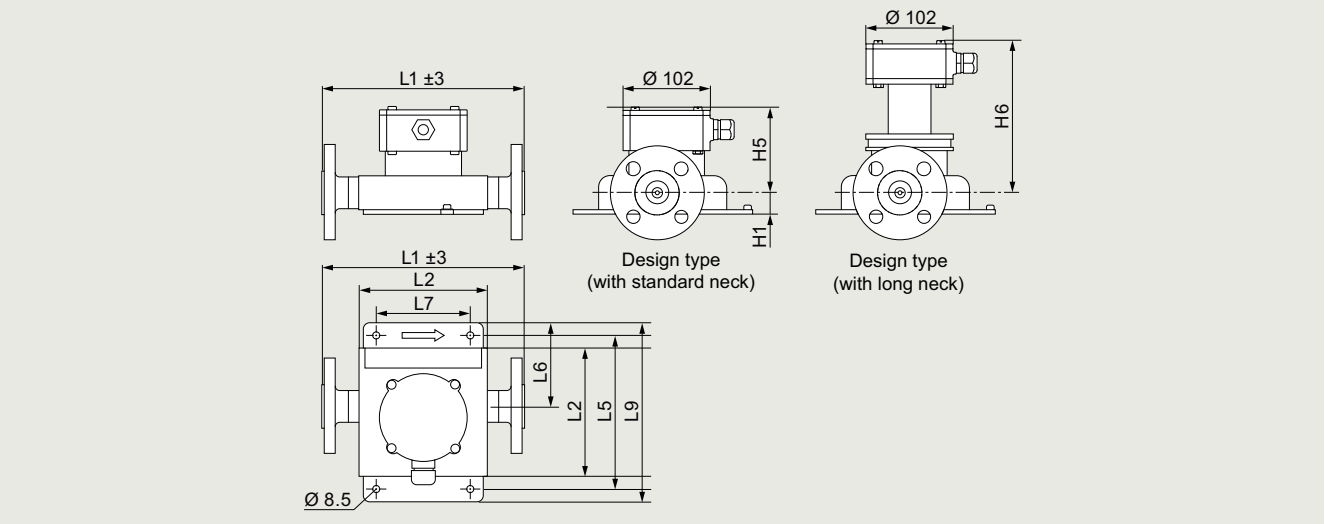
Technical specifications (continued)

Position in code, type	Order code	Description
ZC1, Certificate	C20	Functional Safety (IEC 61508) - SIL2/3
ZC1, Certificate	C33	X-ray DIN EN ISO 17636-1/B
ZC1, Certificate	C34	X-ray test according to ASME V
ZC1, Certificate	C36	WPS; WPQR; WQC
ZC1, Certificate	C37	Welding procedures and Certificate ASME IX
ZC1, Certificate	C38	Dye penetration DIN EN ISO 3452-1
ZC1, Certificate	C39	Dye penetration ASME V
ZC1, Certificate	C40	Quality Inspection Certificate 3.1 EN 10204
ZC1, Certificate	C54	Degreasing ASTM G93-03, including report
ZC1, Certificate	C80	Certification package (C13, C18, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test and Quality inspection certificate
ZC1, Certificate	C81	Certification package (C13, C15, C40) including Marking Transfer and raw material certificate, Positive material identification and Quality inspection certificate
ZC1, Certificate	C82	Certification package (C13, C18, C38, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, Dye penetration and Quality inspection certificate
ZC1, Certificate	C83	Certification package (C13, C15, C18, C36, C38, C40) including Marking Transfer and raw material certificate, Positive material identification, Hydrostatic pressure test, Welding certificates, Dye penetration and Quality inspection certificate
ZC1, Certificate	C84	Certification package (C15, C18, C36) including Positive material identification, Hydrostatic pressure test and Welding certificates
ZC1, Certificate	C85	Certification package (C34, C37, C39) including X-ray test according ASME V, Welding procedures and Certificates according ASME IX and Dye penetrant test of flange welding according ASME V
ZC1, Certificate	C86	Certification package (C13, C18, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate
ZC1, Certificate	C87	Certification package (C13, C15, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Positive material identification, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate

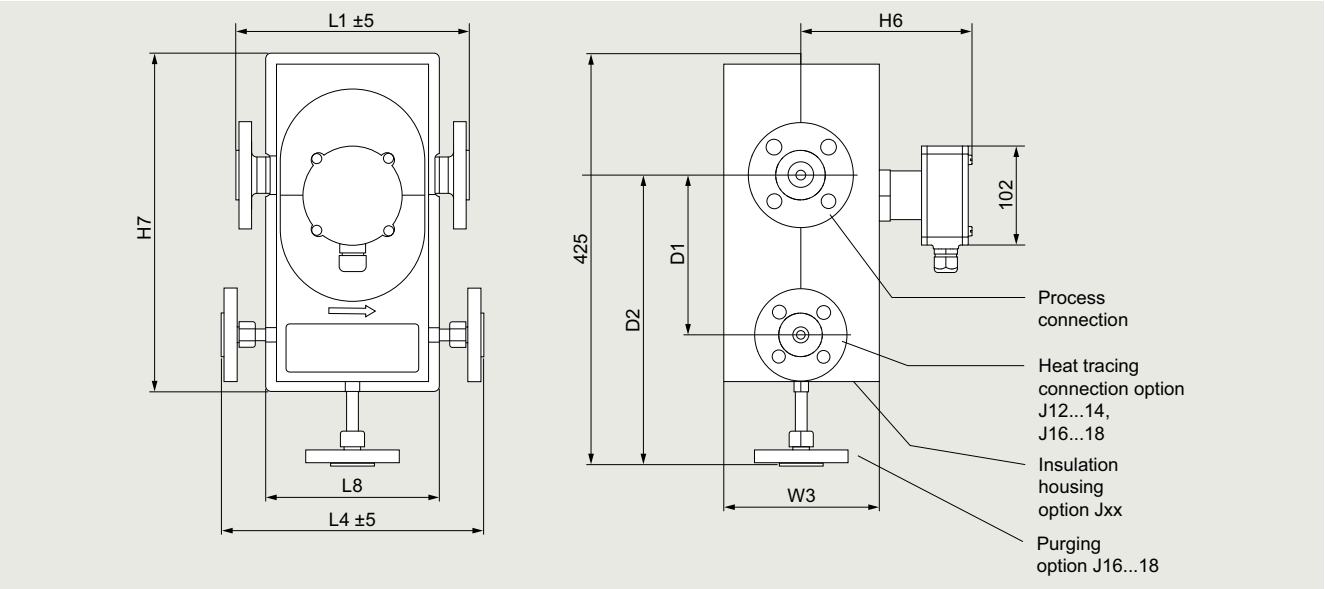
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Dimensional drawings

Drawings, dimensions and weight for FCS100 sensors



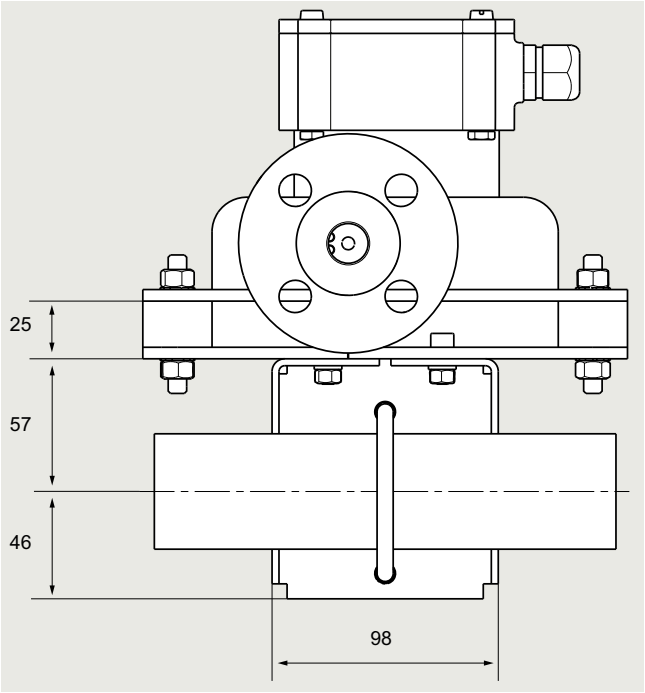
FCS100 sensor, dimensions in mm



FCS100 with insulation housing, dimensions in mm

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Dimensional drawings (continued)



FCS100 with optional pipe mounting bracket, dimensions in mm

FCS100 sensor dimensions

Nominal size	L2	L4	L5	L6	L7	L8	L9
	Dimensions in mm (inch)						
DN 1	150 (5.9)	270 (10.6)	180 (7.1)	111 (4.4)	110 (4.3)	180 (7.1)	210 (8.3)
DN 2	150 (5.9)	270 (10.6)	180 (7.1)	111 (4.4)	110 (4.3)	180 (7.1)	210 (8.3)
DN 4	150 (5.9)	270 (10.6)	180 (7.1)	99 (3.9)	110 (4.3)	180 (7.1)	210 (8.3)
DN 6	150 (5.9)	270 (10.6)	180 (7.1)	89 (3.5)	110 (4.3)	180 (7.1)	210 (8.3)
DN 8	150 (5.9)	270 (10.6)	180 (7.1)	55 (2.2)	110 (4.3)	180 (7.1)	210 (8.3)

Nominal size	H1	H3	H5	H6	L7	W3	D1	D2
	Dimensions in mm (inch)							
DN 1	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 2	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 4	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 6	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)
DN 8	25 (1)	81 (3.2)	101 (4)	176 (6.9)	350 (13.8)	160 (6.3)	165 (6.5)	299 (11.8)

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to ASME B16.5 (AISI 316 / AISI 316L)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 150, raised face (RF)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)	240 (9.4)	6.2 (14)
ASME ½" class 300, raised face (RF)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)
ASME ½" class 600, raised face (RF)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)	250 (9.8)	6.9 (15)
ASME ½" class 600, ring joint (RJ)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)	250 (9.8)	6.8 (15)
ASME ½" class 900, raised face (RF)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)
ASME ½" class 900, ring joint (RJ)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)
ASME ½" class 1500, raised face (RF)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)	270 (10.6)	8.8 (19)
ASME ½" class 1500, ring joint (RJ)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)	270 (10.6)	11.3 (25)
ASME 1" class 150, raised face (RF)	n/a	n/a	240 (9.4)	7.1 (16)	240 (9.4)	7.1 (16)	240 (9.4)	7.1 (16)	240 (9.4)	7.1 (16)
ASME 1" class 300, raised face (RF)	n/a	n/a	240 (9.4)	8.1 (18)	240 (9.4)	8.1 (18)	240 (9.4)	8.1 (18)	240 (9.4)	8.1 (18)
ASME 1" class 600, raised face (RF)	n/a	n/a	260 (10.2)	8.5 (19)	260 (10.2)	8.5 (19)	260 (10.2)	8.5 (19)	260 (10.2)	8.5 (19)
ASME 1" class 600, ring joint (RJ)	n/a	n/a	260 (10.2)	8.6 (19)	260 (10.2)	8.6 (19)	260 (10.2)	8.6 (19)	260 (10.2)	8.6 (19)
ASME 1" class 900, raised face (RF)	n/a	n/a	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)
ASME 1" class 900, ring joint (RJ)	n/a	n/a	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)
ASME 1" class 1500, raised face (RF)	n/a	n/a	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)	320 (12.6)	12.7 (28)
ASME 1" class 1500, ring joint (RJ)	n/a	n/a	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)	320 (12.6)	12.8 (28)
ASME 1½" class 150, raised face (RF)	n/a	n/a	250 (9.8)	8 (18)	250 (9.8)	8 (18)	250 (9.8)	8 (18)	250 (9.8)	8 (18)
ASME 1½" class 300, raised face (RF)	n/a	n/a	250 (9.8)	10.3 (23)	250 (9.8)	10.3 (23)	250 (9.8)	10.3 (23)	250 (9.8)	10.3 (23)
ASME 1½" class 600, raised face (RF)	n/a	n/a	270 (10.6)	11.7 (26)	270 (10.6)	11.7 (26)	270 (10.6)	11.7 (26)	270 (10.6)	11.7 (26)
ASME 1½" class 600, ring joint (RJ)	n/a	n/a	270 (10.6)	11.6 (26)	270 (10.6)	11.6 (26)	270 (10.6)	11.6 (26)	270 (10.6)	11.6 (26)
ASME 1½" class 900, raised face (RF)	n/a	n/a	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)
ASME 1½" class 900, ring joint (RJ)	n/a	n/a	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)
ASME 1½" class 1500, raised face (RF)	n/a	n/a	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)	340 (13.4)	17.5 (39)
ASME 1½" class 1500, ring joint (RJ)	n/a	n/a	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)	340 (13.4)	17.7 (39)

L1 dimension and weight with process connections according to EN 1092-1 (AISI 316L)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 40 type B1, raised face (RF)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)	240 (9.4)	6.8 (15)
EN DN 15 PN 40 type D, with groove	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)	240 (9.4)	6.6 (15)
EN DN 15 PN 40 type E, with spigot	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)
EN DN 15 PN 40 type F, with recess	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)
EN DN 15 PN 100 type B1, raised face (RF)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)	250 (9.8)	7.6 (17)
EN DN 15 PN 100 type D, with groove	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)	250 (9.8)	13.6 (30)
EN DN 15 PN 100 type E, with spigot	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)	250 (9.8)	7.3 (16)

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Dimensional drawings (continued)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 100 type F, with recess	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)	250 (9.8)	7.5 (17)
EN DN 25 PN 40 type B1, raised face (RF)	n/a	n/a	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)
EN DN 25 PN 40 type D, with groove	n/a	n/a	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)
EN DN 25 PN 40 type E, with spigot	n/a	n/a	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)
EN DN 25 PN 40 type F, with recess	n/a	n/a	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)
EN DN 25 PN 40 type B1, raised face (RF)	n/a	n/a	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)
EN DN 25 PN 40 type D, with groove	n/a	n/a	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)	240 (9.4)	7.7 (17)
EN DN 25 PN 40 type E, with spigot	n/a	n/a	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)	240 (9.4)	7.4 (16)
EN DN 25 PN 40 type F, with recess	n/a	n/a	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)
EN DN 25 PN 100 type B1, raised face (RF)	n/a	n/a	260 (10.2)	10.3 (23)	260 (10.2)	10.3 (23)	260 (10.2)	10.3 (23)	260 (10.2)	10.3 (23)
EN DN 25 PN 100 type D, with groove	n/a	n/a	260 (10.2)	10.2 (22)	260 (10.2)	10.2 (22)	260 (10.2)	10.2 (22)	260 (10.2)	10.2 (22)
EN DN 25 PN 100 type E, with spigot	n/a	n/a	260 (10.2)	9.7 (21)	260 (10.2)	9.7 (21)	260 (10.2)	9.7 (21)	260 (10.2)	9.7 (21)
EN DN 25 PN 100 type F, with recess	n/a	n/a	260 (10.2)	10.1 (22)	260 (10.2)	10.1 (22)	260 (10.2)	10.1 (22)	260 (10.2)	10.1 (22)
EN DN 40 PN 40 type B1, raised face (RF)	n/a	n/a	240 (9.4)	9.2 (20)	240 (9.4)	9.2 (20)	240 (9.4)	9.2 (20)	240 (9.4)	9.2 (20)
EN DN 40 PN 40 type D, with groove	n/a	n/a	240 (9.4)	9.1 (20)	240 (9.4)	9.1 (20)	240 (9.4)	9.1 (20)	240 (9.4)	9.1 (20)
EN DN 40 PN 40 type E, with spigot	n/a	n/a	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)
EN DN 40 PN 40 type F, with recess	n/a	n/a	240 (9.4)	9.0 (20)	240 (9.4)	9.0 (20)	240 (9.4)	9.0 (20)	240 (9.4)	9.0 (20)
EN DN 40 PN 100 type B1, raised face (RF)	n/a	n/a	320 (12.6)	13.7 (30)	320 (12.6)	13.7 (30)	320 (12.6)	13.7 (30)	320 (12.6)	13.7 (30)
EN DN 40 PN 100 type D, with groove	n/a	n/a	320 (12.6)	13.6 (30)	320 (12.6)	13.6 (30)	320 (12.6)	13.6 (30)	320 (12.6)	13.6 (30)
EN DN 40 PN 100 type E, with spigot	n/a	n/a	320 (12.6)	13.2 (29)	320 (12.6)	13.2 (29)	320 (12.6)	13.2 (29)	320 (12.6)	13.2 (29)
EN DN 40 PN 100 type F, with recess	n/a	n/a	320 (12.6)	13.5 (30)	320 (12.6)	13.5 (30)	320 (12.6)	13.5 (30)	320 (12.6)	13.5 (30)

L1 dimension and weight with process connections according to JIS B 2220 (AISI 316 / AISI 316L)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 15 10K	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)	240 (9.4)	6.5 (14)
JIS DN 15 20K	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)	240 (9.4)	6.7 (15)
JIS DN 25 10K	n/a	n/a	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)	240 (9.4)	7.6 (17)
JIS DN 25 20K	n/a	n/a	240 (9.4)	8 (18)	240 (9.4)	8 (18)	240 (9.4)	8 (18)	240 (9.4)	8 (18)
JIS DN 40 10K	n/a	n/a	240 (9.4)	8.4 (19)	240 (9.4)	8.4 (19)	240 (9.4)	8.4 (19)	240 (9.4)	8.4 (19)
JIS DN 40 20K	n/a	n/a	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)	240 (9.4)	8.8 (19)

L1 dimension and weight with process connections according to NPT internal thread

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
¼" NPT	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
⅜" NPT	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
½" NPT	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
¾" NPT	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to G internal thread

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ¼ inch	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
G ⅜ inch	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
G ½ inch	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)	260 (10.2)	5.6 (12)
G ¾ inch	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)	260 (10.2)	5.5 (12)

L1 dimension and weight with hygienic clamp process connections according to DIN 32676 series A

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series A DN 15	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)
DIN 32676 series A DN 25	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)
DIN 32676 series A DN 40	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)

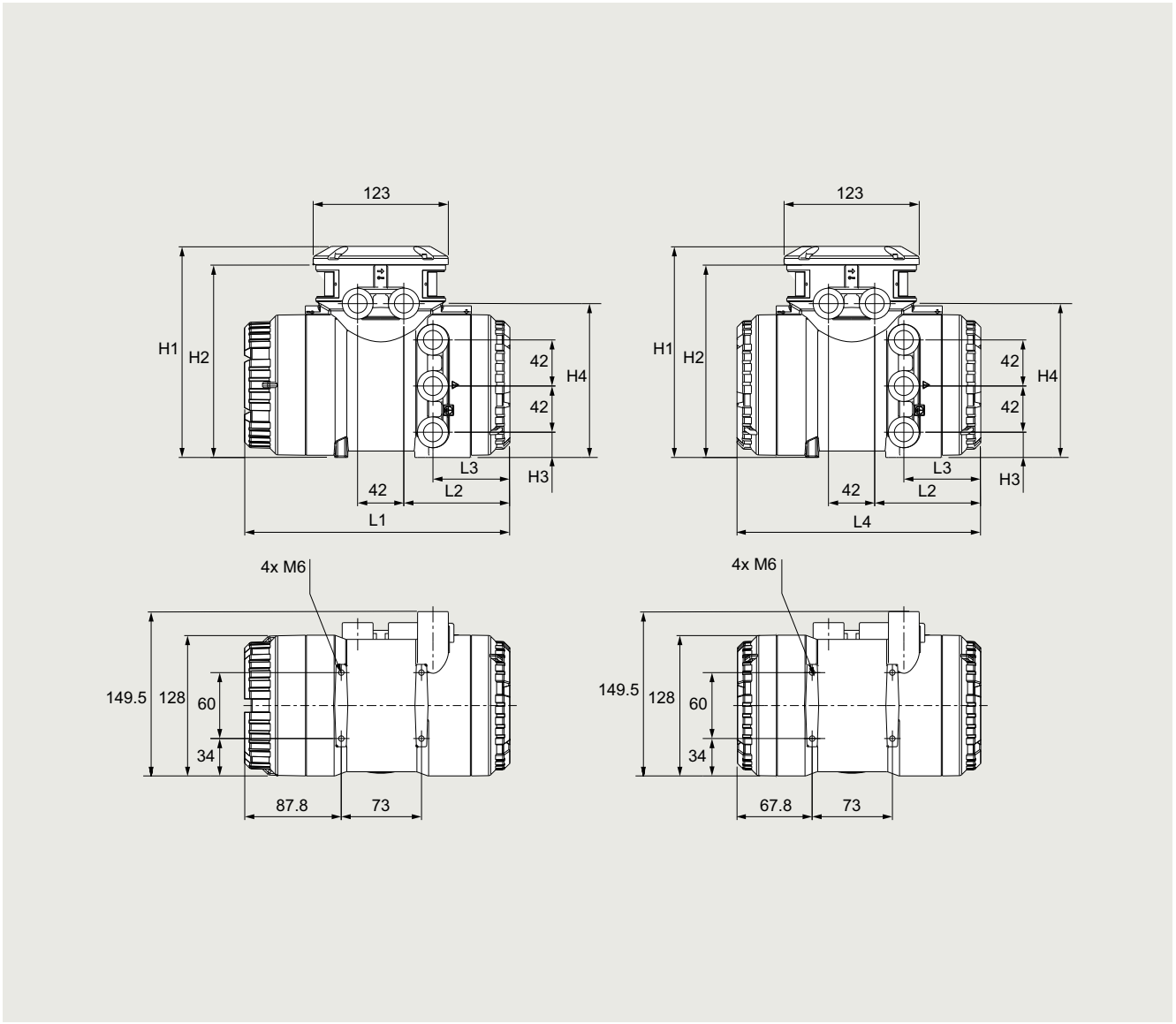
L1 dimension and weight with hygienic clamp process connections according to DIN 32676 series C (Tri-clamp)

Process connection size and type	FCS100 sensor nominal size DN 1		DN 2		DN 4		DN 6		DN 8	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series C ½ inch	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)	240 (9.4)	5.3 (12)
DIN 32676 series C 1 inch	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)
DIN 32676 series C 1½ inch	n/a	n/a	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)	240 (9.4)	5.4 (12)

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Dimensional drawings (continued)

Drawings, dimensions and weight for FCT020 and FCT040 transmitters



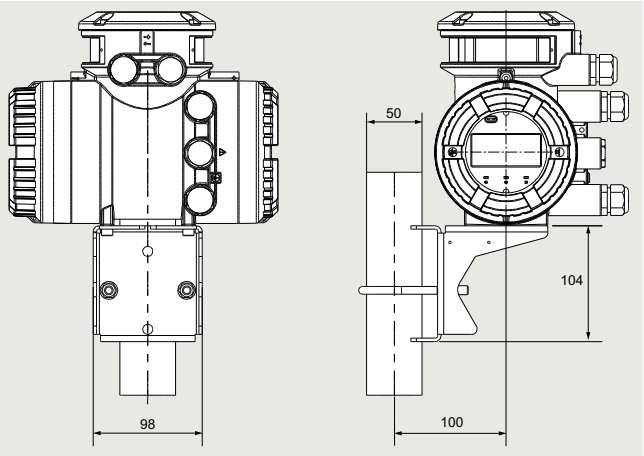
Dimensions of FCT020 or FCT040 transmitter in mm. Transmitter with display shown on the left. Transmitter without display shown on the right.

Dimensions L1 to L4 and H1 to H4 (material options: stainless steel, aluminum)

Material	L1 in mm (inch)	L2 in mm (inch)	L3 in mm (inch)	L4 in mm (inch)	H1 in mm (inch)	H2 in mm (inch)	H3 in mm (inch)	H4 in mm (inch)
Stainless steel	255.5 (10.06)	110.5 (4.35)	69 (2.72)	235 (9.25)	201 (7.91)	184 (7.24)	24 (0.94)	150.5 (5.93)
Aluminum	241.5 (9.51)	96.5 (3.8)	70 (2.76)	221 (8.7)	192 (7.56)	175 (6.89)	23 (0.91)	140 (5.51)

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Dimensional drawings (continued)



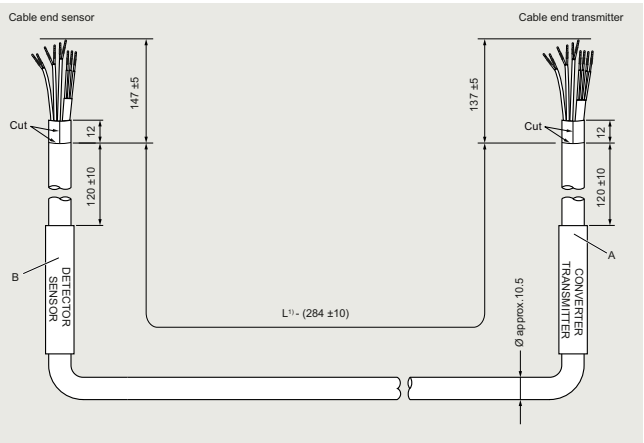
Dimensions of transmitter in mm, attached to mounting bracket.

Transmitter weights

Design type	Transmitter enclosure material	Weight in kg (lb)
Remote	Cast aluminum	4.2 (9.3)
	CF-8M stainless steel	12.5 (27.6)

Connecting cable dimensions and weights

Standard cable

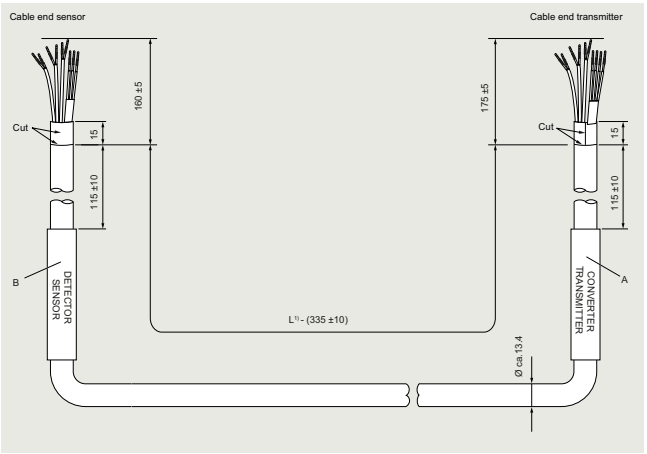


Dimensions in mm. Standard terminated cable. A and B are factory fitted labels.

Option code	Cable length, L	Cable color
L51	5 m (16.4 ft)	Non-Ex: gray / Ex: blue
L54	10 m (32.8 ft)	
L57	15 m (49.2 ft)	
L60	20 m (65.6 ft)	
L63	30 m (98.4 ft)	

Weight of cable ≤ 0.200 kg/m (0.134 lb/ft)

Standard cable with steel armored option

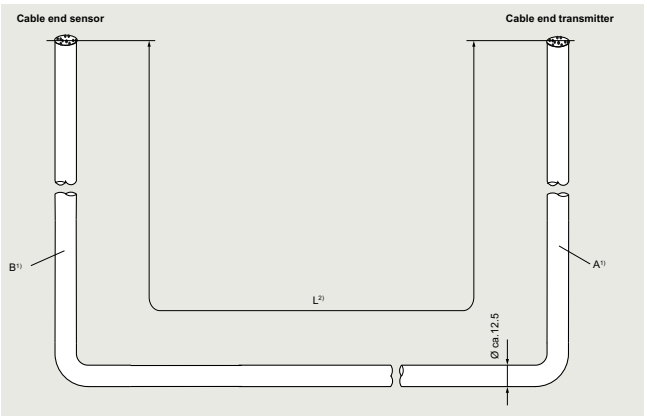


Dimensions in mm. Steel armored terminated cable. A and B are factory fitted labels.

Option code	Cable length, L	Cable color
L51 + A20/A21	5 m (16.4 ft)	Blue
L54 + A20/A21	10 m (32.8 ft)	
L57 + A20/A21	15 m (49.2 ft)	
L60 + A20/A21	20 m (65.6 ft)	
L63 + A20/A21	30 m (98.4 ft)	

Weight of cable ≤ 0.300 kg/m (0.202 lb/ft)

Fire retardant cable



Dimensions in mm. Fire retardant unterminated cable. Labels A and B are supplied loose with termination kit.

Option code	Cable length, L	Cable color
L71	5 m (16.4 ft)	Gray
L74	10 m (32.8 ft)	
L77	15 m (49.2 ft)	
L80	20 m (65.6 ft)	
L83	30 m (98.4 ft)	

Weight of cable ≤ 0.270 kg/m (0.181 lb/ft)

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Overview

The flowmeter systems of the SITRANS FC500 series are the universal Coriolis multi-parameter flowmeter for routine and hygienic applications.

They are formed by one FCS500 sensor and one FCT transmitter:

- SITRANS FC520 is the combination of the FCS500 sensor and the FCT020 transmitter
- SITRANS FC540 is the combination of the FCS500 sensor and the FCT040 transmitter

Features:

- Dual curved AISI 316L stainless steel measuring tubes
- Process connection: flange, thread, or a selection of hygienic fittings
- Nominal sizes: DN 10 to DN 80
- Connection sizes: DN 8 to DN 125 (⅜" to 5")
- Nominal flow rates: 1 600 to 170 000 kg/h (3 527 to 374 786 lb/h)
- FCS500 sensors can be combined with compact or remote transmitters
- Versatility with superior turndown and low pressure loss
- Hygienic specification for food and beverage, biotechnological and pharmaceutical applications



FC520/540 Coriolis flowmeter

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Benefits

Product features aligned to user value targets

	User value targets	SITRANS FC features and solutions
Engineering and project management	• Reduce engineering investment • Cut specification effort • Minimize project expenditure • Decrease the spending on each measurement point • Eliminate function duplication • Reduce number of suppliers	• Siemens project teams offer complimentary evaluation of customer specifications, provided by regional and HQ experts • Simple product selection using intuitive sizing software • One SITRANS FC device can typically provide 3 to 6 individual measurements, all transmitted via digital communication, when planned during pre-project design • Added value functions: batch control, viscosity, thermal energy, concentration measurement (Fraction) of two-component solutions, and pressure compensation
Installation	• Reduce footprint and transport outlay of OEM machinery • Lower installation complexity • Avoid costly modifications of existing plant	• Can be installed in horizontal or vertical (self-draining) pipes • Twin tube bend design delivers strong signal to noise characteristic resistant to external influence, so install in tight spaces with no inlet and outlet restrictions • Adaptable to existing pipes:typically, 3 or 4 connection sizes for each sensor size • Flexible selection of traditional inputs, outputs, and digital communications
Configuration and commissioning	• Shorter commissioning schedules with lower costs • Faster start-up with reduced outgoings	• Easy setup wizard delivers working meters straight after start-up • microSD card stores sensor calibration data and default setup • Simple configuration using Process Device Manager (PDM) • Siemens device-specific faceplates simplify operation in plantwide control systems
Efficient plant operation	• Improve finished product consistency to reduce waste • Keep process performance when scaling production up or down • Optimize process control • Improve finished product quality enabling higher levels of profit • Reduce downtime with fast resolution of process upsets • Improve asset performance	• SITRANS FC meters are calibrated in rigs accredited to EN/ISO 17025 to ensure consistently high performance of flow, density, and concentration measurements • First-class zero-point quality maintains high accuracy into the low flow region • High sensitivity and intelligent dynamic range keeps the measurement active in demanding high fluid damping cases • Designed-in resilience to process extremes • Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout or solid deposits building up in the tubes • Diagnostic data via local menu or PDM is backed by Siemens application experts • Intelligent Siemens SITRANS IQ apps for continuing asset evaluation
Maintenance and asset management	• Optimize technician training • Reduce cost of spare parts • Increase predictive maintenance • Reduce production downtime and associated costs • Decrease unplanned maintenance • Maximize asset value	• Simple product design with interchangeable modular parts • microSD card loads sensor-specific data to deliver fast service exchange • Self-verification: tube health check monitors key diagnostics, including tube stiffness, driver and pickups; the user defines verification frequency and alarm behavior • Verification results indicate whether preventive maintenance action is required • Siemens SIMATIC Maintenance Station uses cyclical acquisition to provide life cycle reports and intelligent preventive maintenance strategies
Industry compliance	• Cut effort required to comply with Industry-specific demands • Reduce resources needed to maintain regulatory compliance	• Food and beverage sector covered with EHEDG and 3-A approvals, polished tubes • Global hazardous area approvals for international plant duplications • Common and emerging digital networks covered: HART, PROFIBUS PA, MODBUS or PROFINET over APL Ethernet (IS) • Class-leading safety: SIL2/SIL3, secondary containment, PED, NAMUR NE95

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Application

Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Chemical and petrochemical Bulk chemicals Industrial gases Polymers Agrochemicals Fine chemicals Aroma chemicals	• Transfer, loading and unloading of bulk chemicals • Concentration control of acids and alkalis (process optimization) • Accurate mass or volume flow of feed chemicals to in-line blending systems • Accurate mass flow and density (quality) of reactor fluid feeds catalyst • Chemical recovery • Mass balance optimization • Compressed and cryogenic gases • Lubricating oil blending and dosing • High accuracy measurement of critical fluid components • Low flow control in pilot plants and R&D facilities
Food and beverage Food processing Dairies Breweries Distilleries Confectionary Soft drinks Animal feed plants OEM	• Accurate bulk transfer (mass or volume) of all dairy products: milk, cream, whey and yoghurt • Fat concentration in cream • Flow, density, temperature and concentration (Plato) during all fermentation processes • Flow, density, temperature and sugar concentration (Brix) in soft drink processing • Distilled spirits – % alcohol by volume (ABV), liters of pure alcohol, volume transfer, blending, batch and column still optimization and energy management, cask filling, tanker loading • Flow and density of fruit juices and pulps • Mixing and inventory control of confectionary ingredients, e.g. chocolate, syrup, oils, flavors • Metering pump control • Oils, fats enzymes dosing in animal feed plants • CO_2 dosing • CIP liquids • Bottling of beer, spirits, wine, soft drinks, etc. • Bulk sugar processing – molasses, sugar slurries, density, Brix of finished product
Oil and gas Offshore/onshore Upstream/downstream Pipelines Distribution networks Refineries Skid manufacturers	• Loading/unloading of hydrocarbons (e.g. crude oil, bitumen) from/to ship, road tanker, rail car • High pressure chemical injection • High pressure low flow gas • Net oil computing • Gas void fraction • Filling of gas bottles • Furnace control • Test separators • LPG, natural gas hydration • Well-head water-cut monitoring • All hydrocarbon fluids in refineries • Metrology, custody transfer • Drilling mud • Oil well cementing and hydrofracturing
Life sciences Pharmaceutical Bio	• High accuracy flow and batching of bioreactor feeds • Solvent flow rate, density and batching • Flow of demineralized and deionized water • Solvents and fish oils used in high grade omega 3 oils • Precision coatings • Vacuum thin film coating
Household and personal care Detergents Cosmetics	• Blending and batching of detergent ingredients • Tanker loading and unloading • Salt concentration • Reliable measurement of aerated liquids

Application (continued)

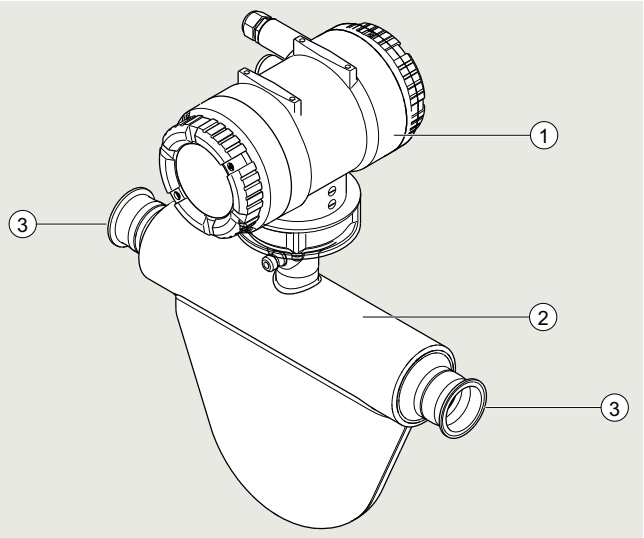
Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Automotive and aeronautical Vehicle manufacturing Paint Engine testing OEM	• Fuel injection nozzle and pump testing • Filling of under bonnet fluid reservoirs, air conditioning, coolant • Fuel flow and density measurement in engine test beds • Checking for air in oil using high accuracy density measurement • Paint spray robots – requires accurate and fast measurements • Aircraft fuel loading (kerosene) • High pressure flow used in turbine blade manufacture
Power and energy Renewable Hydrogen	• Boiler fuel flow and burner control • Turbine fuel flow • Glycol flow and concentration • Bioethanol
Marine OEM Shipbuilders	• Fuel consumption management • Boiler control • Bunkering management • Density used to indicate fuel quality
Pulp, paper and textiles	• Accurate dosing of dyes and chemicals
Water and environmental	• Dosing of chemicals for water treatment • Chemical concentration for water quality control

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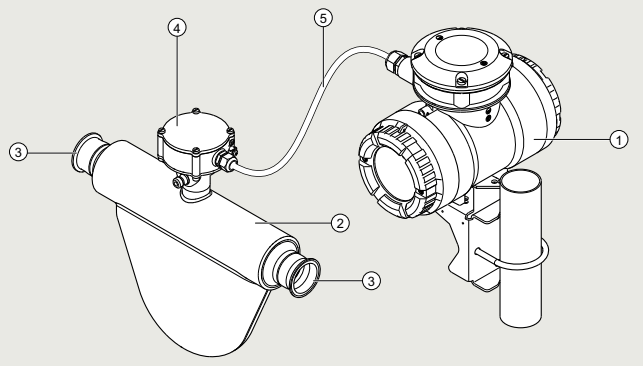
Design

Design options and related temperature range for FC500 series

Design version	Transmitter style	Process fluid temperature range
Non-hygienic, flange or thread, standard neck	Compact	Standard [-50 ... +150 °C (-58 ... +302 °F)]
	Remote	Standard [-70 ... +200 °C (-94 ... +392 °F)]
Hygienic, thread, polished wetted parts, standard neck	Compact	Standard [-40 ... +140 °C (-58 ... +284 °F)]
	Remote	Standard [-70 ... +140 °C (-94 ... +284 °F)]
Hygienic, clamp, polished wetted parts, standard neck	Compact	Standard [-10 ... +140 °C (14 ... 284 °F)]
	Remote	Standard [-10 ... +140 °C (14 ... 284 °F)]



FCS500 sensor with compact transmitter (hygienic version)



FCS500 sensor with remote transmitter (hygienic version)

1	Transmitter
2	FCS500 sensor
3	Process connection
4	Sensor terminal box
5	Connecting cable

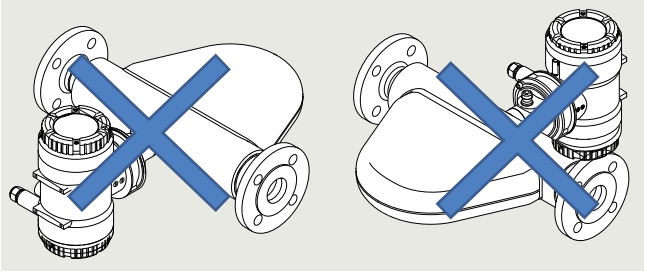
Design (continued)

Installation guidelines

FC500 series flowmeters can be mounted horizontally, vertically and at an incline. The measuring tubes should be filled with the fluid during flow measurement as entrained gas may result in errors in measurement. Straight pipe runs at inlet or outlet are usually not required.

Avoid the following installation locations and positions:

- Measuring tubes as highest point in piping when measuring liquids
- Measuring tubes as lowest point in piping when measuring gases
- Immediately in front of a free pipe outlet in a downpipe
- Lateral positions



Avoid measuring tubes in sideways position resulting in possible non-homogeneous fluid separation

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Function

Compatible fluids

- Liquids
- Gases
- Mixtures, solutions, emulsions, suspensions, and slurries

Primary measured variables

- Mass flow
- Density
- Temperature

Based on the primary measured quantities, the transmitter also calculates

- Volume flow
- Percent concentration (fraction) of a two-component mixture (FCT040 only)
- Partial component flow rate (net flow) of a mixture consisting of two components (FCT040 only)

Bi-directional operation

The mass flow, volume flow, and net flow measurements can be bi-directional.

Measurement variables for NTEP approval

- Mass flow uni-directional
- Volume flow uni-directional

Feature overview

- Energy-efficient low pressure loss design with short tube paths and large tube diameter
- Cost-effective short face-to-face length or customized installation length options
- Batching function with batch leakage detection and batch control by transmitter for precise dosing
- Accurate density measurement and up to four advanced Concentration Measurement data sets
- Benefit from Viscosity function and capability to handle high viscous process fluids
- Hygienic design, self-draining in vertical installation, with hygienic approval options

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Selection and ordering data

SITRANS FC520/540 (Standard and Hygienic)	Article No. 7ME445	● -	● ● ● ● ● -	● ● ● ● -	Order code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Transmitter variant					
None (spare sensor)		0			
Coriolis sensor FCS500 with transmitter FCT020		2			
Coriolis sensor FCS500 with transmitter FCT040		4			
SITRANS FC spare part transmitter, no sensor included		9			G 3 Y
Sensor size / Connector size					
No sensor (SITRANS FCT transmitter as spare part)			0 A		
Sensor size DN 10 with connection size 3/8"			1 B		
Sensor size DN 10 with connection size ½" DN 15			1 C		
Sensor size DN 10 with connection size ¾"			1 D		
Sensor size DN 10 with connection size 1" DN 25			1 E		
Sensor size DN 10 with connection size 1½" DN 40			1 F		
Sensor size DN 10 with special connection			1 Y		
Sensor size DN 15 with connection size ½" DN 15			2 C		
Sensor size DN 15 with connection size 3/4"			2 D		
Sensor size DN 15 with connection size 1" DN 25			2 E		
Sensor size DN 15 with connection size 1½" DN 40			2 F		
Sensor size DN 15 with special connection			2 Y		
Sensor size DN 25 with connection size 1" DN 25			3 E		
Sensor size DN 25 with connection size 1½" DN 40			3 F		
Sensor size DN 25 with connection size 2" DN 50			3 G		
Sensor size DN 25 with special connection			3 Y		
Sensor size DN 50 with connection size 1 ½" DN 40			4 F		
Sensor size DN 50 with connection size 2" DN 50			4 G		
Sensor size DN 50 with connection size 2½" DN 65			4 H		
Sensor size DN 50 with connection size 3" DN 80			4 J		
Sensor size DN 50 with special connection			4 Y		
Sensor size DN 80 with connection size 3" DN 80			5 J		
Sensor size DN 80 with connection size 4" DN 100			5 K		
Sensor size DN 80 with connection size 5" DN 125			5 L		
Sensor size DN 80 with special connection			5 Y		
Process connection					
No connection (SITRANS FCT transmitter as spare part)				A 0	
EN flange PN 40, suitable for EN 1092-1 type B1, raised face (RF)				A 1	
EN flange PN 100, suitable for EN 1092-1 type B1, raised face (RF)				A 3	
EN flange PN 40, suitable for EN 1092-1 type D, groove				A 5	
EN flange PN 100, suitable for EN 1092-1 type D, groove				A 7	
EN flange PN 40, suitable for EN 1092-1 type E, spigot				B 1	
EN flange PN 100, suitable for EN 1092-1 type E, spigot				B 3	
EN flange PN 40, suitable for EN 1092-1 type F, recess				B 5	
EN flange PN 100, suitable for EN 1092-1 type F, recess				B 7	
ASME flange class 600, suitable for ASME B16.5, ring joint (RJ)				C 3	
ASME flange class 150, suitable for ASME B16.5, raised face (RF)				D 1	
ASME flange class 300, suitable for ASME B16.5, raised face (RF)				D 2	
ASME flange class 600, suitable for ASME B16.5, raised face (RF)				D 3	
Process connection with internal thread G				E 1	
Process connection with internal thread NPT				E 3	
DIN 11851 threaded connection				F 1	
Clamp process connection according to DIN 32676 series A				G 2	
Clamp process connection according to DIN 32676 series C (Tri-clamp)				G 6	
DIN 11864-2 Form A				H 2	

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Selection and ordering data (continued)

SITRANS FC520/540 (Standard and Hygienic)	Article No. 7ME445	● -	● ● ● ● ● -	● ● ● ● -	Order code ● ● ●
JIS G3447 and ISO 2852 clamp			J 1		
JIS flange 10K, JIS B 2220			L 2		
JIS flange 20K, JIS B 2220			L 4		
Special design request			Y 1		
Tube material (wetted) and max operational temperature					
None (SITRANS FCT transmitter as spare part)			0		
316L, 1.4404 media temperature -50 ... 150 °C (-58 ... 302 °F)			1		
316L, 1.4404 media temperature -50 ... 140 °C (-58 ... 284 °F), polished Ra ≤ 0.8 µm			2		
316L, 1.4404 media temperature -70 ... 200 °C (-94 ... 392 °F)			3		
316L, 1.4404 media temperature -70 ... 140 °C (-94 ... 284 °F), polished Ra ≤ 0.8 µm			4		
Calibration					
No calibration				0	
Massflow 0.1%, density 0.5 g/l				1	
Massflow 0.1%, density 1 g/l				2	
Massflow 0.1%, density 4 g/l				5	
Massflow 0.2%, density 4 g/l				6	
Accuracy for gas please select below				9	
Massflow gas 0.75%					N 1 A
Massflow gas 0.5%					N 2 A
Massflow gas 0.35%					N 3 A
Mounting style, transmitter housing and material					
Compact type with "urethane-cured polyester powder coating" coated aluminum transmitter housing				A	
Compact type with "corrosion protection coating" coated aluminum transmitter housing				B	
Remote type with "urethane-cured polyester powder coating" coated aluminum transmitter housing and standard neck sensor				C	
Remote type with "corrosion protection coating" coated aluminum transmitter housing and standard neck sensor				E	
Remote type stainless steel transmitter and standard neck sensor				G	
Ex approvals					
None				A	
ATEX, explosion group IIC and IIIC				B	
ATEX, explosion group IIB and IIIC				C	
IECEx, explosion group IIC and IIIC				D	
IECEx, explosion group IIB and IIIC				E	
EAC Ex, IIC and IIIC				F	
EAC Ex, IIB and IIIC				G	
FM, groups A B C D E F G				H	
FM, groups C D E F G				J	
INMETRO, explosion group IIC and IIIC				K	
INMETRO, explosion group IIB and IIIC				L	
NEPSI, explosion group IIC and IIIC				M	
NEPSI, explosion group IIB and IIIC				N	
Korea Ex, explosion group IIC and IIIC				P	
Korea Ex, explosion group IIB and for integral type also IIIC				Q	
Local User Interface					
Spare sensor without transmitter, no display applied				0	
No display				1	
With display				3	

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Selection and ordering data (continued)

	Order code
Further designs Please add "**-Z**" to Article No. and specify order code(s).	
Cable glands	
Metric, no glands (M20)	**A10**
NPT, no glands (1/2")	**A11**
Armored cable setup (NPT threads supplied)	**A20**
NPT, no glands (1/2") steel armored cable	**A21**
Sensor housing material	
None (SITRANS FCT transmitter as spare part)	**B00**
Stainless steel 1.4301/304, 1.4404/316L	**B01**
I/O Configuration Ch1	
None	**E00**
4-20 mA HART active	**E06**
4-20 mA HART passive	**E07**
PROFIBUS PA	**E10**
Modbus RTU RS 485	**E14**
PROFINET over Ethernet-APL (IS)	**E15**
I/O Configuration Ch2, Ch3 and Ch4	
Spare sensor without transmitter, all communication types and I/Os apply	**F00**
1 passive current output, 1 passive pulse or status output	**F01**
1 passive current output, 2 passive pulse or status outputs	**F02**
1 passive current output, 1 passive pulse or status outputs, 1 passive NAMUR pulse or status output	**F03**
1 passive current output, 2 passive NAMUR pulse or status outputs	**F04**
1 passive pulse or status output	**F11**
2 passive pulse or status outputs, 1 passive status output	**F12**
2 passive pulse or status outputs, 1 voltage-free status input	**F13**
2 passive pulse or status outputs, 1 active current input	**F14**
2 passive pulse or status outputs, 1 passive current input	**F15**
1 passive pulse or status output, 1 passive current output, 1 active current input	**F16**
1 passive pulse or status output, 1 passive current output, 1 passive current input	**F17**
1 passive pulse or status output, 1 voltage-free status input, 1 active current input	**F18**
1 passive pulse or status output, 1 voltage-free status input, 1 passive current input	**F19**
1 passive pulse or status output, 1 active pulse or status output, 1 voltage-free status input	**F20**
1 passive pulse or status output, 1 active pulse or status output with pull-up resistor, 1 voltage-free status input	**F21**
1 active current output, 2 passive pulse or status outputs	**F22**
1 active current output, 1 passive pulse or status output,1 voltage-free status input	**F23**
1 passive pulse or status output	**F31**
2 passive pulse or status outputs	**F32**
1 passive pulse or status output,1 active current input	**F33**
1 passive pulse or status output,1 passive current input	**F34**
1 passive pulse or status output,1 active pulse or status output	**F35**
1 passive pulse or status output,1 active pulse or status output with pull-up resistor	**F36**
1 passive pulse or status output,1 active current output	**F37**
1 passive pulse output	**F41**
Output CH1 intrinsically safe, 1 passive pulse output	**F42**
Output CH3 intrinsically safe, 1 passive pulse output	**F50**
Certificates	
Declaration of compliance with the order 2.1 according to EN 10204	**C11**
Certificate of Marking Transfer and Raw Material Certificates (Inspection Certificate 3.1 according to EN 10204), including IGC and conform to NACE MR0175 and MR0103	**C13**
Positive Material Identification of wetted parts, including certificate (Inspection Certificate 3.1 according to EN 10204)	**C15**
NTEP approval accuracy class 0.3 acc. NIST	**C16**
Hydrostatic Pressure Test Certificate (Inspection Certificate 3.1 according to EN 10204)	**C18**
Delivery to EAEU+KazakPA	**C19**
Functional Safety (IEC 61508) - SIL2/3	**C20**
X-ray inspection of flange weld seam according to DIN EN ISO 17636-1/B, evaluation according to AD 2000 HP 5/3 and DIN EN ISO 5817/C, including certificate	**C33**
X-ray test according to ASME V	**C34**
WPS according to DIN EN ISO 15809-1; WPQR according to DIN EN ISO 15814-1; WQC according to DIN EN 287-1 or DIN EN ISO 8908-4	**C36**
Welding procedures and certificate ASME IX	**C37**
Dye penetrant test of process connection weld seams according to EN ISO 3452-1, including certificate	**C38**
Dye penetrant test of flange welding according to ASME V, including certificate	**C39**
Quality Inspection Certificate (Inspection Certificate 3.1 according to EN 10204)	**C40**
Ferrite test for flange welding acc. DIN EN ISO 8249	**C50**
Degreasing of wetted surfaces according to ASTM G93-03 (Level C), including test report	**C54**
3-A product conformity with 3-A certificate and marking, including Surface Roughness wetted parts Ra ≤ 0.8 µm and Surface Roughness Inspection Certificate	**C62**
EHEDG product conformity with EHEDG Certificate and marking, including Surface Roughness wetted parts Ra ≤ 0.8 µm and Surface Roughness Inspection Certificate	**C63**
Surface Roughness wetted parts Ra ≤ 0.8 µm and Surface Roughness Inspection Certificate	**C61**
Combined certificates	
Certification package (C13, C18, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test and Quality inspection certificate	**C80**
Certification package (C13, C15, C40) including Marking Transfer and raw material certificate, Positive material identification and Quality inspection certificate	**C81**
Certification package (C13, C18, C38, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, Dye penetration and Quality inspection certificate	**C82**
Certification package (C13, C15, C18, C36, C38, C40) including Marking Transfer and raw material certificate, Positive material identification, Hydrostatic pressure test, Welding certificates, Dye penetration and Quality inspection certificate	**C83**
Certification package (C15, C18, C36) including Positive material identification, Hydrostatic pressure test and Welding certificates	**C84**
Certification package (C34, C37, C39) including X-ray test according ASME V, Welding procedures and Certificates according ASME IX and Dye penetrant test of flange welding according ASME V	**C85**
Certification package (C13, C18, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	**C86**
Certification package (C13, C15, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Positive material identification, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	**C87**
Connecting cable type and length	
Without standard connecting cable	**L50**
5 meter (16.4 ft) remote connecting cable terminated standard gray / Ex blue	**L51**
10 meter (32.8 ft) remote connecting cable terminated standard gray / Ex blue	**L54**

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Selection and ordering data (continued)

	Order code
15 meter (49.2 ft) remote connecting cable terminated standard gray / Ex blue	**L57**
20 meter (65.6 ft) remote connecting cable terminated standard gray / Ex blue	**L60**
30 meter (98.4 ft) remote connecting cable terminated standard gray / Ex blue	**L63**
without fire retardant connecting cable	**L70**
5 meter (16.4 ft) remote fire retardant connecting cable not terminated	**L71**
10 meter (32.8 ft) remote fire retardant connecting cable not terminated	**L74**
15 meter (49.2 ft) remote fire retardant connecting cable not terminated	**L77**
20 meter (65.6 ft) remote fire retardant connecting cable not terminated	**L80**
30 meter (98.4 ft) remote fire retardant connecting cable not terminated	**L83**
SW functions	
Heat measurement	**S11**
Tube health check	**S12**
Batching and filling function	**S13**
Netoil computing	**S14**
Viscosity computing function for liquids	**S15**
Standard concentration measurement	**S16**
Advanced concentration	**S17**
Marine approval	
Marine approved DNV, ABS, KR piping class 2	**S22**
Marine approved DNV, ABS, KR piping class 3	**S23**
Marine approved LR, MR, TAC piping class 2	**S24**
Marine approved LR, MR, TAC piping class 3	**S25**
Marine approved BV piping class 2	**S26**
Marine approved BV piping class 3	**S27**
Mounting	
Namur built-in length according to NE132	**S31**
Country-specific delivery	
Delivery to China including China RoHS mark	**W21**
Delivery to Korea including KC mark	**W22**
Delivery to Canada including CRN mark	**W26**

	Order code
Fraction setup PIA: Please select four options	
Sugar / Water 0 ... 85 °Bx, 0 ... 80 °C (32 ... 176 °F)	**G01**
NaOH / Water 2 ... 50 WT%, 0 ... 100 °C (32 ... 212 °F)	**G02**
KOH / Water 0 ... 60 WT%, 54 ... 100 °C (129 ... 212 °F)	**G03**
NH_4NO_3 / Water 1 ... 50 WT%, 0 ... 80 °C (32 ... 176 °F)	**G04**
NH_4NO_3 / Water 20 ... 70 WT%, 20 ... 100 °C (68 ... 212 °F)	**G05**
HCl / Water 22 ... 34 WT%, 20 ... 40 °C (68 ... 104 °F)	**G06**
HNO_3 / Water 50 ... 67 WT%, 10 ... 60 °C (50 ... 140 °F)	**G07**
H_2O_2 / Water 30 ... 75 WT%, 4 ... 44 °C (39 ... 111 °F)	**G09**
Ethylene Glycol / Water 10 ... 50 WT%, -20 ... 40 °C (-4 ... 104 °F)	**G10**
Amylum = Starch / Water 33 ... 43 WT%, 35 ... 45 °C (95 ... 113 °F)	**G11**
Methanol / Water 35 ... 60 WT%, 0 ... 40 °C (32 ... 104 °F)	**G12**
Alcohol / Water 55 ... 100 VOL%, 10 ... 40 °C (50 ... 104 °F)	**G20**
Sugar / Water 40 ... 80 °Bx, 75 ... 100 °C (167 ... 212 °F)	**G21**
Alcohol / Water 66 ... 100 WT%, 15 ... 40 °C (59 ... 104 °F)	**G30**
Alcohol / Water 66 ... 100 WT%, 10 ... 40 °C (50 ... 104 °F)	**G37**
Tag name	
Tag name plate, SS (max. 16 characters)	**Y11**
Tag plate wired (316L)	**Y15**
HART/MODBUS software tag No. (max. 8 characters)	**Y25**
HART/MODBUS software tag No. (max. 32 characters)	**Y26**
PROFIBUS PA NODE ADDRESS (4 characters HEX)	**Y28**
PROFIBUS PA SOFTWARE TAG (max. 32 characters)	**Y29**
Customer installation length	
Customer installation length (mm)	**Y30**
Calibration	
Predefined 6-Point Accredited Calibration: 10%, 20%, 40%, 60%, 80%, 100% of Q_{nom}. Calibrated Output: Frequency	**D62**
Special versions	
ID-Number of special design	**Y99**

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Technical specifications

Mass flow rate of liquids

The mass flow rate characteristics of SITRANS FC meters are defined by the values of zero stability, Q_{flat}, Q_{nom} and Q_{max}.

Zero stability is the maximum allowable flow rate value that can be displayed at zero flow under reference conditions. It is a good indicator of the meter performance as flow rates reduce, and approach zero.

- Q_{flat} is the mass flow rate above which the base accuracy is maintained (0.1% when using FCT040 transmitters).
- Q_{nom} is the nominal mass flow rate of water at reference conditions that would result in a pressure drop of 1 bar (15 psi).
- Q_{max} is the recommended maximum mass flow rate for each sensor size.

For questions regarding expected performance in specific applications, please contact your regional Siemens Measurement Intelligence team.

Flow rate summary by FCS500 sensor size

Nominal size	Zero stability kg/h	lb/h	Q_{flat} kg/h	lb/min	Q_{nom} kg/h	lb/min	Q_{max} kg/h	lb/min
DN 10	0.032	0.070	80.0	2.94	1 600	58.7	2 300	84.4
DN 15	0.090	0.198	235	8.62	4 700	172	7 000	257
DN 25	0.400	0.880	1 000	36.7	20 000	734	29 000	1 064
DN 50	2.55	5.61	2 550	93.6	51 000	1 872	76 000	2 789
DN 80	8.50	18.7	8 500	312	170 000	6 239	255 000	9 359

Performance summary by FCS500 sensor size and transmitter type

Sensor size			DN 10	DN 15	DN 25	DN 50	DN 80
Mass flow (liquids)							
Accuracy	% (of rate)	FCT020	± 0.2	± 0.2	± 0.2	± 0.2	± 0.2
	% (of rate)	FCT040	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1
Zero stability	kg/h (lb/h)		± 0.032 (0.07)	± 0.09 (0.198)	± 0.4 (0.88)	± 2.55 (5.61)	± 8.5 (18.7)
Density (liquids)							
Accuracy	kg/m³ (lb/ft³)	FCT020/FCT040	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)
	kg/m3 (lb/ft³)	FCT040	± 0.5 (0.03)	± 0.5 (0.03)	± 0.5 (0.03)	± 0.5 (0.03)	± 1 (0.06)
Mass flow (gases)							
Accuracy	% (of rate)	FCT020	± 0.75	± 0.75	± 0.75	± 0.75	± 0.75
	% (of rate)	FCT040					
	% (of rate)	FCT040	± 0.35	± 0.35	± 0.35	± 0.35	± 0.35
Temperature							
Accuracy	°C (°F)		± 1 (1.8)	± 1 (1.8)	± 1 (1.8)	± 1 (1.8)	± 1 (1.8)

Note:

The accuracy values in the table above are based on reference conditions at the time of calibration and represent the combined measurement uncertainties including sensor, electronic and pulse output interface.

Liquid density calibration is performed when density accuracy of 0.5 kg/m³ (0.03 lb/ft³) is selected in the model code.

Mass flow calibration and density adjustment for liquids

Siemens SITRANS FC Coriolis meters are calibrated in rigs accredited according to the international standard DIN EN ISO/IEC 17025:2018. Each flowmeter comes with a standard calibration certificate.

Mass flow calibration takes place at reference conditions. Specific values are listed in the standard calibration certificate.

Mass flow calibration reference conditions

Fluid	Water
Density	900 ... 1 100 kg/m³ (56 ... 69 lb/ft³)
Fluid temperature	10 ... 35 °C (50 ... 95 °F), average temperature: 22.5 °C (72.5 °F)
Ambient temperature	10 ... 35 °C (50 ... 95 °F)
Process pressure	1 ... 5 bar (15 ... 73 psi)

Density calibration reference conditions

Flow condition	Fully developed flow profile
Fluid densities used to obtain density calibration constants	700 kg/m³ (44 lb/ft³) 1 000 kg/m³ (62 lb/ft³) 1 650 kg/m³ (103 lb/ft³)
Fluid temperature	20 °C (68 °F)
Determination of temperature compensation coefficients	20 ... 80 °C (68 ... 176 °F)

Analog output performance specification

Typical additional uncertainty when using the analog current output: ± 0.04% at a nominal mid-range current output of 12 mA, which includes the effects of: Output adjustment, linearity, power supply variation, load resistance variation, short-term and long-term drift for one year, and ambient temperature effect on the transmitter in the range 20 °C ± 30 °C (14 ... 122 °F).

Process pressure effect on flow measurement performance

Changes in operating pressure have a small effect on the mass flow measurement performance. When the pressure changes are very large this effect can be corrected by a dynamic pressure input or a fixed process pressure.

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Technical specifications (continued)

Sensor size	Additional flow measurement errors due to change in operating pressure from reference pressure in % of rate per 1 bar variation	 in % of rate per 1 psi variation
DN 10	-0.0020	-0.00014
DN 15	-0.0084	-0.00058
DN 25	-0.0109	-0.00075
DN 50	-0.0130	-0.0009
DN 80	-0.0233	-0.0016

Process temperature effect

For mass flow measurement, process fluid temperature effect is defined as the change in sensor flow accuracy due to process fluid temperature change, away from the 20 °C (68 °F) reference condition. Variation in process temperature influences the measuring tube characteristics and this is compensated for using the built-in PT 1000 temperature sensor.

A small flow uncertainty remains in the compensation circuit, defined below.

Uncertainty due to process temperature change: ± 0.0009% of mass flow rate per °C (± 0.0005% of mass flow rate per °F)

Temperature effect on zero

Temperature effect on the mass flow zero-point quality can be corrected by zeroing at the process fluid temperature.

Process conditions

Process fluid temperature range

Design version	Transmitter	Process fluid temperature range
Non-hygienic, flange or thread, standard neck	Compact	Standard [-50 ... +150 °C (-58 ... +302 °F)]
	Remote	Standard [-70 ... +200 °C (-94 ... +392 °F)]
Hygienic, thread, polished wetted parts, standard neck	Compact	Standard [-40 ... +140 °C (-58 ... +284 °F)]
	Remote	Standard [-70 ... +140 °C (-94 ... +284 °F)]
Hygienic, clamp, polished wetted parts, standard neck	Compact	Standard [-10 ... +140 °C (14 ... 284 °F)]
	Remote	Standard [-10 ... +140 °C (14 ... 284 °F)]

Operating pressure

The maximum allowed process pressure depends on the selected process connection and process temperature.

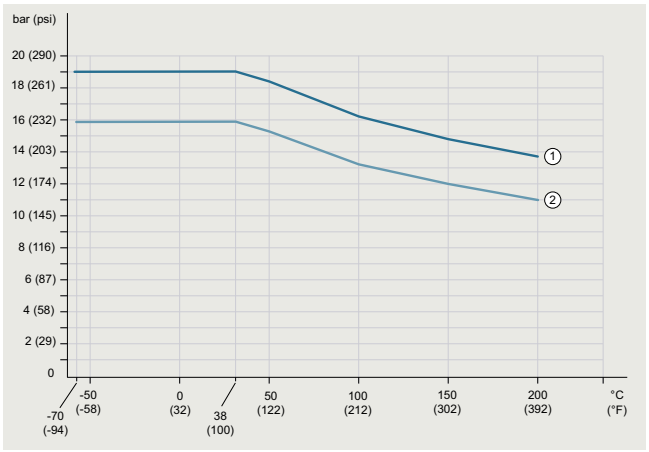
The given process temperature and process pressure ranges are calculated and approved without corrosion or erosion effects.

Pressure versus temperature relationship depending on selected process connection

The following diagrams show the process pressure as a function of process temperature as well as the process connection used (type and size of process connection).

Calculations for ASME flanges are based on ASME B16.5 Material group 2.2 (316/316L dual certified).

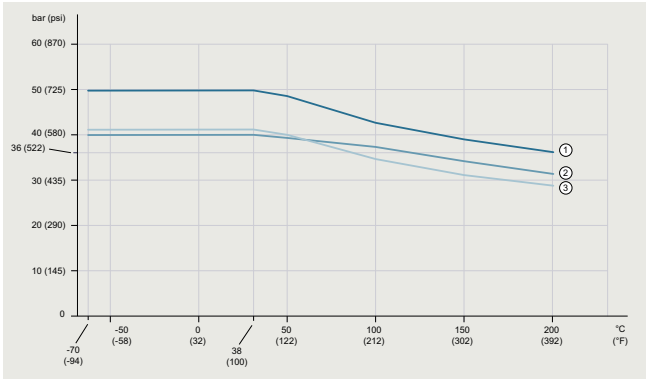
ASME class 150



Allowed process pressure as a function of process fluid temperature

1	Process connection compatible to ASME B16.5 class 150
2	Not used for this product

ASME class 300, EN PN 40



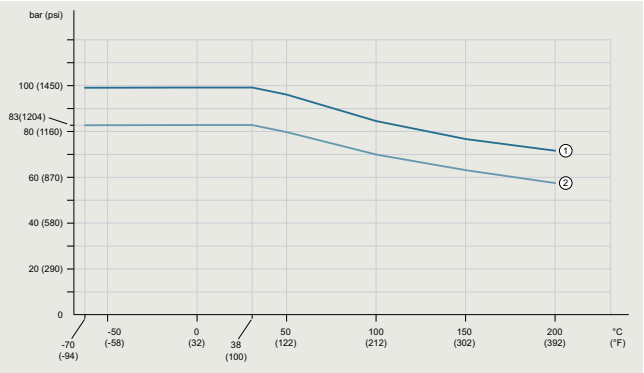
Allowed process pressure as a function of process fluid temperature

1	Process connection compatible to ASME B16.5 class 300
2	Process and heat tracing connection compatible to EN 1092-1 PN 40
3	Not used for this product

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Technical specifications (continued)

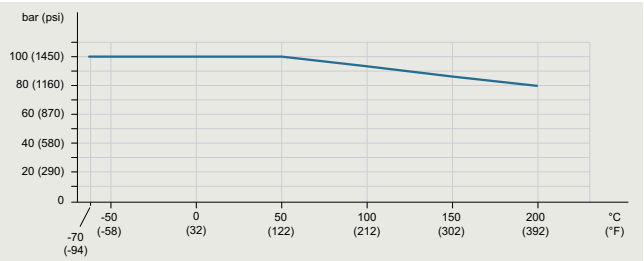
ASME class 600



Allowed process pressure as a function of process fluid temperature

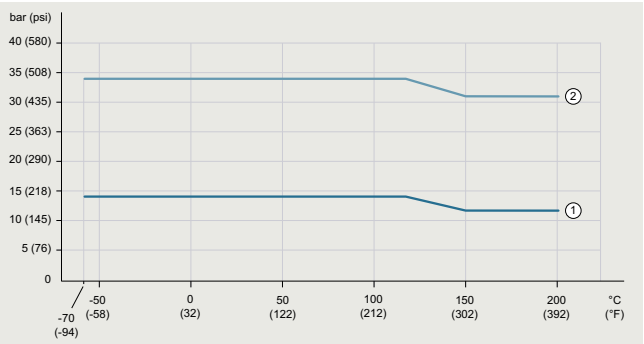
1	Process connection compatible to ASME B16.5 class 600
2	Not used for this product

EN PN100



Allowed process pressure as a function of process fluid temperature, compatible to EN 1092-1 PN 100

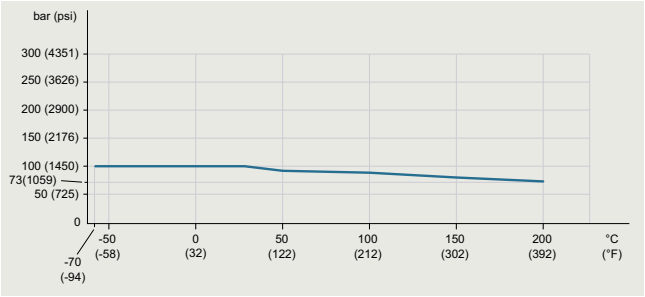
JIS 10K, JIS 20K



Allowed process pressure as a function of process connection temperature

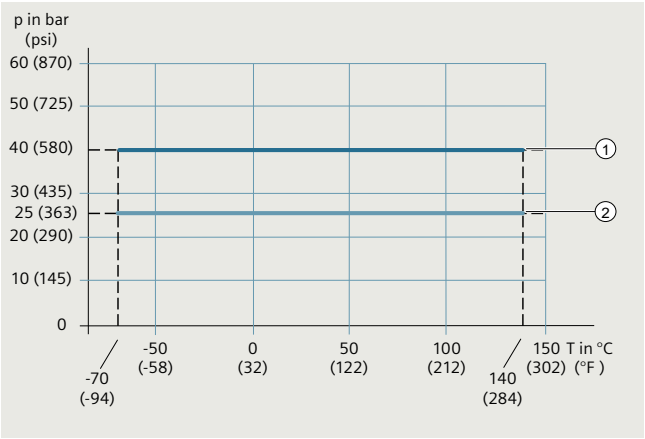
1	Process connection compatible to JIS B 2220 10K
2	Process connection compatible to JIS B 2220 20K

Process connection with internal thread G and NPT



Allowed process pressure as a function of process fluid temperature

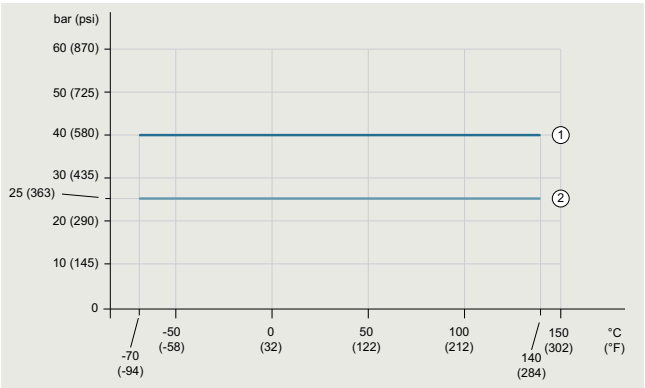
Threaded connection according to DIN 11851



Allowed process pressure as a function of process connection temperature

1	Threaded connection compatible to DIN 11851 up to DN 40
2	Threaded connection compatible to DIN 11851 from DN 50 to DN 100

Threaded connection according to SMS 1145



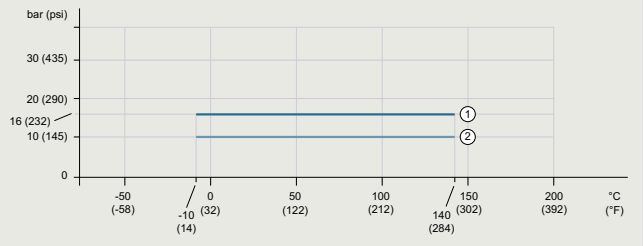
Allowed process pressure as a function of process connection temperature

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Technical specifications (continued)

1	Threaded sanitary connection for SMS 1145 up to DN 40
2	Threaded sanitary connection for SMS 1145 from DN 50 up to DN 80

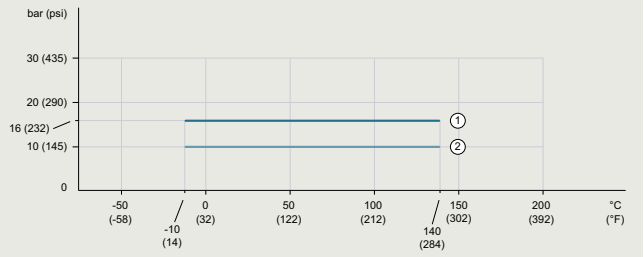
Clamp process connection according to DIN 32676 series A



Allowed process pressure as a function of process fluid temperature

1	Clamp connection compatible to DIN 32676 series A up to DN 50
2	Clamp connection compatible to DIN 32676 series A above DN 50

Clamp process connection according to DIN 32676 series C (Tri-Clamp)



Allowed process pressure as a function of process fluid temperature

1	Clamp connection compatible to DIN 32676 series C up to 2"
2	Clamp connection compatible to DIN 32676 series C above 2"

Ambient conditions

Allowed ambient and storage temperature of SITRANS FC500 series is influenced by the temperature specification of FCS500 sensor, FCT0X0 transmitter and the interconnecting cable.

Ambient temperature

Device surrounding air temperature is considered as ambient temperature. If the device is operating outdoors make sure that the solar irradiation does not increase the surface temperature of the device higher than the allowed maximum ambient temperature. Transmitter display has limited legibility below -20 °C (-4 °F).

The sensor ambient temperature limits may also be influenced by the process fluid temperature, details shown in the chapter “Sensors” (Technical specifications).

Maximum ambient temperature ranges for FC500 series

Cable type	Transmitter style	Device	Ambient temperature range
None	Compact	Sensor and transmitter	-40 ... +60 °C (-40 ... +140 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +60 °C (-40 ... +140 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +60 °C (-31 ... +140 °F)

Ambient temperature range for NTEP custody transfer approval

Cable type	Transmitter style	Device	Ambient temperature range
None	Compact	Sensor and transmitter	-40 ... +50 °C (-40 ... +122 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +50 °C (-40 ... +122 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +50 °C (-31 ... +122 °F)

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Technical specifications (continued)

Maximum storage temperature ranges for FC500 series

Cable type	Transmitter style	Device	Storage temperature range
None	Compact	Sensor and transmitter	-40 ... +60 °C (-40 ... +140 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +60 °C (-40 ... +140 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +60 °C (-31 ... +140 °F)

Temperature specification of FC500 series Ex versions located in hazardous areas

Please select appropriate equipment in accordance with the laws and regulations of the relevant country/region, when it is used in a location where explosive atmospheres may be present.

The maximum ambient and process fluid temperatures depending on explosion groups and temperature classes can be determined via the SITRANS FC order code together with the Ex code (see the corresponding explosion proof type manual).

Note:

The maximum process fluid temperature could be further restricted due to process connection type. Refer to curves above under the heading, “Allowed ambient temperature for FCS500 sensors”.

FCS500 nominal sizes DN 10 and DN 15, compact transmitter

Ex approvals:

All gas groups: ATEX, IEC Ex, FM, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	47 °C (116 °F)	43 °C (109 °F)
T5	62 °C (143 °F)	58 °C (136 °F)
T4	99 °C (210 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

FCS500 nominal size DN 25, compact transmitter

Ex approvals:

All gas groups: ATEX, IEC Ex, FM, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	54 °C (129 °F)	54 °C (129 °F)
T5	68 °C (154 °F)	60 °C (140 °F)
T4	107 °C (224 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

FCS500 nominal size DN 50, compact transmitter

Ex approvals:

- Gas groups IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas groups A, B, C, D, E, F & G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	64 °C (147 °F)	40 °C (104 °F)
T5	80 °C (176 °F)	55 °C (131 °F)
T4	117 °C (224 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

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Technical specifications (continued)

Ex approvals:

- Gas groups IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas groups C, D, E, F & G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	64 °C (147 °F)	44 °C (111 °F)
T5	80 °C (176 °F)	59 °C (138 °F)
T4	117 °C (242 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

FCS500 nominal size DN 80, compact transmitter

Ex approvals:

All gas groups: ATEX, IEC Ex, FM, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	68 °C (154 °F)	39 °C (102 °F)
T5	83 °C (181 °F)	54 °C (129 °F)
T4	119 °C (246 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

FCS500 nominal sizes DN 10 and DN 15, remote transmitter

Ex approvals:

All gas groups: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature	
		Standard cable	Fire retardant cable
T6	47 °C (116 °F)	46 °C (114 °F)	46 °C (114 °F)
T5	62 °C (143 °F)	61 °C (141 °F)	61 °C (141 °F)
T4	99 °C (210 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	162 °C (323 °F)	74 °C (165 °F)	56 °C (132 °F)
T2	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)
T1	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)

Ex approvals:

All gas groups: FM

Temperature class	Maximum process temperature	Maximum ambient temperature	
		Standard cable	Fire retardant cable
T6	47 °C (116 °F)	46 °C (114 °F)	46 °C (114 °F)
T5	62 °C (143 °F)	61 °C (141 °F)	61 °C (141 °F)
T4	99 °C (210 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	162 °C (323 °F)	74 °C (165 °F)	56 °C (132 °F)
T2	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)
T1	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)

FCS500 nominal size DN 25, remote transmitter

Ex approvals:

All gas groups: ATEX, IEC Ex, FM, EAC Ex, NEPSI, Korea Ex, INMETRO

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Technical specifications (continued)

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	54 °C (129 °F)	54 °C (129 °F)	54 °C (129 °F)
T5	68 °C (154 °F)	68 °C (154 °F)	68 °C (154 °F)
T4	107 °C (224 °F)	80 °C (176 °F)	66 °C (150 °F)
T3	176 °C (348 °F)	68 °C (154 °F)	51 °C (123 °F)
T2	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)
T1	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)

FCS500 nominal size DN 50, remote transmitter

Ex approvals:

- Gas groups IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas groups A, B, C, D, E, F & G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	64 °C (147 °F)	42 °C (107 °F)	42 °C (107 °F)
T5	80 °C (176 °F)	57 °C (134 °F)	57 °C (134 °F)
T4	117 °C (242 °F)	80 °C (176 °F)	66 °C (150 °F)
T3	185 °C (365 °F)	68 °C (154 °F)	50 °C (122 °F)
T2	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)
T1	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)

Ex approvals:

- Gas groups IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas groups C, D, E, F & G: F

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	64 °C (147 °F)	46 °C (114 °F)	46 °C (114 °F)
T5	80 °C (176 °F)	61 °C (141 °F)	61 °C (141 °F)
T4	117 °C (242 °F)	80 °C (176 °F)	66 °C (150 °F)
T3	185 °C (365 °F)	66 °C (150 °F)	50 °C (122 °F)
T2	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)
T1	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)

FCS500 nominal size DN 80, remote transmitter

Ex approvals:

- All gas groups: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	68 °C (154 °F)	40 °C (104 °F)	40 °C (104 °F)
T5	83 °C (181 °F)	55 °C (131 °F)	55 °C (131 °F)
T4	119 °C (246 °F)	80 °C (176 °F)	66 °C (150 °F)
T3	185 °C (365 °F)	66 °C (150 °F)	50 °C (122 °F)
T2	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)
T1	200 °C (392 °F)	60 °C (140 °F)	46 °C (114 °F)

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Technical specifications (continued)

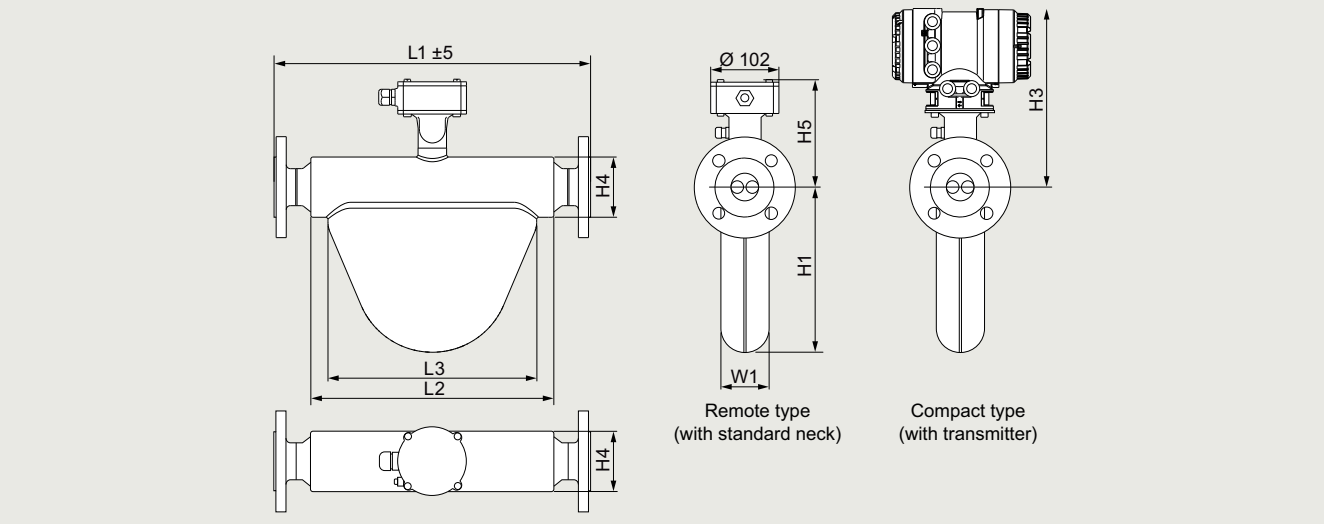
Additional ambient and environmental specifications

Specification	Rating/level of compliance
Relative humidity	0 ... 95%
Ingress protection	IP66 or IP67 with suitable cable glands
Environmental pollution	Pollution degree 4 in accordance with EN 61010-1 whilst in operation
Maximum altitude	2 000 m (6 600 ft) above mean sea level (MSL)
Mechanical load	• Transmitter: 10 ... 500 Hz, 1g • Sensor: 10 ... 500 Hz, 1g according to IEC 60068-2-6
Electromagnetic (EMC) immunity	• EN IEC 61326-1, Table 2 • EN IEC 61326-2-3 • EN IEC 61326-2-5 • NAMUR NE 21 recommendation • DNV-CG-0339 section 3, chapter 14
Surge immunity emission	• EN IEC 61000-4-5 for lightning protection • EN IEC 61000-3-2, Class A (harmonic current emissions) • EN IEC 61000-3-3, Class A (voltage fluctuations) • Immunity assessment criterion: output signal fluctuation is within ± 1% of the output span
Overvoltage	Category II according to EN IEC 61010-1

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Dimensional drawings

Drawings, dimensions and weight for FCS500 sensors (non-hygienic versions)



FCS500 sensor non hygienic, dimensions in mm

FCS500 sensor dimensions (non-hygienic versions)

Nominal size	L2	L3	H1	H3	H4	H5	W1
	Dimensions in mm (inch)						
DN 10	190 (7.5)	165 (6.5)	117 (4.6)	268 (10.6)	56 (2.2)	138 (5.4)	42 (1.7)
DN 15	227 (8.9)	195 (7.7)	145 (5.7)	277 (10.9)	71 (2.8)	148 (5.8)	50 (2)
DN 25	361 (14.2)	310 (12.2)	245 (9.6)	289 (11.4)	90 (3.5)	159 (6.3)	72 (2.8)
DN 50	455 (17.9)	400 (15.7)	333 (13.1)	296 (11.7)	102 (4)	167 (6.6)	96 (3.8)
DN 80	682 (26.9)	620 (24.4)	482 (19)	330 (13)	168 (6.6)	201 (7.9)	150 (5.9)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb)

L1 dimension and weight with process connections according to ASME B16.5 (AISI 316/AISI 316L)

Process connection size and type	FCS500 sensor nominal size									
	DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 150, raised face (RF)	280 (11)	6 (13)	320 (12.6)	8 (18)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 300, raised face (RF)	280 (11)	6.4 (14)	320 (12.6)	8.4 (18)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, raised face (RF)	290 (11.4)	6.7 (15)	330 (13)	8.7 (19)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, ring joint (RJ)	290 (11.4)	6.6 (15)	330 (13)	8.6 (19)	n/a	n/a	n/a	n/a	n/a	n/a
ASME 1" class 150, raised face (RF)	280 (11)	6.9 (15)	320 (12.6)	8.9 (20)	490 (19.3)	15.7 (35)	n/a	n/a	n/a	n/a
ASME 1" class 300, raised face (RF)	280 (11)	7.9 (17)	320 (12.6)	9.9 (22)	490 (19.3)	16.7 (37)	n/a	n/a	n/a	n/a
ASME 1" class 600, raised face (RF)	300 (11.8)	8.3 (18)	340 (13.4)	10.3 (23)	500 (19.7)	17 (38)	n/a	n/a	n/a	n/a
ASME 1" class 600, ring joint (RJ)	300 (11.8)	8.4 (19)	340 (13.4)	10.4 (23)	500 (19.7)	17.2 (38)	n/a	n/a	n/a	n/a
ASME 1½" class 150, raised face (RF)	290 (11.4)	7.8 (17)	330 (13)	9.8 (22)	470 (18.5)	16.5 (36)	620 (24.4)	25.7 (57)	n/a	n/a
ASME 1½" class 300, raised face (RF)	290 (11.4)	10.1 (22)	330 (13)	12.1 (27)	480 (18.9)	19 (42)	620 (24.4)	28.1 (62)	n/a	n/a
ASME 1½" class 600, raised face (RF)	310 (12.2)	11.5 (25)	350 (13.8)	13.5 (30)	500 (19.7)	20 (44)	630 (24.8)	28.9 (64)	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 1½" class 600, ring joint (RJ)	310 (12.2)	11.4 (25)	350 (13.8)	13.4 (30)	500 (19.7)	20 (44)	630 (24.8)	29.1 (64)	n/a	n/a
ASME 2" class 150, raised face (RF)	n/a	n/a	n/a	n/a	480 (18,9)	18.1 (40)	580 (22.8)	26.8 (59)	n/a	n/a
ASME 2" class 300, raised face (RF)	n/a	n/a	n/a	n/a	480 (18,9)	19.7 (43)	580 (22.8)	28.3 (62)	n/a	n/a
ASME 2" class 600, raised face (RF)	n/a	n/a	n/a	n/a	510 (20.1)	21.3 (47)	610 (24)	30.5 (67)	n/a	n/a
ASME 2" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	510 (20.1)	21.8 (48)	610 (24)	30.3 (67)	n/a	n/a
ASME 2½" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	29.8 (66)	n/a	n/a
ASME 2½" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	31.3 (69)	n/a	n/a
ASME 2½" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	610 (24)	33.4 (74)	n/a	n/a
ASME 2½" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	610 (24)	33.8 (74)	n/a	n/a
ASME 3" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	580 (23.3)	30.9 (68)	870 (34.3)	71.2 (157)
ASME 3" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	590 (22.8)	34.5 (76)	880 (34.6)	75 (165)
ASME 3" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	630 (24.8)	37.8 (83)	900 (35.4)	77.7 (171)
ASME 3" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	610 (24)	38.4 (85)	900 (35.4)	78.3 (173)
ASME 4" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	74.4 (164)
ASME 4" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	81.8 (180)
ASME 4" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	94 (207)
ASME 4" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	94.6 (209)
ASME 5" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	77 (170)
ASME 5" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	890 (35)	89.4 (197)
ASME 5" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	114.2 (252)
ASME 5" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	920 (36.2)	114.9 (253)

L1 dimension and weight with process connections according to EN 1092-1 (AISI 316L)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 40 type B1, raised face (RF)	280 (11)	6.6 (14)	320 (12.6)	8.6 (19)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type D, with groove	280 (11)	6.4 (14)	320 (12.6)	8.4 (18)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type E, with spigot	280 (11)	6.3 (14)	320 (12.6)	8.3 (18)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type F, with recess	280 (11)	6.5 (14)	320 (12.6)	8.5 (19)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type B1, raised face (RF)	290 (11.4)	7.4 (16)	330 (13)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN15 PN100 type D, with groove	290 (11.4)	7.4 (16)	330 (13)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type E, with spigot	290 (11.4)	7.1 (16)	330 (13)	9.1 (20)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type F, with recess	290 (11.4)	7.3 (16)	330 (13)	9.3 (21)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type B1, raised face (RF)	280 (11)	7.5 (17)	320 (12.6)	9.5 (21)	490 (19.3)	16.4 (36)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type D, with groove	280 (11)	7.5 (17)	320 (12.6)	9.5 (21)	490 (19.3)	16.3 (36)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type E, with spigot	280 (11)	7.2 (16)	320 (12.6)	9.2 (20)	490 (19.3)	16.1 (35)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 25 PN 40 type F, with recess	280 (11)	7.4 (67)	320 (12.6)	9.4 (21)	490 (19.3)	16.3 (36)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type B1, raised face (RF)	300 (10.1)	10.1 (22)	340 (13.4)	12.1 (27)	490 (19.3)	18.8 (41)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type D, with groove	300 (10.1)	10 (22)	340 (13.4)	12 (26)	490 (19.3)	18.7 (41)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type E, with spigot	300 (10.1)	9.5 (21)	340 (13.4)	11.5 (25)	490 (19.3)	18.3 (40)	n/a	n/a	n/a	n/a
EN DN 25 PN100 type F, with recess	300 (10.1)	9.9 (22)	340 (13.4)	11.9 (26)	490 (19.3)	18.7 (41)	n/a	n/a	n/a	n/a
EN DN 40 PN40 type B1, raised face (RF)	280 (11)	9.1 (20)	320 (12.6)	11.1 (24)	470 (18.5)	17.7 (39)	610 (24)	26.9 (59)	n/a	n/a
EN DN 40 PN 40 type D, with groove	280 (11)	8.9 (20)	320 (12.6)	10.9 (24)	470 (18.5)	17.6 (39)	610 (24)	26.8 (59)	n/a	n/a
EN DN 40 PN 40 type E, with spigot	280 (11)	8.6 (19)	320 (12.6)	10.6 (23)	470 (18.5)	17.4 (38)	610 (24)	26.5 (58)	n/a	n/a
EN DN 40 PN 40 type F, with recess	280 (11)	8.8 (19)	320 (12.6)	10.8 (24)	470 (18.5)	17.5 (39)	610 (24)	26.7 (59)	n/a	n/a
EN DN 40 PN 100 type B1, raised face (RF)	360 (14.2)	13.5 (30)	400 (15.7)	15.5 (34)	500 (19.7)	21.5 (47)	610 (24)	30.5 (67)	n/a	n/a
EN DN 40 PN 100 type D, with groove	360 (14.2)	13.4 (30)	400 (15.7)	15.4 (34)	500 (19.7)	21.4 (47)	610 (24)	30.4 (67)	n/a	n/a
EN DN 40 PN 100 type E, with spigot	360 (14.2)	13 (29)	400 (15.7)	15 (33)	500 (19.7)	21.1 (46)	610 (24)	30 (66)	n/a	n/a
EN DN 40 PN 100 type F, with recess	360 (14.2)	13.3 (29)	400 (15.7)	15.3 (34)	500 (19.7)	21.3 (47)	610 (24)	30.3 (67)	n/a	n/a
EN DN 50 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	470 (18.5)	19.1 (42)	580 (22.8)	27.8 (61)	n/a	n/a
EN DN 50 PN 40 type D, with groove	n/a	n/a	n/a	n/a	470 (18.5)	18.9 (42)	580 (22.8)	27.7 (61)	n/a	n/a
EN DN 50 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	470 (18.5)	18.6 (41)	580 (22.8)	27.4 (60)	n/a	n/a
EN DN 50 PN 40 type F, with recess	n/a	n/a	n/a	n/a	470 (18.5)	18.8 (41)	580 (22.8)	27.6 (61)	n/a	n/a
EN DN 50 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	540 (21.3)	25.4 (56)	610 (24)	33.5 (74)	n/a	n/a
EN DN 50 PN 100 type D, with groove	n/a	n/a	n/a	n/a	540 (21.3)	25.3 (56)	610 (24)	33.4 (74)	n/a	n/a
EN DN 50 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	540 (21.3)	24.8 (55)	610 (24)	32.9 (72)	n/a	n/a
EN DN 50 PN 100 type F, with recess	n/a	n/a	n/a	n/a	540 (21.3)	25.2 (56)	610 (24)	33.2 (73)	n/a	n/a
EN DN 80 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	31.5 (69)	870 (34.2)	71.6 (158)
EN DN 80 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	31.3 (69)	870 (34.2)	71.1 (157)
EN DN 80 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	30.9 (68)	870 (34.2)	70.7 (156)
EN DN 80 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	31.1 (69)	870 (34.2)	70.9 (156)
EN DN 80 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	40 (88)	890 (35)	79.1 (174)
EN DN 80 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	39.8 (88)	890 (35)	78.9 (174)
EN DN 80 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	39.2 (86)	890 (35)	78.3 (173)
EN DN 80 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	650 (25.6)	39.6 (87)	890 (35)	78.7 (173)
EN DN 100 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.8 (163)
EN DN 100 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.6 (162)
EN DN 100 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73 (161)
EN DN 100 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.3 (162)
EN DN 100 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	85.2 (188)
EN DN 100 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	84.8 (187)
EN DN 100 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	84 (185)

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Dimensional drawings (continued)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 100 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	870 (34.3)	84.5 (186)
EN DN125 PN40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	78.5 (173)
EN DN 135 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	78.1 (172)
EN DN 125 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	77.4 (171)
EN DN 125 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	860 (33.9)	77.7 (171)
EN DN 125 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	98 (216)
EN DN 125 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	97.6 (215)
EN DN 125 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	96.3 (212)
EN DN 125 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	880 (34.6)	97.1 (214)

L1 dimension and weight with process connections according to JIS B 2220 (AISI 316/AISI 316L)

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 15 10 K	280 (11)	6.3 (14)	320 (12.6)	8.3 (18)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 15 20 K	280 (11)	6.5 (14)	320 (12.6)	8.5 (19)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 25 10 K	280 (11)	7.4 (16)	320 (12.6)	9.4 (21)	490 (19.3)	16.3 (36)	n/a	n/a	n/a	n/a
JIS DN 25 20 K	280 (11)	7.8 (17)	320 (12.6)	9.8 (22)	490 (19.3)	16.6 (37)	n/a	n/a	n/a	n/a
JIS DN 40 10 K	280 (11)	8.2 (18)	320 (12.6)	10.2 (23)	470 (18.5)	16.9 (37)	620 (24.4)	26.1 (58)	n/a	n/a
JIS DN 40 20 K	280 (11)	8.6 (19)	320 (12.6)	10.6 (23)	470 (18.5)	17.3 (38)	620 (24.4)	26.5 (58)	n/a	n/a
JIS DN 50 10 K	n/a	n/a	n/a	n/a	470 (18.5)	17.5 (39)	600 (23.6)	26.6 (59)	n/a	n/a
JIS DN 50 20 K	n/a	n/a	n/a	n/a	470 (18.5)	17.7 (39)	600 (23.6)	26.7 (59)	n/a	n/a
JIS DN 80 10 K	n/a	n/a	n/a	n/a	n/a	n/a	570 (22.4)	27.9 (62)	880 (34.6)	68.7 (151)
JIS DN 80 20 K	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	30.4 (67)	880 (34.6)	71 (156)
JIS DN 100 10 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	69.8 (154)
JIS DN 100 20 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.4 (162)
JIS DN 125 10 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	73.5 (162)
JIS DN 125 20 K	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	850 (33.5)	79.7 (176)

L1 dimension and weight with process connections according to NPT internal thread

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
⅜" NPT	300 (11.8)	5.4 (12)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
½" NPT	300 (11.8)	5.4 (12)	340 (13.4)	7.4 (16)	n/a	n/a	n/a	n/a	n/a	n/a
¾" NPT	300 (11.8)	5.3 (12)	340 (13.4)	7.3 (16)	n/a	n/a	n/a	n/a	n/a	n/a

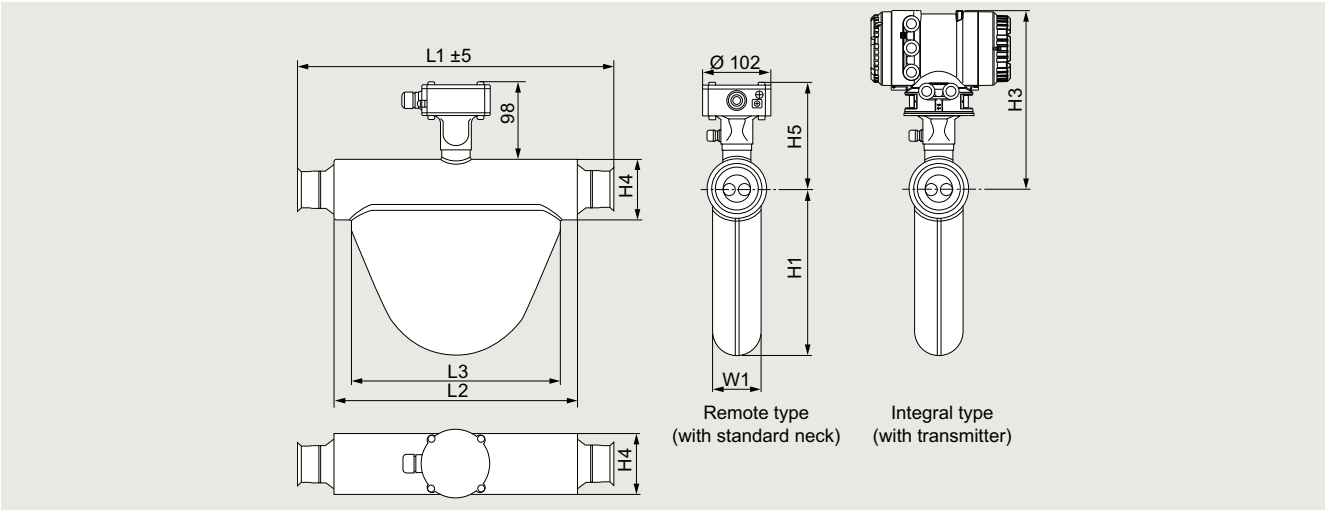
L1 dimension and weight with process connections according to G internal thread

Process connection size and type	FCS500 sensor nominal size DN 10		DN 15		DN 25		DN 50		DN 80	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ⅜"	300 (11.8)	5.4 (12)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
G ½"	300 (11.8)	5.4 (12)	340 (13.4)	7.4 (16)	n/a	n/a	n/a	n/a	n/a	n/a
G ¾"	300 (11.8)	5.3 (12)	340 (13.4)	7.3 (16)	n/a	n/a	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

Drawings, dimensions and weight for FCS500 sensors (hygienic versions)



Dimensions in mm

FCS500 sensor dimensions (hygienic versions)

Nominal size	L2	L3	H1	H3	H4	H5	W1
	Dimensions in mm (inch)						
DN 10	190 (7.5)	165 (6.5)	117 (4.6)	268 (10.6)	56 (2.2)	138 (5.4)	42 (1.7)
DN 15	227 (8.9)	195 (7.7)	145 (5.7)	277 (10.9)	71 (2.8)	148 (5.8)	50 (2)
DN 25	361 (14.2)	310 (12.2)	245 (9.6)	289 (11.4)	90 (3.5)	159 (6.3)	72 (2.8)
DN 50	455 (17.9)	400 (15.7)	333 (13.1)	296 (11.7)	102 (4)	167 (6.6)	96 (3.8)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb)

L1 dimension and weight with threaded hygienic process connections according to DIN 11851

Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 11851, DN 25	280 (11)	5.4 (12)	320 (12.6)	7.4 (16)	n/a	n/a	n/a	n/a
DIN 11851, DN 40	290 (11.4)	5.5 (12)	330 (13)	7.5 (17)	490 (19.3)	14.3 (32)	n/a	n/a
DIN 11851, DN 50	n/a	n/a	n/a	n/a	480 (18.9)	14.4 (32)	610 (24)	23.4 (52)
DIN 11851, DN 65	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23.4 (52)
DIN 11851, DN 80	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23.8 (52)

L1 dimension and weight with hygienic clamp process connections according to DIN 32676 Series A

Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series A, DN 25	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	n/a	n/a	n/a	n/a
DIN 32676 series A, DN 40	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	470 (18.5)	14 (31)	n/a	n/a
DIN 32676 series A, DN 50	n/a	n/a	n/a	n/a	470 (18.5)	14 (31)	600 (23.6)	22.9 (50)
DIN 32676 series A, DN 65	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23 (51)
DIN 32676 series A, DN 80	n/a	n/a	n/a	n/a	n/a	n/a	590 (23.2)	23.1 (51)

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Dimensional drawings (continued)

L1 dimension and weight with hygienic clamp process connections according to DIN 32676 Series C (Tri-clamp)

Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series C, 1"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	n/a	n/a	n/a	n/a
DIN 32676 series C, 1½"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	480 (18.9)	14 (31)	n/a	n/a
DIN 32676 series C, 2"	n/a	n/a	n/a	n/a	470 (18.5)	14 (31)	600 (23.6)	22.9 (50)
DIN 32676 series C, 2½"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.8 (50)
DIN 32676 series C, 3"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.9 (50)

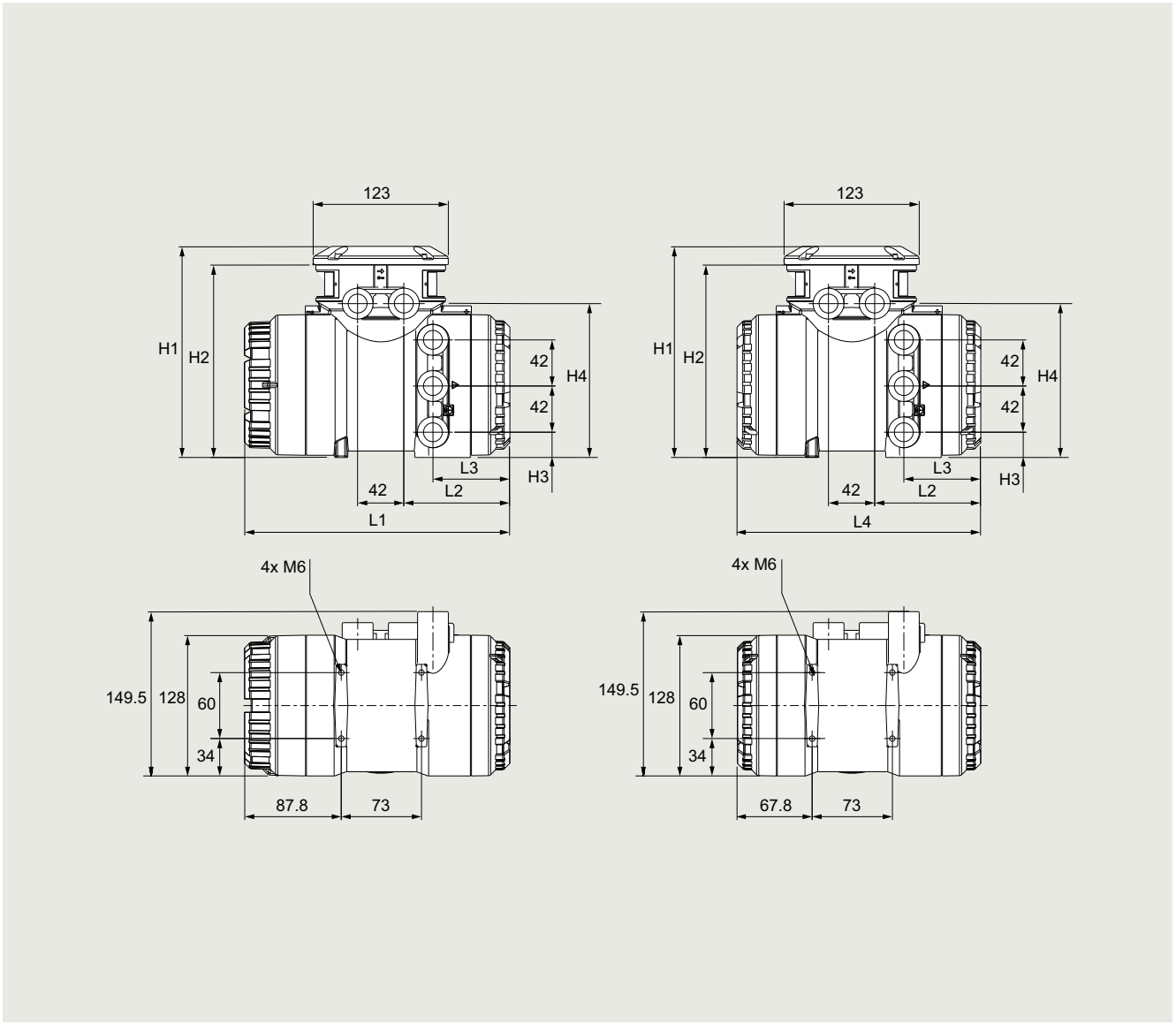
L1 dimension and weight with hygienic clamp process connections according to JIS/ISO 2852

Process connection size and type	FCS500 sensor nominal size							
	DN 10		DN 15		DN 25		DN 50	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS/ISO 2852, 1"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	n/a	n/a	n/a	n/a
JIS/ISO 2852, 1½"	280 (11)	5.2 (11)	320 (12.6)	7.2 (16)	480 (18.9)	14 (31)	n/a	n/a
JIS/ISO 2852, 2"	n/a	n/a	n/a	n/a	470 (18.5)	14 (31)	600 (23.6)	22.9 (50)
JIS/ISO 2852, 2½"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.8 (50)
JIS/ISO 2852, 3"	n/a	n/a	n/a	n/a	n/a	n/a	580 (22.8)	22.9 (50)

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Dimensional drawings (continued)

Drawings, dimensions and weight for FCT020 and FCT040 transmitters



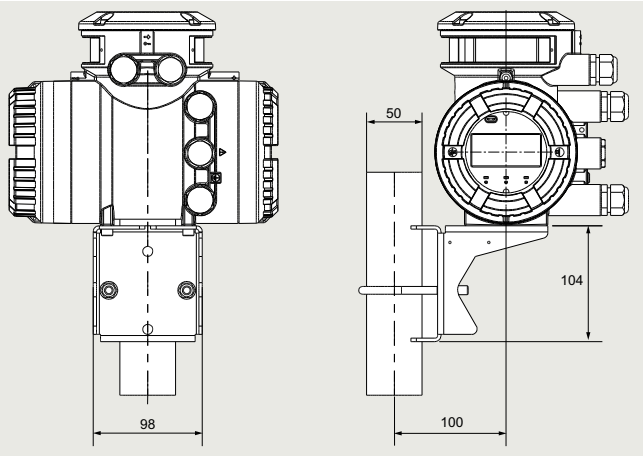
Dimensions of FCT020 or FCT040 transmitter in mm. Transmitter with display shown on the left. Transmitter without display shown on the right.

Dimensions L1 to L4 and H1 to H4 (material options: stainless steel, aluminum)

Material	L1 in mm (inch)	L2 in mm (inch)	L3 in mm (inch)	L4 in mm (inch)	H1 in mm (inch)	H2 in mm (inch)	H3 in mm (inch)	H4 in mm (inch)
Stainless steel	255.5 (10.06)	110.5 (4.35)	69 (2.72)	235 (9.25)	201 (7.91)	184 (7.24)	24 (0.94)	150.5 (5.93)
Aluminum	241.5 (9.51)	96.5 (3.8)	70 (2.76)	221 (8.7)	192 (7.56)	175 (6.89)	23 (0.91)	140 (5.51)

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Dimensional drawings (continued)



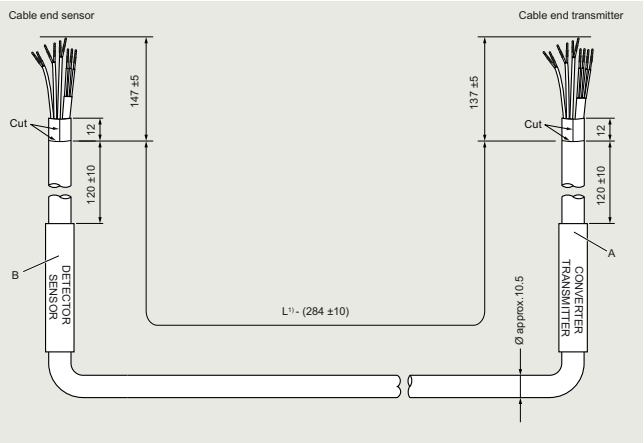
Dimensions of transmitter in mm, attached to mounting bracket.

Transmitter weights

Design type	Transmitter enclosure material	Weight in kg (lb)
Remote	Cast aluminum	4.2 (9.3)
	CF-8M stainless steel	12.5 (27.6)

Connecting cable dimensions and weights

Standard cable

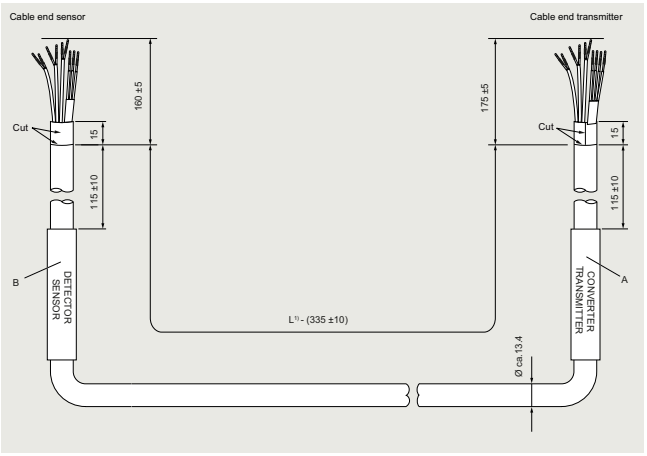


Dimensions in mm. Standard terminated cable. A and B are factory-fitted labels.

Option code	Cable length, L	Cable color
L51	5 m (16.4 ft)	Non-Ex: gray / Ex: blue
L54	10 m (32.8 ft)	
L57	15 m (49.2 ft)	
L60	20 m (65.6 ft)	
L63	30 m (98.4 ft)	

Weight of cable ≤ 0.200 kg/m (0.134 lb/ft)

Standard cable with steel armored option

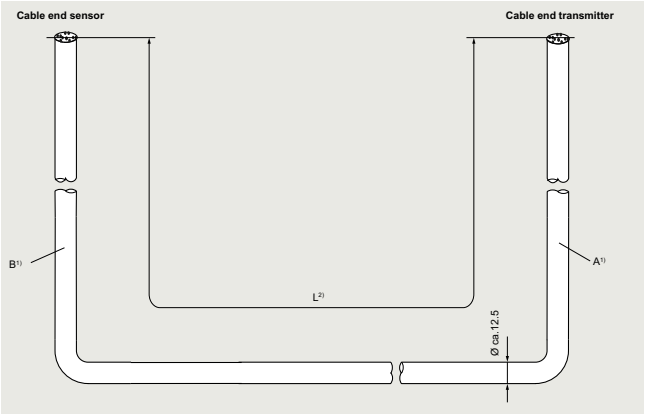


Dimensions in mm. Steel armored terminated cable. A and B are factory-fitted labels.

Option code	Cable length, L	Cable colour
L51 + A20/A21	5 m (16.4 ft)	Blue
L54 + A20/A21	10 m (32.8 ft)	
L57 + A20/A21	15 m (49.2 ft)	
L60 + A20/A21	20 m (65.6 ft)	
L63 + A20/A21	30 m (98.4 ft)	

Weight of cable ≤ 0.300 kg/m (0.202 lb/ft)

Fire retardant cable



Dimensions in mm. Fire retardant unterminated cable. Labels A and B are supplied loose with termination kit.

Option code	Cable length, L	Cable colour
L71	5 m (16.4 ft)	Gray
L74	10 m (32.8 ft)	
L77	15 m (49.2 ft)	
L80	20 m (65.6 ft)	
L83	30 m (98.4 ft)	

Weight of cable ≤ 0.270 kg/m (0.181 lb/ft)

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Overview

The flowmeter systems of the SITRANS FC600 series are the resistant Coriolis multi-parameter flowmeter for extreme conditions.

The Coriolis flowmeters of this serie are rugged with superior performance under very tough operating conditions.

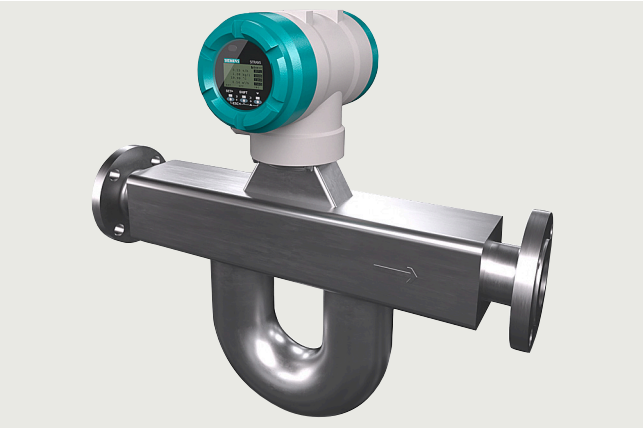
They are formed by one FCS600 sensor and one FCT transmitter:

- SITRANS FC620 is the combination of the FCS600 sensor and the FCT020 transmitter
- SITRANS FC640 is the combination of the FCS600 sensor and the FCT040 transmitter

Features:

- Resistant to high temperature up to 350 °C (662 °F)
- Resistant to high pressure up to 700 bar (10 153 psi) (gauge)
- Resistant to corrosive fluids
- Dual curved measuring tubes with optimum decoupling from external stresses and vibrations
- Wetted parts: stainless steel 316L or alloy 22
- Process connection: flange or thread
- Nominal sizes: DN 2, DN 4, DN 15, DN 25, DN 40, DN 65
- Connection sizes: DN 8 to DN 125 (⅜" to 5")
- Nominal flow: 45 to 100 000 kg/h (99 to 220 462 lb/h)
- FCS600 sensors can be combined with compact or remote transmitters
- Thick measuring tubes and optional alloy 22 wetted parts for long-term durability
- Superior aeration handling and advanced diagnostic functionality

Note: FC600 sizes DN 2 and DN 4 are only available with standard neck and remote transmitter



FC620/640 Coriolis flowmeter

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Benefits

Product features aligned to user value targets

	User value targets	SITRANS FC features and solutions
Engineering and project management	• Reduce engineering investment • Cut specification effort • Minimize project expenditure • Decrease the spending on each measurement point • Eliminate function duplication • Reduce number of suppliers	• Siemens project teams offer complimentary evaluation of customer specifications, provided by regional and HQ experts • Simple product selection using intuitive sizing software • One SITRANS FC device can typically provide three to six individual measurements, all transmitted via digital communication, when planned during pre-project design • Added value functions: batch control, viscosity, thermal energy, concentration measurement (Fraction) of two component solutions and pressure compensation
Installation	• Reduce footprint and transport outlay of OEM machinery • Lower installation complexity • Avoid costly modifications of existing plant	• Can be installed in horizontal or vertical (self-draining) pipes • Twin tube bend design delivers strong signal to noise characteristic resistant to external influence, so install in tight spaces with no inlet and outlet restrictions • Adaptable to existing pipes:typically, three or four connection sizes for each sensor size • Flexible selection of traditional inputs, outputs, and digital communications
Configuration and commissioning	• Shorter commissioning schedules with lower costs • Faster start-up with reduced outgoings	• Easy setup wizard delivers working meters straight after start-up • microSD card stores sensor calibration data and default setup • Simple configuration using Process Device Manager (PDM) • Siemens device-specific faceplates simplify operation in plantwide control systems
Efficient plant operation	• Improve finished product consistency to reduce waste • Keep process performance when scaling production up or down • Optimize process control • Improve finished product quality enabling higher levels of profit • Reduce downtime with fast resolution of process upsets • Improve asset performance	• SITRANS FC meters are calibrated in rigs accredited to EN/ISO 17025 to ensure consistently high performance of flow, density and concentration measurements • First-class zero-point quality maintains high accuracy into the low flow region • High sensitivity and intelligent dynamic range keeps the measurement active in demanding high fluid damping cases • Designed-in resilience to process extremes • Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout or solid deposits building up in the tubes • Diagnostic data via local menu or PDM is backed by Siemens applications experts • Intelligent Siemens SITRANS IQ apps for continuing asset evaluation
Maintenance and asset management	• Optimize technician training • Reduce cost of spare parts • Increase predictive maintenance • Reduce production downtime and associated costs • Decrease unplanned maintenance • Maximize asset value	• Simple product design with interchangeable modular parts • microSD card loads sensor-specific data to deliver fast service exchange • Self-verification: tube health check monitors key diagnostics, including tube stiffness, driver and pickups; the user defines verification frequency and alarm behavior • Verification results indicate whether preventive maintenance action is required • Siemens SIMATIC Maintenance Station uses cyclical acquisition to provide life cycle reports and intelligent preventive maintenance strategies
Industry compliance	• Cut effort required to comply with Industry-specific demands • Reduce resource needed to maintain regulatory compliance	• Food and beverage sector covered with EHEDG and 3-A approvals, polished tubes • Global hazardous area approvals for international plant duplications • Common and emerging digital networks covered: HART, PROFIBUS PA, MODBUS or PROFINET over APL Ethernet (IS) • Class-leading safety: SIL2/SIL3, secondary containment, PED, NAMUR NE95

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Application

Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Chemical and petrochemical Bulk chemicals Industrial gases Polymers Agrochemicals Fine chemicals Aroma chemicals	• Transfer, loading and unloading of bulk chemicals • Concentration control of acids and alkalis (process optimization) • Accurate mass or volume flow of feed chemicals to in-line blending systems • Accurate mass flow and density (quality) of reactor fluid feeds catalyst • Chemical recovery • Mass balance optimization • Compressed and cryogenic gases • Lubricating oil blending and dosing • High accuracy measurement of critical fluid components • Low flow control in pilot plants and R&D facilities
Food and beverage Food processing Dairies Breweries Distilleries Confectionary Soft drinks Animal feed plants OEM	• Accurate bulk transfer (mass or volume) of all dairy products: milk, cream, whey and yoghurt • Fat concentration in cream • Flow, density, temperature and concentration (Plato) during all fermentation processes • Flow, density, temperature and sugar concentration (Brix) in soft drink processing • Distilled spirits – % alcohol by volume (ABV), liters of pure alcohol, volume transfer, blending, batch and column still optimization and energy management, cask filling, tanker loading • Flow and density of fruit juices and pulps • Mixing and inventory control of confectionary ingredients, e.g. chocolate, syrup, oils, flavors • Metering pump control • Oils, fat enzymes dosing in animal feed plants • CO_2 dosing • CIP liquids • Bottling of beer, spirits, wine, soft drinks, etc. • Bulk sugar processing – molasses, sugar slurries, density, Brix of finished product
Oil and gas Offshore/onshore Upstream/downstream Pipelines Distribution networks Refineries Skid manufacturers	• Loading/unloading of hydrocarbons (e.g. crude oil, bitumen) from/to ship, road tanker, rail car • High pressure chemical injection • High pressure low flow gas • Net oil computing • Gas void fraction • Filling of gas bottles • Furnace control • Test separators • LPG, natural gas hydration • Well-head water-cut monitoring • All hydrocarbon fluids in refineries • Metrology, custody transfer • Drilling mud • Oil well cementing and hydrofracturing
Life sciences Pharmaceutical Bio	• High accuracy flow and batching of bioreactor feeds • Solvent flow rate, density and batching • Flow of demineralized and deionized water • Solvents and fish oils used in high grade omega 3 oils • Precision coatings • Vacuum thin film coating
Household and personal care Detergents Cosmetics	• Blending and batching of detergent ingredients • Tanker loading and unloading • Salt concentration • Reliable measurement of aerated liquids

Application (continued)

Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Automotive and aeronautical Vehicle manufacturing Paint Engine testing OEM	• Fuel injection nozzle and pump testing • Filling of under bonnet fluid reservoirs, air conditioning, coolant • Fuel flow and density measurement in engine test beds • Checking for air in oil using high accuracy density measurement • Paint spray robots – requires accurate and fast measurements • Aircraft fuel loading (kerosene) • High pressure flow used in turbine blade manufacture
Power and energy Renewable Hydrogen	• Boiler fuel flow and burner control • Turbine fuel flow • Glycol flow and concentration • Bioethanol
Marine OEM Shipbuilders	• Fuel consumption management • Boiler control • Bunkering management • Density used to indicate fuel quality
Pulp, paper and textiles	• Accurate dosing of dyes and chemicals
Water and environmental	• Dosing of chemicals for water treatment • Chemical concentration for water quality control

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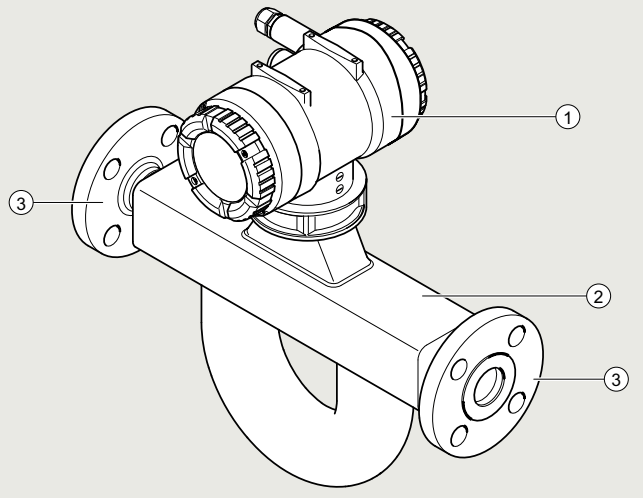
Design

Design options and related temperature range for FC600 series

Design version	Transmitter	Process fluid temperature range
Compact, standard neck	Aluminum	Standard [-50 ... +150 °C (-58 ... +302 °F)]
Compact, standard neck, hygienic clamps	Aluminum	Standard [-10 ... +140 °C (-14 ... +284 °F)]
Remote, standard neck or long neck	Aluminum or stainless steel	Standard [-70 ... +150 °C (-94 ... +302 °F)]
Remote, standard neck or long neck, hygienic clamps	Aluminum or stainless steel	Standard [-10 ... +140 °C (-14 ... +284 °F)]
Remote only, long neck only	Aluminum or stainless steel	Low [-196 ... +150 °C (-321 ... +302 °F)] Medium [-70 ... +230 °C (-94 ... +446 °F)] High [0 ... 350 °C (32 ... 662 °F)]

FCS600 in sizes DN 2 and DN 4 only available with:

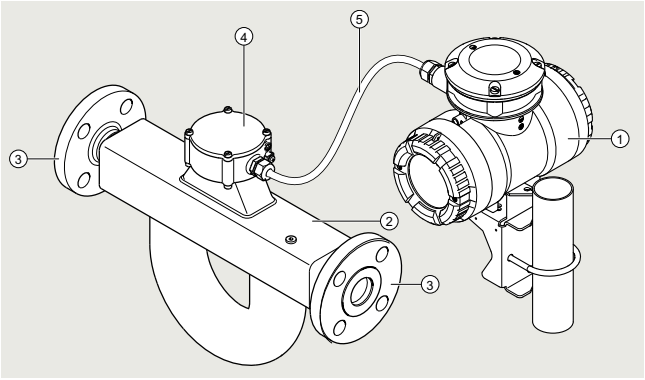
- High pressure autoclave adaptors
- Standard temperature range
- Standard sensor neck (pedestal)
- Remote mounted transmitters



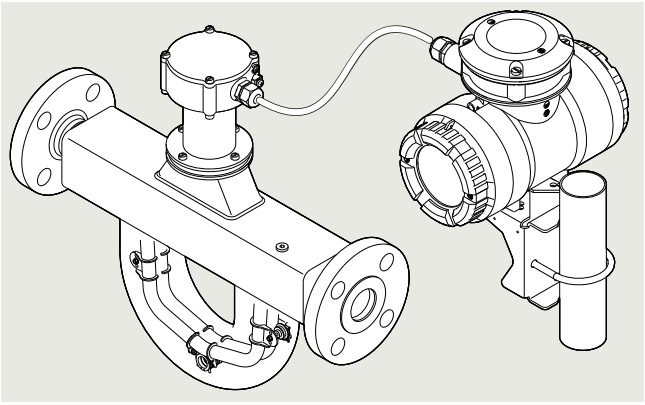
FCS600 sensor with compact, close mounted transmitter. Only sizes DN 15, DN 25, DN 40, and DN 65.

1	Transmitter
2	FCS600 sensor
3	Process connection

Design (continued)



FCS600 sensor with remote transmitter, standard sensor neck

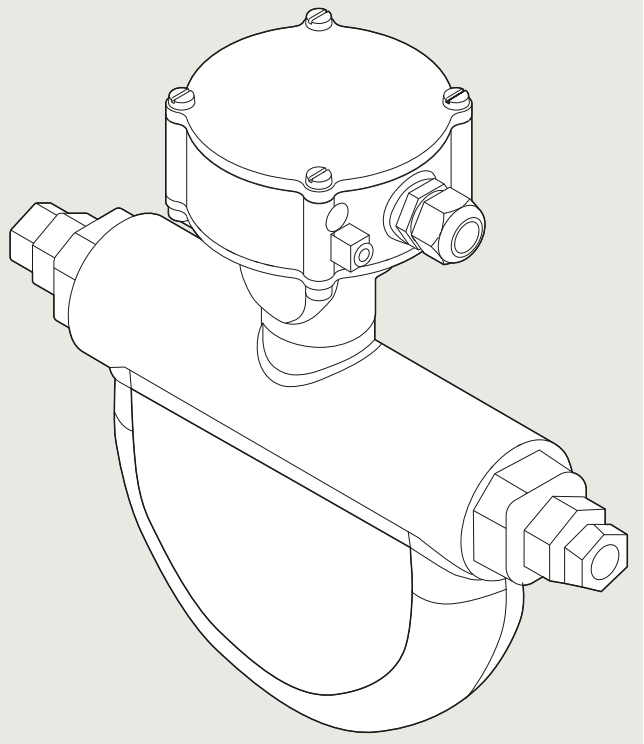


FCS600 sensor with remote transmitter, long sensor neck

1	Transmitter
2	FCS600 sensor
3	Process connection
4	Sensor terminal box
5	Connecting cable

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Design (continued)



FCS600 sensors (remote transmitter only) in sizes DN 2 and DN 4 standard neck

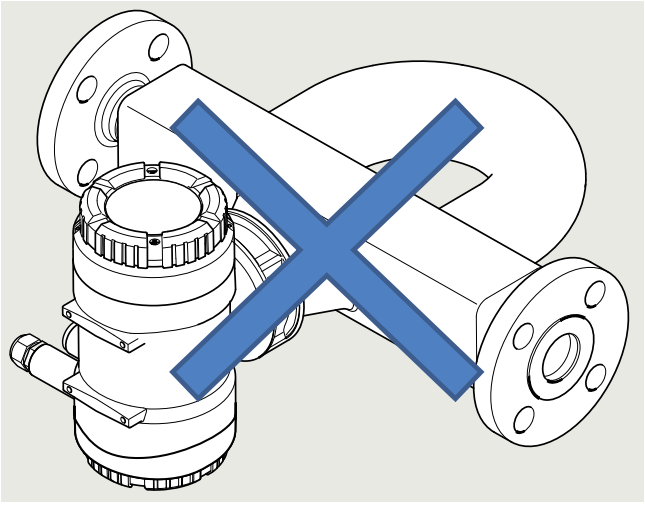
Installation guidelines

FCS600 series flowmeters can be mounted horizontally, vertically and at an incline. The measuring tubes should be filled with the fluid during flow measurement as entrained gas may result in errors in measurement. Straight pipe runs at inlet or outlet are usually not required.

Avoid the following installation locations and positions:

- Measuring tubes as highest point in piping when measuring liquids
- Measuring tubes as lowest point in piping when measuring gases
- Immediately in front of a free pipe outlet in a downpipe
- Lateral positions

Design (continued)



Avoid measuring tubes in sideways position resulting in possible non-homogeneous fluid separation

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Function

Compatible fluids

FC600 series flowmeters can be used to measure the following liquids:

- Liquids
- Gases
- Mixtures, solutions, emulsions, suspensions and slurries

Primary measured variables

- Mass flow
- Density
- Temperature

Based on the primary measured quantities, the transmitter also calculates

- Volume flow
- Percent concentration (fraction) of a two-component mixture (FCT040 only)
- Partial component flow rate (net flow) of a mixture consisting of two components (FCT040 only)

Bi-directional operation

The mass flow, volume flow, and net flow measurements can be bi-directional.

Measurement variables for NTEP approval

- Mass flow uni-directional
- Volume flow uni-directional

Feature overview

- Designed to meet the highest safety requirements when operating at high pressures
- Temperatures from -196 °C (-321 °F), for cryogenic fluids, up to +350 °C (+662 °F)
- Insulation and heat tracing options for viscous and molten liquids
- Gas Void Fraction and Net Oil Computing functions combine to deliver in multi-phase applications
- Dynamic pressure compensation for accurate measurement under changing process pressure
- Accurate density measurement and up to four advanced concentration measurement data sets

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Selection and ordering data

SITRANS FC620/640 (High pressure and temperature)	Article No. 7ME446	● -	● ● ● ● ● -	● ● ● ● -	Order code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Transmitter variant					
None (spare sensor)		0			
Coriolis sensor FCS600 with transmitter FCT020		2			
Coriolis sensor FCS600 with transmitter FCT040		4			
SITRANS FC spare part transmitter, no sensor included		9			G 3 Y
Sensor size, tube material (wetted), process connection material and size					
Sensor size DN 2 tube material C22, process connection 316L, connection size 9/16"			0 A		
Sensor size DN 2 tube material C22, process connection 316L, connection size ¾"			0 D		
Sensor size DN 2, tube material C22, Process connection 316L, with special connection			0 Y		
Sensor size DN 4 tube material C22, process connection 316L, connection size 9/16"			1 A		
Sensor size DN 4 tube material C22, process connection 316L, connection size ¾"			1 D		
Sensor size DN 4, tube material C22, Process connection 316L, with special connection			1 Y		
Sensor size DN 15 tube material 316L, process connection 316L, connection size 3/8"			2 B		
Sensor size DN 15 tube material 316L, process connection 316L, connection size ½" DN 15			2 C		
Sensor size DN 15 tube material 316L, process connection 316L, connection size ¾"			2 D		
Sensor size DN 15 tube material 316L, process connection 316L, connection size 1" DN 25			2 E		
Sensor size DN 15 tube material 316L, process connection 316L, connection size 1½" DN 40			2 F		
Sensor size DN 15, tube material 316L, Process connection 316L, with special connection			2 Y		
Sensor size DN 25 tube material 316L, process connection 316L, connection size 1" DN 25			3 E		
Sensor size DN 25 tube material 316L, process connection 316L, connection size 1 ½" DN 40			3 F		
Sensor size DN 25 tube material 316L, process connection 316L, connection size 2" DN 50			3 G		
Sensor size DN 25, tube material 316L, Process connection 316L, with special connection			3 Y		
Sensor size DN 40 tube material 316L, process connection 316L, connection size 1½" DN 40			4 F		
Sensor size DN 40 tube material 316L, process connection 316L, connection size 2" DN 50			4 G		
Sensor size DN 40 tube material 316L, process connection 316L, connection size 2½" DN 65			4 H		
Sensor size DN 40 tube material 316L, process connection 316L, connection size 3" DN 80			4 J		
Sensor size DN 40, tube material 316L, Process connection 316L, with special connection			4 Y		
Sensor size DN 65 tube material 316L, process connection 316L, connection size 3" DN 80			5 J		
Sensor size DN 65 tube material 316L, process connection 316L, connection size 4" DN 100			5 K		
Sensor size DN 65 tube material 316L, process connection 316L, connection size 5" DN 125			5 L		
Sensor size DN 65, tube material 316L, Process connection 316L, with special connection			5 Y		
Sensor size DN 15 tube material C22, process connection C22, connection size 1" DN 25			6 E		
Sensor size DN 15 tube material C22, process connection C22, connection size 1½" DN 40			6 F		
Sensor size DN 15 tube material C22, process connection C22, connection size 2" DN 50			6 G		
Sensor size DN 15, tube material C22, Process connection C22, with special connection			6 Y		
Sensor size DN 25 tube material C22, process connection C22, connection size 1" DN 25			7 E		
Sensor size DN 25 tube material C22, process connection C22, connection size 1½" DN 40			7 F		
Sensor size DN 25 tube material C22, process connection C22, connection size 2" DN 50			7 G		
Sensor size DN 25, tube material C22, Process connection C22, with special connection			7 Y		
Sensor size DN 40 tube material C22, process connection C22, connection size 2" DN 50			8 G		
Sensor size DN 40 tube material C22, process connection C22, connection size 2½" DN 65			8 H		
Sensor size DN 40 tube material C22, process connection C22, connection size 3" DN 80			8 J		
Sensor size DN 40, tube material C22, Process connection C22, with special connection			8 L		
Sensor size DN 65, tube material C22, Process connection C22, with special connection			8 Y		
No sensor (SITRANS FCT transmitter as spare part)			9 A		H 1 A
Process connection					
No connections (SITRANS FCT transmitter as spare part)				A 0	
EN flange PN 40, suitable for EN 1092-1 type B1, raised face (RF)				A 1	
EN flange PN 63, suitable for EN 1092-1 type B1, raised face (RF)				A 2	
EN flange PN 100, suitable for EN 1092-1 type B1, raised face (RF)				A 3	
EN flange PN 40, suitable for EN 1092-1 type D, groove				A 5	

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Selection and ordering data (continued)

SITRANS FC620/640 (High pressure and temperature)	Article No. 7ME446	Order code
EN flange PN 63, suitable for EN 1092-1 type D, groove		A 6
EN flange PN 100, suitable for EN 1092-1 type D, groove		A 7
EN flange PN 40, suitable for EN 1092-1 type E, spigot		B 1
EN flange PN 63, suitable for EN 1092-1 type E, spigot		B 2
EN flange PN 100, suitable for EN 1092-1 type E, spigot		B 3
EN flange PN 40, suitable for EN 1092-1 type F, recess		B 5
EN flange PN 63, suitable for EN 1092-1 type F, recess		B 6
EN flange PN 100, suitable for EN 1092-1 type F, recess		B 7
ASME flange class 600, suitable for ASME B16.5, ring joint (RJ)		C 3
ASME flange class 900, suitable for ASME B16.5, ring joint (RJ)		C 4
ASME flange class 1500, suitable for ASME B16.5, ring joint (RJ)		C 5
ASME flange class 150, suitable for ASME B16.5, raised face (RF)		D 1
ASME flange class 300, suitable for ASME B16.5, raised face (RF)		D 2
ASME flange class 600, suitable for ASME B16.5, raised face (RF)		D 3
ASME flange class 900, suitable for ASME B16.5, raised face (RF)		D 4
ASME flange class 1500, suitable for ASME B16.5, raised face (RF)		D 5
Process connection with internal thread G		E 1
Process connection with internal thread NPT		E 3
DIN 11851 threaded		F 1
Clamp process connection according to DIN 32676 series A		G 2
Clamp process connection according to DIN 32676 series C (Tri-Clamp)		G 6
DIN 11864-2 BF Form A		H 2
JIS G3447 / ISO2852 Clamp		J 1
Autoclave adapter		K 1
JIS flange 10K, JIS B 2220		L 2
JIS flange 20K, JIS B 2220		L 4
Special design request		Y 1
Max operational temperature		
None (SITRANS FCT transmitter as spare part)		0
Media temperature -70 °C (-94 °F) Remote, -50 °C (-58 °F) Compact, max temperature 150 °C (302 °F)		1
Media temperature -196 ... 150 °C (-321 ... 302 °F)		2
Media temperature -70 ... 230 °C (-94 ... 446 °F)		3
Media temperature 0 ... 350 °C (32 ... 662 °F)		4
Media temperature -70 °C (-94 °F) Remote, -50 °C (-58 °F) Compact, max. temperature 150 °C (302 °F), high pressure		6
Media temperature -70 ... 230 °C (-94 ... 446 °F), high pressure		7
Media temperature 0 ... 350 °C (32 ... 662 °F), high pressure		8
Calibration		
No calibration		0
Massflow 0.1%, density 0.5 g/l		1
Massflow 0.1%, density 1 g/l		2
Massflow 0.1%, density 2 g/l		3
Massflow 0.1%, density 3 g/l		4
Massflow 0.1%, density 4 g/l		5
Massflow 0.1%, density 8 g/l		6
Massflow 0.2%, density 4 g/l		7
Massflow 0.2%, density 8 g/l		8
Accuracy for gas please select below		9
Massflow gas 0.75%		N 1 A
Massflow gas 0.5%		N 2 A
Massflow gas 0.35%		N 3 A

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Selection and ordering data (continued)

SITRANS FC620/640 (High pressure and temperature)	Article No. 7ME446	Order code
Mounting style, transmitter housing and material		
Compact type with "urethane-cured polyester powder coating" coated aluminum transmitter housing		A
Compact type with "corrosion protection coating" coated aluminum transmitter housing		B
Remote type with "urethane-cured polyester powder coating" coated aluminum transmitter housing and standard neck sensor		C
Remote type with "urethane-cured polyester powder coating" coated aluminum transmitter housing and long neck sensor		D
Remote type with "corrosion protection coating" coated aluminum transmitter housing and standard neck sensor		E
Remote type with "corrosion protection coating" coated aluminum transmitter housing and long neck sensor		F
Remote type stainless steel transmitter and standard neck sensor		G
Remote type stainless steel transmitter and long neck sensor		H
Ex approvals		
None		A
ATEX, explosion group IIC and IIIC		B
ATEX, explosion group IIB and IIIC		C
IECEx, explosion group IIC and IIIC		D
IECEx, explosion group IIB and IIIC		E
EAC Ex, IIC and IIIC		F
EAC Ex, IIB and IIIC		G
FM, groups A B C D E F G		H
FM, groups C D E F G		J
INMETRO, explosion group IIC and IIIC		K
INMETRO, explosion group IIB and IIIC		L
NEPSI, explosion group IIC and IIIC		M
NEPSI, explosion group IIB and IIIC		N
Korea Ex, explosion group IIC and IIIC		P
Korea Ex, explosion group IIB and for integral type also IIIC		Q
Local user interface		
Spare sensor without transmitter, no display applied		0
No display		1
With display		3

	Order code
Further designs Please add "**-Z**" to Article No. and specify order code(s).	
Cable glands	
Metric, no glands (M20)	**A10**
NPT, no glands (1/2")	**A11**
Metric, no glands (M20) steel armored cable	**A20**
NPT, no glands (1/2") steel armored cable	**A21**
Sensor housing material	
None (SITRANS FCT transmitter as spare part)	**B00**
Stainless steel 1.4301/304, 1.4404/316L	**B01**
Stainless steel 1.4404/316L DN 15	**B02**
Stainless steel 1.4404/316L DN 25	**B03**
Stainless steel 1.4404/316L DN 40	**B04**
Stainless steel 1.4404/316L DN 65	**B05**
Stainless steel 1.4404/316L DN 2/DN 4	**B06**
I/O Configuration Ch1	
None	**E00**
4-20 mA HART active	**E06**

	Order code
4-20 mA HART passive	**E07**
PROFIBUS PA	**E10**
Modbus RTU RS 485	**E14**
PROFINET over Ethernet-APL (IS)	**E15**
I/O Configuration Ch2, Ch3 and Ch4	
Spare sensor without transmitter, all communication types and I/Os apply	**F00**
1 passive current output, 1 passive pulse or status output	**F01**
1 passive current output, 2 passive pulse or status outputs	**F02**
1 passive current output, 1 passive pulse or status outputs, 1 passive NAMUR pulse or status output	**F03**
1 passive current output, 2 passive NAMUR pulse or status outputs	**F04**
1 passive pulse or status output	**F11**
2 passive pulse or status outputs, 1 passive status output	**F12**
2 passive pulse or status outputs, 1 voltage-free status input	**F13**
2 passive pulse or status outputs, 1 active current input	**F14**
2 passive pulse or status outputs, 1 passive current input	**F15**

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Selection and ordering data (continued)

	Order code
1 passive pulse or status output, 1 passive current output, 1 active current input	F16
1 passive pulse or status output, 1 passive current output, 1 passive current input	F17
1 passive pulse or status output, 1 voltage-free status input, 1 active current input	F18
1 passive pulse or status output, 1 voltage-free status input, 1 passive current input	F19
1 passive pulse or status output, 1 active pulse or status output, 1 voltage-free status input	F20
1 passive pulse or status output, 1 active pulse or status output with pull-up resistor, 1 voltage-free status input	F21
1 active current output, 2 passive pulse or status outputs	F22
1 active current output, 1 passive pulse or status output,1 voltage-free status input	F23
1 passive pulse or status output	F31
2 passive pulse or status outputs	F32
1 passive pulse or status output, 1 active current input	F33
1 passive pulse or status output, 1 passive current input	F34
1 passive pulse or status output, 1 active pulse or status output	F35
1 passive pulse or status output, 1 active pulse or status output with pull-up resistor	F36
1 passive pulse or status output, 1 active current output	F37
1 passive pulse output	F41
Output CH1 intrinsically safe, 1 passive pulse output	F42
Output CH3 intrinsically safe, 1 passive pulse output	F50
Certificates	
Declaration of compliance with the order 2.1 according to EN 10204	C11
Certificate of Marking Transfer and Raw Material Certificates (Inspection Certificate 3.1 according to EN 10204), including IGC and conform to NACE MR0175 and MR0103	C13
Positive Material Identification of wetted parts, including certificate (Inspection Certificate 3.1 according to EN 10204)	C15
NTEP approval accuracy class 0.3 according to NIST	C16
Hydrostatic Pressure Test Certificate (Inspection Certificate 3.1 according to EN 10204)	C18
Delivery to EAEU+KazakPA	C19
Functional Safety (IEC 61508) - SIL2/3	C20
X-ray inspection of flange weld seam according to DIN EN ISO 17636-1/B, evaluation according to AD 2000 HP 5/3 and DIN EN ISO 5817/C, including certificate	C33
X-ray test according to ASME V	C34
WPS according to DIN EN ISO 15809-1; WPQR according to DIN EN ISO 15814-1; WQC according to DIN EN 287-1 or DIN EN ISO 8908-4	C36
Welding procedures and certificate according to ASME IX	C37
Dye penetrant test of process connection weld seams according to DIN EN ISO 3452-1, including certificate	C38
Dye penetrant test of flange welding according to ASME V, including certificate	C39
Quality Inspection Certificate (Inspection Certificate 3.1 according to EN 10204)	C40
Ferrite test for flange welding according to DIN EN ISO 8249	C50
Degreasing of wetted surfaces according to ASTM G93-03 (Level C), including test report	C54
Surface Roughness wetted parts Ra ≤ 0.8 µm	C60
Surface Roughness wetted parts Ra ≤ 0.8 µm and Surface Roughness Inspection Certificate	C61
3-A product conformity with 3-A certificate and marking, including Surface Roughness wetted parts Ra ≤ 0.8 µm and Surface Roughness Inspection Certificate	C62
EHEDG product conformity with EHEDG certificate and marking, including Surface Roughness wetted parts Ra ≤ 0.8 µm and Surface Roughness Inspection Certificate	C63
ASME B31.3 compliance NORMAL FLUID SERVICE	C70

	Order code
Combined certificates	
Certification package (C13, C18, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test and Quality inspection certificate	C80
Certification package (C13, C15, C40) including Marking Transfer and raw material certificate, Positive material identification and Quality inspection certificate	C81
Certification package (C13, C18, C38, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, Dye penetration and Quality inspection certificate	C82
Certification package (C13, C15, C18, C36, C38, C40) including Marking Transfer and raw material certificate, Positive material identification, Hydrostatic pressure test, Welding certificates, Dye penetration and Quality inspection certificate	C83
Certification package (C15, C18, C36) including Positive material identification, Hydrostatic pressure test and Welding certificates	C84
Certification package (C34, C37, C39) including X-ray test according ASME V, Welding procedures and Certificates according ASME IX and Dye penetrant test of flange welding according ASME V	C85
Certification package (C13, C18, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	C86
Certification package (C13, C15, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Positive material identification, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	C87
Connecting cable type and length	
Without standard connecting cable	L50
5 meter (16.4 ft) remote connecting cable terminated standard gray / Ex blue	L51
10 meter (32.8 ft) remote connecting cable terminated standard gray / Ex blue	L54
15 meter (49.2 ft) remote connecting cable terminated standard gray / Ex blue	L57
20 meter (65.6 ft) remote connecting cable terminated standard gray / Ex blue	L60
30 meter (98.4 ft) remote connecting cable terminated standard gray / Ex blue	L63
without fire retardant connecting cable	L70
5 meter (16.4 ft) remote fire retardant connecting cable not terminated	L71
10 meter (32.8 ft) remote fire retardant connecting cable not terminated	L74
15 meter (49.2 ft) remote fire retardant connecting cable not terminated	L77
20 meter (65.6 ft) remote fire retardant connecting cable not terminated	L80
30 meter (98.4 ft) remote fire retardant connecting cable not terminated	L83
SW functions	
Heat measurement	S11
Tube health check	S12
Batching and filling function	S13
Netoil computing	S14
Viscosity computing function for liquids	S15
Standard concentration measurement	S16
Advanced concentration	S17
Marine approval	
Marine approved DNV, ABS, KR piping class 2	S22
Marine approved DNV, ABS, KR piping class 3	S23
Marine approved LR, MR, TAC piping class 2	S24
Marine approved LR, MR, TAC piping class 3	S25
Marine approved BV piping class 2	S26

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Selection and ordering data (continued)

	Order code
Marine approved BV piping class 3	**S27**
Mounting	
Namur built-in length according to NE132	**S31**
Rupture Disk	**S32**
Insulation DN 15	
Insulation	**J10**
Insulation and heat tracing, ½"ASME class 150, raised face (RF)	**J12**
Insulation and heat tracing, ½" ASME class 300, raised face (RF)	**J13**
Insulation and heat tracing, EN DN 15, PN 40	**J14**
Insulation, heat tracing with ventilation, ½" ASME class 150, raised face (RF)	**J16**
Insulation, heat tracing with ventilation, ½" ASME class 300, raised face (RF)	**J17**
Insulation, heat tracing with ventilation, EN DN 15, PN 40	**J18**
Insulation DN 25	
Insulation	**J20**
Insulation and heat tracing, ½"ASME class 150, raised face (RF)	**J22**
Insulation and heat tracing, ½" ASME class 300, raised face (RF)	**J23**
Insulation and heat tracing, EN DN 15, PN 40	**J24**
Insulation, heat tracing with ventilation, ½" ASME class 150, raised face (RF)	**J26**
Insulation, heat tracing with ventilation, ½" ASME class 300, raised face (RF)	**J27**
Insulation, heat tracing with ventilation, EN DN 15, PN 40	**J28**
Insulation DN 40	
Insulation	**J30**
Insulation and heat tracing, ½"ASME class 150, raised face (RF)	**J32**
Insulation and heat tracing, ½" ASME class 300, raised face (RF)	**J33**
Insulation and heat tracing, EN DN 15, PN 40	**J34**
Insulation, heat tracing with ventilation, ½" ASME class 150, raised face (RF)	**J36**
Insulation, heat tracing with ventilation, ½" ASME class 300, raised face (RF)	**J37**
Insulation, heat tracing with ventilation, EN DN 15, PN 40	**J38**
Insulation DN 65	
Insulation	**J40**
Insulation and heat tracing, ½"ASME class 150, raised face (RF)	**J42**
Insulation and heat tracing, ½" ASME class 300, raised face (RF)	**J43**
Insulation and heat tracing, EN DN 15, PN 40	**J44**
Insulation, heat tracing with ventilation, ½" ASME class 150, raised face (RF)	**J46**
Insulation, heat tracing with ventilation, ½" ASME class 300, raised face (RF)	**J47**
Insulation, heat tracing with ventilation, EN DN 15, PN 40	**J48**
Country specific delivery	
Delivery to China including China RoHS mark	**W21**
Delivery to Korea including KC mark	**W22**
Delivery to Canada including CRN mark	**W26**
Fraction setup PIA: Please select four options	
Sugar / Water 0 ... 85 °Bx, 0 ... 80 °C (32 ... 176 °F)	**G01**
NaOH / Water 2 ... 50 WT%, 0 ... 100 °C (32 ... 212 °F)	**G02**
KOH / Water 0 ... 60 WT%, 54 ... 100 °C (129 ... 212 °F)	**G03**
NH_4NO_3 / Water 1 ... 50 WT%, 0 ... 80 °C (32 ... 176 °F)	**G04**
NH_4NO_3 / Water 20 ... 70 WT%, 20 ... 100 °C (68 ... 212 °F)	**G05**
HCl / Water 22 ... 34 WT%, 20 ... 40 °C (68 ... 104 °F)	**G06**
HNO_3 / Water 50 ... 67 WT%, 10 ... 60 °C (50 ... 140 °F)	**G07**
H_2O_2 / Water 30 ... 75 WT%, 4 ... 44 °C (39 ... 111 °F)	**G09**
Ethylene Glycol / Water 10 ... 50 WT%, -20 ... 40 °C (-4 ... 104 °F)	**G10**
Amylum = Starch / Water 33 ... 43 WT%, 35 ... 45 °C (95 ... 113 °F)	**G11**
Methanol / Water 35 ... 60 WT%, 0 ... 40 °C (32 ... 104 °F)	**G12**
Alcohol / Water 55 ... 100 VOL%, 10 ... 40 °C (50 ... 104 °F)	**G20**
Sugar / Water 40 ... 80 °Bx, 75 ... 100 °C (167 ... 212 °F)	**G21**
Alcohol / Water 66 ... 100 WT%, 15 ... 40 °C (59 ... 104 °F)	**G30**
Alcohol / Water 66 ... 100 WT%, 10 ... 40 °C (50 ... 104 °F)	**G37**
Tag name	
Tag name plate, SS (max. 16 characters)	**Y11**
Tag plate wired (316L)	**Y15**
HART/MODBUS software tag No. (max. 8 characters)	**Y25**
HART/MODBUS software tag No. (max. 32 characters)	**Y26**
PROFIBUS PA NODE ADDRESS (4 characters HEX)	**Y28**
PROFIBUS PA SOFTWARE TAG (max. 32 characters)	**Y29**
Customer installation length	
Customer installation length (mm)	**Y30**
Calibration	
Predefined 6-Point Accredited Calibration: 10%, 20%, 40%, 60%, 80%, 100% of Q_{nom}. Calibrated Output: Frequency	**D62**
Special versions	
ID-Number of special design	**Y99**

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Technical specifications

Mass flow rate of liquids

The mass flow rate characteristics of SITRANS FC meters are defined by the values of zero stability, Q_{flat}, Q_{nom} and Q_{max}.

Zero stability is the maximum allowable flow rate value that can be displayed at zero flow under reference conditions. It is a good indicator of the meter performance as flow rates reduce and approach zero.

- Q_{flat} is the mass flow rate above which the base accuracy is maintained (0.1% when using FCT040 transmitters).
- Q_{nom} is the nominal mass flow rate of water at reference conditions that would result in a pressure drop of 1 bar (15 psi).
- Q_{max} is the recommended maximum mass flow rate for each sensor size.

For questions regarding expected performance in specific applications, please contact your regional Siemens Measurement Intelligence team.

Flow rate summary by FCS600 sensor size

Nominal size	Zero stability kg/h	lb/h	Q_{flat} kg/h	lb/min	Q_{nom} kg/h	lb/min	Q_{max} kg/h	lb/min
DN 2	0.005	0.011	4.00	0.147	45.0	1.65	94.0	3.45
DN 4	0.018	0.040	14.0	0.514	170	6.24	300	11.0
DN 15	0.150	0.330	250	9.18	3 000	110	5 000	184
DN 25	0.500	1.10	830	30.5	10 000	367	17 000	624
DN 40	1.60	3.52	2 670	98.0	32 000	1 174	50 000	1 835
DN 65	5.00	11.0	8 330	306	100 000	3 670	170 000	6 239

Performance summary by FCS600 sensor size and transmitter type

Sensor size			DN 2	DN 4	DN 15	DN 25	DN 40	DN 65
Mass flow (liquids)								
Accuracy	% (of rate)	FCT020	± 0.2	± 0.2	± 0.2	± 0.2	± 0.2	± 0.2
	% (of rate)	FCT040	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1
Zero stability	kg/h (lb/h)		± 0.005 (0.011)	± 0.018 (0.44)	± 0.15 (0.33)	± 0.5 (1.1)	± 1.6 (3.52)	± 5 (11)
Density (liquids)								
Accuracy	kg/m³ (lb/ft³)	FCT020/FCT040	± 8 (0.5)	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)
	kg/m3 (lb/ft³)	FCT040	± 8 (0.5)	± 1 (0.06)	± 0.5 (0.03)	± 0.5 (0.03)	± 0.5 (0.03)	± 0.5 (0.03)
Mass flow (gases)								
Accuracy	% (of rate)	FCT020	± 0.75	± 0.75	± 0.75	± 0.75	± 0.75	± 0.75
	% (of rate)	FCT040	± 0.5	± 0.5	± 0.35	± 0.35	± 0.35	± 0.35
Temperature								
Accuracy	°C (°F)		± 0.5 (0.9)	± 0.5 (0.9)	± 0.5 (0.9)	± 0.5 (0.9)	± 0.5 (0.9)	± 0.5 (0.9)

Note:

The accuracy values in the table above are based on reference conditions at the time of calibration and represent the combined measurement uncertainties including sensor, electronic and pulse output interface.

Liquid density calibration is performed when density accuracy of 0.5 kg/m³ (0.03 lb/ft³) is selected in the model code.

Mass flow calibration and density adjustment for liquids

Siemens SITRANS FC Coriolis meters are calibrated in rigs accredited according to the international standard EN ISO/IEC 17025:2018. Each flowmeter comes with a standard calibration certificate.

Mass flow calibration takes place at reference conditions. Specific values are listed in the standard calibration certificate.

Mass flow calibration reference conditions

Fluid	Water
Density	900 ... 1 100 kg/m³ (56 ... 69 lb/ft³)
Fluid temperature	10 ... 35 °C (50 ... 95 °F), average temperature: 22.5 °C (72.5 °F)
Ambient temperature	10 ... 35 °C (50 ... 95 °F)
Process pressure	1 ... 5 bar (15 ... 73 psi)

Density calibration reference conditions

Flow condition	Fully developed flow profile
Fluid densities used to obtain density calibration constants	700 kg/m³ (44 lb/ft³) 1 000 kg/m³ (62 lb/ft³) 1 650 kg/m³ (103 lb/ft³)
Fluid temperature	20 °C (68 °F)
Determination of temperature compensation coefficients	20 ... 80 °C (68 ... 176 °F)

Analog output performance specification

Typical additional uncertainty when using the analog current output: ± 0.04% at a nominal mid-range current output of 12 mA, which includes the effects of: output adjustment, linearity, power supply variation, load resistance variation, short-term and long-term drift for one year and ambient temperature effect on the transmitter in the range 20 °C ± 30 °C (14 ... 122 °F).

Process pressure effect on flow measurement performance

Changes in operating pressure have a small effect on the mass flow measurement performance. When the pressure changes are very large this effect can be corrected by a dynamic pressure input or a fixed process pressure.

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Technical specifications (continued)

Sensor size	Sensor wetted parts	Additional flow measurement errors due to change in operating pressure from reference pressure in % of rate per 1 bar variation	in % of rate per 1 psi variation
DN 2	Alloy 22 / AISI 316L stainless steel	-0.0001	-0.000007
DN 4	Alloy 22 / AISI 316L stainless steel	-0.0001	-0.000007
DN 15	AISI 316L stainless steel or alloy 22	-0.0005	-0.00003
DN 25	AISI 316L stainless steel	-0.0024	-0.00017
	Alloy 22	-0.0023	-0.00016
DN 40	AISI 316L stainless steel	-0.0034	-0.00023
	Alloy 22	-0.0035	-0.00024
DN 65	AISI 316L stainless steel	-0.0084	-0.00058
	Alloy 22	-0.0074	-0.00051

Process temperature effect

For mass flow measurement, process fluid temperature effect is defined as the change in sensor flow accuracy due to process fluid temperature change, away from the 20 °C (68 °F) reference condition. Variation in process temperature influences the measuring tube characteristics and this is compensated for using the built-in PT 1000 temperature sensor.

A small flow uncertainty remains in the compensation circuit defined below.

Uncertainty due to process temperature change: ± 0.001% of mass flow rate per °C (± 0.0006% of mass flow rate per °F)

Temperature effect on zero

Temperature effect on the mass flow zero-point quality can be corrected by zeroing at the process fluid temperature.

Process conditions

Process fluid temperature range

Note: Some design combinations may not be available in all sizes.

Design version	Transmitter	Process fluid temperature range
Compact, standard neck	Aluminum	Standard [-50 ... +50 °C (-58 ... +302 °F)]
Compact, standard neck, hygienic clamps	Aluminum	Standard [-10 ... +140 °C (-14 ... +284 °F)]
Remote, standard neck or long neck	Aluminum or stainless steel	Standard [-70 ... +150 °C (-94 ... +302 °F)]
Remote, standard neck or long neck, hygienic clamps		Standard [-10 ... +140 °C (-14 ... +284 °F)]
Remote only, long neck only	Aluminum or stainless steel	Low [-196 ... +150 °C (-321 ... +302 °F)]
Remote only, long neck only		Medium [-70 ... +230 °C (-94 ... +446 °F)]
Remote only, long neck only		High [0 ... 350 °C (32 ... 662 °F)]

Operating pressure

The maximum allowed process pressure depends on the selected process connection and process temperature.

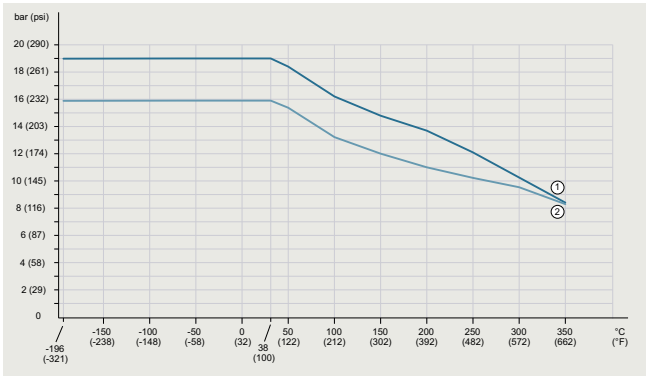
The given process temperature and process pressure ranges are calculated and approved without corrosion or erosion effects.

Pressure versus temperature relationship depending on selected process connection

The following diagrams show the process pressure as a function of process temperature as well as the process connection used (type and size of process connection).

Calculations for ASME flanges are based on ASME B16.5 Material group 2.2 (316/316L dual certified).

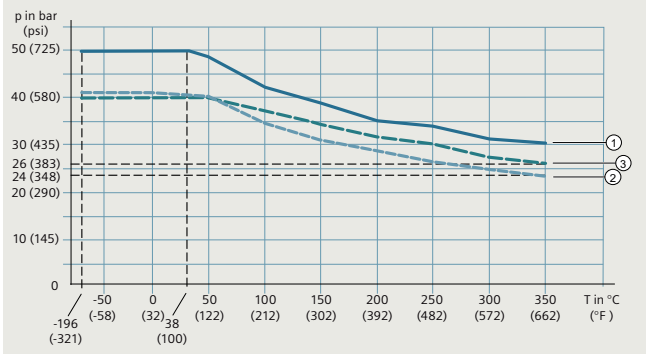
ASME class 150



Allowed process pressure as a function of process fluid temperature

1	Process connection compatible to ASME B16.5 class 150
2	Heat tracing connection compatible to ASME B16.5 class 150

ASME class 300, EN PN 40



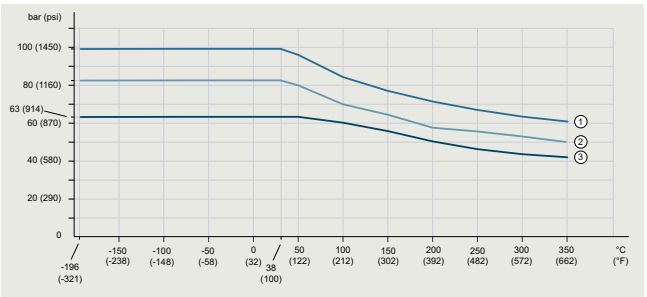
Allowed process pressure as a function of process fluid temperature

1	Process connection compatible to ASME B16.5 class 300
2	Process and heat tracing connection compatible to EN 1092-1 PN 40
3	Process and heat tracing connection for ASME B16.5 class 300

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Technical specifications (continued)

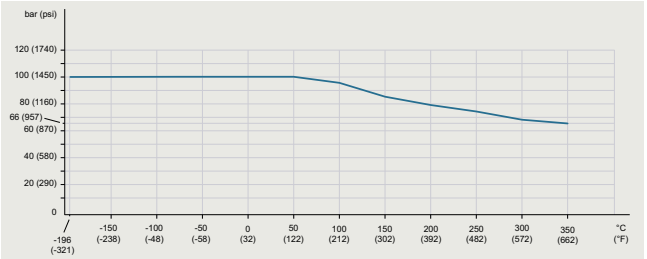
ASME class 600, EN PN63



Allowed process pressure as a function of process fluid temperature

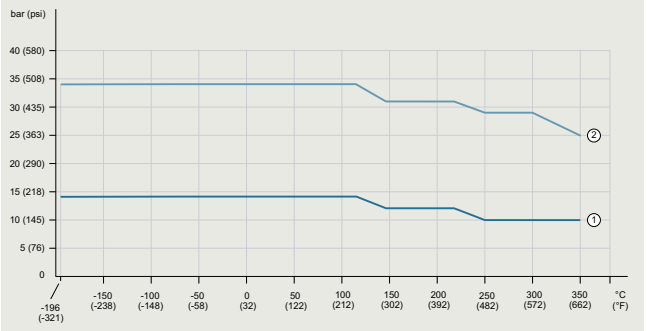
1	Process connection compatible to ASME B16.5 class 600
2	Not used for this product
3	Process connection compatible to EN 1092-1 PN 63

EN PN 100



Allowed process pressure as a function of process fluid temperature, compatible to EN 1092-1 PN 100

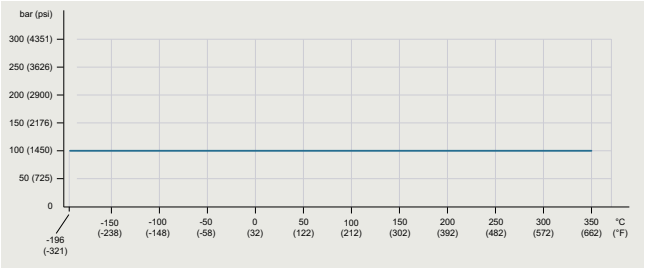
JIS 10K, JIS 20K



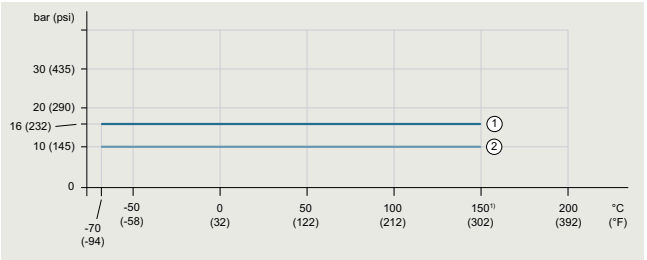
Allowed process pressure as a function of process connection temperature

1	Process connection compatible to JIS B 2220 10K
2	Process connection compatible to JIS B 2220 20K

Process connection with internal thread G and NPT (standard pressure)



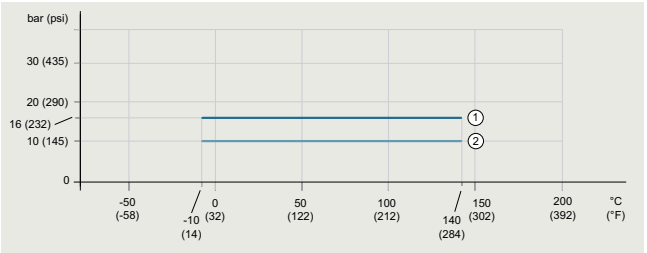
Clamp process connection according to JIS/ISO 2852



Allowed process pressure as a function of process connection temperature

1	Clamp connection for JIS/ISO 2852 up to 2"
2	Clamp connection for JIS/ISO 2852 above 2"

Clamp process connection according to DIN 32676 series A



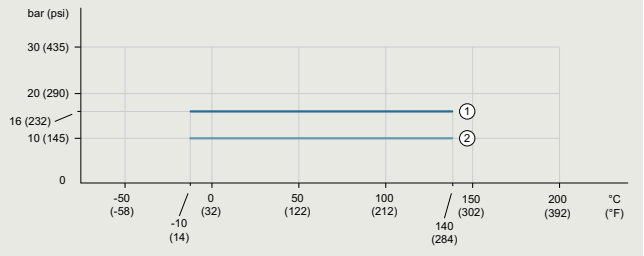
Allowed process pressure as a function of process fluid temperature

1	Clamp connection compatible to DIN 32676 series A up to DN 50
2	Clamp connection compatible to DIN 32676 series A above DN 50

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Technical specifications (continued)

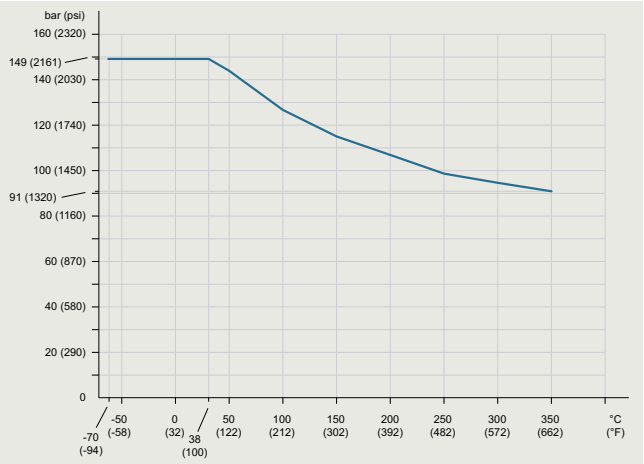
Clamp process connection according to DIN 32676 series C (Tri-Clamp)



Allowed process pressure as a function of process fluid temperature

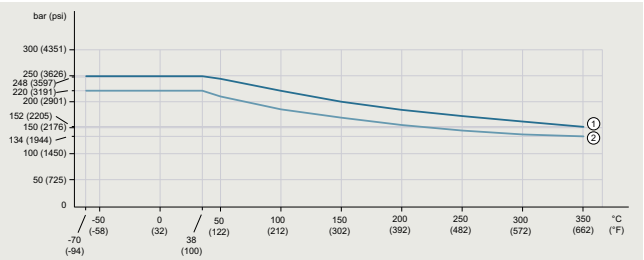
1	Clamp connection compatible to DIN 32676 series C up to 2"
2	Clamp connection compatible to DIN 32676 series C above 2"

ASME class 900



Allowed process pressure as a function of process fluid temperature, compatible to ASME B16.5 class 900

ASME class 1500

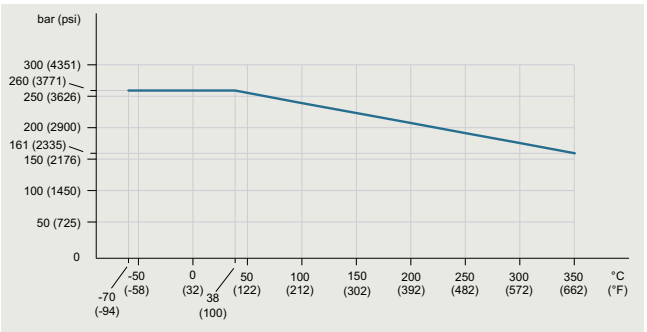


Allowed process pressure as a function of process connection temperature

1	Process connection compatible to ASME B16.5 class 1500: • With alloy 22 wetted parts (without ASME compliance) • With 316L wetted parts in size DN 15 (without ASME compliance) • With alloy 22 wetted parts in size DN 15 (requires option code C70, compliant with ASME B31.3 normal fluid service)
2	Process connection compatible to ASME B16.5 class 1500: • With 316L wetted parts in size DN 25 (without ASME compliance) • With 316L wetted parts in size DN 15 (requires option code C70, compliant with ASME B31.3 normal fluid service) • With alloy 22 wetted parts in size DN 25 (requires option code C70, compliant with ASME B31.3 normal fluid service)

Process connection with internal thread G and NPT (high pressure)

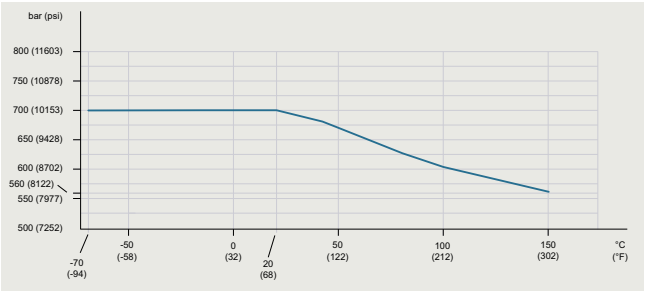
Note: Only available with FCS600 size DN 15 with 316L wetted parts



Allowed process pressure as a function of process connection temperature

Process connection compatible to medium pressure autoclave

Note: Only available with FCS600 sizes DN 2 and DN 4



Allowed process pressure as a function of process connection temperature

Rupture disc

The rupture disc is located on the sensor housing. It is available with some FC600 specification combinations (selectable using order option code S32).

Its bursting pressure is 20 bar (291 psi), the nominal diameter is 8 mm (0.315 in.). In the case of larger nominal diameters and high pressures, the entire process pressure may not be released across the rupture disc. In such case it is possible to request a customized design from your local Siemens sales organization.

In the event of a burst pipe, the rupture disc provides an acoustic signal in applications with gases.

Ambient conditions

Allowed ambient and storage temperature of SITRANS FC600 series is influenced by the temperature specification of FCS600 sensor, FCT0X0 transmitter and the interconnecting cable.

Ambient temperature

Device surrounding air temperature is considered as ambient temperature. If the device is operating outdoors make sure that the

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Technical specifications (continued)

solar irradiation does not increase the surface temperature of the device higher than the allowed maximum ambient temperature. Transmitter display has limited legibility below -20 °C (-4 °F).

The sensor ambient temperature limits may also be influenced by the process fluid temperature, details shown in the chapter "Sensors" (Technical specifications).

Maximum ambient temperature ranges for FC600 series

Cable type	Transmitter style	Device	Ambient temperature range
None	Compact	Sensor and transmitter	-40 ... +60 °C (-40 ... +140 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +60 °C (-40 ... 140 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +60 °C (-31 ... +140 °F)

Ambient temperature range for NTEP custody transfer approval

Cable type	Transmitter style	Device	Ambient temperature range
None	Compact	Sensor and transmitter	-40 ... +50 °C (-40 ... +122 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +50 °C (-40 ... +122 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +50 °C (-31 ... +122 °F)

Maximum storage temperature ranges for FC600 series

Cable type	Transmitter style	Device	Storage temperature range
None	Compact	Sensor and transmitter	-40 ... +60 °C (-40 ... +140 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +60 °C (-40 ... +140 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +60 °C (-31 ... +140 °F)

Temperature specification of FC600 series Ex versions located in hazardous areas

Please select appropriate equipment in accordance with the laws and regulations of the relevant country/region when it is used in a location where explosive atmospheres may be present.

The maximum ambient and process fluid temperatures depending on explosion groups and temperature classes can be determined via the SITRANS FC order code together with the Ex code (see the corresponding explosion proof type manual).

Note**:** The maximum process fluid temperature could be further restricted due to process connection type, refer to curves above under the heading "Allowed ambient temperature for FCS600 sensors".

FCS600 nominal sizes DN 2 and DN 4, remote transmitter

Ex approvals:

All gas groups: ATEX, IEC Ex, FM, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	75 °C (167 °F)	43 °C (109 °F)	43 °C (109 °F)
T5	90 °C (194 °F)	58 °C (136 °F)	58 °C (136 °F)
T4	125 °C (257 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	60 °C (140 °F)

FCS600 nominal sizes DN 15, DN 25, DN 40 and DN 65, compact transmitter

Standard temperature

Ex approvals:

- Gas groups IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas groups A, B, C, D, E, F and G: FM

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Technical specifications (continued)

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	66 °C (150 °F)	43 °C (109 °F)
T5	82 °C (179 °F)	58 °C (136 °F)
T4	118 °C (244 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

Ex approvals:

- Gas groups IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas groups C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	59 °C (138 °F)	59 °C (138 °F)
T5	75 °C (167 °F)	60 °C (140 °F)
T4	112 °C (233 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

FCS600 nominal sizes DN 15, DN 25, DN 40 and DN 65, remote transmitter

Standard temperature, standard neck

Ex approvals:

- Gas groups IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas groups A, B, C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	66 °C (150 °F)	41 °C (105 °F)	41 °C (105 °F)
T5	82 °C (179 °F)	56 °C (132 °F)	56 °C (132 °F)
T4	118 °C (244 °F)	80 °C (176 °F)	62 °C (143 °F)
T3	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T2	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T1	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)

Ex approvals:
Gas groups IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	59 °C (138 °F)	59 °C (138 °F)	59 °C (138 °F)
T5	75 °C (167 °F)	75 °C (167 °F)	75 °C (167 °F)
T4	112 °C (233 °F)	80 °C (176 °F)	65 °C (149 °F)
T3	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T2	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T1	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)

Ex approvals:
Gas groups C, D, E, F and G: FM

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Technical specifications (continued)

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	59 °C (138 °F)	59 °C (138 °F)	59 °C (138 °F)
T5	75 °C (167 °F)	75 °C (167 °F)	70 °C (158 °F)
T4	112 °C (233 °F)	80 °C (176 °F)	65 °C (149 °F)
T3	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T2	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T1	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)

Standard temperature, long neck

Ex approvals:

Gas groups IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	66 °C (150 °F)	47 °C (116 °F)	47 °C (116 °F)
T5	82 °C (179 °F)	62 °C (143 °F)	62 °C (143 °F)
T4	118 °C (244 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:

Gas groups A, B, C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	66 °C (150 °F)	47 °C (116 °F)	47 °C (116 °F)
T5	82 °C (179 °F)	62 °C (143 °F)	62 °C (143 °F)
T4	118 °C (244 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:

Gas groups IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	59 °C (138 °F)	59 °C (138 °F)	59 °C (138 °F)
T5	75 °C (167 °F)	75 °C (167 °F)	75 °C (167 °F)
T4	112 °C (233 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:

Gas groups C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	59 °C (138 °F)	59 °C (138 °F)	59 °C (138 °F)
T5	75 °C (167 °F)	75 °C (167 °F)	70 °C (158 °F)
T4	112 °C (233 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

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Technical specifications (continued)

Low temperature, long neck

Ex approvals:
Gas groups IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	60 °C (140 °F)	60 °C (140 °F)	60 °C (140 °F)
T5	76 °C (168 °F)	76 °C (168 °F)	76 °C (168 °F)
T4	113 °C (235 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:
Gas groups A, B, C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	60 °C (140 °F)	60 °C (140 °F)	60 °C (140 °F)
T5	76 °C 168 °F)	76 °C (168 °F)	70 °C (158 °F)
T4	113 °C (235 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:
Gas groups IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	58 °C (136 °F)	58 °C (136 °F)	58 °C (136 °F)
T5	74 °C (165 °F)	74 °C (165 °F)	74 °C (165 °F)
T4	111 °C (232 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:
Gas groups C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	58 °C (136 °F)	58 °C (136 °F)	58 °C (136 °F)
T5	74 °C (165 °F)	74 °C (165 °F)	70 °C (158 °F)
T4	111 °C (232 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Medium temperature, long neck

Ex approvals:
Gas groups IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

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Technical specifications (continued)

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	66 °C (150 °F)	47 °C (116 °F)	47 °C (116 °F)
T5	82 °C (179 °F)	62 °C (143 °F)	62 °C (143 °F)
T4	118 °C (244 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	185 °C (365 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

Ex approvals:
Gas groups A, B, C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	66 °C (150 °F)	47 °C (116 °F)	47 °C (116 °F)
T5	82 °C (179 °F)	62 °C (143 °F)	62 °C (143 °F)
T4	118 °C (244 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	185 °C (365 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

Ex approvals:
Gas groups IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	59 °C (138 °F)	59 °C (138 °F)	59 °C (138 °F)
T5	75 °C (167 °F)	75 °C (167 °F)	75 °C (167 °F)
T4	112 °C (233 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	181 °C (357 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

Ex approvals:
Gas groups C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	59 °C (138 °F)	59 °C (138 °F)	59 °C (138 °F)
T5	75 °C (167 °F)	75 °C (167 °F)	70 °C (158 °F)
T4	112 °C (233 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	181 °C (357 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

High temperature, long neck
Ex approvals:
All gas groups: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	62 °C (143 °F)	62 °C (143 °F)
T5	80 °C (176 °F)	77 °C (170 °F)	77 °C (170 °F)
T4	115 °C (239 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	180 °C (356 °F)	80 °C (176 °F)	65 °C (149 °F)
T2	275 °C (527 °F)	73 °C (163 °F)	50 °C (122 °F)
T1	350 °C (662 °F)	60 °C (140 °F)	40 °C (104 °F)

Ex approvals:
All gas groups: FM

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Technical specifications (continued)

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	62 °C (143 °F)	62 °C (143 °F)
T5	80 °C (176 °F)	77 °C (170 °F)	70 °C (158 °F)
T4	115 °C (239 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	180 °C (356 °F)	80 °C (176 °F)	65 °C (149 °F)
T2	275 °C (527 °F)	73 °C (163 °F)	50 °C (122 °F)
T1	350 °C (662 °F)	60 °C (140 °F)	40 °C (104 °F)

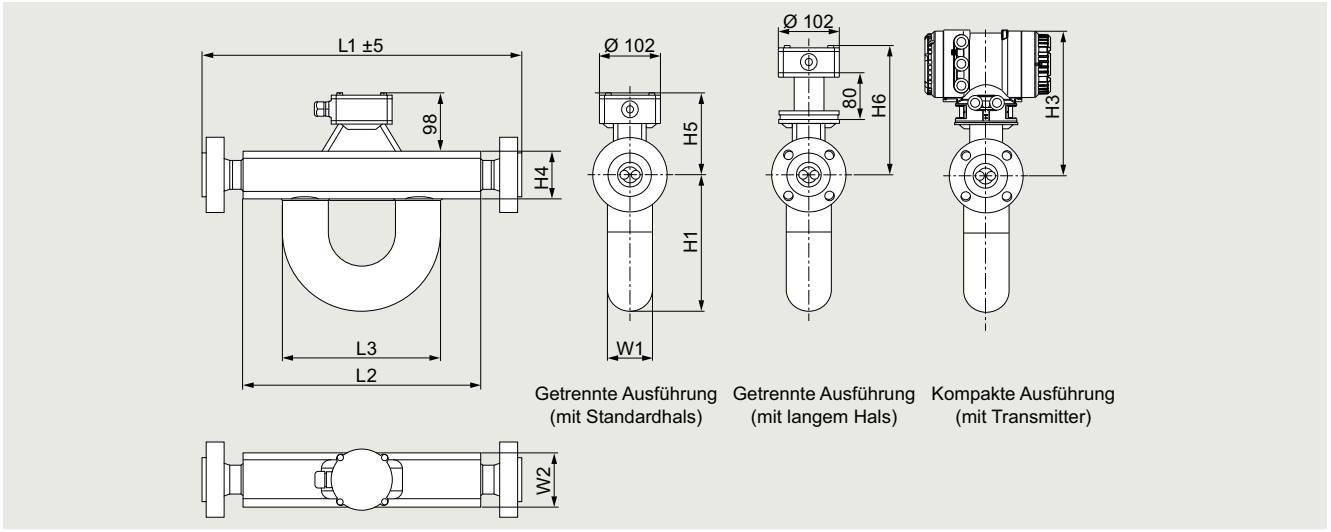
Additional ambient and environmental specifications

Specification	Rating/level of compliance
Relative humidity	0 ... 95%
Ingress protection	IP66 or IP67 with suitable cable glands
Environmental pollution	Pollution degree 4 in accordance with EN 61010-1 whilst in operation
Maximum altitude	2 000 m (6 600 ft) above mean sea level (MSL)
Mechanical load	• Transmitter: 10 ... 500 Hz, 1g • Sensor: 10 ... 500 Hz, 1g according to IEC 60068-2-6
Electromagnetic (EMC) immunity	• EN IEC 61326-1, Table 2 • EN IEC 61326-2-3 • EN IEC 61326-2-5 • NAMUR NE 21 recommendation • DNV-CG-0339 section 3, chapter 14
Surge immunity emission	• EN IEC 61000-4-5 for lightning protection • EN IEC 61000-3-2, Class A (harmonic current emissions) • EN IEC 61000-3-3, Class A (voltage fluctuations) • Immunity assessment criterion: output signal fluctuation is within ± 1% of the output span
Overvoltage	Category II according to EN IEC 61010-1

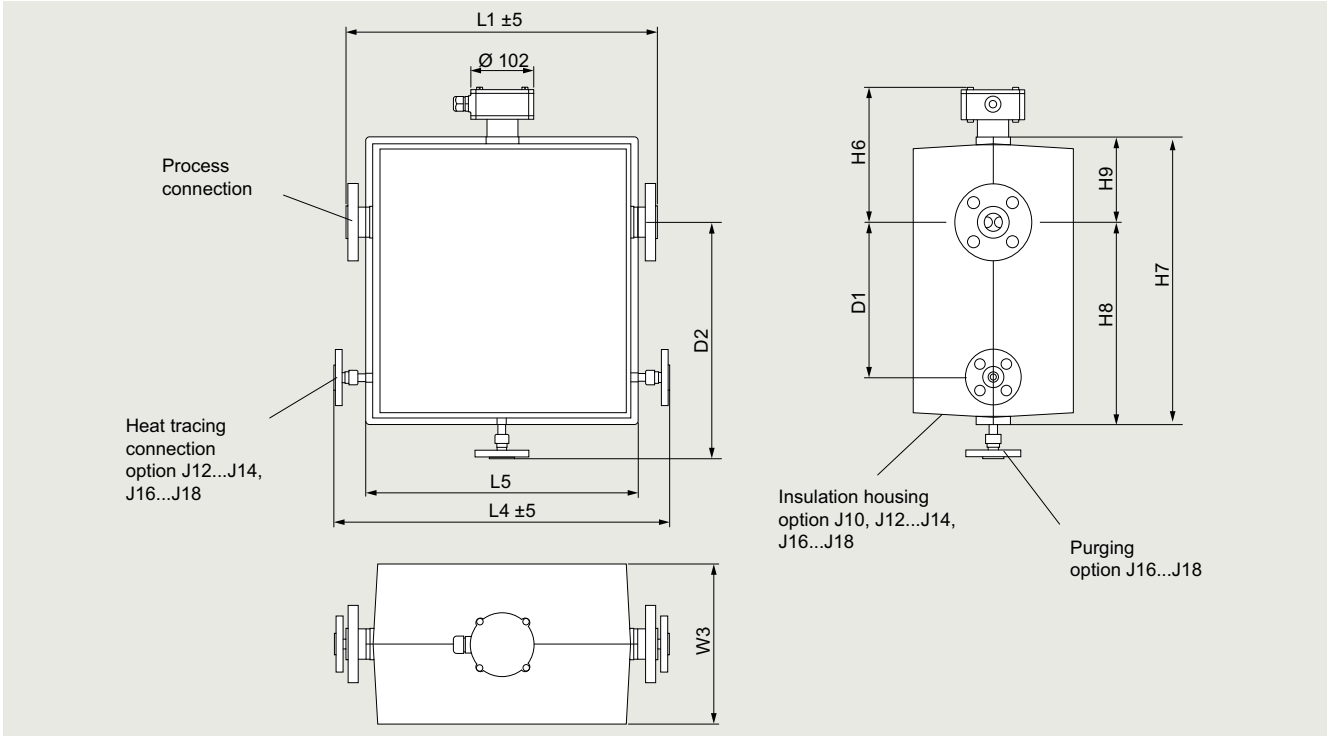
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Dimensional drawings

Drawings, dimensions and weight for FCS600 sensors
FCS dimensions and weight (excluding high pressure versions)



DImensions in mm



Dimensions in mm (with insulation and heating options)

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Dimensional drawings (continued)

FCS600 sensor dimensions without L1

Nominal size	L2	L3	L4	L5	W1	W2	W3	D1	D2
	Dimensions in mm (inch)								
DN 15	272 (10.7)	212 (8.3)	420 (16.5)	310 (12.2)	60 (2.4)	80 (3.1)	240 (9.4)	200 (7.9)	330 (13)
DN 25	400 (15.7)	266 (10.5)	540 (21.3)	439 (17.3)	76 (3)	90 (3.5)	260 (10.2)	250 (9.8)	380 (15)
DN 40	490 (19.3)	267 (10.5)	640 (25.2)	530 (20.9)	89 (3.5)	110 (4.3)	260 (10.2)	250 (9.8)	430 (16.9)
DN 65	850 (33.5)	379 (14.9)	1000 (39.4)	894 (35.2)	129 (5.1)	160 (6.3)	302 (11.9)	350 (13.8)	545 (21.5)

Nominal size	H1	H3	H4	H5	H6	H7	H8	H9
	Dimensions in mm (inch)							
DN 15	177 (7)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	411 (16.2)	273 (10.7)	138 (5.4)
DN 25	230 (9.1)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	464 (18.3)	326 (12.8)	138 (5.4)
DN 40	268 (10.6)	277 (10.9)	100 (3.9)	148 (5.8)	228 (9)	524 (20.6)	376 (14.8)	148 (5.8)
DN 65	370 (14.6)	294.5 (11.6)	135 (5.3)	165 (6.5)	246 (9.7)	668 (26.3)	503 (19.8)	165 (6.5)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb).

L1 dimension and weight with process connections according to ASME B16.5, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 150, raised face (RF)	370 (14.6)	10 (22)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 300, raised face (RF)	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, raised face (RF)	380 (15)	10.6 (23)	n/a	n/a	n/a	n/a	n/a	n/a
ASME ½" class 600, ring joint (RJ)	380 (15)	10.6 (23)	n/a	n/a	n/a	n/a	n/a	n/a
ASME 1" class 150, raised face (RF)	370 (14.6)	10.8 (24)	500 (19.7)	14.8 (33)	n/a	n/a	n/a	n/a
ASME 1" class 300, raised face (RF)	370 (14.6)	11.8 (26)	500 (19.7)	15.8 (35)	n/a	n/a	n/a	n/a
ASME 1" class 600, raised face (RF)	390 (15.4)	12.2 (27)	520 (20.5)	16.2 (36)	n/a	n/a	n/a	n/a
ASME 1" class 600, ring joint (RJ)	390 (15.4)	12.4 (27)	520 (20.5)	16.2 (36)	n/a	n/a	n/a	n/a
ASME 1½" class 150, raised face (RF)	380 (15)	11.8 (26)	500 (19.7)	15.8 (35)	600 (23.6)	25 (56)	n/a	n/a
ASME 1½" class 300, raised face (RF)	380 (15)	14.2 (31)	510 (20.1)	18.2 (40)	600 (23.6)	27.2 (60)	n/a	n/a
ASME 1½" class 600, raised face (RF)	400 (15.7)	15.4 (34)	530 (20.9)	19.2 (42)	620 (24.4)	28.2 (62)	n/a	n/a
ASME 1½" class 600, ring joint (RJ)	400 (15.7)	15.4 (34)	530 (20.9)	19.4 (43)	620 (24.4)	28.2 (62)	n/a	n/a
ASME 2" class 150, raised face (RF)	n/a	n/a	510 (20.1)	17.4 (38)	600 (23.6)	26.4 (58)	n/a	n/a
ASME 2" class 300, raised face (RF)	n/a	n/a	510 (20.1)	19 (42)	600 (23.6)	28 (62)	n/a	n/a
ASME 2" class 600, raised face (RF)	n/a	n/a	540 (21.3)	20.8 (46)	630 (24.8)	29.8 (66)	n/a	n/a
ASME 2" class 600, ring joint (RJ)	n/a	n/a	540 (21.3)	21.2 (47)	630 (24.8)	29.8 (66)	n/a	n/a
ASME 2½" class 150, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	29.6 (65)	n/a	n/a
ASME 2½" class 300, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	31 (68)	n/a	n/a
ASME 2½" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	33.4 (74)	n/a	n/a
ASME 2½" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	640 (25.2)	34.4 (76)	n/a	n/a
ASME 3" class 150, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	30.6 (67)	1 000 (39.4)	60.2 (133)
ASME 3" class 300, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	34.6 (76)	1 000 (39.4)	63.4 (140)

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Dimensional drawings (continued)

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 3" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	38 (84)	1 000 (39.4)	65.8 (145)
ASME 3" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	640 (25.2)	38.6 (85)	1 000 (39.4)	65.8 (145)
ASME 4" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	64 (141)
ASME 4" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	71.4 (157)
ASME 4" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	82.6 (182)
ASME 4" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	82.8 (183)
ASME 5" class 150, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	66 (146)
ASME 5" class 300, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	78.4 (173)
ASME 5" class 600, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	102.8 (227)
ASME 5" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	n/a	n/a	1 030 (40.6)	103.6 (228)

L1 dimension and weight with process connections according to ASME B16.5, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 1" class 150, raised face (RF)	390 (15.4)	11.4 (25)	n/a	n/a	n/a	n/a
ASME 1" class 300, raised face (RF)	390 (15.4)	12.6 (28)	n/a	n/a	n/a	n/a
ASME 1" class 600, raised face (RF)	390 (15.4)	12.4 (27)	n/a	n/a	n/a	n/a
ASME 1½" class 150, raised face (RF)	390 (15.4)	12.6 (28)	520 (20.5)	16.5 (35)	n/a	n/a
ASME 1½" class 300, raised face (RF)	390 (15.4)	15.4 (34)	520 (20.5)	19.1 (42)	n/a	n/a
ASME 1½" class 600, raised face (RF)	400 (15.7)	15.6 (34)	530 (20.9)	19.6 (43)	n/a	n/a
ASME 2" class 150, raised face (RF)	390 (15.4)	14.8 (33)	520 (20.5)	18.5 (41)	620 (24.4)	27.3 (60)
ASME 2" class 300, raised face (RF)	390 (15.4)	16 (35)	520 (20.5)	20.5 (45)	620 (24.4)	29.1 (64)
ASME 2" class 600, raised face (RF)	410 (16.1)	17.6 (39)	540 (21.3)	21.6 (48)	630 (24.8)	29.7 (66)
ASME 2½" class 150, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	30.9 (68)
ASME 2½" class 300, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	32.5 (72)
ASME 2½" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	33.9 (75)
ASME 3" class 150, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	32.8 (72)
ASME 3" class 300, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	36.6 (81)
ASME 3" class 600, raised face (RF)	n/a	n/a	n/a	n/a	640 (25.2)	38.9 (86)

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to EN 1092-1, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 15 PN 40 type B1, raised face (RF)	370 (14.6)	10.6 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type D, with groove	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type E, with spigot	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 40 type F, with recess	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type B1, raised face (RF)	380 (15)	11.4 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type D, with groove	380 (15)	11.4 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type E, with spigot	380 (15)	11.2 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 15 PN 100 type F, with recess	380 (15)	11.4 (25)	n/a	n/a	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type B1, raised face (RF)	370 (14.6)	11.6 (26)	500 (19.7)	15.6 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type D, with groove	370 (14.6)	11.4 (25)	500 (19.7)	15.4 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type E, with spigot	370 (14.6)	11.2 (25)	500 (19.7)	15.2 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 40 type F, with recess	370 (14.6)	11.4 (25)	500 (19.7)	15.4 (34)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type B1, raised face (RF)	390 (15.4)	14 (31)	520 (20.5)	18.2 (40)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type D, with groove	390 (15.4)	14 (31)	520 (20.5)	18 (40)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type E, with spigot	390 (15.4)	13.6 (30)	520 (20.5)	17.6 (39)	n/a	n/a	n/a	n/a
EN DN 25 PN 100 type F, with recess	390 (15.4)	14 (31)	520 (20.5)	18 (40)	n/a	n/a	n/a	n/a
EN DN 40 PN 40 type B1, raised face (RF)	370 (14.6)	13 (29)	500 (19.7)	17 (37)	600 (23.6)	26.2 (58)	n/a	n/a
EN DN 40 PN 40 type D, with groove	370 (14.6)	13 (29)	500 (19.7)	17 (37)	600 (23.6)	26 (57)	n/a	n/a
EN DN 40 PN 40 type E, with spigot	370 (14.6)	12.6 (28)	500 (19.7)	16.6 (37)	600 (23.6)	25.8 (57)	n/a	n/a
EN DN 40 PN 40 type F, with recess	370 (14.6)	12.8 (29)	500 (19.7)	16.8 (37)	600 (23.6)	26 (57)	n/a	n/a
EN DN 40 PN 100 type B1, raised face (RF)	450 (17.7)	17.6 (39)	560 (22)	21.2 (47)	620 (24.4)	29.8 (66)	n/a	n/a
EN DN 40 PN 100 type D, with groove	450 (17.7)	17.4 (38)	560 (22)	21.2 (47)	620 (24.4)	29.6 (65)	n/a	n/a
EN DN 40 PN 100 type E, with spigot	450 (17.7)	17 (37)	560 (22)	20.8 (46)	620 (24.4)	29.2 (64)	n/a	n/a
EN DN 40 PN 100 type F, with recess	450 (17.7)	17.4 (38)	560 (22)	21 (46)	620 (24.4)	29.6 (65)	n/a	n/a
EN DN 50 PN 40 type B1, raised face (RF)	n/a	n/a	500 (19.7)	18.4 (41)	600 (23.6)	27.4 (60)	n/a	n/a
EN DN 50 PN40 type D, with groove	n/a	n/a	500 (19.7)	18.2 (40)	600 (23.6)	27.4 (60)	n/a	n/a
EN DN 50 PN 40 type E, with spigot	n/a	n/a	500 (19.7)	18 (40)	600 (23.6)	27 (60)	n/a	n/a
EN DN 50 PN 40 type F, with recess	n/a	n/a	500 (19.7)	18.2 (40)	600 (23.6)	27.2 (60)	n/a	n/a
EN DN 50 PN 63 type B1, raised face (RF)	n/a	n/a	520 (20.5)	21.6 (48)	620 (24.4)	30.6 (67)	n/a	n/a
EN DN 50 PN 63 type D, with groove	n/a	n/a	520 (20.5)	21.4 (47)	620 (24.4)	30.4 (67)	n/a	n/a
EN DN 50 PN 63 type E, with spigot	n/a	n/a	520 (20.5)	21 (46)	620 (24.4)	30 (66)	n/a	n/a
EN DN 50 PN 63 type F, with recess	n/a	n/a	520 (20.5)	21.2 (47)	620 (24.4)	30.2 (67)	n/a	n/a
EN DN 50 PN 100 type B1, raised face (RF)	n/a	n/a	590 (23.2)	25.2 (56)	660 (26)	33.6 (74)	n/a	n/a
EN DN 50 PN 100 type D, with groove	n/a	n/a	590 (23.2)	25 (55)	660 (26)	33.4 (74)	n/a	n/a
EN DN 50 PN 100 type E, with spigot	n/a	n/a	590 (23.2)	24.4 (54)	660 (26)	33 (73)	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 50 PN 100 type F, with recess	n/a	n/a	590 (23.2)	24.8 (56)	660 (26)	33.4 (74)	n/a	n/a
EN DN 80 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	610 (24)	31 (68)	1 000 (39.4)	60.4 (133)
EN DN 80 PN 40 type D, with groove	n/a	n/a	n/a	n/a	610 (24)	30.8 (68)	1 000 (39.4)	60.2 (133)
EN DN 80 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	610 (24)	30.4 (67)	1 000 (39.4)	59.8 (132)
EN DN 80 PN 40 type F, with recess	n/a	n/a	n/a	n/a	610 (24)	30.6 (67)	1 000 (39.4)	60 (132)
EN DN 80 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	34.4 (76)	1 000 (39.4)	63.4 (140)
EN DN 80 PN 63 type D, with groove	n/a	n/a	n/a	n/a	620 (24.4)	34.2 (75)	1 000 (39.4)	63.2 (139)
EN DN 80 PN 63 type E, with spigot	n/a	n/a	n/a	n/a	620 (24.4)	33.6 (74)	1 000 (39.4)	62.8 (138)
EN DN 80 PN 63 type F, with recess	n/a	n/a	n/a	n/a	620 (24.4)	33.8 (75)	1 000 (39.4)	63 (139)
EN DN 80 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	730 (28.7)	41.8 (92)	1 000 (39.4)	67.2 (148)
EN DN 80 PN 100 type D, with groove	n/a	n/a	n/a	n/a	730 (28.7)	41.6 (92)	1 000 (39.4)	67 (148)
EN DN 80 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	730 (28.7)	41 (90)	1 000 (39.4)	66.4 (146)
EN DN 80 PN 100 type F, with recess	n/a	n/a	n/a	n/a	730 (28.7)	41.4 (91)	1 000 (39.4)	66.6 (147)
EN DN 100 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	63.6 (140)
EN DN 100 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	63.2 (139)
EN DN 100 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	62.4 (138)
EN DN 100 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	62.6 (138)
EN DN 100 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	68 (150)
EN DN 100 PN 63 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.8 (149)
EN DN 100 PN 63 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67 (148)
EN DN 100 PN 63 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.4 (149)
EN DN 100 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	76.6 (169)
EN DN 100 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	76.2 (168)
EN DN 100 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	75.4 (166)
EN DN 100 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 050 (41.3)	75.8 (167)
EN DN 125 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.6 (149)
EN DN 125 PN 40 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	67.2 (148)
EN DN 125 PN 40 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	66.4 (146)
EN DN 125 PN 40 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	66.6 (147)
EN DN 125 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	77.8 (172)
EN DN 125 PN 63 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	77.4 (171)
EN DN 125 PN 63 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	76.4 (168)
EN DN 125 PN 63 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	76.8 (169)
EN DN 125 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	93.2 (205)
EN DN 125 PN 100 type D, with groove	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	92.8 (205)
EN DN 125 PN 100 type E, with spigot	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	91.4 (202)

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Dimensional drawings (continued)

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 125 PN 100 type F, with recess	n/a	n/a	n/a	n/a	n/a	n/a	1 100 (43.3)	92.4 (204)

L1 dimension and weight with process connections according to EN 1092-1, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 25 PN 40, type B1, raised face (RF)	390 (15.4)	11.7 (26)	520 (20.5)	15.7 (35)	n/a	n/a
EN DN 40 PN 40, type B1, raised face (RF)	390 (15.4)	13.7 (30)	520 (20.5)	17.5 (39)	n/a	n/a
EN DN 50 PN 40, type B1, raised face (RF)	n/a	n/a	520 (20.5)	19.3 (43)	620 (24.4)	28 (62)
EN DN 80 PN 40, type B1, raised face (RF)	n/a	n/a	n/a	n/a	620 (24.4)	32.6 (72)

L1 dimension and weight with process connections according to JIS B 2220, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 15 10 K	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 15 20 K	370 (14.6)	10.4 (23)	n/a	n/a	n/a	n/a	n/a	n/a
JIS DN 25 10 K	370 (14.6)	11.4 (25)	500 (19.7)	15.6 (34)	n/a	n/a	n/a	n/a
JIS DN 25 20 K	370 (14.6)	11.8 (26)	500 (19.7)	15.8 (35)	n/a	n/a	n/a	n/a
JIS DN 40 10 K	370 (14.6)	12.2 (27)	500 (19.7)	16.2 (36)	600 (23.6)	25.4 (56)	n/a	n/a
JIS DN 40 20 K	370 (14.6)	12.6 (28)	500 (19.7)	16.6 (37)	600 (23.6)	25.8 (57)	n/a	n/a
JIS DN 50 10 K	n/a	n/a	500 (19.7)	17 (37)	600 (23.6)	26 (57)	n/a	n/a
JIS DN 50 20 K	n/a	n/a	500 (19.7)	17.2 (38)	600 (23.6)	26.2 (58)	n/a	n/a
JIS DN 80 10 K	n/a	n/a	n/a	n/a	600 (23.6)	27.8 (61)	1 000 (40.2)	57.8 (127)
JIS DN 80 20 K	n/a	n/a	n/a	n/a	610 (24)	30.4 (67)	1 000 (40.2)	60 (132)
JIS DN 100 10 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	59 (130)
JIS DN 100 20 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	63 (139)
JIS DN 125 10 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	62.8 (138)
JIS DN 125 20 K	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (40.2)	69 (152)

L1 dimension and weight with process connections according to JIS B 2220, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS DN 25 10 K	390 (15.4)	12.1 (27)	n/a	n/a	n/a	n/a
JIS DN 25 20 K	390 (15.4)	12.5 (28)	n/a	n/a	n/a	n/a
JIS DN 40 10 K	390 (15.4)	13.6 (30)	520 (20.5)	17.4 (38)	n/a	n/a
JIS DN 40 20 K	390 (15.4)	14 (31)	520 (20.5)	17.6 (39)	n/a	n/a
JIS DN 50 10 K	n/a	n/a	520 (20.5)	18.6 (41)	620 (24.4)	27.3 (60)
JIS DN 50 20 K	n/a	n/a	520 (20.5)	18.8 (41)	620 (24.4)	27.3 (60)
JIS DN 80 10 K	n/a	n/a	n/a	n/a	620 (24.4)	30.8 (68)
JIS DN 80 20 K	n/a	n/a	n/a	n/a	620 (24.4)	33.3 (73)

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Dimensional drawings (continued)

L1 dimension and weight with G threaded process connections, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ⅜"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
G ½"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
G ¾"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a

L1 dimension and weight with NPT threaded process connections, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
⅜" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
½" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a
¾" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a	n/a	n/a

L1 dimension and weight with hygienic clamp process connections to DIN 32676 Series A, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series A, DN 25	370 (14.8)	9.2 (20)	n/a	n/a	n/a	n/a	n/a	n/a
DIN 32676 series A, DN 40	370 (14.8)	9.2 (20)	500 (19.7)	13.2 (29)	n/a	n/a	n/a	n/a
DIN 32676 series A, DN 50	n/a	n/a	500 (19.7)	13.2 (29)	600 (23.6)	22.4 (49)	n/a	n/a
DIN 32676 series A, DN 65	n/a	n/a	n/a	n/a	600 (23.6)	22.5 (50)	n/a	n/a
DIN 32676 series A, DN 100	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	52.1 (115)

L1 dimension and weight with hygienic clamp process connections to DIN 32676 Series C (Tri-clamp), AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
DIN 32676 series C, 1"	370 (14.8)	9.2 (20)	n/a	n/a	n/a	n/a	n/a	n/a
DIN 32676 series C, 1½"	370 (14.8)	9.2 (20)	500 (19.7)	13.2 (29)	n/a	n/a	n/a	n/a
DIN 32676 series C, 2"	n/a	n/a	500 (19.7)	13.2 (29)	600 (23.6)	22.4 (49)	n/a	n/a
DIN 32676 series C, 3"	n/a	n/a	n/a	n/a	600 (23.6)	22.5 (50)	n/a	n/a
DIN 32676 series C, 4"	n/a	n/a	n/a	n/a	n/a	n/a	1 000 (39.4)	52.2 (115)

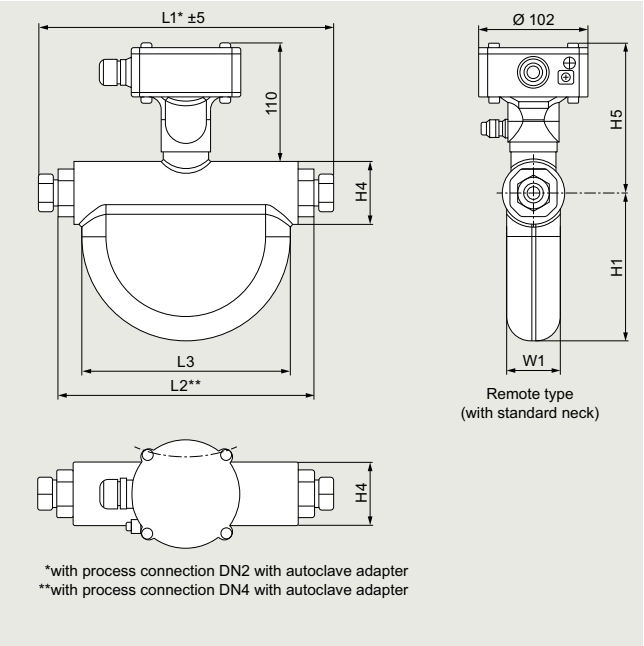
L1 dimension and weight with hygienic clamp process connections to JIS/ISO 2852, AISI 316L wetted parts

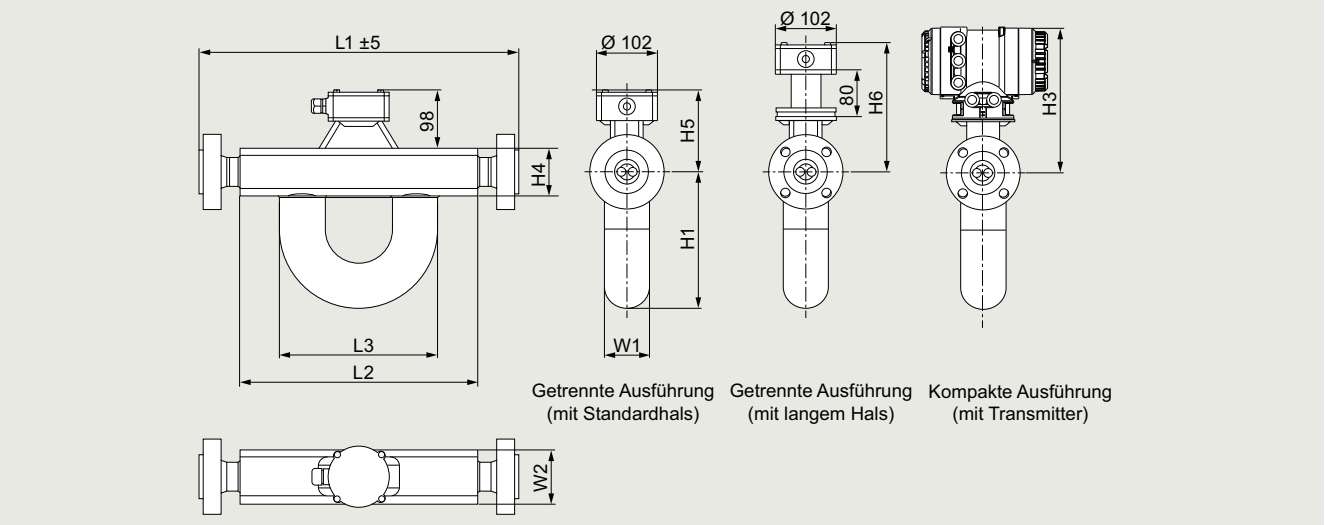
Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40		DN 65	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
JIS/ISO 2852, 1"	370 (14.8)	9.2 (20)	n/a	n/a	n/a	n/a	n/a	n/a
JIS/ISO 2852, 1½"	370 (14.8)	9.2 (20)	500 (19.7)	13.2 (29)	n/a	n/a	n/a	n/a
JIS/ISO 2852, 2"	n/a	n/a	500 (19.7)	13.3 (29)	600 (23.6)	22.4 (49)	n/a	n/a
JIS/ISO 2852, 3"	n/a	n/a	n/a	n/a	600 (23.6)	22.5 (50)	n/a	n/a

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Dimensional drawings (continued)

FCS600 dimensions and weight (high pressure versions)

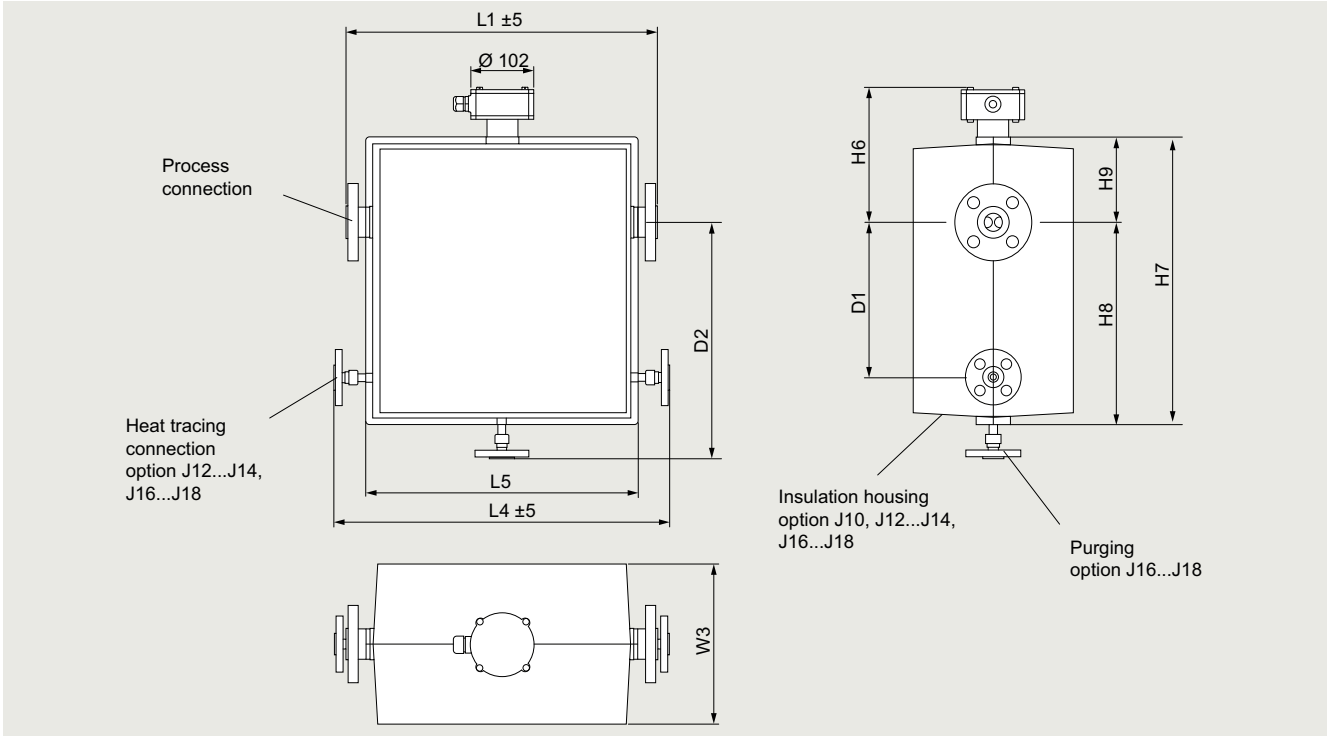




Dimensions in mm for sizes DN 15, DN 25 and DN 40

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Dimensional drawings (continued)



Dimensions in mm, version with insulation housing for sizes DN 15, DN 25 and DN 40 only

Dimensions without length L1

Nominal size	L2	L3	L4	L5	W1	W2	W3	D1	D2
	Dimensions in mm (inch)								
DN 2	240 (9.5)	195 (7.7)			50 (2.0)				
DN 4	240 (9.5)	195 (7.7)			50 (2.0)				
DN 15	272 (10.7)	212 (8.3)	420 (16.5)	310 (12.2)	60 (2.4)	80 (3.1)	240 (9.4)	200 (7.9)	330 (13)
DN 25	400 (15.7)	266 (10.5)	540 (21.3)	439 (17.3)	76 (3)	90 (3.5)	260 (10.2)	250 (9.8)	380 (15)
DN 40	490 (19.3)	267 (10.5)	640 (25.2)	530 (20.9)	89 (3.5)	110 (4.3)	260 (10.2)	250 (9.8)	430 (16.9)

Nominal size	H1	H3	H4	H5	H6	H7	H8	H9
	Dimensions in mm (inch)							
DN 2	138 (5.4)		59 (2.3)	140 (5.5)				
DN 4	138 (5.4)		59 (2.3)	140 (5.5)				
DN 15	177 (7)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	411 (16.2)	273 (10.7)	138 (5.4)
DN 25	230 (9.1)	267 (10.5)	80 (3.1)	138 (5.4)	218 (8.6)	464 (18.3)	326 (12.8)	138 (5.4)
DN 40	268 (10.6)	277 (10.9)	100 (3.9)	148 (5.8)	228 (9)	524 (20.6)	376 (14.8)	148 (5.8)

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the compact type: up to 3.2 kg (7.1 lb).

L1 dimension and weight for medium pressure autoclave process connections

Wetted parts AISI 316L stainless steel and alloy 22

Process connection size and type	FCS600 sensor nominal size DN 2 L1 in mm (inch)	Weight in kg (lb)	DN 4 L1 in mm (inch)	Weight in kg (lb)
Autoclave 9/16" adapter	275 (10.8)	7 (15.4)	275 (10.8)	7 (15.4)
Autoclave ¾"	240 (9.5)	7 (15.4)	240 (9.5)	7 (15.4)

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Dimensional drawings (continued)

L1 dimension and weight for process connections compatible to ASME B16.5, AISI 316L wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME ½" class 900, raised face (RF)	400 (15.7)	12.6 (28)	n/a	n/a	n/a	n/a
ASME ½" class 900, ring joint (RJ)	400 (15.7)	13 (29)	n/a	n/a	n/a	n/a
ASME ½" class 1 500, raised face (RF)	400 (15.7)	12.6 (28)	n/a	n/a	n/a	n/a
ASME ½" class 1 500, ring joint (RJ)	400 (15.7)	13 (29)	n/a	n/a	n/a	n/a
ASME 1" class 900, raised face (RF)	450 (17.7)	16.4 (36)	540 (21.3)	20.6 (45)	n/a	n/a
ASME 1" class 900, ring joint (RJ)	450 (17.7)	16.6 (37)	540 (21.3)	20.4 (45)	n/a	n/a
ASME 1" class 1500, raised face (RF)	450 (17.7)	16.4 (36)	n/a	n/a	n/a	n/a
ASME 1" class 1500, ring joint (RJ)	450 (17.7)	16.6 (37)	n/a	n/a	n/a	n/a
ASME 2" class 900, raised face (RF)	n/a	n/a	660 (26)	35.2 (78)	720 (28.3)	43 (95)
ASME 2" class 900, ring joint (RJ)	n/a	n/a	660 (26)	35.6 (78)	720 (28.3)	43.4 (96)

L1 dimension and weight for process connections compatible to ASME B16.5, alloy 22 wetted parts

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
ASME 1" class 900, raised face (RF)	400 (15.7)	16.4 (36)	n/a	n/a	n/a	n/a
ASME 1" class 900, ring joint (RJ)	n/a	n/a	580 (23)	21 (46)	n/a	n/a
ASME 1" class 1 500, raised face (RF)	400 (15.7)	16.4 (36)	n/a	n/a	n/a	n/a
ASME 1" class 1 500, ring joint (RJ)	n/a	n/a	580 (23)	21 (46)	n/a	n/a
ASME 2" class 900, raised face (RF)	n/a	n/a	580 (23)	34 (75)	710 (28)	44 (97)
ASME 2" class 900, ring joint (RJ)	n/a	n/a	580 (23)	36 (80)	710 (28)	44 (97)
ASME 2" class 1 500, ring joint (RJ)	n/a	n/a	580 (23)	36 (80)	710 (28)	44 (97)
ASME 3" class 900, raised face (RF)	n/a	n/a	n/a	n/a	710 (28)	50 (110)
ASME 3" class 900, ring joint (RJ)	n/a	n/a	n/a	n/a	710 (28)	52 (115)

L1 dimension and weight for process connections with internal thread G

Process connection size and type	FCS600 sensor nominal size DN 15		DN 25		DN 40	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
G ⅜"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
G ½"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
G ¾"	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a

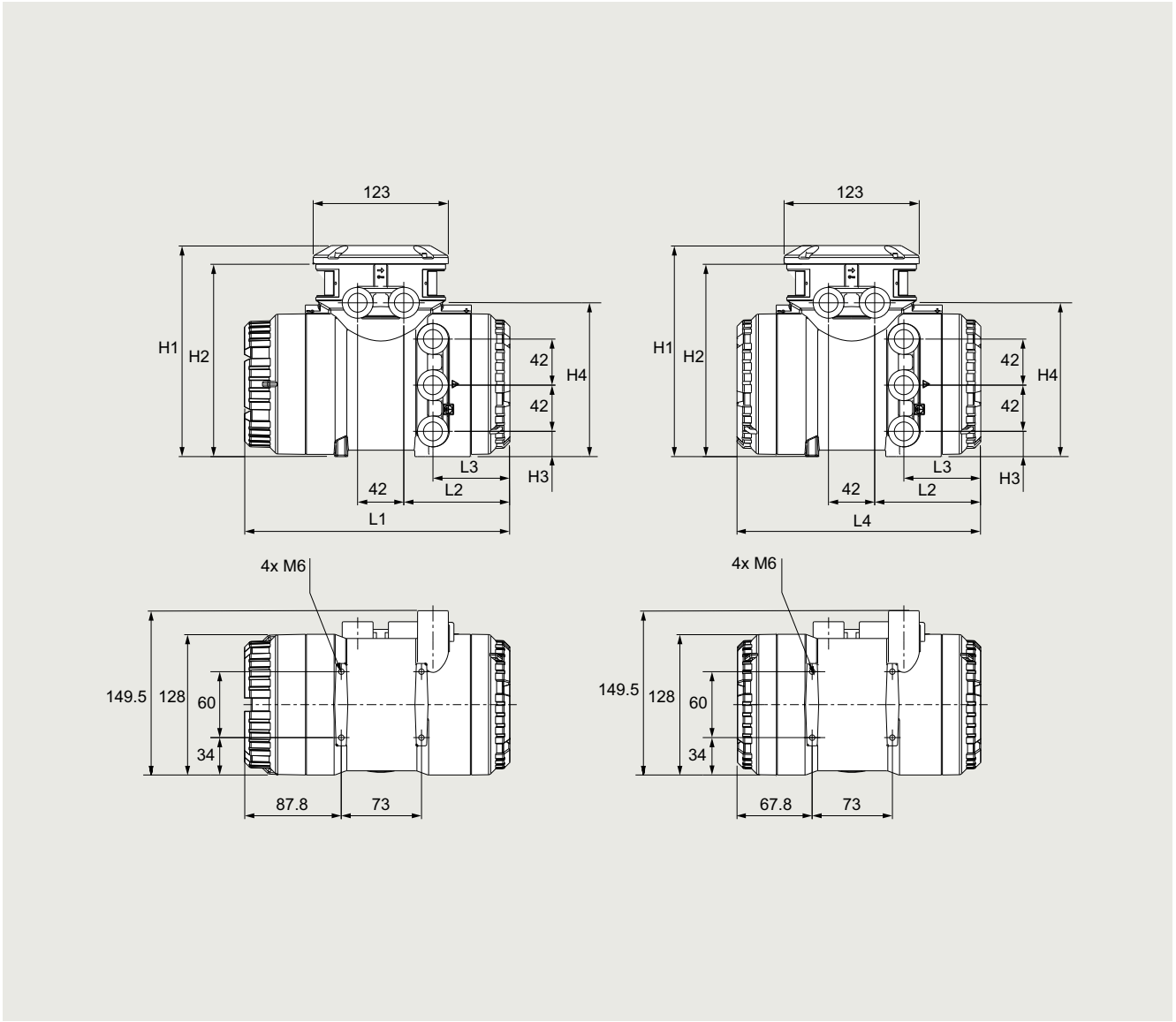
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Dimensional drawings (continued)

L1 dimension and weight for process connections with internal thread NPT

Process connection size and type	FCS600 sensor nominal size DN 15 L1 in mm (inch)	Weight in kg (lb)	DN 25 L1 in mm (inch)	Weight in kg (lb)	DN 40 L1 in mm (inch)	Weight in kg (lb)
⅜" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
½" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a
¾" NPT	390 (15.4)	9.4 (21)	n/a	n/a	n/a	n/a

Drawings, dimensions and weight for FCT020 and FCT040 transmitters



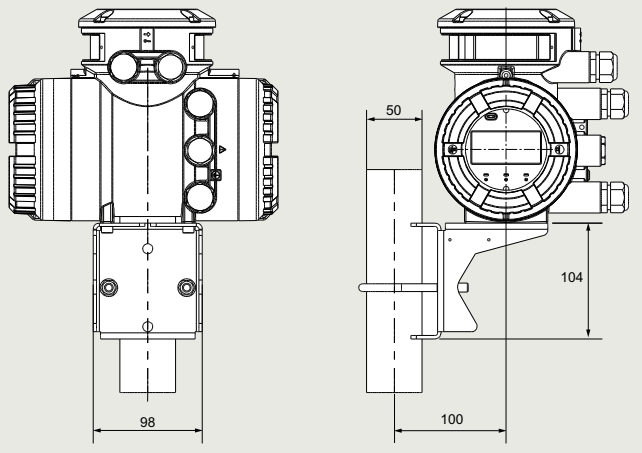
Dimensions of FCT020 or FCT040 transmitter in mm. Transmitter with display shown on the left. Transmitter without display shown on the right.

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Dimensional drawings (continued)

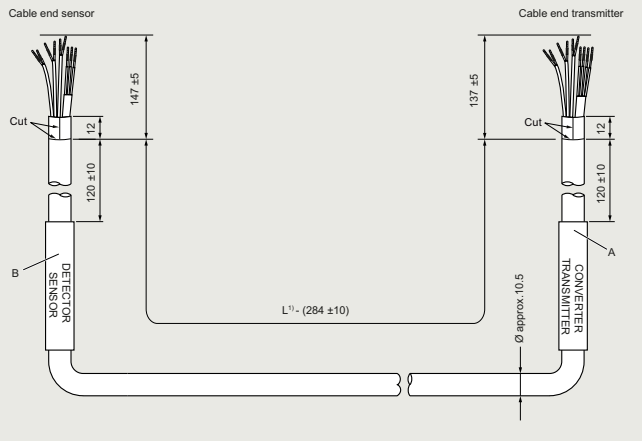
Dimensions L1 to L4 and H1 to H4 (material options: stainless steel, aluminum)

Material	L1 in mm (inch)	L2 in mm (inch)	L3 in mm (inch)	L4 in mm (inch)	H1 in mm (inch)	H2 in mm (inch)	H3 in mm (inch)	H4 in mm (inch)
Stainless steel	255.5 (10.06)	110.5 (4.35)	69 (2.72)	235 (9.25)	201 (7.91)	184 (7.24)	24 (0.94)	150.5 (5.93)
Aluminum	241.5 (9.51)	96.5 (3.8)	70 (2.76)	221 (8.7)	192 (7.56)	175 (6.89)	23 (0.91)	140 (5.51)



Connecting cable dimensions and weights

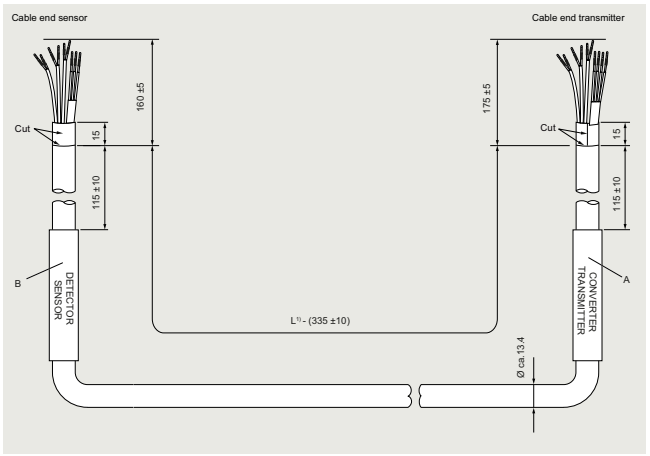
Standard cable



Dimensions in mm. Standard terminated cable. A and B are factory-fitted labels.

Option code	Cable length, L	Cable colour
L51	5 m (16.4 ft)	Non-Ex: gray / Ex: blue
L54	10 m (32.8 ft)	
L57	15 m (49.2 ft)	
L60	20 m (65.6 ft)	
L63	30 m (98.4 ft)	

Standard cable with steel-armored option

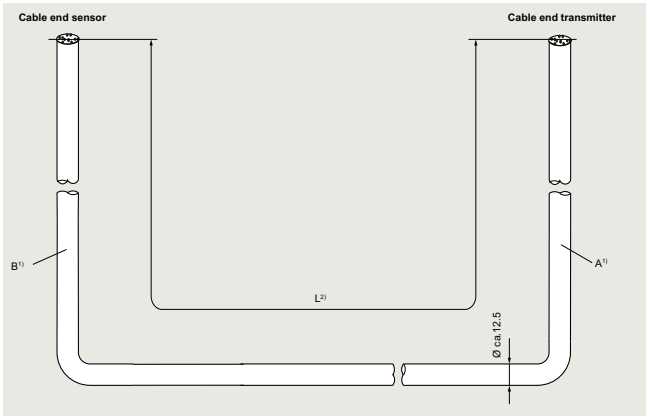


Dimensions in mm. Steel-armored terminated cable. A and B are factory-fitted labels.

Option code	Cable length, L	Cable colour
L51 + A20/A21	5 m (16.4 ft)	Blue
L54 + A20/A21	10 m (32.8 ft)	
L57 + A20/A21	15 m (49.2 ft)	
L60 + A20/A21	20 m (65.6 ft)	
L63 + A20/A21	30 m (98.4 ft)	

Weight of cable ≤ 0.300 kg/m (0.202 lb/ft)

Fire retardant cable



Dimensions in mm. Fire retardant unterminated cable. Labels A and B are supplied loose with termination kit.

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Dimensional drawings (continued)

Option code	Cable length, L	Cable colour
L71	5 m (16.4 ft)	Gray
L74	10 m (32.8 ft)	
L77	15 m (49.2 ft)	
L80	20 m (65.6 ft)	
L83	30 m (98.4 ft)	

Weight of cable ≤ 0.270 kg/m (0.181 lb/ft)

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Overview

The flowmeter systems of the SITRANS FC500 series are the grande Coriolis multi-parameter flowmeter for large pipes and high flows.
They are formed by one FCS700 sensor and one FCT transmitter:

- SITRANS FC720 is the combination of the FCS700 sensor and the FCT020 transmitter
- SITRANS FC740 is the combination of the FCS700 sensor and the FCT040 transmitter

Features:

- Dual curved AISI 316L stainless steel or alloy 22 measuring tubes
- Process connection: flanges
- Nominal sizes: DN 100 to DN 200
- Connection sizes DN 100 to DN 250 (4" to 10")
- Nominal flow rates: 250 000 kg/h to 900 000 kg/h (551 156 to 1 984 160 lb/h)
- FCS700 sensors can be combined with compact or remote transmitters
- Versatility with superior turndown and modest pressure loss
- Durability and the performance required in large-scale processes



FC720/740 Coriolis flowmeter

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Benefits

Product features aligned to user value targets

	Customer value targets	SITRANS FC features and solutions
Engineering and project management	• Reduce engineering investment • Cut specification effort • Minimize project expenditure • Decrease the spending on each measurement point • Eliminate function duplication • Reduce number of suppliers	• Siemens project teams offer complimentary evaluation of customer specifications, provided by regional and HQ experts • Simple product selection using intuitive sizing software • One SITRANS FC device can typically provide 3 to 6 individual measurements, all transmitted via digital communication, when planned during pre-project design • Added value functions: batch control, viscosity, thermal energy, concentration measurement (Fraction) of two-component solutions, and pressure compensation
Installation	• Reduce footprint and transport outlay of OEM machinery • Lower installation complexity • Avoid costly modifications of existing plant	• Can be installed in horizontal or vertical (self-draining) pipes • Twin tube bend design delivers strong signal to noise characteristic resistant to external influence, so install in tight spaces with no inlet and outlet restrictions • Adaptable to existing pipes: typically, 3 or 4 connection sizes for each sensor size • Flexible selection of traditional inputs, outputs, and digital communications
Configuration and commissioning	• Shorter commissioning schedules with lower costs • Faster start-up with reduced outgoings	• Easy setup wizard delivers working meters straight after start-up • microSD card stores sensor calibration data and default setup • Simple configuration using Process Device Manager (PDM) • Siemens device-specific faceplates simplify operation in plantwide control systems
Efficient plant operation	• Improve finished product consistency to reduce waste • Keep process performance when scaling production up or down • Optimize process control • Improve finished product quality enabling higher levels of profit • Reduce downtime with fast resolution of process upsets • Improve asset performance	• SITRANS FC meters are calibrated in rigs accredited to EN/ISO 17025 to ensure consistently high performance of flow, density, and concentration measurements • First-class zero-point quality maintains high accuracy into the low flow region • High sensitivity and intelligent dynamic range keeps the measurement active in demanding high fluid damping cases • Designed-in resilience to process extremes • Self-verification alerts to potential performance issues due to unplanned process events, for example gas or vapor breakout or solid deposits building up in the tubes • Diagnostic data via local menu or PDM is backed by Siemens applications experts • Intelligent Siemens SITRANS IQ apps for continuing asset evaluation
Maintenance and asset management	• Optimize technician training • Reduce cost of spare parts • Increase predictive maintenance • Reduce production downtime and associated costs • Decrease unplanned maintenance • Maximize asset value	• Simple product design with interchangeable modular parts • Micro SD card loads sensor specific data to deliver fast service exchange • Self-verification: tube health check monitors key diagnostics, including tube stiffness, driver and pickups; the user defines verification frequency and alarm behavior • Verification results indicate whether preventive maintenance action is required • Siemens SIMATIC Maintenance Station uses cyclical acquisition to provide life cycle reports and intelligent preventive maintenance strategies
Industry compliance	• Cut effort required to comply with Industry-specific demands • Reduce resource needed to maintain regulatory compliance	• Food and beverage sector covered with EHEDG and 3-A approvals, polished tubes • Global hazardous area approvals for international plant duplications • Common and emerging digital networks covered: HART, PROFIBUS PA, MODBUS or PROFINET over APL Ethernet • Class leading safety: SIL2/SIL3, secondary containment, PED, NAMUR NE95

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Application

Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Chemical and petrochemical Bulk chemicals Industrial gases Polymers Agrochemicals Fine chemicals Aroma chemicals	• Transfer, loading and unloading of bulk chemicals • Concentration control of acids and alkalis (process optimization) • Accurate mass or volume flow of feed chemicals to in-line blending systems • Accurate mass flow and density (quality) of reactor fluid feeds catalyst • Chemical recovery • Mass balance optimization • Compressed and cryogenic gases • Lubricating oil blending and dosing • High accuracy measurement of critical fluid components • Low flow control in pilot plants and R&D facilities
Food and beverage Food processing Dairies Breweries Distilleries Confectionary Soft drinks Animal feed plants OEM	• Accurate bulk transfer (mass or volume) of all dairy products: milk, cream, whey and yoghurt • Fat concentration in cream • Flow, density, temperature, and concentration (Plato) during all fermentation processes • Flow, density, temperature, and sugar concentration (Brix) in soft drink processing • Distilled spirits: % alcohol by volume (ABV), liters of pure alcohol, volume transfer, blending, batch and column still optimization and energy management, cask filling, tanker loading • Flow and density of fruit juices and pulps • Mixing and inventory control of confectionary ingredients, e.g., chocolate, syrup, oils, flavors • Metering pump control • Oils, Fats enzymes dosing in animal feed plants • CO_2 dosing • CIP liquids • Bottling of beer, spirits, wine, soft drinks, etc. • Bulk sugar processing: molasses, sugar slurries, density, Brix of finished product
Oil and gas Offshore/onshore Upstream/downstream Pipelines Distribution networks Refineries Skid manufacturers	• Loading/unloading of hydrocarbons (e.g., crude oil, bitumen) from/to ship, road tanker, rail car • High pressure chemical injection • High pressure low flow gas • Net oil computing • Gas void fraction • Filling of gas bottles • Furnace control • Test separators • LPG, natural gas hydration • Well-head water-cut monitoring • All hydrocarbon fluids in refineries • Metrology, custody transfer • Drilling mud • Oil well cementing and hydrofracturing
Life sciences Pharmaceutical Bio	• High accuracy flow and batching of bioreactor feeds • Solvent flow rate, density and batching • Flow of demineralized and deionized water • Solvents and fish oils used in high grade omega 3 oils • Precision coatings • Vacuum thin film coating
Household and personal care Detergents Cosmetics	• Blending and batching of detergent ingredients • Tanker loading and unloading • Salt concentration • Reliable measurement of aerated liquids

Application (continued)

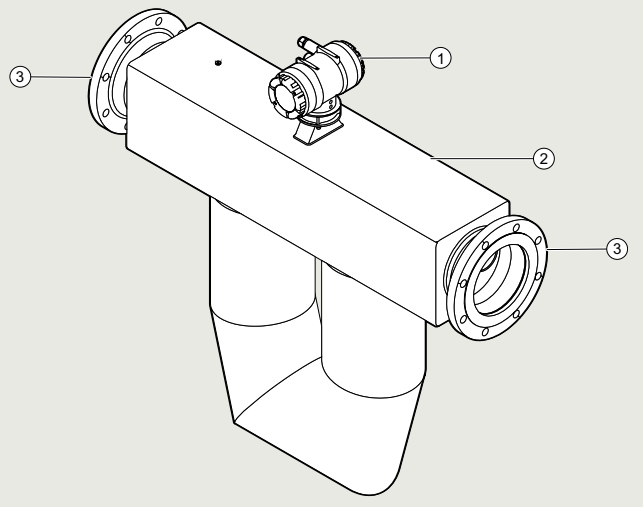
Application examples for SITRANS FC multi-parameter meters across diverse industry sectors	
Automotive and aeronautical Vehicle manufacturing Paint Engine testing OEM	• Fuel injection nozzle and pump testing • Filling of under bonnet fluid reservoirs, air conditioning, coolant • Fuel flow and density measurement in engine test beds • Checking for air in oil using high accuracy density measurement • Paint spray robots – requires accurate and fast measurements • Aircraft fuel loading (kerosene) • High pressure flow used in turbine blade manufacture
Power and energy Renewable Hydrogen	• Boiler fuel flow and burner control • Turbine fuel flow • Glycol flow and concentration • Bioethanol
Marine OEM Shipbuilders	• Fuel consumption management • Boiler control • Bunkering management • Density used to indicate fuel quality
Pulp, paper and textiles	• Accurate dosing of dyes and chemicals
Water and environmental	• Dosing of chemicals for water treatment • Chemical concentration for water quality control

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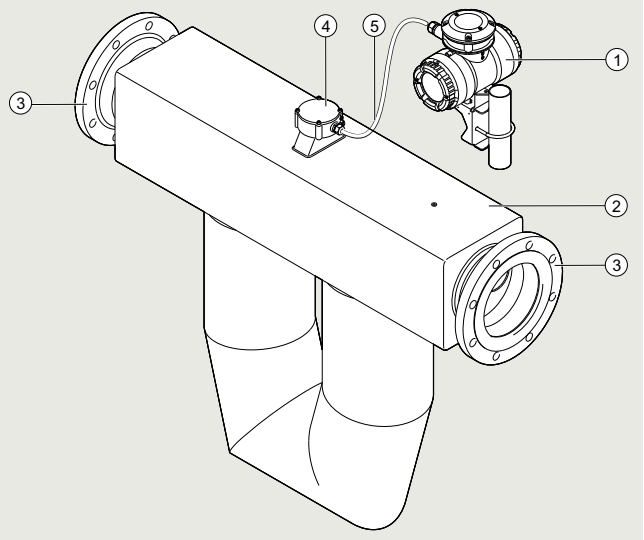
Design

Design options and related temperature range for FC700 series

Design version	Transmitter	Process fluid temperature range
Compact, standard neck	Aluminum	Standard [-50 ... 150 °C (-58 ... 302 °F)]
Remote, standard neck, or long neck	Aluminum or stainless steel	Standard [-70 ... 150 °C (-94 ... 302 °F)]
Remote only, long neck only	Aluminum or stainless steel	Medium [-70 ... 230 °C (-94 ... 446 °F)] High [0 ... 350 °C (32 ... 662 °F)]



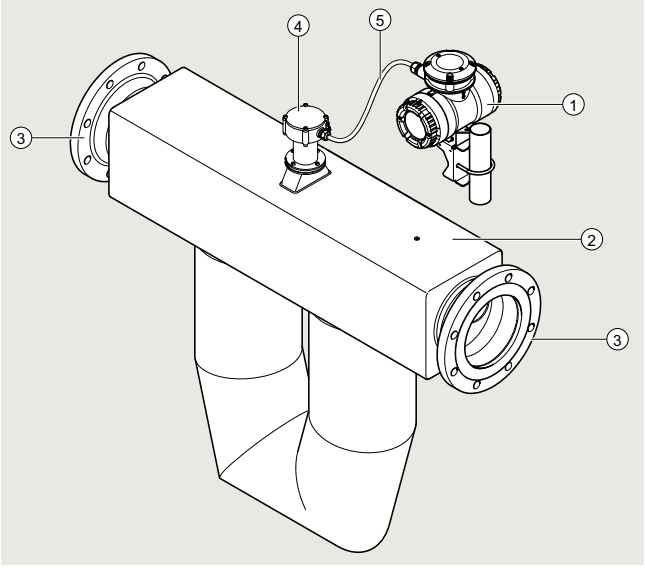
FCS700 sensor with compact transmitter



FCS700 sensor with remote transmitter

Design (continued)

1	Transmitter
2	FCS700 sensor
3	Process connection
4	Sensor terminal box
5	Connecting cable



FCS700 sensor with long neck (pedestal) and remote transmitter.

1	Transmitter
2	FCS700 sensor
3	Process connection
4	Sensor terminal box
5	Connecting cable

Installation guidelines

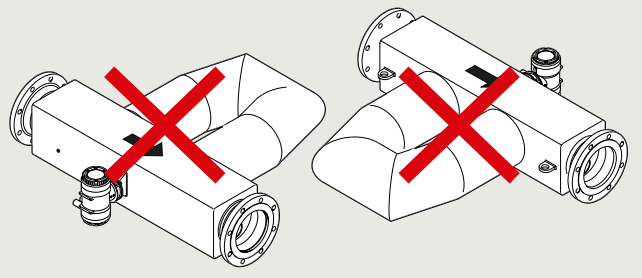
FCS700 series flowmeters can be mounted horizontally, vertically and at an incline. The measuring tubes should be filled with the fluid during flow measurement as entrained gas may result in errors in measurement. Straight pipe runs at inlet or outlet are usually not required.

Avoid the following installation locations and positions:

- Measuring tubes as highest point in piping when measuring liquids
- Measuring tubes as lowest point in piping when measuring gases
- Immediately in front of a free pipe outlet in a downpipe
- Lateral positions

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Design (continued)



Avoid installation position above: measuring tubes in sideways position resulting in possible non-homogeneous fluid separation

Function

Compatible fluids

FC700 series flowmeters can be used to measure the following fluids:

- Liquids
- Gases
- Mixtures, solutions, emulsions, suspensions, and slurries

Primary measured variables

- Mass flow
- Density
- Temperature

Based on the primary measured quantities, the transmitter also calculates:

- Volume flow
- Percent concentration (fraction) of a two-component mixture (FCT040 only)
- Partial component flow rate (net flow) of a mixture consisting of two components (FCT040 only)

Bi-directional operation

The mass flow, volume flow, and net flow measurements can be bi-directional.

Measurement variables for NTEP approval

- Mass flow uni-directional
- Volume flow uni-directional

Feature overview

- Energy-efficient low pressure loss design with short tube paths and large tube diameter
- Optimal decoupling of the dual tube measuring element from external stress and vibration
- Accurate density measurement and up to four advanced concentration measurement data sets
- Benefit from viscosity function and capability to handle high viscous process fluids
- High power tube driver to detect gas content to maintain dependable measurements with entrained gas

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Selection and ordering data

SITRANS FC720/740 (High flow)	Article No. 7ME447	● -	● ●	●	●	● -	●	●	●	● -	Order code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Transmitter variant													
None (spare sensor)		0											
Coriolis sensor FCS700 with transmitter FCT020		2											
Coriolis sensor FCS700 with transmitter FCT040		4											
SITRANS FC spare part transmitter, no sensor included		9									G	3	Y
Sensor size / Connector size													
No sensor (SITRANS FCT transmitter as spare part)			0	A									
Sensor size DN 100 with connection size 4" DN 100			1	B									
Sensor size DN 100 with connection size 5" DN 125			1	C									
Sensor size DN 100 with connection size 6" DN 150			1	D									
Sensor size DN 100 with special connection			1	Y									
Sensor size DN 150 with connection size 6" DN 150			2	D									
Sensor size DN 150 with connection size 8" DN 200			2	E									
Sensor size DN 150 with special connection			2	Y									
Sensor size DN 200 with connection size 8" DN 200			3	E									
Sensor size DN 200 with connection size 10" DN 250			3	F									
Sensor size DN 200 with special connection			3	Y									
Process connection													
No connection (SITRANS FCT transmitter as spare part)					A	0							
EN flange PN 16, suitable for EN 1092-1 type B1, raised face (RF)					A	8							
EN flange PN 40, suitable for EN 1092-1 type B1, raised face (RF)					A	1							
EN flange PN 63, suitable for EN 1092-1 type B1, raised face (RF)					A	2							
EN flange PN 100, suitable for EN 1092-1 type B1, raised face (RF)					A	3							
EN flange PN 16, suitable for EN 1092-1 type D, groove					A	4							
EN flange PN 40, suitable for EN 1092-1 type D, groove					A	5							
EN flange PN 63, suitable for EN 1092-1 type D, groove					A	6							
EN flange PN 100, suitable for EN 1092-1 type D, groove					A	7							
EN flange PN 16, suitable for EN 1092-1 type E, spigot					B	0							
EN flange PN 40, suitable for EN 1092-1 type E, spigot					B	1							
EN flange PN 63, suitable for EN 1092-1 type E, spigot					B	2							
EN flange PN 100, suitable for EN 1092-1 type E, spigot					B	3							
EN flange PN 16, suitable for EN 1092-1 type F, recess					B	4							
EN flange PN 40, suitable for EN 1092-1 type F, recess					B	5							
EN flange PN 63, suitable for EN 1092-1 type F, recess					B	6							
EN flange PN 100, suitable for EN 1092-1 type F, recess					B	7							
ASME flange class 600, suitable for ASME B16.5, ring joint (RJ)					C	3							
ASME flange class 150, suitable for ASME B16.5, raised face (RF)					D	1							
ASME flange class 300, suitable for ASME B16.5, raised face (RF)					D	2							
ASME flange class 600, suitable for ASME B16.5, raised face (RF)					D	3							
JIS flange 10K, JIS B 2220					L	2							
JIS flange 20K, JIS B 2220					L	4							
Special design request					Y	1							
Tube material (wetted) Process connection material and max operational temperature													
None (SITRANS FCT transmitter as spare part)							0						
316L, 316L, max. temperature 150 °C (302 °F)							1						
316L, 316L, max. temperature 230 °C (446 °F)							2						
316L, 316L, max. temperature 350 °C (662 °F)							3						
C22, C22, max. temperature 150 °C (302 °F)							4						
C22, C22, max. temperature 230 °C (446 °F)							5						
C22, C22, max. temperature 350 °C (662 °F)							6						

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Selection and ordering data (continued)

SITRANS FC720/740 (High flow)	Article No. 7ME447 ● - ● ● ● ● ● - ● ● ● ● -	Order code ● ● ●
Calibration		
No calibration	**0**	
Massflow 0.1%, density 2 g/l	**3**	
Massflow 0.2%, density 4 g/l	**6**	
Accuracy for gas please select below	**9**	
Massflow gas 0.75%		**N 1 A**
Massflow gas 0.5%		**N 2 A**
Massflow gas 0.35%		**N 3 A**
Mounting style, transmitter housing and material		
Compact type with "urethane-cured polyester powder coating" coated aluminum transmitter housing	**A**	
Compact type with "corrosion protection coating" coated aluminum transmitter housing	**B**	
Remote type with "urethane-cured polyester powder coating" coated aluminum transmitter housing and standard neck sensor	**C**	
Remote type with "urethane-cured polyester powder coating" coated aluminum transmitter housing and long neck sensor	**D**	
Remote type with "corrosion protection coating" coated aluminum transmitter housing and standard neck sensor	**E**	
Remote type with "corrosion protection coating" coated aluminum transmitter housing and long neck sensor	**F**	
Remote type stainless steel transmitter and standard neck sensor	**G**	
Remote type stainless steel transmitter and long neck sensor	**H**	
Ex approvals		
None	**A**	
ATEX, explosion group IIC and IIIC	**B**	
ATEX, explosion group IIB and IIIC	**C**	
IECEx, explosion group IIC and IIIC	**D**	
IECEx, explosion group IIB and IIIC	**E**	
EAC Ex, IIC and IIIC	**F**	
EAC Ex, IIB and IIIC	**G**	
FM, groups A B C D E F G	**H**	
FM, groups C D E F G	**J**	
INMETRO, explosion group IIC and IIIC	**K**	
INMETRO, explosion group IIB and IIIC	**L**	
NEPSI, explosion group IIC and IIIC	**M**	
NEPSI, explosion group IIB and IIIC	**N**	
Korea Ex, explosion group IIC and IIIC	**P**	
Korea Ex, explosion group IIB and for integral type also IIIC	**Q**	
Local user interface		
Spare sensor without transmitter, no display applied	**0**	
No display	**1**	
With display	**3**	

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Selection and ordering data (continued)

	Order code
Further designs Please add "**-Z**" to Article No. and specify order code(s).	
Cable glands	
Metric, no glands (M20)	**A10**
NPT, no glands (1/2")	**A11**
Metric, no glands (M20) steel armored cable	**A20**
NPT, no glands (1/2") steel armored cable	**A21**
Sensor housing material	
None (SITRANS FCT transmitter as spare part)	**B00**
Stainless steel 1, 4301/304, 1.4404/316L	**B01**
Stainless steel 1, 4404/316L DN 100	**B02**
Stainless steel 1, 4404/316L DN 150	**B03**
Stainless steel 1, 4404/316L DN 200	**B04**
I/O Configuration Ch1	
None	**E00**
4-20 mA HART active	**E06**
4-20 mA HART passive	**E07**
PROFIBUS PA	**E10**
PROFINET over Ethernet-APL (IS)	**E15**
I/O Configuration Ch2, Ch3 and Ch4	
Spare sensor without transmitter, all communication types and I/Os apply	**F00**
1 passive current output, 1 passive pulse or status output	**F01**
1 passive current output, 2 passive pulse or status outputs	**F02**
1 passive current output, 1 passive pulse or status outputs, 1 passive NAMUR pulse or status output	**F03**
1 passive current output, 2 passive NAMUR pulse or status outputs	**F04**
1 passive pulse or status output	**F11**
2 passive pulse or status outputs, 1 passive status output	**F12**
2 passive pulse or status outputs, 1 voltage-free status input	**F13**
2 passive pulse or status outputs, 1 active current input	**F14**
2 passive pulse or status outputs, 1 passive current input	**F15**
1 passive pulse or status output, 1 passive current output, 1 active current input	**F16**
1 passive pulse or status output, 1 passive current output, 1 passive current input	**F17**
1 passive pulse or status output, 1 voltage-free status input, 1 active current input	**F18**
1 passive pulse or status output, 1 voltage-free status input, 1 passive current input	**F19**
1 passive pulse or status output, 1 active pulse or status output, 1 voltage-free status input	**F20**
1 passive pulse or status output, 1 active pulse or status output with pull-up resistor, 1 voltage-free status input	**F21**
1 active current output, 2 passive pulse or status outputs	**F22**
1 active current output, 1 passive pulse or status output,1 voltage-free status input	**F23**
1 passive pulse or status output	**F31**
2 passive pulse or status outputs	**F32**
1 passive pulse or status output, 1 active current input	**F33**
1 passive pulse or status output, 1 passive current input	**F34**
1 passive pulse or status output, 1 active pulse or status output	**F35**
1 passive pulse or status output, 1 active pulse or status output with pull-up resistor	**F36**
1 passive pulse or status output, 1 active current output	**F37**
1 passive pulse output	**F41**
Output CH1 intrinsically safe, 1 passive pulse output	**F42**
Output CH3 intrinsically safe, 1 passive pulse output	**F50**

	Order code
Certificates	
Declaration of compliance with the order 2.1 according to EN 10204	**C11**
Certificate of Marking Transfer and Raw Material Certificates (Inspection Certificate 3.1 according to EN 10204), including IGC and conform to NACE MR0175 and MR0103	**C13**
Positive Material Identification of wetted parts, including certificate (Inspection Certificate 3.1 according to EN 10204)	**C15**
NTEP accuracy class 0.3 acc. NIST for heated products	**C17**
Hydrostatic Pressure Test Certificate (Inspection Certificate 3.1 according to EN 10204)	**C18**
Delivery to EAEU+KazakPA	**C19**
Functional Safety (IEC 61508) - SIL2/3	**C20**
X-ray inspection of flange weld seam according to DIN EN ISO 17636-1/B, evaluation according to AD 2000 HP 5/3 and DIN EN ISO 5817/C, including certificate	**C33**
X-ray test according to ASME V	**C34**
WPS according to DIN EN ISO 15809-1; WPQR according to DIN EN ISO 15814-1; WQC according to DIN EN 287-1 or DIN EN ISO 8908-4	**C36**
Welding procedures and certificate according to ASME IX	**C37**
Dye penetrant test of process connection weld seams according to DIN EN ISO 3452-1, including certificate	**C38**
Dye penetrant test of flange welding according to ASME V, including certificate	**C39**
Quality Inspection Certificate (Inspection Certificate 3.1 according to EN 10204)	**C40**
Traceable calibration to national standards, including a list of working standards used for calibration. Language: English/Japanese	**C41**
Traceable calibration to national standards, including a list of primary standards to which the delivered product is traceable. Language: English/Japanese	**C42**
Ferrite test for flange welding according to DIN EN ISO 8249	**C50**
Degreasing of wetted surfaces according to ASTM G93-03 (Level C), including test report	**C54**
ASME B31.3 compliance NORMAL FLUID SERVICE	**C70**
Combined certificates	
Certification package (C13, C18, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test and Quality inspection certificate	**C80**
Certification package (C13, C15, C40) including Marking Transfer and raw material certificate, Positive material identification and Quality inspection certificate	**C81**
Certification package (C13, C18, C38, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, Dye penetration and Quality inspection certificate	**C82**
Certification package (C13, C15, C18, C36, C38, C40) including Marking Transfer and raw material certificate, Positive material identification, Hydrostatic pressure test, Welding certificates, Dye penetration and Quality inspection certificate	**C83**
Certification package (C15, C18, C36) including Positive material identification, Hydrostatic pressure test and Welding certificates	**C84**
Certification package (C34, C37, C39) including X-ray test according ASME V, Welding procedures and Certificates according ASME IX and Dye penetrant test of flange welding according ASME V	**C85**
Certification package (C13, C18, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Hydrostatic pressure test, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	**C86**
Certification package (C13, C15, C34, C37, C39, C40) including Marking Transfer and raw material certificate, Positive material identification, X-ray test according ASME V, Welding procedures and Certificates according ASME IX, Dye penetrant test of flange welding according ASME V and Quality inspection certificate	**C87**
Connecting cable type and length	
without standard connecting cable	**L50**
5 meter (16.4 ft) remote connecting cable terminated standard gray / Ex blue	**L51**

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Selection and ordering data (continued)

	Order code
10 meter (32.8 ft) remote connecting cable terminated standard gray / Ex blue	**L54**
15 meter (49.2 ft) remote connecting cable terminated standard gray / Ex blue	**L57**
20 meter (65.6 ft) remote connecting cable terminated standard gray / Ex blue	**L60**
30 meter (98.4 ft) remote connecting cable terminated standard gray / Ex blue	**L63**
without fire retardant connecting cable	**L70**
5 meter (16.4 ft) remote fire retardant connecting cable not terminated	**L71**
10 meter (32.8 ft) remote fire retardant connecting cable not terminated	**L74**
15 meter (49.2 ft) remote fire retardant connecting cable not terminated	**L77**
20 meter (65.6 ft) remote fire retardant connecting cable not terminated	**L80**
30 meter (98.4 ft) remote fire retardant connecting cable not terminated	**L83**
SW functions	
Heat measurement	**S11**
Tube health check	**S12**
Batching and filling function	**S13**
Netoil computing	**S14**
Viscosity computing function for liquids	**S15**
Standard concentration measurement	**S16**
Advanced concentration	**S17**
Marine approval	
Marine approved DNV, ABS, KR piping class 2	**S22**
Marine approved DNV, ABS, KR piping class 3	**S23**
Marine approved LR, MR, TAC piping class 2	**S24**
Marine approved LR, MR, TAC piping class 3	**S25**
Marine approved BV piping class 2	**S26**
Marine approved BV piping class 3	**S27**
Rupture Disk	
Namur built-in length according to NE132	**S31**
Rupture Disk	**S32**
Insulation	
Insulation	**J10**
Insulation and heat tracing, ½"ASME class 150, raised face (RF)	**J12**
Insulation and heat tracing, ½" ASME class 300, raised face (RF)	**J13**
Insulation and heat tracing, EN DN 15, PN 40	**J14**
Insulation, heat tracing with ventilation, ½" ASME class 150, raised face (RF)	**J16**
Insulation, heat tracing with ventilation, ½" ASME class 300, raised face (RF)	**J17**
Insulation, heat tracing with ventilation, EN DN 15, PN 40	**J18**

	Order code
Country specific delivery	
Delivery to China including China RoHS mark	**W21**
Delivery to Korea including KC mark	**W22**
Delivery to Canada including CRN mark	**W26**
Fraction setup PIA: Please select four options	
Sugar / Water 0 ... 85 °Bx, 0 ... 80 °C (32 ... 176 °F)	**G01**
NaOH / Water 2 ... 50 WT%, 0 ... 100 °C (32 ... 212 °F)	**G02**
KOH / Water 0 ... 60 WT%, 54 ... 100 °C (129 ... 212 °F)	**G03**
NH_4NO_3 / Water 1 ... 50 WT%, 0 ... 80 °C (32 ... 176 °F)	**G04**
NH_4NO_3 / Water 20 ... 70 WT%, 20 ... 100 °C (68 ... 212 °F)	**G05**
HCl / Water 22 ... 34 WT%, 20 ... 40 °C (68 ... 104 °F)	**G06**
HNO_3 / Water 50 ... 67 WT%, 10 ... 60 °C (50 ... 140 °F)	**G07**
H_2O_2 / Water 30 ... 75 WT%, 4 ... 44 °C (39 ... 111 °F)	**G09**
Ethylene Glycol / Water 10 ... 50 WT%, -20 ... 40 °C (-4 ... 104 °F)	**G10**
Amylum = Starch / Water 33 ... 43 WT%, 35 ... 45 °C (95 ... 113 °F)	**G11**
Methanol / Water 35 ... 60 WT%, 0 ... 40 °C (32 ... 104 °F)	**G12**
Alcohol / Water 55 ... 100 VOL%, 10 ... 40 °C (50 ... 104 °F)	**G20**
Sugar / Water 40 ... 80 °Bx, 75 ... 100 °C (167 ... 212 °F)	**G21**
Alcohol / Water 66 ... 100 WT%, 15 ... 40 °C (59 ... 104 °F)	**G30**
Alcohol / Water 66 ... 100 WT%, 10 ... 40 °C (50 ... 104 °F)	**G37**
Tag name	
Tag name plate, SS (max. 16 characters)	**Y11**
Tag plate wired (316L)	**Y15**
HART/MODBUS software tag No. (max. 8 characters)	**Y25**
HART/MODBUS software tag No. (max. 32 characters)	**Y26**
PROFIBUS PA NODE ADDRESS (4 characters HEX)	**Y28**
PROFIBUS PA SOFTWARE TAG (max. 32 characters)	**Y29**
Customer installation length	
Customer installation length (mm)	**Y30**
Calibration	
Predefined 6-Point Accredited Calibration: 10%, 20%, 40%, 60%, 80%, 100% of Q_{nom}. Calibrated Output: Frequency	**D62**
Special versions	
ID-Number of special design	**Y99**

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Technical specifications

Mass flow rate of liquids

The mass flow rate characteristics of SITRANS FC meters are defined by the values of zero stability, Q_{flat}, Q_{nom} and Q_{max}.

Zero stability is the maximum allowable flow rate value that can be displayed at zero flow under reference conditions. It is a good indicator of the meter performance as flow rates reduce, and approach zero.

- Q_{flat} is the mass flow rate above which the base accuracy is maintained (0.1% when using FCT040 transmitters).
- Q_{nom} is the nominal mass flow rate of water at reference conditions that would result in a pressure drop of 1 bar (15 psi).
- Q_{max} is the recommended maximum mass flow rate for each sensor size.

For questions regarding expected performance in specific applications, please contact your regional Siemens Measurement Intelligence team.

Flow rate summary by FCS700 sensor size

Nominal size	Zero stability kg/h	lb/h	Q_{flat} kg/h	lb/min	Q_{nom} kg/h	lb/min	Q_{max} kg/h	lb/min
DN 100	13.0	28.6	20 000	734	250 000	9 175	300 000	11 010
DN 150	25.0	55.0	38 000	1395	500 000	18 350	600 000	22 020
DN 200	27.0	59.4	45 000	1652	900 000	33 030	1 100 000	40 370

Performance summary by FCS700 sensor size and transmitter type

Sensor size			DN 100	DN 150	DN 200
Mass flow (liquids)					
Accuracy	% (of rate)	FCT020	± 0.2	± 0.2	± 0.2
	% (of rate)	FCT040	± 0.1	± 0.1	± 0.1
Zero stability	kg/h (lb/h)		± 13 (28.6)	± 25 (55)	± 27 (59.4)
Density (liquids)					
Accuracy	kg/m³ (lb/ft³)	FCT020/FCT0-40	± 4 (0.25)	± 4 (0.25)	± 4 (0.25)
	kg/m3 (lb/ft)	FCT040	± 2 (0.12)	± 2 (0.12)	± 2 (0.12)
Mass flow (gases)					
Accuracy	% (of rate)	FCT020	± 0.75	± 0.75	± 0.75
	% (of rate)	FCT040	± 0.35	± 0.35	± 0.5
Temperature					
Accuracy	°C (°F)		± 1 (1.8)	± 1 (1.8)	± 1 (1.8)

Note:

The accuracy values in the table above are based on reference conditions at the time of calibration and represent the combined measurement uncertainties including sensor, electronic and pulse output interface.

Liquid density calibration is performed when density accuracy of 0.5 kg/m³ (0.03 lb/ft³) is selected in the model code.

Mass flow calibration and density adjustment for liquids

Siemens SITRANS FC Coriolis meters are calibrated in rigs accredited according to the international standard DIN EN ISO/IEC 17025:2018. Each flowmeter comes with a standard calibration certificate.

Mass flow calibration takes place at reference conditions. Specific values are listed in the standard calibration certificate.

Mass flow calibration reference conditions

Fluid	Water
Density	900 ... 1 100 kg/m³ (56 ... 69 lb/ft³)
Fluid temperature	10 ... 35 °C (50 ... 95 °F), average temperature: 22.5 °C (72.5 °F)
Ambient temperature	10 ... 35 °C (50 ... 95 °F)
Process pressure	1 ... 5 bar (15 ... 73 psi)

Density calibration reference conditions

Flow condition	Fully developed flow profile
Fluid densities used to obtain density calibration constants	700 kg/m³ (44 lb/ft³) 1 000 kg/m³ (62 lb/ft³) 1 650 kg/m³ (103 lb/ft³)
Fluid temperature	20 °C (68 °F)
Determination of temperature compensation coefficients	20 ... 80 °C (68 ... 176 °F)

Analog output performance specification

Typical additional uncertainty when using the analog current output: ± 0.04 % at a nominal mid-range current output of 12 mA, which includes the effects of: output adjustment, linearity, power supply variation, load resistance variation, short-term and long-term drift for one year, and ambient temperature effect on the transmitter in the range 20 °C ± 30 °C (14 ... 122 °F).

Process pressure effect on flow measurement performance

Changes in operating pressure have a small effect on the mass flow measurement performance. When the pressure changes are very large, this effect can be corrected by a dynamic pressure input or a fixed process pressure.

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Technical specifications (continued)

Sensor size, material	Additional flow measurement errors due to change in operating pressure from reference pressure	
	in % of rate per 1 bar variation	in % of rate per 1 psi variation
DN 100, AISI 316L	-0.0298	-0.00199
DN 100, alloy 22	-0.0313	-0.00216
DN 150, AISI 316L	-0.0484	-0.00334
DN 200, AISI 316L	-0.0183	-0.00126

Process temperature effect

For mass flow measurement, process fluid temperature effect is defined as the change in sensor flow accuracy due to process fluid temperature change, away from the 20 °C (68 °F) reference condition. Variation in process temperature influences the measuring tube characteristics and this is compensated for using the built-in PT 1000 temperature sensor.

A small flow uncertainty remains in the compensation circuit, defined below.

Uncertainty due to process temperature change: ± 0.001% of mass flow rate per °C (± 0.0006% of mass flow rate per °F)

Temperature effect on zero

Temperature effect on the mass flow zero-point quality can be corrected by zeroing at the process fluid temperature.

Process conditions

Process fluid temperature range

Design version	Transmitter	Process fluid temperature range
Compact, standard neck	Aluminum	Standard [-50 ... +150 °C (-58 ... +302 °F)]
Remote, standard neck, or long neck	Aluminum or stainless steel	Standard [-70 ... +150 °C (-94 ... +302 °F)]
Remote only, long neck only	Aluminum or stainless steel	Medium [-70 ... +230 °C (-94 ... +446 °F)]
		High [0 ... 350 °C (32 ... 662 °F)]

Operating pressure

The maximum allowed process pressure depends on the selected process connection and process temperature.

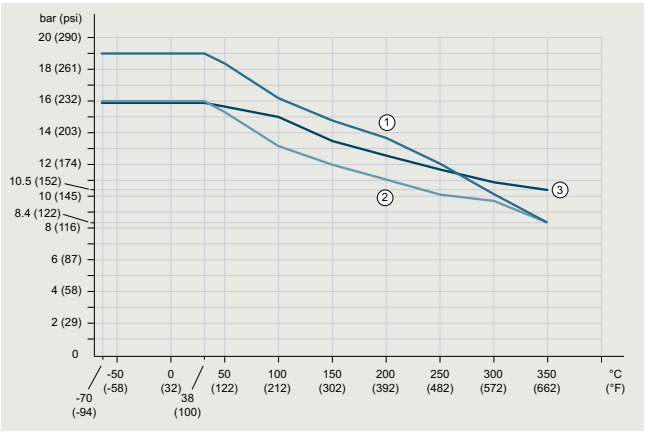
The given process temperature and process pressure ranges are calculated and approved without corrosion or erosion effects.

Pressure versus temperature relationship depending on selected process connection

The following diagrams show the process pressure as a function of process temperature, as well as the process connection used (type and size of process connection).

Calculations for ASME flanges are based on ASME B16.5 Material group 2.2 (316/316L dual certified).

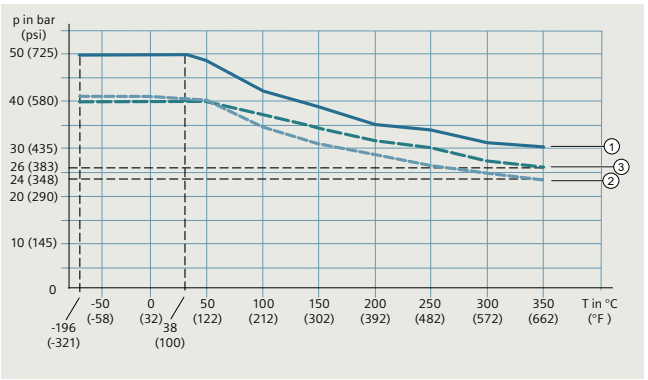
ASME class 150, EN PN 16



Allowed process pressure as a function of process fluid temperature

1	Process connection compatible to ASME B16.5 class 150
2	Heat tracing connection compatible to ASME B16.5 class 150
3	Process connection compatible to EN 1092-1 PN 16

ASME class 300, EN PN 40



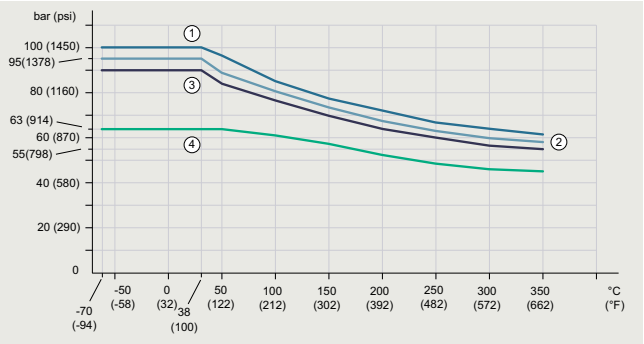
Allowed process pressure as a function of process fluid temperature

1	Process connection compatible to ASME B16.5 class 300
2	Heat tracing connection for ASME B16.5 class 300
3	Process and heat tracing connection compatible to EN 1092-1 PN 40

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Technical specifications (continued)

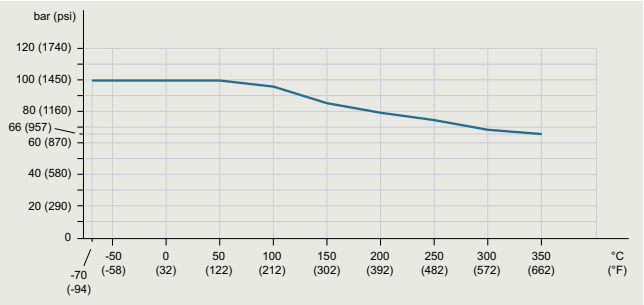
ASME class 600, EN PN63



Allowed process pressure as a function of process fluid temperature

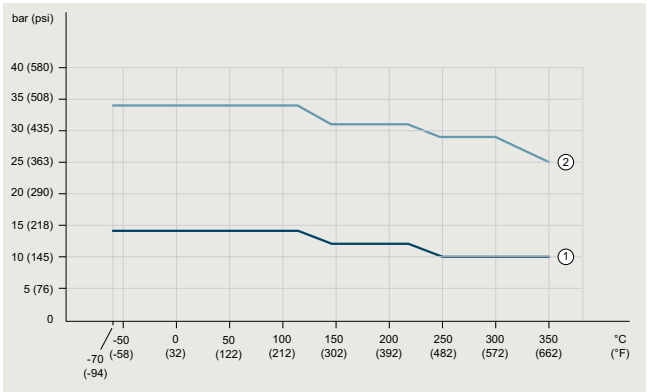
1	Process connection compatible to ASME B16.5 class 600: • FCS700 size DN 100, AISI 316L or alloy 22 wetted parts (without ASME B31.3 compliance) • FCS700 size DN 100, alloy 22 wetted parts and ASME B31.3 compliance (requires option C70) • FCS700 size DN 200, AISI 316L wetted parts (without ASME B31.3 compliance)
2	Process connection compatible to ASME B16.5 class 600: • FCS700 size DN 100, AISI 316L wetted parts and ASME B31.3 compliance (requires option C70) • FCS700 size DN 200, AISI 316L wetted parts and ASME B31.3 compliance (requires option C70)
3	Process connection compatible to ASME B16.5 class 600: FCS700 size DN 150
4	Process connection compatible to EN 1092-1 PN 63

EN PN 100



Allowed process pressure as a function of process fluid temperature, compatible to EN 1092-1 PN 100

JIS 10 K, JIS 20 K



Allowed process pressure as a function of process connection temperature

1	Process connection compatible to JIS B 2220 10 K
2	Process connection compatible to JIS B 2220 20 K

Rupture disc

The rupture disc is located on the sensor housing. It is available with some FC700 specification combinations (selectable using order option code S32).

Its bursting pressure is 20 bar (291 psi), the nominal diameter is 8 mm (0.315"). In the case of larger nominal diameters and high pressures, the entire process pressure may not be released across the rupture disc. In such case it is possible to request a customized design from your local Siemens sales organization.

In the event of a burst pipe, the rupture disc provides an acoustic signal in applications with gases.

Ambient conditions

Allowed ambient and storage temperature of SITRANS FC700 series is influenced by the temperature specification of FCS700 sensor, FCT0X0 transmitter and the interconnecting cable.

Ambient temperature

Device-surrounding air temperature is considered as ambient temperature. If the device is operating outdoors make sure that the solar irradiation does not increase the surface temperature of the device higher than the allowed maximum ambient temperature. Transmitter display has limited legibility below -20 °C (-4 °F).

The sensor ambient temperature limits may also be influenced by the process fluid temperature, details shown in the chapter “Sensors” (Technical specifications).

Maximum ambient temperature ranges for FC700 series

Cable type	Transmitter style	Device	Ambient temperature range
None	Compact	Sensor and transmitter	-40 ... +60 °C (-40 ... +140 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +60 °C (-40 ... +140 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +60 °C (-31 ... +140 °F)

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Technical specifications (continued)

Ambient temperature range for NTEP custody transfer approval

Cable type	Transmitter style	Device	Ambient temperature range
None	Compact	Sensor and transmitter	-40 ... +50 °C (-40 ... +122 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +50 °C (-40 ... +122 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +50 °C (-31 ... +122 °F)

Maximum storage temperature ranges for FC700 series

Cable type	Transmitter style	Device	Storage temperature range
None	Compact	Sensor and transmitter	-40 ... +60 °C (-40 ... +140 °F)
Standard cable	Remote	Sensor	-50 ... +80 °C (-58 ... +176 °F)
		Transmitter	-40 ... +60 °C (-40 ... +140 °F)
Fire retardant cable	Remote	Sensor	-35 ... +80 °C (-31 ... +176 °F)
		Transmitter	-35 ... +60 °C (-31 ... +140 °F)

Temperature specification of FC700 series Ex versions located in hazardous areas

Please select appropriate equipment in accordance with the laws and regulations of the relevant country/region, when it is used in a location where explosive atmospheres may be present.

The maximum ambient and process fluid temperatures depending on explosion groups and temperature classes can be determined via the SITRANS FC order code together with the Ex code (see the corresponding explosion proof type manual).

Note: The maximum process fluid temperature could be further restricted due to process connection type. Refer to curves above under the heading, “Allowed ambient temperature for FCS700 sensors”.

FCS700 all sizes, compact transmitter

Standard temperature specification

Ex approvals:

- Gas group IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas group A, B, C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	70 °C (158 °F)	39 °C (102 °F)
T5	85 °C (185 °F)	54 °C (129 °F)
T4	121 °C (249 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

Ex approvals:

- Gas group IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas group C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature
T6	65 °C (149 °F)	41 °C (105 °F)
T5	80 °C (176 °F)	56 °C (132 °F)
T4	117 °C (242 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	60 °C (140 °F)
T2	150 °C (302 °F)	60 °C (140 °F)
T1	150 °C (302 °F)	60 °C (140 °F)

FCS700 all sizes, remote transmitter

Standard temperature, standard neck

Ex approvals:

- Gas group IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas group A, B, C, D, E, F and G: FM

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Technical specifications (continued)

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	70 °C (158 °F)	37 °C (98 °F)	37 °C (98 °F)
T5	85 °C (185 °F)	52 °C (125 °F)	52 °C (125 °F)
T4	121 °C (249 °F)	80 °C (176 °F)	60 °C (140 °F)
T3	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T2	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T1	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)

Ex approvals:

- Gas group IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO
- Gas group C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	39 °C (54 °F)	39 °C (54 °F)
T5	80 °C (176 °F)	54 °C (129 °F)	54 °C (129 °F)
T4	117 °C (242 °F)	80 °C (176 °F)	49 °C (120 °F)
T3	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T2	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)
T1	150 °C (302 °F)	78 °C (172 °F)	49 °C (120 °F)

Standard temperature, long neck

Ex approvals:

Gas group IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	70 °C (158 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	85 °C (185 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	121 °C (249 °F)	80 °C (176 °F)	73 °C (163 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:

Gas group A, B, C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	70 °C (158 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	85 °C (185 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	121 °C (249 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Ex approvals:

Gas group IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	80 °C (176 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	117 °C (242 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

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Technical specifications (continued)

Ex approvals:
Gas group C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	80 °C (176 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	117 °C (242 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T2	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)
T1	150 °C (302 °F)	80 °C (176 °F)	70 °C (158 °F)

Medium temperature, long neck
Ex approvals:
Gas group IIC and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	70 °C (158 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	85 °C (185 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	121 °C (249 °F)	80 °C (176 °F)	73 °C (163 °F)
T3	186 °C (366 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

Ex approvals:
Gas group A, B, C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	70 °C (158 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	85 °C (185 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	121 °C (249 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	186 °C (366 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

Ex approvals:
Gas group IIB and IIIC: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	80 °C (176 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	117 °C (242 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	183 °C (361 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

Ex approvals:
Gas group C, D, E, F and G: FM

Temperature class	Maximum process temperature	Maximum ambient temperature Standard cable	Fire retardant cable
T6	65 °C (149 °F)	44 °C (111 °F)	44 °C (111 °F)
T5	80 °C (176 °F)	59 °C (138 °F)	59 °C (138 °F)
T4	117 °C (242 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	183 °C (361 °F)	80 °C (176 °F)	64 °C (147 °F)
T2	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)
T1	220 °C (428 °F)	80 °C (176 °F)	59 °C (138 °F)

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Technical specifications (continued)

High temperature, long neck

Ex approvals:

• All gas groups: ATEX, IEC Ex, EAC Ex, NEPSI, Korea Ex, INMETRO

Temperature class	Maximum process temperature	Maximum ambient temperature	
		Standard cable	Fire retardant cable
T6	65 °C (149 °F)	62 °C (143 °F)	62 °C (143 °F)
T5	80 °C (176 °F)	77 °C (170 °F)	77 °C (170 °F)
T4	115 °C (239 °F)	80 °C (176 °F)	74 °C (165 °F)
T3	180 °C (356 °F)	80 °C (176 °F)	65 °C (149 °F)
T2	275 °C (527 °F)	73 °C (163 °F)	50 °C (122 °F)
T1	350 °C (662 °F)	60 °C (140 °F)	40 °C (104 °F)

Ex approvals:

• All gas groups: FM

Temperature class	Maximum process temperature	Maximum ambient temperature	
		Standard cable	Fire retardant cable
T6	65 °C (149 °F)	62 °C (143 °F)	62 °C (143 °F)
T5	80 °C (176 °F)	77 °C (170 °F)	70 °C (158 °F)
T4	115 °C (239 °F)	80 °C (176 °F)	70 °C (158 °F)
T3	180 °C (356 °F)	80 °C (176 °F)	65 °C (149 °F)
T2	275 °C (527 °F)	73 °C (163 °F)	50 °C (122 °F)
T1	350 °C (662 °F)	60 °C (140 °F)	40 °C (104 °F)

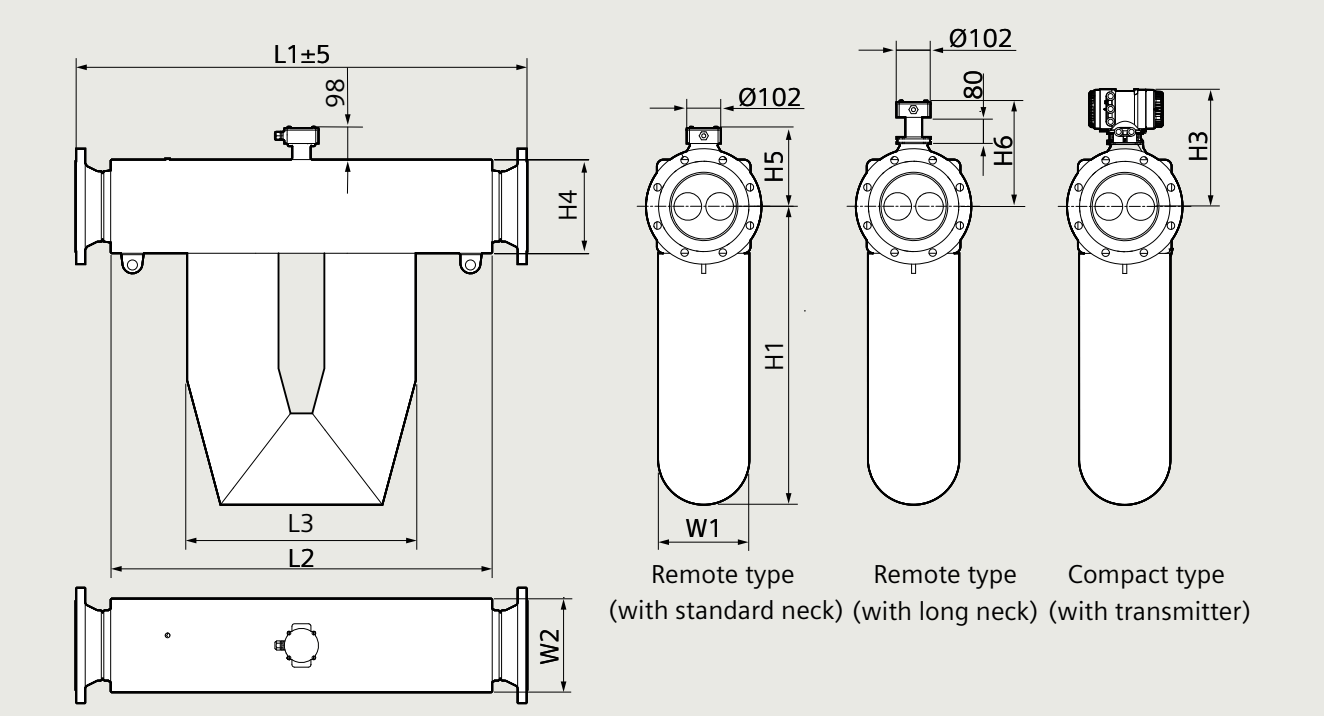
Additional ambient and environmental specifications

Specification	Rating/level of compliance
Relative humidity	0 ... 95
Ingress protection	IP66 or IP67 with suitable cable glands
Environmental pollution	Pollution degree 4 in accordance with EN 61010-1 whilst in operation
Maximum altitude	2 000 m (6 600 ft) above mean sea level (MSL)
Mechanical load	• Transmitter: 10 ... 500 Hz, 1g • Sensor: 10 ... 500 Hz, 1g according to IEC 60068-2-6
Electromagnetic (EMC) immunity	• EN IEC 61326-1, Table 2 • EN IEC 61326-2-3 • EN IEC 61326-2-5 • NAMUR NE21 recommendation • DNV-CG-0339 section 3, chapter 14
Surge immunity emission	• EN IEC 61000-4-5 for lightning protection • EN IEC 61000-3-2, Class A (harmonic current emissions) • EN IEC 61000-3-3, Class A (voltage fluctuations) • Immunity assessment criterion: output signal fluctuation is within ± 1% of the output span.
Overvoltage	Category II according to EN IEC 61010-1

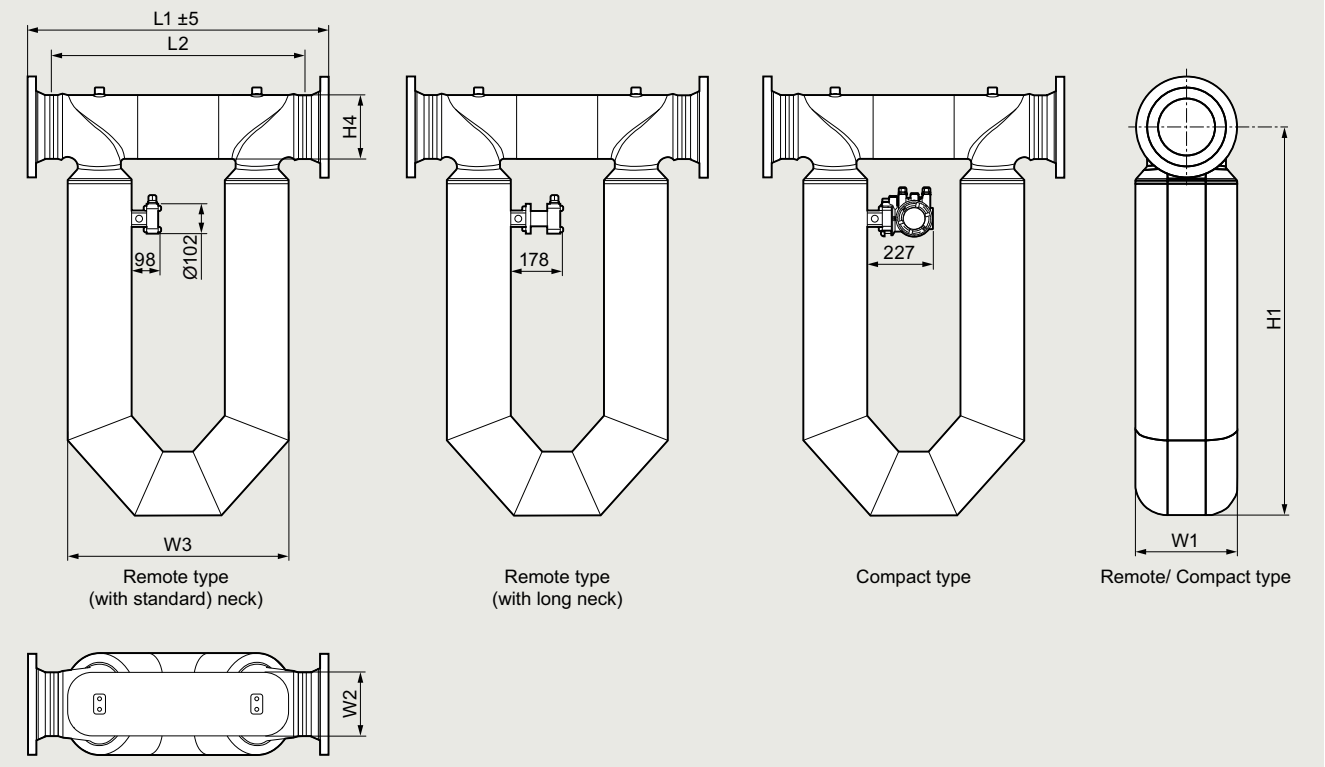
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Dimensional drawings

Drawings, dimensions and weight for FCS700 sensors



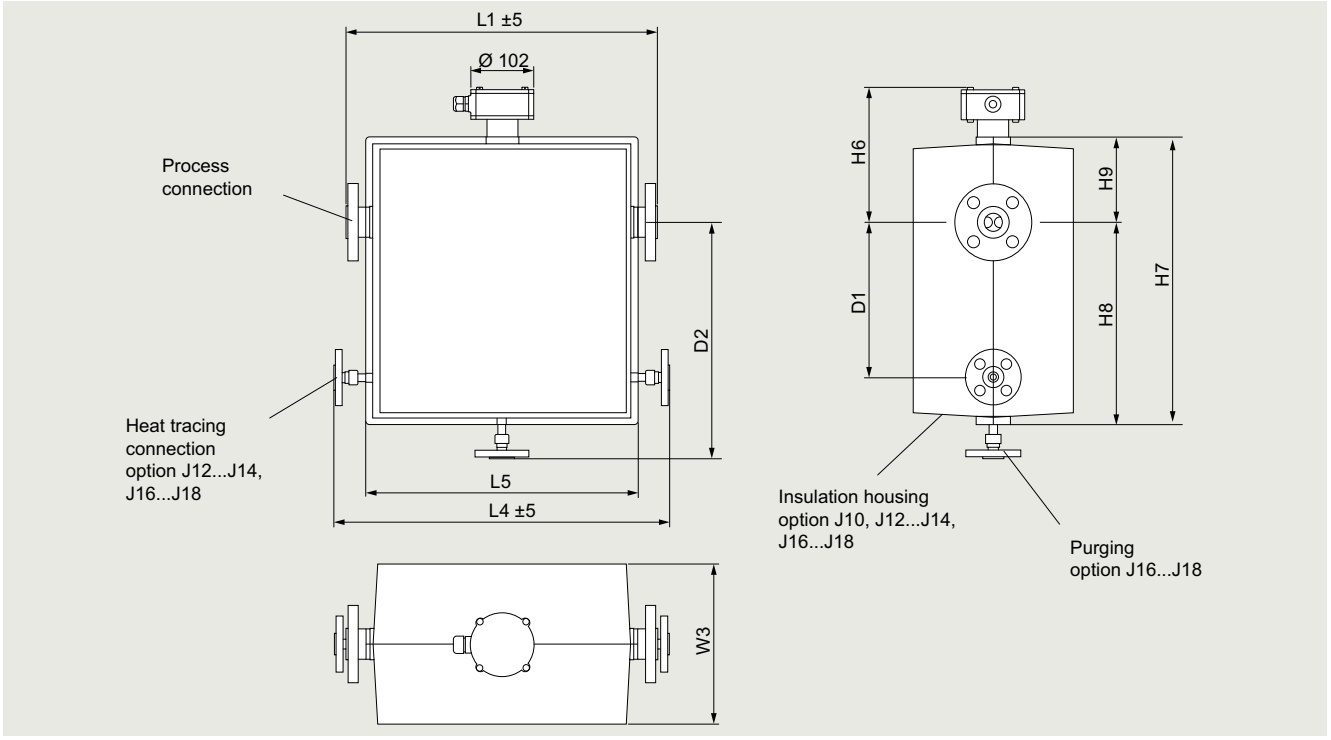
Dimensions in mm, sizes DN 100 and DN 150



Dimensions in mm, sizes DN 200

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Dimensional drawings (continued)



Dimensions in mm (with insulation and heating options)

FCS700 sensor dimensions without L1

Nominal size	L2	L3	L4	L5	W1	W2	W3	D1	D2
	Dimensions in mm (inch)								
DN 100	892 (35.1)	691 (27.2)	1050 (41.3)	944 (37.2)	168 (6.6)	176 (6.9)	342 (13.5)	350 (13.8)	677 (26.7)
DN 150	1 140 (44.9)	683 (26.9)	n/a	n/a	273 (10.7)	280 (11)	n/a	n/a	n/a
DN 200	870 (34.3)	759 (29.9)	n/a	n/a	350 (13.8)	350 (13.8)	n/a	n/a	n/a

Nominal size	L2	L3	L4	L5	W1	W2	W3	D1	D2
	Dimensions in mm (inch)								
DN 100	556 (21.9)	315 (12.4)	176 (6.9)	186 (7.3)	266 (10.5)	824 (32.4)	628 (24.7)	196 (7.7)	677 (26.7)
DN 150	891 (35.1)	367 (14.5)	280 (11)	238 (9.4)	320 (12.6)	n/a	n/a	n/a	n/a
DN 200	1 335 (52.6)	n/a	219 (8.6)	n/a	n/a	n/a	n/a	n/a	n/a

Overall length L1 and weight

The overall length of the sensor depends on the selected process connection (type and size). The following tables list the overall length and weight as functions of the individual process connection.

The weights in the tables are for the remote type. Additional weight for the integral type: up to 3.2 kg (7.1 b).

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to ASME B16.5, AISI 316L wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
ASME 4" class 150, raised face (RF)	1 100 (43.3)	95 (210)	n/a	n/a	n/a	n/a
ASME 4" class 300, raised face (RF)	1 100 (43.3)	103 (227)	n/a	n/a	n/a	n/a
ASME 4" class 600, raised face (RF)	1 100 (43.3)	112 (246)	n/a	n/a	n/a	n/a
ASME 4" class 600, ring joint (RJ)	1 100 (43.3)	112 (246)	n/a	n/a	n/a	n/a
ASME 5" class 150, raised face (RF)	1 100 (43.3)	97 (214)	n/a	n/a	n/a	n/a
ASME 5" class 300, raised face (RF)	1 100 (43.3)	109 (239)	n/a	n/a	n/a	n/a
ASME 5" class 600, raised face (RF)	1 160 (45.7)	136 (299)	n/a	n/a	n/a	n/a
ASME 5" class 600, ring joint (RJ)	1 160 (45.7)	136 (299)	n/a	n/a	n/a	n/a
ASME 6" class 150, raised face (RF)	1 100 (43.3)	101 (223)	1 350 (53.1)	290 (639)	n/a	n/a
ASME 6" class 300, raised face (RF)	1 100 (43.3)	118 (259)	1 350 (53.1)	307 (677)	n/a	n/a
ASME 6" class 600, raised face (RF)	1 200 (47.2)	149 (329)	1 390 (54.7)	332 (732)	n/a	n/a
ASME 6" class 600, ring joint (RJ)	1 200 (47.2)	150 (331)	1 390 (54.7)	333 (733)	n/a	n/a
ASME 8" class 150, raised face (RF)	n/a	n/a	1 350 (53.1)	302 (666)	1 030 (40.6)	299 (659)
ASME 8" class 300, raised face (RF)	n/a	n/a	1 350 (53.1)	324 (714)	1 050 (41.3)	323 (712)
ASME 8" class 600, raised face (RF)	n/a	n/a	1 440 (56.7)	371 (818)	1 120 (44.1)	368 (811)
ASME 8" class 600, ring joint (RJ)	n/a	n/a	1 440 (56.7)	372 (821)	1 120 (44.1)	369 (814)
ASME 10" class 150, raised face (RF)	n/a	n/a	n/a	n/a	1 090 (42.9)	318 (701)
ASME 10" class 300, raised face (RF)	n/a	n/a	n/a	n/a	1 140 (44.9)	363 (800)
ASME 10" class 600, raised face (RF)	n/a	n/a	n/a	n/a	1 220 (48)	451 (994)
ASME 10" class 600, ring joint (RJ)	n/a	n/a	n/a	n/a	1 220 (48)	453 (999)

L1 dimension and weight with process connections according to ASME B16.5, alloy 22 wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
ASME 5" class 150, raised face (RF)	1 100 (43.3)	99 (219)	n/a	n/a	n/a	n/a
ASME 5" class 300, raised face (RF)	1 100 (43.3)	111 (245)	n/a	n/a	n/a	n/a
ASME 5" class 600, raised face (RF)	1 110 (43.7)	133 (293)	n/a	n/a	n/a	n/a
ASME 6" class 150, raised face (RF)	1 100 (43.3)	106 (235)	n/a	n/a	n/a	n/a
ASME 6" class 300, raised face (RF)	1 100 (43.3)	123 (270)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

L1 dimension and weight with process connections according to EN 1092-1, AISI 316L wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100		DN 150		DN 200	
	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)	L1 in mm (inch)	Weight in kg (lb)
EN DN 100 PN 16 type B1, raised face (RF)	1 100 (43.3)	92 (202)	n/a	n/a	n/a	n/a
EN DN 100 PN 16 type D, with groove	1 100 (43.3)	91 (201)	n/a	n/a	n/a	n/a
EN DN 100 PN 16 type E, with spigot	1 100 (43.3)	91 (201)	n/a	n/a	n/a	n/a
EN DN 100 PN 16 type F, with recess	1 100 (43.3)	91 (201)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type B1, raised face (RF)	1 100 (43.3)	95 (210)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type D, with groove	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type E, with spigot	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 100 PN 40 type F, with recess	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type B1, raised face (RF)	1 100 (43.3)	100 (220)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type D, with groove	1 100 (43.3)	99 (219)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type E, with spigot	1 100 (43.3)	98 (217)	n/a	n/a	n/a	n/a
EN DN 100 PN 63 type F, with recess	1 100 (43.3)	99 (219)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type B1, raised face (RF)	1 100 (43.3)	106 (233)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type D, with groove	1 100 (43.3)	105 (232)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type E, with spigot	1 100 (43.3)	104 (230)	n/a	n/a	n/a	n/a
EN DN 100 PN 100 type F, with recess	1 100 (43.3)	105 (232)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type B1, raised face (RF)	1 100 (43.3)	95 (209)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type D, with groove	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type E, with spigot	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 125 PN 16 type F, with recess	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type B1, raised face (RF)	1 100 (43.3)	99 (218)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type D, with groove	1 100 (43.3)	99 (218)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type E, with spigot	1 100 (43.3)	98 (216)	n/a	n/a	n/a	n/a
EN DN 125 PN 40 type F, with recess	1 100 (43.3)	98 (216)	n/a	n/a	n/a	n/a
EN DN125 PN63 type B1, raised face (RF)	1 100 (43.3)	109 (240)	n/a	n/a	n/a	n/a
EN DN 125 PN 63 type D, with groove	1 100 (43.3)	108 (239)	n/a	n/a	n/a	n/a
EN DN 125 PN 63 type E, with spigot	1 100 (43.3)	107 (237)	n/a	n/a	n/a	n/a
EN DN 125 PN 63 type F, with recess	1 100 (43.3)	108 (239)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
EN DN 125 PN 100 type B1, raised face (RF)	1 140 (44.9)	121 (267)	n/a	n/a	n/a	n/a
EN DN 125 PN 100 type D, with groove	1 140 (44.9)	121 (267)	n/a	n/a	n/a	n/a
EN DN 125 PN 100 type E, with spigot	1 140 (44.9)	119 (263)	n/a	n/a	n/a	n/a
EN DN 125 PN 100 type F, with recess	1 140 (44.9)	120 (265)	n/a	n/a	n/a	n/a
EN DN 150 PN 16 type B1, raised face (RF)	1 100 (43.3)	98 (216)	1 350 (53.1)	288 (634)	n/a	n/a
EN DN 150 PN 16 type D, with groove	1 100 (43.3)	98 (216)	1 350 (53.1)	287 (632)	n/a	n/a
EN DN150 PN16 type E, with spigot	1 100 (43.3)	97 (214)	1 350 (53.1)	286 (631)	n/a	n/a
EN DN 150 PN 16 type F, with recess	1 100 (43.3)	97 (214)	1 350 (53.1)	287 (632)	n/a	n/a
EN DN 150 PN 40 type B1, raised face (RF)	1 100 (43.3)	105 (231)	1 350 (53.1)	294 (648)	n/a	n/a
EN DN 150 PN 40 type D, with groove	1 100 (43.3)	104 (230)	1 350 (53.1)	293 (647)	n/a	n/a
EN DN 150 PN 40 type E, with spigot	1 100 (43.3)	103 (228)	1 350 (53.1)	293 (647)	n/a	n/a
EN DN 150 PN 40 type F, with recess	1 100 (43.3)	104 (230)	1 350 (53.1)	293 (647)	n/a	n/a
EN DN 150 PN 63 type B1, raised face (RF)	1 140 (44.9)	124 (274)	1 350 (53.1)	311 (685)	n/a	n/a
EN DN 150 PN 63 type D, with groove	1 140 (44.9)	124 (274)	1 350 (53.1)	310 (684)	n/a	n/a
EN DN 150 PN 63 type E, with spigot	1 140 (44.9)	122 (269)	1 350 (53.1)	309 (681)	n/a	n/a
EN DN 150 PN 63 type F, with recess	1 140 (44.9)	123 (272)	1 350 (53.1)	310 (684)	n/a	n/a
EN DN 150 PN 100 type B1, raised face (RF)	1 180 (46.5)	138 (303)	n/a	n/a	n/a	n/a
EN DN 150 PN 100 type D, with groove	1 180 (46.5)	137 (302)	n/a	n/a	n/a	n/a
EN DN 150 PN 100 type E, with spigot	1 180 (46.5)	136 (299)	n/a	n/a	n/a	n/a
EN DN 150 PN 100 type F, with recess	1 180 (46.5)	137 (301)	n/a	n/a	n/a	n/a
EN DN 200 PN 16 type B1, raised face (RF)	n/a	n/a	1 350 (53.1)	294 (649)	1 010 (39.8)	290 (639)
EN DN 200 PN 16 type D, with groove	n/a	n/a	1 350 (53.1)	294 (649)	n/a	n/a
EN DN 200 PN 16 type E, with spigot	n/a	n/a	1 350 (53.1)	293 (646)	n/a	n/a
EN DN 200 PN 16 type F, with recess	n/a	n/a	1 350 (53.1)	293 (646)	n/a	n/a
EN DN200 PN40 type B1, raised face (RF)	n/a	n/a	1 350 (53.1)	311 (685)	1 030 (40.6)	308 (679)
EN DN 200 PN 40 type D, with groove	n/a	n/a	1 350 (53.1)	310 (683)	n/a	n/a
EN DN 200 PN 40 type E, with spigot	n/a	n/a	1 350 (53.1)	308 (680)	n/a	n/a
EN DN 200 PN 40 type F, with recess	n/a	n/a	1 350 (53.1)	309 (682)	n/a	n/a
EN DN 200 PN 63 type B1, raised face (RF)	n/a	n/a	1 350 (53.1)	333 (733)	1 060 (41.7)	332 (732)

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Dimensional drawings (continued)

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
EN DN 200 PN 63 type D, with groove	n/a	n/a	1 350 (53.1)	332 (732)	n/a	n/a
EN DN 200 PN 63 type E, with spigot	n/a	n/a	1 350 (53.1)	330 (728)	n/a	n/a
EN DN 200 PN 63 type F, with recess	n/a	n/a	1 350 (53.1)	331 (730)	n/a	n/a
EN DN 200 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 100 (43.3)	362 (798)
EN DN 250 PN 16 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 080 (42.5)	306 (675)
EN DN 250 PN 40 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 130 (44.5)	343 (756)
EN DN 250 PN 63 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 150 (45.3)	370 (816)
EN DN 250 PN 100 type B1, raised face (RF)	n/a	n/a	n/a	n/a	1 150 (45.3)	433 (955)

L1 dimension and weight with process connections according to EN 1092-1, alloy 22 wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
EN DN 125 PN 16, type B1, raised face (RF)	1 100 (43.3)	96 (212)	n/a	n/a	n/a	n/a
EN DN 125 PN 40, type B1, raised face (RF)	1 100 (43.3)	101 (222)	n/a	n/a	n/a	n/a
EN DN 150 PN 16, type B1, raised face (RF)	1 100 (43.3)	103 (227)	n/a	n/a	n/a	n/a
EN DN 150 PN 40, type B1, raised face (RF)	1 100 (43.3)	110 (241)	n/a	n/a	n/a	n/a

L1 dimension and weight with process connections according to JIS B 2220, AISI 316L wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
JIS DN 100 10 K	1 100 (43.3)	91 (200)	n/a	n/a	n/a	n/a
JIS DN 100 20 K	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
JIS DN 125 10 K	1 100 (43.3)	94 (208)	n/a	n/a	n/a	n/a
JIS DN 125 20 K	1 100 (43.3)	101 (222)	n/a	n/a	n/a	n/a

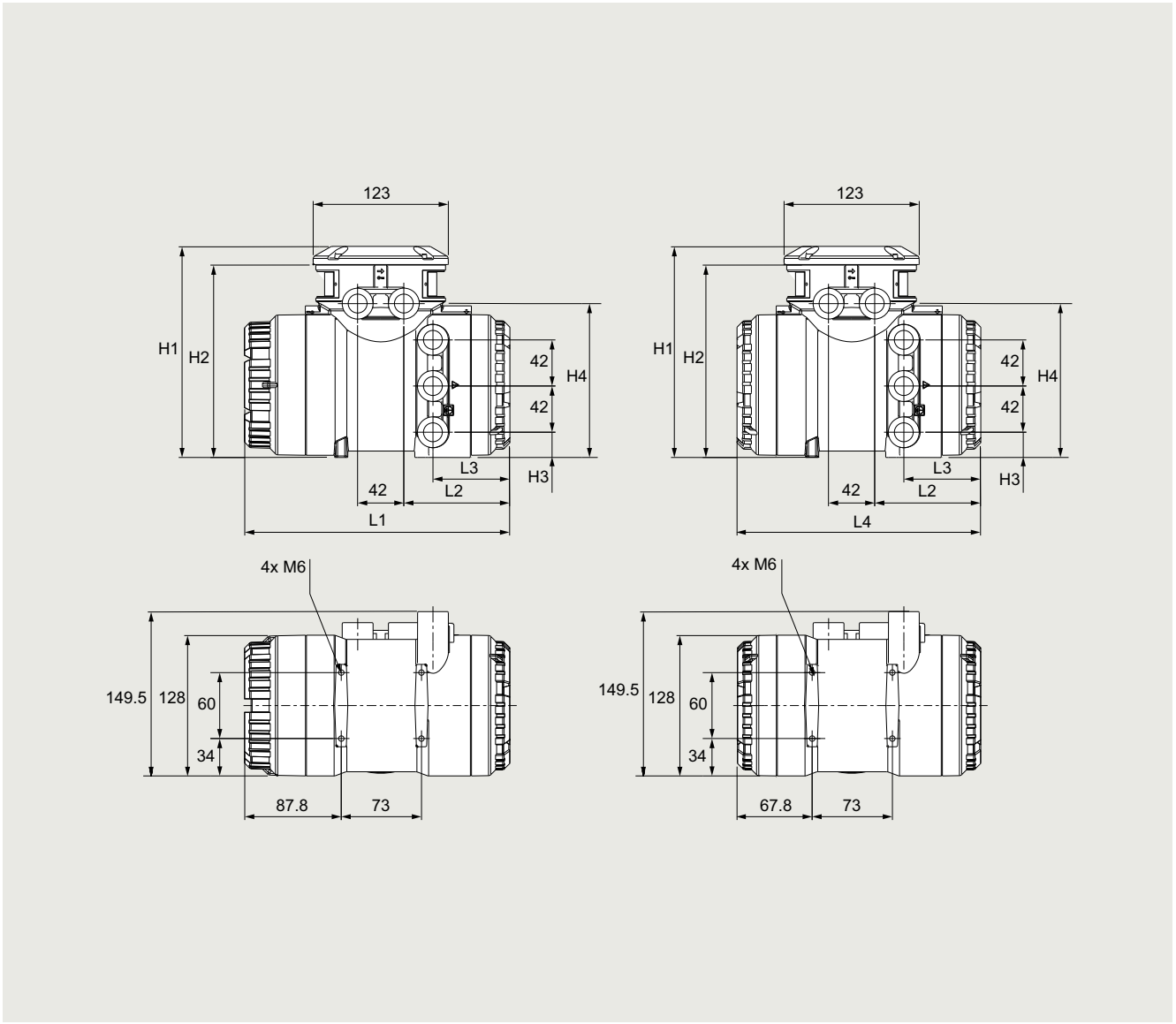
L1 dimension and weight with process connections according to JIS B 2220, alloy 22 wetted parts

Process connection size and type	FCS700 sensor nominal size DN 100 L1 in mm (inch)	Weight in kg (lb)	DN 150 L1 in mm (inch)	Weight in kg (lb)	DN 200 L1 in mm (inch)	Weight in kg (lb)
JIS DN 125 10 K	1 100 (43.3)	97 (213)	n/a	n/a	n/a	n/a
JIS DN 125 20 K	1 100 (43.3)	103 (228)	n/a	n/a	n/a	n/a

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Dimensional drawings (continued)

Drawings, dimensions and weight for FCT020 and FCT040 transmitters



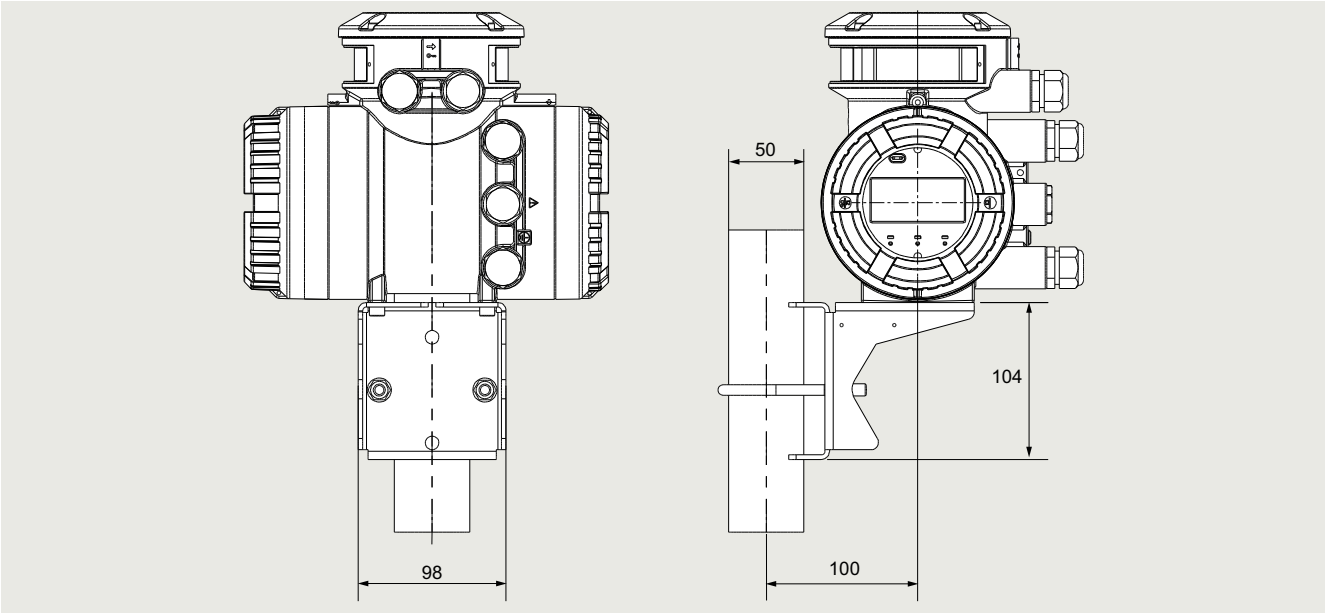
Dimensions of FCT020 or FCT040 transmitter in mm. Transmitter with display shown on the left. Transmitter without display shown on the right.

Dimensions L1 to L4 and H1 to H4 (material options: stainless steel, aluminum)

Material	L1 in mm (inch)	L2 in mm (inch)	L3 in mm (inch)	L4 in mm (inch)	H1 in mm (inch)	H2 in mm (inch)	H3 in mm (inch)	H4 in mm (inch)
Stainless steel	255.5 (10.06)	110.5 (4.35)	69 (2.72)	235 (9.25)	201 (7.91)	184 (7.24)	24 (0.94)	150.5 (5.93)
Aluminum	241.5 (9.51)	96.5 (3.8)	70 (2.76)	221 (8.7)	192 (7.56)	175 (6.89)	23 (0.91)	140 (5.51)

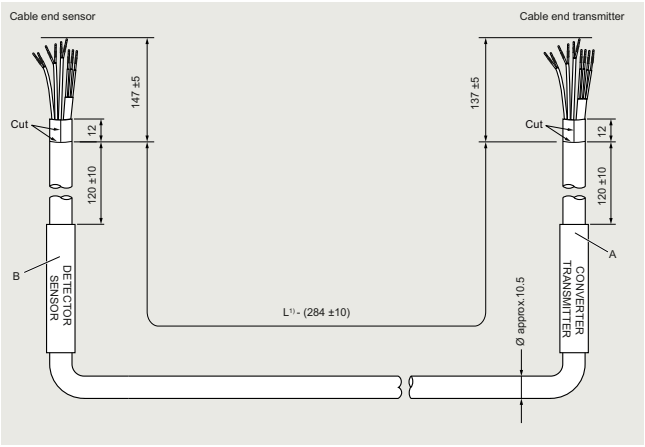
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Dimensional drawings (continued)



Connecting cable dimensions and weights

Standard cable

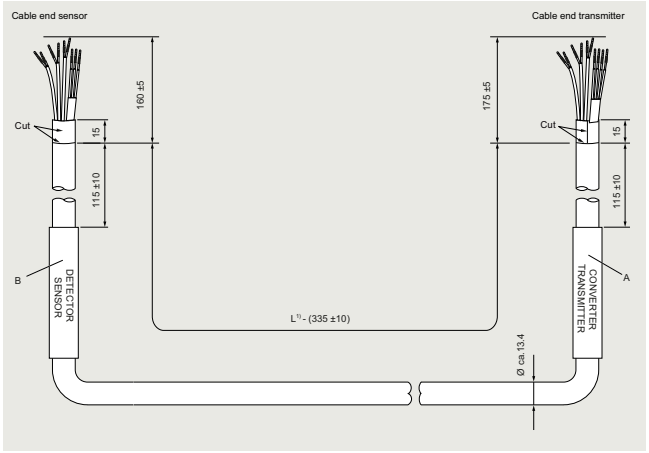


Dimensions in mm. Standard terminated cable. A and B are factory-fitted labels.

Option code	Cable length, L	Cable color
L51	5 m (16.4 ft)	Non-Ex: gray / Ex: blue
L54	10 m (32.8 ft)	
L57	15 m (49.2 ft)	
L60	20 m (65.6 ft)	
L63	30 m (98.4 ft)	

Weight of cable ≤ 0.200 kg/m (0.134 lb/ft)

Standard cable with steel-armored option



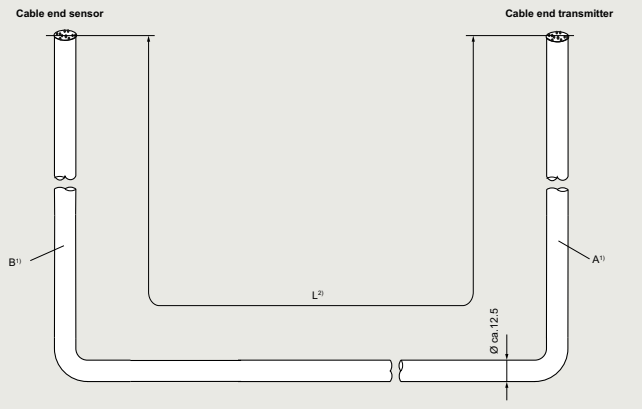
Dimensions in mm. Steel-armored terminated cable. A and B are factory-fitted labels.

Option code	Cable length, L	Cable color
L51 + A20/A21	5 m (16.4 ft)	Blue
L54 + A20/A21	10 m (32.8 ft)	
L57 + A20/A21	15 m (49.2 ft)	
L60 + A20/A21	20 m (65.6 ft)	
L63 + A20/A21	30 m (98.4 ft)	

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Dimensional drawings (continued)

Fire retardant cable



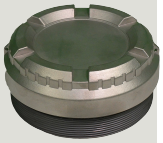
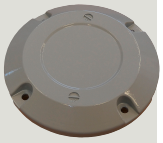
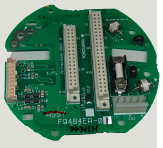
Dimensions in mm. Fire retardant unterminated cable. Labels A and B are supplied loose with termination kit.

Option code	Cable length, L	Cable color
L71	5 m (16.4 ft)	Gray
L74	10 m (32.8 ft)	
L77	15 m (49.2 ft)	
L80	20 m (65.6 ft)	
L83	30 m (98.4 ft)	

Weight of cable ≤ 0.270 kg/m (0.181 lb/ft)

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Selection and ordering data

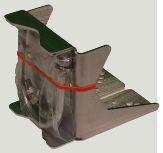
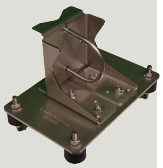
Description	Article No.	
Cover		
Back cover, aluminum PU coating	SAG:M3889JB-01	
Back cover, aluminum high corrosion protection coating	SAG:M3889JC-01	
Back cover, stainless steel	SAG:M3830YB-01	
Front cover, aluminum PU coating, with glass	SAG:M3889JD-01	
Front cover, aluminum high corrosion protection coating, with glass	SAG:M3889JE-01	
Front cover, stainless steel, with glass	SAG:M3829RC-01	
Neck cover, aluminum PU coating	SAG:M3889JF-01	
Neck cover, aluminum high corrosion protection coating	SAG:M3889JG-01	
Neck cover, stainless steel	SAG:M3830YC-01	
Base board		
Base board HART	SAG:M3829ND-01	
Base board for PROFIBUS Fieldbus	SAG:M3829JQ-01	
Base board Modbus	SAG:M3829ZR-01	
Amplifier for sensor incl. specific SN setting and customer set-up		
Transmitter cassette, FCT040, HART, Non-Ex, including serial number setting, without option board (please provide serial number)	SAG:M3889JH-01	
Transmitter cassette, FCT020, HART, Non-Ex, including serial number setting, without option board	SAG:M3889JJ-01	
Transmitter cassette, FCT040, Modbus, Non-Ex, including serial number setting, without option board	SAG:M3889JK-01	
Transmitter cassette, FCT020, Modbus, Non-Ex, including serial number setting, without option board	SAG:M3889JL-01	

Selection and ordering data (continued)

Description	Article No.	
Transmitter cassette, FCT040, PROFIBUS PA, Non-Ex, including SN setting	SAG:M3889JL-01	
Display (serial number mandatory)		
Display, HART FCT020 aluminum housing	SAG:M3889JN-01	
Display, HART FCT040 aluminum housing	SAG:M3889JP-01	
Display, Modbus FCT020 aluminum housing	SAG:M3889JY-01	
Display, Modbus FCT040 aluminum housing	SAG:M3889JZ-01	
Display, PROFIBUS FCT040 aluminum housing	SAG:M3889KA-01	
Display, HART FCT020 SST housing	SAG:M3889JN-01	
Display, HART FCT040 SST housing	SAG:M3889JP-01	
Display, Modbus FCT020 SST housing	SAG:M3889JY-01	
Display, Modbus FCT040 SST housing	SAG:M3889JZ-01	
Display, PROFIBUS FCT040 SST housing	SAG:M3889KA-01	
Accessories		
Cable cover	SAG:M3829NE-01	
Safety cover	SAG:M3829QC-01	
MicroSD card with mini case	SAG:M3829QR-01	
Complete O-Ring set transmitter/sensor	SAG:M3829QW-01	
O-Ring set 114,4x3,1 NBR/HNBR -40 ... 100 °C (-40 ... 212 °F)	SAG:M3827XJ-01	
O-Ring set 83x4 NBR [-50 ... +100 °C (-58 ... 212 °F)]	SAG:M3827XK-01	
O-Ring set 84x3 NBR [-50 ... +100 °C (-58 ... 212 °F)]	SAG:M3827XL-01	
Adapter NPT 1/2" ==> G1/2"	SAG:M3810EM-01	
Terminal box housing part	SAG:M3889KB-01	

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Selection and ordering data (continued)

Description	Article No.	
Terminal box cover and O-ring part	SAG:M3889KC-01	
Mounting bracket and bracket mounting set	SAG:M3810DR-01	
2" pipe mounting set	SAG:M3806JA-01	
Remote sensor cable standard		
5 meter sensor cable std terminated	SAG:M3889KJ-01	
10 meter sensor cable std terminated	SAG:M3889KK-01	
15 meter sensor cable std terminated	SAG:M3889KL-01	
20 meter sensor cable std terminated	SAG:M3889KM-01	
30 meter sensor cable std terminated	SAG:M3889KN-01	
50 meter sensor cable std not terminated	SAG:M3889KP-01	
100 meter sensor cable std not terminated	SAG:M3889KQ-01	
150 meter sensor cable std not terminated	SAG:M3889KR-01	
200 meter sensor cable std not terminated	SAG:M3889KS-01	
250 meter sensor cable std not terminated	SAG:M3889KT-01	
300 meter sensor cable std not terminated	SAG:M3889KW-01	
Cable termination set standard and Ex	SAG:M3889KX-01	
Remote sensor cable Ex		
5 meter sensor cable Ex terminated	SAG:M3889KY-01	
10 meter sensor cable Ex terminated	SAG:M3889KZ-01	
15 meter sensor cable Ex terminated	SAG:M3889LA-01	
20 meter sensor cable Ex terminated	SAG:M3889LB-01	
30 meter sensor cable Ex terminated	SAG:M3889LC-01	
50 meter sensor cable Ex not terminated	SAG:M3889LD-01	
100 meter sensor cable Ex not terminated	SAG:M3889LE-01	
150 meter sensor cable Ex not terminated	SAG:M3889LF-01	
200 meter sensor cable Ex not terminated	SAG:M3889LG-01	
250 meter sensor cable Ex not terminated	SAG:M3889LH-01	
300 meter sensor cable Ex not terminated	SAG:M3889LJ-01	
Cable termination set standard and Ex	SAG:M3889KX-01	
Marine and fire retardant remote sensor cable		
5 meter marine sensor cable terminated	SAG:M3889LK-01	
10 meter marine sensor cable terminated	SAG:M3889LL-01	
15 meter marine sensor cable terminated	SAG:M3889LM-01	
20 meter marine sensor cable terminated	SAG:M3889LN-01	
30 meter marine sensor cable terminated	SAG:M3889LP-01	
50 meter marine sensor cable	SAG:M3889LQ-01	

Selection and ordering data (continued)

Description	Article No.
100 meter marine sensor cable	SAG:M3889LR-01
150 meter marine sensor cable	SAG:M3889LS-01
300 meter marine sensor cable	SAG:M3889LT-01
1000 meter marine sensor cable roll	SAG:M3889LW-01
Cable termination set > 50+ meter marine	SAG:M3889LX-01

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Selection and ordering data

Accessories and spare parts for flowmeters

Description	Article No.	
CT connector Tamper cover for CT locking. Fits over the M12 connector at both sensor and transmitter ends of the remote system cable (2 pcs.)	A5E31478498	
Bag of glands (metric) in black plastic[1]	A5E03907414	
Bag of glands, (metric) in gray plastic Ex e/i[1]	A5E03907424	
Bag of glands (metric) in AISI 316 SS Ex e/i[1]	A5E03907429	
Bag of glands (metric) in Ni-plated brass Ex e/i[1]	A5E03907430	
Bag of glands (NPT) in black plastic[2]	A5E03907435	
Bag of glands (NPT) in gray plastic Ex e/i[2]	A5E03907451	
Bag of glands (NPT) in AISI 316 SS Ex e/i[2]	A5E03907467	
Bag of glands (NPT) in Ni-plated brass Ex e/i[2]	A5E03907473	
Standard cable (non-Ex) with 2 × M12 connectors, PO insulation and PUR sleeve, gray, -40 ... +80 °C (-40 ... +176 °F)		
• 5 m (16.4 ft)	A5E03914805	
• 10 m (32.8 ft)	A5E03914850	
• 25 m (82 ft)	A5E03914853	
• 50 m (164 ft)	A5E03914859	
• 75 m (246 ft)	A5E03914861	
• 150 m (492 ft), max. +30 °C (86 °F)	A5E03914874	
Standard cable (non-Ex) for termination, PO insulation and PUR sleeve, gray, -40 ... +80 °C (-40 ... +176 °F)		
• 5 m (16.4 ft)	A5E03914833	
• 10 m (32.8 ft)	A5E03914849	
• 25 m (82 ft)	A5E03914854	
• 50 m (164 ft)	A5E03914856	
• 75 m (246 ft)	A5E03914864	
• 150 m (492 ft), max. +30 °C (86 °F)	A5E03914873	

Selection and ordering data (continued)

Description	Article No.	
Standard cable (non-Ex) f with M12 connector on one side, PO insulation and PUR sleeve, gray, -40 ... +80 °C (-40 ... +176 °F)		
• 5 m (16.4 ft)		
• 10 m (32.8 ft)		
• 25 m (82 ft)		
• 50 m (164 ft)		
• 75 m (246 ft)		
• 150 m (492 ft), max. +30 °C (86 °F)		
Standard cable (Ex) with 2 × M12 connectors, PO insulation and PUR sleeve, blue, -40 ... +80 °C (-40 ... +176 °F)		
• 5 m (16.4 ft)	A5E03914929	
• 10 m (32.8 ft)	A5E03914962	
• 25 m (82 ft)	A5E03914995	
• 50 m (164 ft)	A5E03915004	
• 75 m (246 ft)	A5E03915074	
• 150 m (492 ft), max. +30 °C (86 °F)	A5E03915088	
Standard cable (Ex) for termination, PO insulation and PUR sleeve, blue, -40 ... +80 °C (-40 ... +176 °F)		
• 5 m (16.4 ft)	A5E03914945	
• 10 m (32.8 ft)	A5E03914973	
• 25 m (82 ft)	A5E03914984	
• 50 m (164 ft)	A5E03915015	
• 75 m (246 ft)	A5E03915057	
• 150 m (492 ft), max. +30 °C (86 °F)	A5E03915100	
Standard cable (Ex) with M12 connector on one side, PO insulation and PUR sleeve, blue, -40 ... +80 °C (-40 ... +176 °F)		
• 5 m (16.4 ft)		
• 10 m (32.8 ft)		
• 25 m (82 ft)		
• 50 m (164 ft)		
• 75 m (246 ft)		
• 150 m (492 ft), max. +30 °C (86 °F)		
Analog signal cable For analog cable connection between MASS 2100/ FC300 sensor and FCT010/FCT030/FCT070 transmitters. 5 × 2 × Ø 0.34 mm screened and twisted in pairs. Blue PVC insulation and sleeve. With two M20 connectors, female/female. -20 ... 105 °C (-4 ... +221 °F), Ex		
• 1 m (3.28 ft)	A5E42815465	
• 2 m (6.56 ft)	A5E42521862	
• 5 m (16.4 ft)	A5E42522447	
• 10 m (32.8 ft)	A5E42523233	
• 15 m (49.21 ft)	A5E42523347	

[1] 2 pcs M20; 1 pce M25 with single and dual cable inserts.
[2] 2 pcs ½" NPT; 1 pce ½" NPT with single and dual cable inserts.

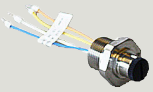
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Selection and ordering data (continued)

Heating jacket for FCS400

Description	Article No.	
Heating jacket indoor use, 0 ... 200 °C (32 ...392 °F) max. temperature. Complete with 5 m (16.4 ft) high temperature cable fitted. Dedicated plug connection to included controller		
• 230 V AC, DN 15 electric	A5E33035287	
• 230 V AC, DN 25 electric	A5E33035324	
• 230 V AC, DN 50 electric	A5E33035325	
• 115 V AC, DN 15 electric	A5E32877520	
• 115 V AC, DN 25 electric	A5E32877556	
• 115 V AC, DN 50 electric	A5E32877557	
Heating jacket controller IP65, digital display for 0 ... 200 °C (32 ...392 °F) control setpoint		
• 230 V AC	A5E03839193	
• 115 V AC	A5E03839194	

Spare parts - sensor FCS400/FCS300 and MASS 2100/FC300

Description	Article No.	
Blind lid in painted aluminum with silicone o-ring seal	A5E03549295	
Sensor housing		
• Metric	A5E03549313	
• NPT	A5E03906080	
Bag of loose parts for sensor including cable strain relief components, washer, seals, silicone o-rings, and assorted screws	A5E03549324	
M12 option for sensor housing in stainless steel pre-wired and potted to replace M12 socket in DSL housing	A5E03906095	

Selection and ordering data (continued)

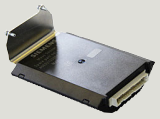
Spare parts - Transmitter FCT030 field mount enclosure (all FW versions)

Description	Article No.	
Display lid in painted aluminum with Ex glass plate and silicone o-ring seal, Ex and Non-Ex	A5E03549344	
Blind lid in painted aluminum with silicone o-ring seal	A5E03549429	
Bag of loose spare parts including cable strain relief components, mounting tool, seals and gasket, assorted screws and washers, hex cap nut, blind connectors, and silicone o-rings	A5E03549396	
Mounting bracket - FCT030 field mount in painted aluminum for pipe or wall mounting of transmitter FCT030 remote version. Including lock ring, pressure pads and seal cap	A5E03906091	
M12 option - remote in painted aluminum; pre-wired and potted replacement M12 connection for FCT030 field mount transmitter remote version	A5E03906104	
Remote junction box painted aluminum for sensor cable termination at FCT030 transmitter remote version. Pre-wired and potted		
• M20	A5E03906112	
• NPT	A5E03906130	

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Selection and ordering data (continued)

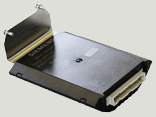
Spare parts - Transmitter FCT030 (FW 3.1)

Description	Article No.	
Display and keypad assembly for field mount enclosure with Siemens logo for HW 2 and FW 3.1 version	A5E03548971	
Sensor cassette (compact) (HW version 2, FW 3.1.x)	A5E03549142	
Sensor cassette (remote) (HW version 2, FW 3.1.x)	A5E03549098	
Frontend cassette Spare part frontend cassette for remote version of FC430 and cassette for FC410. For firmware 2.02.x	A5E03549191	
Power supply for field mount enclosure 100 ... 240 V AC, 47 ... 63 Hz, 24 ... 90 V DC (HW version 2 and FW 3.1.x)	A5E03549413	
Transmitter cassette (active) 4 ... 20 mA output and HART 7.2 (HW version 2 and FW 3.1.x)	A5E03549357	
Transmitter cassette (passive) 4 ... 20 mA output and HART 7.2 (HW version 2 and FW 3.1.x)	A5E03549383	
I/O assembly Advise Order code F40 to F97, Selection and Ordering data[1)]	A5E03939114	
SensorFlash (microSD card 1G)	A5E03915258	

1) The I/O configuration must be stated in the "Remark" field. The I/O configuration is found in the F option of the ordering code. e.g. code "F40" for ordering Ch2 Active Current/Freq/Pulse, Ch3 Active Current/Freq/Pulse, Ch4 Active Input.

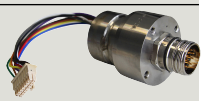
Selection and ordering data (continued)

Spare parts FCT030 - Fieldmount enclosure (FW 4.0)

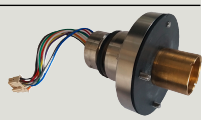
Description	Article No.	
Display and keypad assembly		
• From firmware 4.0, with Siemens logo	A5E37705139	
• From firmware 4.0, neutral version - no company logo	A5E39844362	
Power supply for field mount enclosure FCT030 V 4.0 Fieldmount 100 ... 240 V AC, 47 ... 63 Hz, 19.2 ... 28.8 V DC	A5E38264471	
Sensor cassette (compact) for systems without DSL and for systems with analog sensor connection, HW version 3, FW version 4.0	A5E41526318	
Sensor cassette (remote) Ex barrier module digital sensor connection (HW version 3, FW version 4.0)	A5E03549098	
Sensor cassette (remote) for systems with DSL, HW version 3, FW version 4.0	A5E03549098	
Frontend cassette Spare part frontend DSL for remote version. For firmware V 4.0	A5E41526286	
SensorFlash (microSD card 4G)	A5E38288507	
Transmitter cassette for firmware 4.0		
• Ch1 E02: I/O and comm (active/passive) 4 ... 20 mA output and HART 7.5, Non-Ex	A5E38013040	
• Ch1 E06: I/O and comm (-active) 4 ... 20 mA output and HART 7.5, Ex	A5E38012278	
• Ch1 E07: I/O and comm (-passive) 4 ... 20 mA output and HART 7.5, Ex	A5E38013025	
• Ch1 E10: Communication PROFIBUS PA, Non-Ex & Ex	A5E41216315	
• Ch1 E11: Communication PROFIBUS DP, Non-Ex	A5E41216042	
• Ch1: Communication Modbus RTU 485, Ex	A5E38013054	
• Ch1: Communication Modbus RTU 485, Non-Ex	A5E38013069	
I/O Cassette for firmware 4.0		
• F01, Non-Ex Ch2: Current/Frequ./Pulse Ch3: None Ch4: None	A5E38006256	
• F02, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: None	A5E38006558	

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Selection and ordering data (continued)

Description	Article No.	
• F03, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Current/Frequ./Pulse	A5E38006598	
• F04, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Relay	A5E38006896	
• F05, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: Relay	A5E38006900	
• F06, Non-Ex Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: None	A5E38011432	
• F11, Ex-passive Ch2: Current/Frequ./Pulse Ch3: None Ch4: None	A5E38011478	
• F12, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: None	A5E38011509	
• F13, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Current/Frequ./Pulse	A5E38011541	
• F14, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Relay	A5E38011600	
• F15, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: Relay	A5E38011618	
• F16, Ex-passive Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: None	A5E38011908	
• F21, Ex-active Ch2: Current/Frequ./Pulse Ch3: None Ch4: None	A5E38012039	
• F22, Ex-active Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: None	A5E38012056	
• F23, Ex-active Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Current/Frequ./Pulse	A5E38012121	
• F24, Ex-active Ch2: Current/Frequ./Pulse Ch3: Current/Frequ./Pulse Ch4: Relay	A5E38019235	
• F25, Ex-active Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: Relay	A5E38019263	
• F26, Ex-active Ch2: Current/Frequ./Pulse Ch3: Relay Ch4: None	A5E38019378	
Adapter cable for FCS400 sensor with new transmitter DSL/FCT010/FCT030, Version 4.0	A5E50371933	
Remote adapter for wall bracket M20 cable connection		
• Ex	A5E42404417	
• Non-Ex	A5E42846478	

Selection and ordering data (continued)

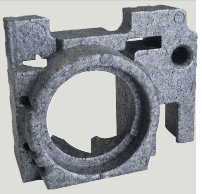
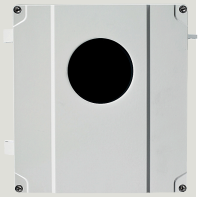
Description	Article No.	
Wall bracket for FCT030 for M20 analog cable connector	A5E42404426	
Wall bracket for FCT010 for M20 analog cable connector	A5E42404447	
Compact adapter for DSL/FCT030 for upgrade from MASS 2100 DI 3, DI 6, DI 15 with MASS 6000 compact to DSL/FCT030		
• Ex	A5E42846758	
• Non-Ex	A5E42846760	
Compact adapter for DSL/FCT030 FCS300 and FCS400 (DN 100 and DN 150 sensor) adapter for compact mount DSL, FCT010 or FCT030, Ex and Non-Ex	TBD	

Spare parts - FCT030 wall mount enclosure

Description	Article No.	
Display and keypad -assembly		
• For wall mount enclosure, Siemens logo	A5E37697615	
• For wall mount enclosure, neutral version	A5E39844261	
Power supply for wall mount 100 ... 240 V AC, 47 ... 63 Hz, 19.2 ... 28.8 V DC	A5E38263021	
Sensor cassette for FCT030 wall mounting enclosure	TBD	

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Selection and ordering data (continued)

Description	Article No.	
Foam insert set for wall mount with connectors	A5E38287828	
Wall mount enclosure front Versions: • blind, Siemens version • blind, neutral version - no company logo • with glass	A5E	
Wall mount enclosure bracket for pipe mounting	A5E38288020	
Wall bracket panel mounting	A5E38288032	
Bag of loose spare parts for wall mount including cable strain relief components, mounting tool, seals and gasket, assorted screws and washers, hex cap nut, blind connectors and O-rings	A5E38288072	
Metall kit PSU cover back pane for wall mount enclosure	A5E38415145	
Power input cover plate for wall mount enclosure	A5E38415205	

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Overview



SITRANS FX Vortex flowmeter are designed for use in industrial applications and optimally suited to the demands in auxiliary supply systems.

The proven principle of vortex flowmeters is suitable for measurement of liquids, gases and vapors unaffected by conductivity, viscosity, temperature and pressure.

Benefits

- Integrated pressure and temperature compensation
- Temperature compensation for saturated steam included as standard
- High measuring accuracy
- Maintenance-free sensor
- Non-wearing, fully welded stainless steel construction with high resistance to corrosion, pressure and temperature
- SIL2 certified according to IEC 61508 Edition 2
- Use in hazardous areas
- Integrated reduction of nominal diameter for space-saving and economic installation and large measuring ranges
- Redundant data management: Easy exchange of electronics without loss of calibration and configuration data
- FAD (Free Air Delivery) functionality
- Gross and net heat calculation to support advanced energy management
- Remote version with cable length up to 50 m (164 ft)

Even the basic version of the vortex flowmeter SITRANS FX330 is equipped with temperature compensation for saturated steam applications. With the optional pressure sensor the SITRANS FX330 has integrated density compensation for calculation of corrected volume and mass (online density compensation). The density compensation for calculation of corrected volume and mass is based on the standards of NIST for gases and IAPWS for steam.

Higher measuring accuracy with the use of compact measuring systems

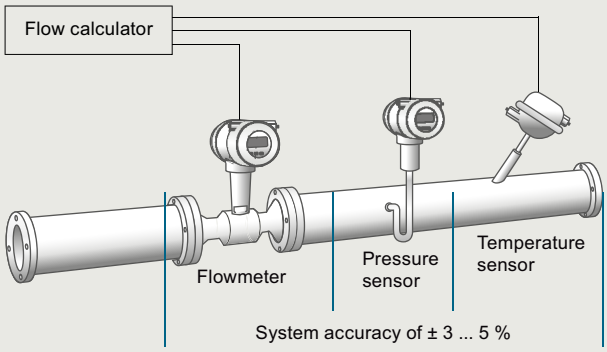
With the classic installation of a vortex flowmeter and separate pressure and temperature sensor as well as flow calculator, all errors occurring in the measuring chain must be taken into account when determining system accuracy. This can result in a measuring error between ± 3 to 5 %.

Using a vortex flowmeter with integrated pressure and temperature compensation such as the SITRANS FX330 allows you not only to lower installation costs but also increase the measuring accuracy of the measuring point. In this case the accuracy is ± 1.5 % of the measured value.

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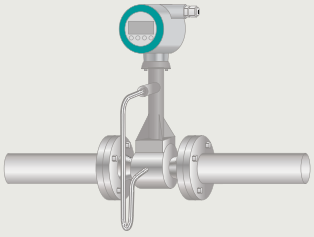
Benefits (continued)

classic



integrated

Flowmeter with integrated pressure and temperature compensation



System accuracy of ±1.5 %

The SITRANS FX330 in flange design is available with integrated reduction of nominal diameter for space-saving installations and large measuring spans. About 90% of all vortex flowmeters are ordered one size smaller than the line diameter in order to increase the flow speed and to get a wider measuring range. Here, the line has to be reduced before and widened after the sensor, typically including 20x DN inlet and 5x DN outlet run. With the reduction and widening of nominal diameter included in the sensor, it is no longer necessary. To compensate the non-existent straight inlet run between reduction and the vortex bluff body, these devices are specially calibrated and linearized.

A new feature of the SITRANS FX330 is the advanced signal processing and filtering called AVFD (Advanced Vortex Frequency Detection): Interferences and disturbances in the measuring signal are suppressed, signals outside from the relevant frequency band are filtered out.

Redundant data management prevents loss of calibration and configuration data when changing electronics or display.

By default, all SITRANS FX330 meters are factory-calibrated (traceable to international standards) and pre-set according to customer specifications. The SITRANS FX330 also comes with an installation wizard to ease installation; e.g. in a steam application it will only show related settings.

Developed according to the standard IEC 61508 edition 2, the SITRANS FX330 can be used in safety-related application with classification SIL2 for continuous volume flow measurement.

Application

- Measurement of saturated steam and superheated steam
- Steam boiler monitoring
- Heat metering of steam and hot water
- Measurement of consumption of industrial gases
- Measurement of consumption in compressed air systems
- Monitoring of compressor output
- Evaluation of Free Air Delivery (FAD)
- SIP and CIP processes in the food, beverage and pharmaceutical industries
- Measuring of conductive and non-conductive liquids
- Safety-related measurement in SIL applications (SIL2)

Gross and net heat quantity calculation

The SITRANS FX330 was designed for applications in auxiliary and supply service lines, such as internal monitoring of energy flows for saturated and superheated steam or hot water. Equipped with temperature sensor as standard, the device can be installed as heat meter in the feed line directly connected with an external temperature sensor in the return line. The gross and net heat calculation can be fed into a DCS to support advanced energy management.

When it comes to energy, the most accurate measurement of consumption is essential. By combining flow, temperature and pressure measurements in one device, SITRANS FX330 provides the basis for a precise mass flow calculation.

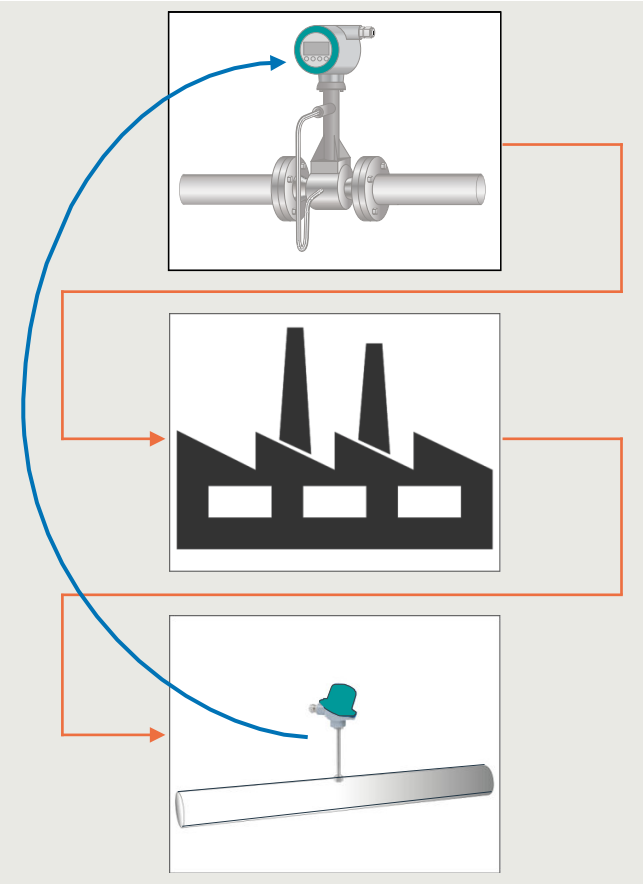
In steam applications, the software even determines the enthalpy - the heat content - of the steam. Therefore, SITRANS FX330 is able to calculate the gross heat quantity.

In case net heat quantity consumption of process is asked for, a single temperature sensor can be added to the return line. SITRANS FX330 uses the readings to calculate the amount of heat consumed.

The SITRANS FX330 thereby proves itself to be a reliable partner.

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Application (continued)



Design

SITRANS FX330 Flange	SITRANS FX330 Sandwich
	
Flange version with integrated temperature compensation as standard for saturated steam and optional pressure compensation for superheated steam, gases and wet gases	All advantages of the flange version in a space-saving sandwich design; centering rings guarantee an easy installation without any offset
Integrated reduction of nominal diameter for space-saving and economic installations plus large measuring ranges	Integrated reduction of nominal diameter not available
Also in remote design with field housing and connection cable up to 50 m (164 ft)	Also in remote design with field housing and connection cable up to 50 m (164 ft)
With shut off valve allowing • exchange and calibration of pressure sensor • pressure and leak testing of pipeline without interrupting the process	With shut off valve allowing • exchange and calibration of pressure sensor • pressure and leak testing of pipeline without interrupting the process

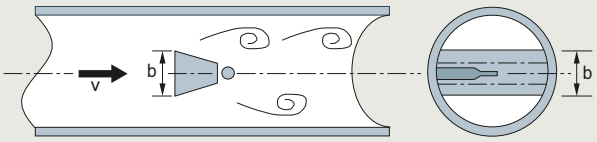
Function

Vortex flowmeters are used to measure the flow of gases, vapors and liquids in completely filled pipes. The measuring principle is based on the principle of the Karman vortex street. Inside the measuring sensor vortices are shed from a bluff body and are detected by a sensor located behind. The frequency **f** of the vortex shedding is proportional to the flow velocity **v**.

The nondimensional Strouhal number **S** describes the relationshipbetween vortex frequency **f,** width **b** of the bluff body and the mean flow velocity **v**:

$$f = (S \cdot v) / b$$

The vortex frequency is recorded at the sensor and evaluated at the converter.



Functional principle

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Configuration

Available combinations of sensors and connection size for SITRANS FX330 in flanged design

SITRANS FX330 Flanged (7ME2610-...)										
Sensor size	**Connection size**	**EN 1092-1, Form B1/B2, PN 10**	**EN 1092-1, Form B1/B2, PN 16**	**EN 1092-1, Form B1/B2, PN 25**	**EN 1092-1, Form B1/B2, PN 40**	**EN 1092-1, Form B1/B2, PN 63**	**EN 1092-1, Form B1/B2, PN 100**	**ANSI B16.5, class 150**	**ANSI B16.5, class 300**	**ANSI B16.5, class 600**
DN 15	DN 15	-	-	-	X	-	X	X	X	X
	DN 25	-	-	-	X	-	X	X	X	X
	DN 40	-	-	-	X	-	X	X	X	X
DN 25	DN 25	-	-	-	X	-	X	X	X	X
	DN 40	-	-	-	X	-	X	X	X	X
	DN 50	-	X	-	X	X	X	X	X	X
DN 40	DN 40	-	-	-	X	-	X	X	X	X
	DN 50	-	X	-	X	X	X	X	X	X
	DN 80	-	X	-	X	X	X	X	X	X
DN 50	DN 50	-	X	-	X	X	X	X	X	X
	DN 80	-	X	-	X	X	X	X	X	X
	DN 100	-	X	-	X	X	X	X	X	X
DN 80	DN 80	-	X	-	X	X	X	X	X	X
	DN 100	-	X	-	X	X	X	X	X	X
	DN 150	-	X	-	X	X	X	X	X	X
DN 100	DN 100	-	X	-	X	X	X	X	X	X
	DN 150	-	X	-	X	X	X	X	X	X
	DN 200	X	X	X	X	-	-	X	X	-
DN 150	DN 150	-	X	-	X	X	X	X	X	X
	DN 200	X	X	X	X	-	-	X	X	-
	DN 250	X	X	X	X	-	-	X	X	-
DN 200	DN 200	X	X	X	X	-	-	X	X	-
	DN 250	X	X	X	X	-	-	X	X	-
	DN 300	X	X	X	X	-	-	X	X	-
DN 250	DN 250	X	X	X	X	-	-	X	X	-
	DN 300	X	X	X	X	-	-	X	X	-
DN 300	DN 300	X	X	X	X	-	-	X	X	-

X = available
- = not available

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Selection and ordering data

SITRANS FX330 Flanged Not approved for SIL2 safety applications Approved for SIL2 safety applications		Article No. 7ME2610- 7ME2611-									
		●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Sensor size	Connection size										
DN 15 (½")	DN 15 (½")	1	A								
	DN 25 (1")	1	B								
	DN 40 (1½")	1	C								
DN 25 (1")	DN 25 (1")	2	B								
	DN 40 (1½")	2	C								
	DN 50 (2")	2	D								
DN 40 (1½")	DN 40 (1½")	2	K								
	DN 50 (2")	2	L								
	DN 80 (3")	2	M								
DN 50 (2")	DN 50 (2")	2	R								
	DN 80 (3")	2	S								
	DN 100 (4")	2	T								
DN 80 (3")	DN 80 (3")	3	L								
	DN 100 (4")	3	M								
	DN 150 (6")	3	R								
DN 100 (4")	DN 100 (4")	3	S								
	DN 150 (6")	3	T								
	DN 200 (8")	3	Q								
DN 150 (6")	DN 150 (6")	4	M								
	DN 200 (8")	4	P								
	DN 250 (10")	4	Q								
DN 200 (8")	DN 200 (8")	4	T								
	DN 250 (10")	4	U								
	DN 300 (12")	4	V								
DN 250 (10")	DN 250 (10")	4	W								
	DN 300 (12")	4	Y								
DN 300 (12")	DN 300 (12")	5	E								
Process connection and pressure rate											
EN 1092-1 type B1											
PN 10	DN 200 ... 300			A							
PN 16	DN 50 ... 300			B							
PN 25	DN 200 ... 300			C							
PN 40	DN 15 ... 300			D							
PN 63	DN 50 ... 150			E							
PN 100	DN 15 ... 150			F							
ANSI B16.5 RF											
Class 150	½ ... 12"			J							
Class 300	½ ... 12"			K							
Class 600	½ ... 6"			L							
System design											
Compact version	No cable				0						
Remote version	Cable length with order code L..				1						
Transmitter housing											
Aluminum						0					
Aluminum, silicon free						1					
Stainless steel						2					

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Selection and ordering data (continued)

SITRANS FX330 Flanged Not approved for SIL2 safety applications Approved for SIL2 safety applications	Article No. 7ME2610- 7ME2611-									
	●	●	●	●	●	-	●	●	●	●
Stainless steel (remote version)					3					
Dual version, aluminum					6					
Dual version, aluminum, silicon free					7					
Communication										
HART							0			
PROFIBUS PA							1			
FOUNDATION Fieldbus							2			
Ex approval										
Without Ex approval								A		
ATEX II2 G Ex ia								B		
ATEX II2 G Ex d								C		
ATEX II3 G Ex nA								D		
ATEX II2 D Ex tb								E		
QPS IS Class I Div.1								F		
QPS XP Class I Div.1								G		
QPS NI Class I Div. 2								H		
QPS DIP Class I, III Div. 1								J		
IECEx II2 G Ex ia								K		
IECEx II2 G Ex d								L		
IECEx II3 G Ex nA								M		
IECEx II2 D Ex tb								N		
EAC Ex i (On Hold)								R		
EAC Ex d (On Hold)								S		
EAC Ex nA (On Hold)								T		
EAC Ex t (On Hold)								U		
Pressure sensor and gasket material										
Without pressure sensor								A		
Integrated pressure sensor and gasket material FPM (Viton). For specified medium Y40 is “Steam” gasket material EPDM, Range:										
1 bar (14.5 psi)								B		
2 bar (29 psi)								C		
4 bar (58 psi)								D		
6 bar (87 psi)								E		
10 bar (145 psi)								F		
16 bar (232 psi)								G		
25 bar (363 psi)								H		
40 bar (580 psi)								J		
60 bar (870 psi)								K		
100 bar (1450 psi)								L		
With pressure sensor and gasket material FFKM (Kalrez), Range:										
1 bar (14.5 psi)								M		
2 bar (29 psi)								N		
4 bar (58 psi)								P		
6 bar (87 psi)								Q		
10 bar (145 psi)								R		
16 bar (232 psi)								S		
25 bar (363 psi)								T		
40 bar (580 psi)								U		
60 bar (870 psi)								V		
100 bar (1450 psi)								W		

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Selection and ordering data (continued)

SITRANS FX330 Flanged	Article No.
Not approved for SIL2 safety applications	7ME2610-
Approved for SIL2 safety applications	7ME2611-
	● ● ● ● ● - ● ● ● ●
Software version	
Standard - Uncompensated for gases, steam and liquids including temperature compensation for saturated steam	0
Standard + Heat meter for saturated steam and water	1
Density compensation for steam + Heat meter for saturated and superheated steam	2
Density compensation for gases, wet gases and mixed gases + FAD	3

SITRANS FX330 Sandwich		Article No.
Not approved for SIL2 safety applications		7ME2710-
Approved for SIL2 safety applications		7ME2711-
		● ● ● ● ● - ● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Sensor size		
DN 15 (½")		1 A
DN 25 (1")		2 B
DN 40 (1½")		2 K
DN 50 (2")		2 R
DN 80 (3")		3 L
DN 100 (4")		3 S
Pressure rating		
EN 1092-1		
PN 16	DN 15 ... 100	B
PN 25	DN 15 ... 100	C
PN 40	DN 15 ... 100	D
PN 63	DN 15 ... 100	E
PN 100	DN 15 ... 100	F
ANSI B16.5		
Class 150	½ ... 4"	J
Class 300	½ ... 4"	K
Class 600	½ ... 4"	L
System design		
Compact version	No cable	0
Remote version	Cable length with Order code L..	1
Transmitter housing		
Aluminum		0
Aluminum, silicon free		1
Communication		
HART		0
PROFIBUS PA		1
FOUNDATION Fieldbus		2
Ex approval		
Without Ex approval		A
ATEX II2 G Ex ia		B
ATEX II2 G Ex d		C
ATEX II3 G Ex nA		D
ATEX II2 D Ex tb		E
QPS IS Class I Div.1		F

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Selection and ordering data (continued)

SITRANS FX330 Sandwich Not approved for SIL2 safety applications Approved for SIL2 safety applications	Article No. 7ME2710- 7ME2711-	●	●	●	●	●	-	●	●	●	●
QPS XP Class I Div.1									G		
QPS NI Class I Div. 2									H		
QPS DIP Class I, III Div. 1									J		
IECEx II2 G Ex ia									K		
IECEx II2 G Ex d									L		
IECEx II3 G Ex nA									M		
IECEx II2 D Ex tb									N		
EAC Ex i (On Hold)									R		
EAC Ex d (On Hold)									S		
EAC Ex nA (On Hold)									T		
EAC Ex t (On Hold)									U		
Pressure sensor and gasket material											
Without pressure sensor										A	
Integrated pressure sensor and gasket material FPM (Viton). For specified medium Y40 is “Steam” gasket material EPDM, Range:											
1 bar (14.5 psi)										B	
2 bar (29 psi)										C	
4 bar (58 psi)										D	
6 bar (87 psi)										E	
10 bar (145 psi)										F	
16 bar (232 psi)										G	
25 bar (363 psi)										H	
40 bar (580 psi)										J	
60 bar (870 psi)										K	
100 bar (1450 psi)										L	
With pressure sensor and gasket material FFKM (Kalrez), Range:											
1 bar (14.5 psi)										M	
2 bar (29 psi)										N	
4 bar (58 psi)										P	
6 bar (87 psi)										Q	
10 bar (145 psi)										R	
16 bar (232 psi)										S	
25 bar (363 psi)										T	
40 bar (580 psi)										U	
60 bar (870 psi)										V	
100 bar (1450 psi)										W	
Software version											
Standard - Uncompensated for gases, steam and liquids including temperature compensation for saturated steam											0
Standard + Heat meter for saturated steam and water											1
Density compensation for steam + Heat meter for saturated and superheated steam											2
Density compensation for gases, wet gases and mixed gases + FAD											3

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Selection and ordering data (continued)

	Order code
Additional information Please add "**-Z**" to Article No. and specify as minimum Order code Y40, Y41, Y42, Y43, Y44 and Y45 in plain text.	
Application data	
Medium: Specify medium (liquid, gas, steam or customer-specific)	**Y40**
Temperature: Specify operating temperature with unit	**Y41**
Pressure: Specify operating pressure with unit	**Y42**
Density: Specify density with unit	**Y43**
Viscosity: Specify viscosity with unit	**Y44**
Flow rate: Specify max. flow rate with unit	**Y45**

Operating instruction

All literature is available to download for free, in a range of languages, at
www.siemens.com/processinstrumentation/documentation

	Order code
Further designs Please add "**-Z**" to Article No. and specify Order code.	
Cable connection	
Without cable glands	**A01**
M20 × 1.5 cable glands (3 cable entries) in plastic, grey	**A02**
M20 × 1.5 cable glands (3 cable entries) in plastic, blue	**A03**
M20 × 1.5 cable glands (3 cable entries) made of brass, Ex-d/t/nA	**A04**
M20 × 1.5 cable glands (3 cable entries) made of stainless steel, Ex-d/t/nA	**A06**
1/2" NPT conduit connection in stainless steel (3 cable entries, cable glands not included)	**A07**
M20 × 1.5 cable glands (2 cable entries - 1 plugged) in plastic, grey	**A12**
M20 × 1.5 cable glands (2 cable entries - 1 plugged) in plastic, blue	**A13**
M20 × 1.5 cable glands (2 cable entries - 1 plugged) made of brass, Ex-d/t/nA	**A14**
M20 × 1.5 cable glands (2 cable entries - 1 plugged) made of stainless steel, Ex-d/t/nA	**A16**
1/2" NPT conduit connection in stainless steel (2 cable entries - 1 plugged, cable glands not included)	**A17**
M20 × 1.5 cable glands (1 cable entry - 2 plugged) in plastic, grey	**A22**
M20 × 1.5 cable glands (1 cable entry - 2 plugged) in plastic, blue	**A23**
M20 × 1.5 cable glands (1 cable entry - 2 plugged) made of brass, Ex-d/t/nA	**A24**
M20 × 1.5 cable glands (1 cable entry - 2 plugged) made of stainless steel, Ex-d/t/nA	**A26**
1/2" NPT conduit connection in stainless steel (3 cable entries, cable glands not included)	**A27**
M20x1.5 cable glands (3 cable entries) made of brass, Ex-d/t/nA approved for Dual Version	**A34**
M20x1.5 cable glands (3 cable entries) made of Stainless steel, Ex-d/t approved for Dual Version	**A36**
1/2" NPT conduit connection in stainless steel (3 cable entries, cable glands not included) for Dual Version	**A37**
M20x1.5 cable glands (2 cable entries - 1 plugged) made of brass, Ex-d/t/nA approved for Dual Version	**A44**
M20x1.5 cable glands (2 cable entries - 1 plugged) made of Stainless steel, Ex-d/t approved for Dual Version	**A46**
1/2" NPT conduit connection in stainless steel (2 cable entries - 1 plugged, cable glands not included) for Dual Version	**A47**
1/2" NPT conduit connection in stainless steel (2 cable entries - 1 plugged, cable glands not included) for Dual Version	**A54**
M20x1.5 cable glands (1 cable entry - 2 plugged) made of brass, Ex-d/t/nA approved for Dual Version	**A56**
1/2" NPT conduit connection in stainless steel (1 cable entry - 2 plugged, cable glands not included) for Dual Version	**A57**

	Order code
Isolation valve	
With isolation valve	**B10**
Language	
English	**B11**
Chinese	**B12**
Russian	**B13**
Certificates	
Certificate of compliance according to EN 10204-2.1	**C10**
Pressure test + Inspection certificate according to EN 10204-3.1	**C11**
Material certification of pressure bearing metal parts according to EN 10204-3.1	**C12**
Material in accordance with NACE MR0175/ISO 15156	**C13**
PMI of pressure bearing metal parts + Inspection certificate according to EN 10204-3.1	**C14**
Material certificate of pressure bearing metal parts according to EN 10204-3.1 + PMI	**C15**
Dye penetration test of wetted welds	**C16**
X-ray test on pressurized weld DN 15 – 80 acc. to EN	**C17**
X-ray test on pressurized weld DN 100 – 300 acc. to EN	**C18**
Dye pen test on pressurized welds acc. to ASME	**C19**
X-ray test on press. welds DN 15 – 80 acc. to ASME	**C20**
X-ray test on press. welds DN 100 - 300 acc. to ASME	**C21**
Calibration	
5-point calibration with certificate	**D11**
General approval	
World (CE) except: EAC, KCC, UKCA, CRN	**E00**
EAC (On Hold)	**E07**
UKCA (In Preparation)	**E13**
KC	**E20**
CRN	**E70**
Cleaning	
Final cleaning for standard applications incl. certificate 2.1	**K50**
Final cleaning for standard applications incl. certificate 3.1	**K51**
Final oil & grease free cleaning for oxygen applications incl. certificate 2.1	**K52**
Final oil & grease free cleaning for oxygen applications incl. certificate 3.1	**K53**
Cable length for remote design	
5 m (16 ft)	**L01**
10 m (32 ft)	**L02**
15 m (49 ft)	**L03**
20 m (65 ft)	**L04**
25 m (82 ft)	**L05**
30 m (98 ft)	**L06**
35 m (114 ft)	**L07**
40 m (131 ft)	**L08**
45 m (147 ft)	**L09**
50 m (164 ft)	**L10**
5 m (16 ft) UV resistant	**L31**
10 m (32 ft) UV resistant	**L32**
15 m (49 ft) UV resistant	**L33**
20 m (65 ft) UV resistant	**L34**
25 m (82 ft) UV resistant	**L35**
30 m (98 ft) UV resistant	**L36**
35 m (114 ft) UV resistant	**L37**
40 m (131 ft) UV resistant	**L38**

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Selection and ordering data (continued)

	Order code
45 m (147 ft) UV resistant	**L39**
50 m (164 ft) UV resistant	**L40**
Tag name plate	
TAG name plate in stainless steel 40 × 20 mm (Add plain text)	**Y17**
TAG name plate in stainless steel tag 120 × 46 mm (Add plain text)	**Y18**

SITRANS FX330 spare parts

Description	Article No.
Transmitter electronic for SITRANS FX330	
• Sparepart electronic for FX330 non Ex, compact design, with HART	**KRH-16000100**
• Sparepart electronic for FX330 non Ex, remote design, with HART	**KRH-16000160**
• Sparepart electronic for FX330 Ex, compact design, with HART	**KRH-16000101**
• Sparepart electronic for FX330 Ex, remote design, with HART	**KRH-16000161**
Display	**KRH-16000200**
Seal disc 21.8 × 12 × 0.1	**KRH-17000700**
O-ring pickup	**KRH-17001400**
O-ring for pressure screw 17.13 × 2.62, FPM 70	**KRH-17001200**
Cover gasket O-ring	**KRH-16000300**
Front Cover (non Ex)	**KRH-16002000**
Front Cover (Ex)	**KRH-16002500**
Back Cover	**KRH-16003000**
Converter housing gasket, 59,35,5-2-N	**KRH-16000400**
O-ring	
• 20 × 1, FPM (DIN 3771)	**KRH-17001100**
• 10 × 2, NBR	**KRH-17001000**
DUBOX plug 5 pole, linear, RM2	**KRH-17000800**
Cable feed through 10 pole (non Ex)	**KRH-16000500**
Shut-off valve	**KRH-17004000**
Centering rings for Sandwich-Version	
• DN 15	**KRH-17006000**
• DN 25	**KRH-17006001**
• DN 40	**KRH-17006002**
• DN 50	**KRH-17006003**
• DN 50 (300 lbs, 600 lbs)	**KRH-17006004**
• DN 50 (JIS 10K, 16K, 20K)	**KRH-17006005**
• DN 80	**KRH-17006006**
• DN 100	**KRH-17006007**
Wall housing incl. Neck (incl. Screws, Gaskets and cable glands)	**KRH-16112002**
Sensor replacement kit including seal disc, socket, pickup and O-rings (for pickup and pressure screw)[1]	
• DN 15	**KRH-16111100**
• DN 25	**KRH-16111150**
• DN 40	**KRH-16111200**
• DN 50	**KRH-16111210**
• DN 80	**KRH-16111220**
• DN 100	**KRH-16111230**
• DN 150 ... 300	**KRH-16111300**

Description	Article No.
Pressure sensor replacement kit including pressure sensor with calibration certificate, DUBOX plug and O-rings[1]	
• 1 bar	**KRH-16111350**
• 2 bar	**KRH-16111370**
• 4 bar	**KRH-16111400**
• 6 bar	**KRH-16111401**
• 10 bar	**KRH-16111402**
• 16 bar	**KRH-16111403**
• 25 bar	**KRH-16111404**
• 40 bar	**KRH-16111405**
• 60 bar	**KRH-16111406**
• 100 bar	**KRH-16111407**
Upgrade Kit SITRANS FX300 (requires serial number of device to be replaced)	**On request**

[1] Pick-up resp. pressure sensor replacement kits are delivered with replacement instructions. Please note that in case of pick-up or pressure sensor replacement the factory pressure test gets invalid and has to be repeated with test pressure PTmax indicated on the type plate.

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Selection and ordering data (continued)

SITRANS FX330 Flow Straightener	Article No. 7ME2900-	●	●	●	0	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Material						
Stainless steel 1.4404 (316L)		1				
Nominal size						
DN 15 / ANSI ½"			A			
DN 25 / ANSI 1"			B			
DN 40 / ANSI 1½"			C			
DN 50 / ANSI 2"			D			
DN 80 / ANSI 3"			E			
DN 100 / ANSI 4"			F			
DN 150 / ANSI 6"			G			
DN 200 / ANSI 8"			H			
DN 250 / ANSI 10"			J			
DN 300 / ANSI 12"			K			
Pressure rating						
PN 10				A		
PN 16				B		
PN 25				C		
PN 40				D		
PN 63				E		
PN 100				F		
Class 150				J		
Class 300				K		
Class 600				L		

	Order code
Additional information Please add "**-Z**" to Article No. and specify Order code.	
Certificates	
Certificate of compliance to EN 10204-2.1	**C10**
Material certification of pressure bearing parts to EN 10204-3.1	**C12**
Material in accordance with NACE MR0175/ISO 15156	**C13**
PMI of pressure bearing parts + Inspection certificate according to EN 10204-3.1	**C14**
Material certificate of pressure bearing parts according to EN 10204-3.1 + PMI	**C15**
Cleaning	
Free of oil and grease (wetted parts)	**K46**
Free of oil and grease (wetted parts) + Inspection certificate according to EN 10204-3.1	**K48**

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Technical specifications

SITRANS FX330		
Range of application	Flow measurement of liquids, gases and vapors	
Mode of operation		
Measuring principle	Karman vortex street	
Primary measured value	• Volume flow • Mass flow • Corrected volume flow • Density • Temperature • Pressure • Heat energy	
Design		
Transmitter		
• Compact and remote version	Cable length up to 50 m (164 ft)	
Sensor	Flange version	Sandwich version
• Integrated temperature measurement	Yes	Yes
• Reduction of nominal diameter	Yes	No
• Pressure and temperature compensation	Yes	Yes
• Isolation valve	Yes	Yes
• Dual measuring device	Yes	No
Display	4-line graphical display (backlit) with control keys	
Operation	• Via local display (languages: German, English, French, Italian, Spanish, Swedish, Danish, Czech, Polish, Russian, Chinese, Turkish, Slovenian) • Via SIMATIC PDM	
Accuracy		
Volume flow		
• Liquids		
- Re ≥ 20 000	± 0.75 % of measured value	
- 10 000 < Re < 20 000	± 2.0 % of measured value	
• Gases and vapors		
- Re ≥ 20 000	± 1.0 % of measured value	
- 10 000 < Re < 20 000	± 2.0 % of measured value	
Mass flow/Corrected volume flow		
• Gases and vapors		
- Re ≥ 20 000	± 1.5 % of measured value	
- 10 000 < Re < 20 000	± 2.5 % of measured value	
Mass flow		
• Liquid/water		
- Re ≥ 20 000	± 1.5 % of measured value	
- 10 000 < Re < 20 000	± 2.5 % of measured value	
Repeatability (Volume flow)	± 0.1 % of measured value	
Operating conditions		
Temperature ratings		
• Medium	-40 ... +240 °C (-40 ... +465 °F)	
• Ambient		
- Non-Ex	-40 ... +85 °C (-40 ... +185 °F)	
- Ex	-40 ... +65 °C (-40 ... +140 °F)	
• Storage	-40 ... +85 °C (-40 ... +185 °F)	
Pressure ratings	Max. 100 bar (1450 psi), higher pressure rates on request	
Max. allowable test pressure		
• With integrated pressure sensor and isolation valve (closed)	1.5 x PN	
• With integrated pressure sensor and without isolation valve	2 times the measuring range of pressure sensor	
Process medium		
• Density	Taken into consideration when sizing	
• Viscosity	< 10 cP	
• Reynold's number	> 10000	
Recommended flow velocities		

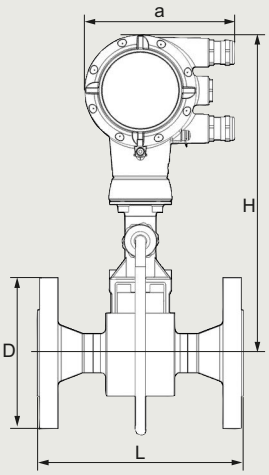
Technical specifications (continued)

SITRANS FX330	
• Liquids	0.3 ... 7 m/s (0.98 ... 23 ft/s)
• Gases and vapors	2.0 ... 80 m/s (6.6 ... 262.5 ft/s)
- DN 15	3.0 ... 45 m/s (9.8 ... 148 ft/s)
- DN 25	2.0 ... 70 m/s (6.6 ... 230 ft/s)
	For detailed information see operating instructions "Intended use"
Installation conditions	
Inlet run	
• For undisturbed flow profile, after pipe section with reducer, after 1 x 90° pipe bend	≥ 15 x DN
• After 2 x 90° pipe bend	≥ 30 x DN
• After 2 x 90° three-dimensional pipe bend	≥ 40 x DN
• After control valves	≥ 50 x DN
• Before flow conditioner	≥ 2 x DN
• After flow conditioner	≥ 8 x DN
Outlet run	≥ 5 x DN
Material	
Sensor and process connections	
• Standard	1.4404/316L
• Option	Hastelloy C22 on request
Transmitter housing	Aluminum
• Standard	Aluminum die-cast, two-layer coating (epoxy/polyester)
• Option	Die-cast aluminum with finish for advanced requirements / 1.4409 / 316L / A 351-CF3M
Pressure sensor gasket	
• Standard	FPM
• Option	FFKM
Sensor gasket (Pick-up)	
• Standard	1.4535/316L
• Option	Hastelloy C276
Process connections	
DIN EN 1092-1	DN 15 ... 300 / PN 16 ... 100
ANSI B16.5	½" ... 12"/150 ... 600 lb
	For valid combinations of connection size and pressure rating see table in section "Configuration"
Enclosure rating	
Standard	Compact and remote version: IP66/IP67
Option	Remote version: IP66/IP68 for sensor
Power supply	
Non-Ex version	14 ... 36 V DC
Ex version	14 ... 30 V DC
Inputs/Outputs	
Current output	4 ... 20 mA, HART
Binary output	Pulse/Frequency/Status/Limit switch
Current input	4 ... 20 mA, passive
Communication	HART 7 PROFIBUS PA FOUNDATION Fieldbus
Calibration	
Standard calibration	3-point calibration: 3 x 15 %, 3 x 50 %, 3 x 80 %
Special calibration	5-point calibration: 3 x 15 %, 3 x 30 %, 3 x 50 %, 3 x 60 %, 3 x 80 %
Certificates and approvals	
Ex approvals	ATEX, QPS, IECEx
CE declaration of conformity	PED 2014/68/EU EMC 2014/30/EU
Safety integration level (SIL)	SIL2 according to IEC 61508

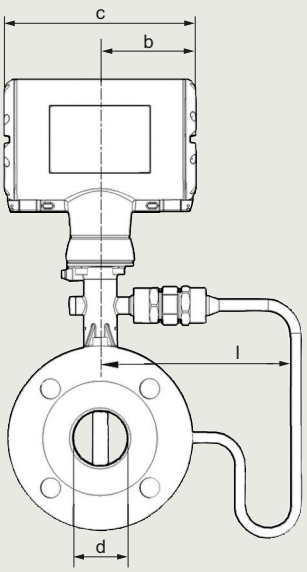
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Dimensional drawings

Compact version



SITRANS FX330 (Vortex), Flanged version with pressure sensor, front view



SITRANS FX330 (Vortex), Flanged version with pressure sensor, side view

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Dimensional drawings (continued)

Flange version EN 1092-1

Size	Pressure rating	Dimensions [mm (inch)] a = 148.5 (5.85), b = 85.8 (3.38), c = 171.5 (6.76)							Weight [kg (lb)]	
DN	PN	d	d FR[1]	d FR[2]	D	L	H	l	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
15	40	17.3 (0.68)	-	-	95 (3.74)	200 (7.87)	358.8 (14.2)	169.3 (6.67)	5.5 (12.13)	6.1 (13.45)
15	100	17.3 (0.68)	-	-	105 (4.13)	200 (7.87)	358.8 (14.2)	169.3 (6.67)	6.5 (14.33)	7.1 (15.65)
25	40	28.5 (1.12)	17.3 (0.68)	-	115 (4.53)	200 (7.87)	358.4 (14.1)	169.3 (6.67)	7.3 (16.09)	7.9 (17.42)
25	100	28.5 (1.12)	17.3 (0.68)	-	140 (5.51)	200 (7.87)	358.4 (14.1)	169.3 (6.67)	9.3 (20.50)	9.9 (21.83)
40	40	43.1 (1.70)	28.5 (1.12)	17.3 (0.68)	150 (5.91)	200 (7.87)	362.3 (14.3)	169.5 (6.67)	10.2 (22.49)	10.8 (23.81)
40	100	42.5 (1.67)	28.5 (1.12)	17.3 (0.68)	170 (6.69)	200 (7.87)	362.3 (14.3)	169.5 (6.67)	14.2 (31.31)	14.8 (32.63)
50	16	54.5 (2.15)	42.5 (1.67)	28.5 (1.12)	165 (6.50)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	12.1 (26.68)	12.7 (28.00)
50	40	54.5 (2.15)	42.5 (1.67)	28.5 (1.12)	165 (6.50)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	12.3 (27.12)	12.9 (28.44)
50	63	54.5 (2.15)	42.5 (1.67)	28.5 (1.12)	180 (7.09)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	16.3 (35.94)	16.9 (37.26)
50	100	53.9 (2.12)	42.5 (1.67)	28.5 (1.12)	195 (7.68)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	17.8 (39.24)	18.4 (40.57)
80	16	82.5 (3.25)	54.5 (2.15)	42.5 (1.67)	200 (7.87)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	16.8 (37.04)	17.4 (38.36)
80	40	82.5 (3.25)	54.5 (2.15)	42.5 (1.67)	200 (7.87)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	18.8 (41.45)	19.4 (42.77)
80	63	81.7 (3.22)	54.5 (2.15)	42.5 (1.67)	215 (8.46)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	22.8 (50.27)	23.4 (51.59)
80	100	80.9 (3.19)	54.5 (2.15)	42.5 (1.67)	230 (9.06)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	26.8 (59.08)	27.4 (60.41)
100	16	107 (4.21)	80.9 (3.19)	54.5 (2.15)	220 (8.66)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	21.4 (47.18)	22 (48.50)
100	40	107 (4.21)	80.9 (3.19)	54.5 (2.15)	235 (9.25)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	24.4 (53.79)	25 (55.12)
100	63	106 (4.17)	80.9 (3.19)	54.5 (2.15)	250 (9.84)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	29.4 (64.82)	30 (66.14)
100	100	104 (4.09)	80.9 (3.19)	54.5 (2.15)	265 (10.43)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	35.4 (78.04)	36 (79.37)
150	16	159 (6.26)	107 (4.21)	80.9 (3.19)	285 (11.22)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	35.2 (77.60)	35.8 (78.93)
150	40	159 (6.26)	107 (4.21)	80.9 (3.19)	300 (11.81)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	41.2 (90.83)	41.8 (92.15)
150	63	157 (6.18)	107 (4.21)	80.9 (3.19)	345 (13.58)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	59.2 (130.51)	59.8 (131.84)
150	100	154 (6.06)	107 (4.21)	80.9 (3.19)	355 (13.98)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	67.2 (148.15)	67.8 (149.47)
200	10	207 (8.15)	159 (6.26)	107 (4.21)	340 (13.39)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	37.8 (83.33)	38.4 (84.66)
200	16	207 (8.15)	159 (6.26)	107 (4.21)	340 (13.39)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	37.8 (83.33)	38.4 (84.66)
200	25	207 (8.15)	159 (6.26)	107 (4.21)	360 (14.17)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	46.8 (103.18)	47.4 (104.50)
200	40	207 (8.15)	159 (6.26)	107 (4.21)	375 (14.76)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	54.8 (120.81)	55.4 (122.14)
250	10	260 (10.24)	207 (8.15)	159.3 (6.27)	395 (15.55)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	57.4 (126.55)	58.0 (127.87)
250	16	260 (10.24)	207 (8.15)	159.3 (6.27)	405 (15.94)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	58.4 (128.75)	59.0 (130.07)
250	25	259 (10.20)	207 (8.15)	159.3 (6.27)	425 (16.73)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	74.4 (164.02)	75.0 (165.35)
250	40	259 (10.20)	207 (8.15)	159.3 (6.27)	450 (17.72)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	92.4 (203.71)	93.0 (205.03)
300	10	310 (12.20)	260 (10.24)	207 (8.15)	445 (17.52)	450 (17.72)	492.8 (19.4)	255 (10.04)	75.7 (166.89)	76.3 (168.21)
300	16	310 (12.20)	260 (10.24)	207 (8.15)	460 (18.11)	450 (17.72)	492.8 (19.4)	255 (10.04)	82.2 (181.22)	82.8 (182.54)
300	25	308 (12.13)	260 (10.24)	207 (8.15)	485 (19.09)	450 (17.72)	492.8 (19.4)	255 (10.04)	98.7 (217.60)	99.3 (218.92)
300	40	308 (12.13)	260 (10.24)	207 (8.15)	515 (20.28)	450 (17.72)	492.8 (19.4)	255 (10.04)	127.5 (281.09)	128.1 (282.41)

1) FR - single reduction
2) F2R - double reduction

Flange version ANSI B16.5

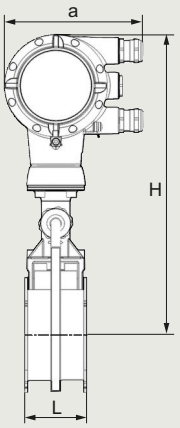
Size	Pressure rating	Dimensions [mm (inch)] a = 148.5 (5.85), b = 85.8 (3.38), c = 171.5 (6.76)							Weight [kg (lb)]	
DN	Class	d	d FR[1]	d FR[2]	D	L	H	l	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
½	150	16 (0.63)	-	-	90 (3.5)	200 (7.9)	358.8 (14.2)	169.3 (6.67)	4.5 (9.92)	5.1 (11.24)
½	300	16 (0.63)	-	-	95 (3.7)	200 (7.9)	358.8 (14.2)	169.3 (6.67)	4.9 (10.80)	5.5 (12.13)
½	600	14 (0.55)	-	-	95 (3.7)	200 (7.9)	358.8 (14.2)	169.3 (6.67)	5.1 (11.24)	5.7 (12.57)
1	150	27 (1.1)	15.8 (0.62)	-	110 (4.3)	200 (7.9)	358.4 (14.1)	169.3 (6.67)	6.2 (13.67)	6.8 (14.99)
1	300	27 (1.1)	15.8 (0.62)	-	125 (4.9)	200 (7.9)	358.4 (14.1)	169.3 (6.67)	7.2 (15.87)	7.8 (17.20)
1	600	24 (1.0)	15.8 (0.62)	-	125 (4.9)	200 (7.9)	358.4 (14.1)	169.3 (6.67)	7.5 (16.53)	8.1 (17.86)
1½	150	41 (1.6)	26.6 (1.1)	15.8 (0.6)	125 (4.9)	200 (7.9)	362.3 (14.3)	169.5 (6.67)	8.3 (18.30)	8.9 (19.62)
1½	300	41 (1.6)	26.6 (1.1)	15.8 (0.6)	155 (6.1)	200 (7.9)	362.3 (14.3)	169.5 (6.67)	10.4 (22.93)	11 (24.25)
1½	600	38 (1.5)	26.6 (1.1)	15.8 (0.6)	155 (6.1)	200 (7.9)	362.3 (14.3)	169.5 (6.67)	11.4 (25.13)	12 (26.46)
2	150	53 (2.1)	40.9 (1.6)	26.6 (1.1)	150 (5.9)	200 (7.9)	368.3 (14.5)	169.5 (6.67)	11 (24.25)	11.6 (25.57)
2	300	53 (2.1)	40.9 (1.6)	26.6 (1.1)	165 (6.5)	200 (7.9)	368.3 (14.5)	169.5 (6.67)	12.4 (27.34)	13 (28.66)
2	600	49 (1.9)	40.9 (1.6)	26.6 (1.1)	165 (6.5)	200 (7.9)	368.3 (14.5)	169.5 (6.67)	13.9 (30.64)	14.5 (31.97)
3	150	78 (3.1)	52.6 (2.1)	40.9 (1.6)	190 (7.5)	200 (7.9)	380.3 (15.0)	169.3 (6.67)	19.8 (43.65)	20.4 (44.97)
3	300	78 (3.1)	52.6 (2.1)	40.9 (1.6)	210 (8.3)	200 (7.9)	380.3 (15.0)	169.3 (6.67)	22.8 (50.27)	23.4 (51.59)

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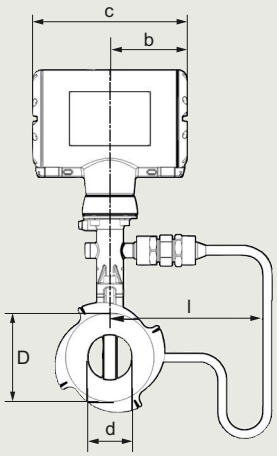
Dimensional drawings (continued)

Size DN	Pressure rating Class	Dimensions [mm (inch)] a = 148.5 (5.85), b = 85.8 (3.38), c = 171.5 (6.76) d	d FR[1]	d FR[2]	D	L	H	l	Weight [kg (lb)] Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
3	600	74 (2.9)	52.6 (2.1)	40.9 (1.6)	210 (8.3)	200 (7.9)	380.3 (15.0)	169.3 (6.67)	23.8 (52.47)	24.4 (53.79)
4	150	102 (4.0)	78 (3.1)	52.6 (2.1)	230 (9.1)	250 (9.8)	396.8 (15.7)	171.5 (6.76)	23.4 (51.59)	24 (52.91)
4	300	102 (4.0)	78 (3.1)	52.6 (2.1)	255 (10)	250 (9.8)	396.8 (15.7)	171.5 (6.76)	31.4 (69.23)	32 (70.55)
4	600	97 (3.8)	78 (3.1)	52.6 (2.1)	275 (11)	250 (9.8)	396.8 (15.7)	171.5 (6.76)	40.4 (89.07)	41 (90.39)
6	150	154 (6.1)	102 (4.0)	78.0 (3.1)	280 (11)	300 (12)	416.3 (16.4)	191.5 (7.54)	36.2 (79.81)	36.8 (81.13)
6	300	154 (6.1)	102 (4.0)	78.0 (3.1)	320 (13)	300 (12)	416.3 (16.4)	191.5 (7.54)	51.2 (112.88)	51.8 (114.20)
6	600	146 (5.8)	102 (4.0)	78.0 (3.1)	355 (14)	300 (12)	416.3 (16.4)	191.5 (7.54)	76.2 (167.99)	76.8 (169.31)
8	150	203 (8.0)	154 (6.1)	102 (4.0)	345 (14)	300 (12)	442.1 (17.4)	202.8 (8.0)	50.0 (110.23)	50.6 (111.55)
8	300	203 (8.0)	154 (6.1)	102 (4.0)	380 (15)	300 (12)	442.1 (17.4)	202.8 (8.0)	74.8 (164.91)	75.4 (166.23)
10	150	255 (10.0)	203 (8.0)	154 (6.1)	405 (16)	380 (15)	468.8 (18.5)	229.5 (9.04)	74.4 (164.02)	75.0 (165.35)
10	300	255 (10.0)	203 (8.0)	154 (6.1)	455 (18)	380 (15)	468.8 (18.5)	229.5 (9.04)	106.4 (234.57)	107.0 (235.89)
12	150	305 (12.0)	255 (10.0)	203 (8.0)	485 (19)	450 (18)	492.8 (19.4)	255 (10.0)	106.4 (234.35)	107.0 (235.67)
12	300	305 (12.0)	255 (10.0)	203 (8.0)	520 (21)	450 (18)	492.8 (19.4)	255 (10.0)	151.4 (333.56)	152.0 (334.88)

[1] FR - single reduction
[2] F2R - double reduction



SITRANS FX330 (Vortex), Sandwich version with pressure sensor, front view



SITRANS FX330 (Vortex), Sandwich version with pressure sensor, side view

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Dimensional drawings (continued)

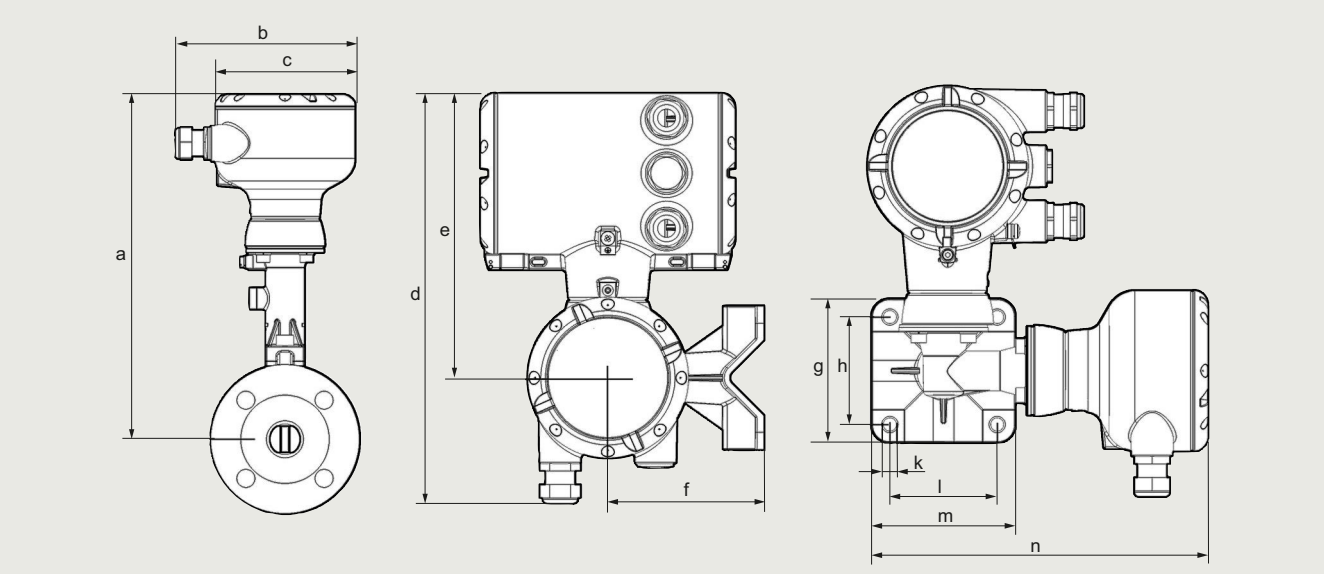
Sandwich version EN

Size	Pressure rating	Dimensions [mm (inch)]								Weight [kg (lb)]	
DN	PN	a	b	c	d	D	L	H	l	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
15	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	16 (0.63)	45 (1.77)	65 (2.56)	265 (10.43)	174.25 (6.86)	3.5 (7.72)	4.1 (9.04)
25	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	24 (0.94)	65 (2.56)	65 (2.56)	265 (10.43)	174.25 (6.86)	4.3 (9.48)	4.9 (10.80)
40	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	38 (1.50)	82 (3.23)	65 (2.56)	270 (10.63)	174.5 (6.87)	4.9 (10.80)	5.5 (12.13)
50	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	50 (1.97)	102 (4.02)	65 (2.56)	275 (10.83)	174.5 (6.87)	6 (13.23)	6.6 (14.55)
80	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	74 (2.91)	135 (5.31)	65 (2.56)	290 (11.42)	174.25 (6.86)	8.2 (18.08)	8.8 (19.40)
100	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	97 (3.82)	158 (6.22)	65 (2.56)	310 (12.20)	176.5 (6.95)	9.5 (20.94)	10.1 (22.27)

Sandwich version ANSI

Size	Pressure rating	Dimensions [inch]								Weight [lb]	
DN	Class	a	b	c	d	D	L	H	l	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
½"	150, 300	5.32	4.26	7.25	0.63	1.77	2.56	10.43	6.82	7.72	9.04
½"	600	5.32	4.26	7.25	0.55	1.77	2.56	10.43	6.82	7.72	9.04
1"	150, 300, 600	5.32	4.26	7.25	0.94	2.56	2.56	10.43	6.82	9.48	10.80
1½"	150, 300, 600	5.32	4.26	7.25	1.50	3.23	2.56	10.63	6.82	10.80	12.13
2"	150, 300, 600	5.32	4.26	7.25	1.97	4.02	2.56	10.83	6.82	13.23	14.55
3"	150, 300, 600	5.32	4.26	7.25	2.91	5.31	2.56	11.42	6.82	18.08	19.40
4"	150, 300, 600	5.32	4.26	7.25	3.82	6.22	2.56	12.20	6.82	20.94	22.27

Remote version



SITRANS FX330 (Vortex), Remote version

Dimension a

	Flanged and Sandwich version						Flanged version			
DN	15 (½")	25 (1")	40 (1½")	50 (2")	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")
[mm]	265.7	265.2	269.2	275.2	287.2	303.7	323.2	348.9	375.7	399.7
[inch]	10.5	10.4	10.6	10.8	11.3	12.0	12.7	13.7	14.8	15.7

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Dimensional drawings (continued)

Dimension a F1/2R

	Flanged version									
DN	**15 (½")**	**25 (1")**	**40 (1½")**	**50 (2")**	**80 (3")**	**100 (4")**	**150 (6")**	**200 (8")**	**250 (10")**	**300 (12")**
F1R[1] [mm]	-	315.7	315.2	319.2	325.2	337.2	353.7	373.2	398.9	425.7
F1R[1] [inch]	-	12.4	12.4	12.6	12.8	13.3	13.9	14.7	15.7	16.8
F2R[2] [mm]	-	-	315.7	315.2	319.2	325.2	337.2	353.7	373.2	398.9
F2R[2] [inch]	-	-	12.4	12.4	12.6	12.8	13.3	13.9	14.7	15.7

Dimension b ... n

	b	c	d	e	f	g	h	j	k	l	m	n
[mm]	139	108	276	191	105	97	72	108	9	72	97	226
[inch]	5.46	4.25	10.9	7.53	4.14	3.82	2.84	4.25	0.35	2.84	3.82	8.90

Flow tables

Measuring range limits

Size DN to EN 1092-1	DN to NSI B16.5	Q_{min} EN 1092-1 [m³/h]	Q_{max} EN 1092-1 [m³/h]	Q_{min} ANSI B16.5 [m³/h]	Q_{max} ANSI B16.5 [m³/h]
Water					
15	½"	0.45	5.07	0.44	4.94
25	1"	0.81	11.40	0.81	11.40
40	1½"	2.04	28.58	2.04	28.58
50	2"	3.53	49.48	3.53	49.48
80	3"	7.74	108.37	7.74	108.37
100	4"	13.30	186.22	13.30	186.21
150	6"	30.13	421.86	30.13	421.86
200	8"	56.60	792.42	56.60	792.42
250	10"	90.48	1 266.8	90.48	1 266.8
300	12"	131.41	1 839.8	131.41	1 839.8

Values based on water at 20 °C (68 °F)

Size DN to EN 1092-1	DN to NSI B16.5	Q_{min} EN 1092-1 [m³/h]	Q_{max} EN 1092-1 [m³/h]	Q_{min} ANSI B16.5 [m³/h]	Q_{max} ANSI B16.5 [m³/h]
Air					
15	½"	6.80	25.33	6.72	24.70
25	1"	10.20	81.43	10.20	81.43
40	1½"	25.35	326.63	25.35	326.63
50	2"	43.89	565.49	43.89	565.49
80	3"	96.14	1 238.64	96.14	1 238.6
100	4"	165.19	2 128.27	165.19	2 128.27
150	6"	374.23	4 821.60	374.23	4 821.6
200	8"	702.95	9 056.8	702.95	9 056.8
250	10"	1 123.7	14 478.0	1 123.7	14 478.0
300	12"	1 632.1	21 028.0	1 632.1	21 028.0

Values based on air at 20 °C (68 °F) and 1.013 bar_{abs} (14.7 psi_{abs})

Flow rate limits

Product	Nominal sizes to EN	to ANSI	Minimum flow rates [m/s]	Maximum flow rates [m/s]
Liquids	DN 15 ... DN 300	DN ½" ... DN 12"	$0.5 \times (998/\rho)^{0.5}$ [1]	$7 \times (998/\rho)^{0.47}$ [1]
Gas, steam/vapor	DN 15 ... DN 300	DN ½" ... DN 12"	$6 \times (1.29/\rho)^{0.5}$ [2]	$7 \times (998/\rho)^{0.47}$ [3]

ρ = operating density [kg/m³]

1) Minimum flow rate 0.3 m/s (0.984 ft/s) - maximum flow rate 7 m/s (23 ft/s)
2) Minimum flow rate 2 m/s (6.6 ft/s)
3) Maximum flow rate 80 m/s (262 ft/s); DN 15: 45 m/s (148 ft/s) and DN 25: 70 m/s (230 ft/s)

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Dimensional drawings (continued)

Measuring range saturated steam: 1 ... 7 bar

Overpressure [bar]		1		3.5		5.2		7	
Density [kg/m³]		1.13498	1.13498	2.4258	2.4258	3.27653	3.27653	4.16732	4.16732
Temperature [°C]		120.6	120.6	148.2	148.2	160.4	160.4	170.6	170.6
Flow [kg/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	**DN to ASME B16.5**								
15	½"	5.87	28.75	7.68	61.46	8.93	83.01	10.06	105.57
25	1"	11.82	92.42	17.28	197.53	20.09	266.81	22.66	339.35
40	1½"	29.64	370.71	43.33	792.33	50.63	1 070.2	56.80	1 361.2
50	2"	51.31	641.82	75.02	1 371.8	87.19	1 852.8	98.33	2 356.6
80	3"	112.41	1 405.8	164.33	3 004.7	191.00	4 058.4	215.39	5 161.8
100	4"	193.14	2 415.5	282.36	5 162.7	328.16	6 973.3	370.09	8 869.2
150	6"	437.56	5 472.4	639.69	11 696.0	743.45	15 798.0	838.44	20 093.0
200	8"	821.9	10 279.0	1 201.6	21 970.0	1 396.5	29 675.0	1 574.9	37 743.0
250	10"	1 313.9	16 433.0	1 920.9	35 122.0	2 232.5	47 439.0	2 517.7	60 337.0
300	12"	1 908.3	23 866.0	2 789.8	51 010.0	3 242.4	68 899.0	3 656.6	87 630.0

Measuring range saturated steam: 10.5 ... 20 bar

Overpressure [bar]		10.5		14.0		17.5		20.0	
Density [kg/m³]		5.88803	5.88803	7.60297	7.60297	9.31702	9.31702	10.5442	10.5442
Temperature [°C]		186.2	186.2	198.5	198.5	208.7	208.7	215.0	215.0
Flow [kg/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	**DN to ANSI B16.5**								
15	½"	12.78	149.17	16.51	192.61	20.23	236.04	22.89	267.12
25	1"	26.93	479.46	30.60	619.11	33.87	758.69	36.04	858.62
40	1½"	67.51	1 878.2	76.72	2 150.7	84.93	2 395.3	90.35	2 557.7
50	2"	116.89	3 251.7	132.82	3 723.4	147.03	4 147.0	156.42	4 428.1
80	3"	256.03	7 122.4	290.93	8 155.8	322.06	9 083.7	342.62	9 699.3
100	4"	439.91	12 238	499.90	14 013.0	553.38	15 608.0	588.69	16 666.0
150	6"	996.62	27 725.0	1 132.5	31 747.0	1 253.7	35 359.0	1 333.7	37 756.0
200	8"	1 872.1	52 079.0	2 127.3	59 634.0	2 354.9	66 419.0	2 505.2	70 921.0
250	10"	2 992.7	83 254.0	3 400.7	95 333.0	3 764.6	106 180.0	4 004.9	113 380.0
300	12"	4 346.5	120 920.0	4 939.1	138 460.0	5 467.5	154 210.0	5 816.5	164 660.0

Measuring range saturated steam: 15 ... 100 psig

Overpressure [psig]		15		50		75		100	
Density [lbs/ft³]		0.0719	0.0719	0.1497	0.1497	0.2036	0.2036	0.2569	0.2569
Temperature [°F]		249.98	249.98	297.86	297.86	320.36	320.36	338.184	338.184
Flow [lbs/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	**DN to ANSI B16.5**								
15	½"	12.95	64.35	16.83	133.87	19.62	182.02	22.04	229.63
25	1"	26.25	206.83	37.86	430.30	44.15	585.06	49.59	738.09
40	1½"	65.81	829.61	94.92	1 726	110.68	2 346.7	124.32	2 960.5
50	2"	113.94	1 436.3	164.34	2 988	191.63	4 062.9	215.23	5 125.6
80	3"	249.57	3 146.1	360.00	6 545.3	419.74	8 899.4	471.45	11 227
100	4"	428.81	5 405.7	618.51	11 246	721.21	15 291	810.06	19 291
150	6"	971.47	12 246	1 401.2	25 478	1 633.9	34 642	1 835.2	43 703
200	8"	1 824.8	23 004	2 632.1	47 859	3 069.1	65 072	3 447.2	82 092
250	10"	2 917.2	36 774	4 207.7	76 508	4 906.4	104 030	5 510.8	131 230
300	12"	4 236.8	53 410	6 111.1	111 120	7 125.8	151 080	8 003.6	190 600

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Dimensional drawings (continued)

Measuring range saturated steam: 150 ... 300 psig

Overpressure [psig]		150		200		250		300	
Density [lbs/ft³]		0.3627	0.3627	0.4681	0.4681	0.5735	0.5735	0.6792	0.6792
Temperature [°F]		366.08	366.08	388.04	388.04	406.22	406.22	422.06	422.06
Flow [lbs/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	**DN to ANSI B16.5**								
15	½"	27.79	324.21	35.86	418.47	43.94	512.66	52.04	607.12
25	1"	58.93	1 042.1	66.94	1 345.1	74.10	1 647.8	80.63	1 951.5
40	1½"	147.72	4 107.2	167.83	4 702.8	185.76	5 237	202.15	5 728
50	2"	255.75	7 111.9	290.56	8 141.9	321.60	9 066.8	350.00	9 917
80	3"	560.19	15 578	636.44	17 834	704.43	19 860	766.60	21 722
100	4"	962.54	26 766	1 093.5	30 643	1 210.4	34 124	1 317.2	37 324
150	6"	2 180.6	60 639	2 477.4	69 421	2 742.1	77 307	2 984	84 556
200	8"	4 096.1	113 900	4 653.6	130 400	5 150.7	145 210	5 605.2	158 830
250	10"	6 548.1	182 090	7 439.3	208 460	8 234.1	232 140	8 960.6	253 910
300	12"	9 510.2	264 460	10 805	302 760	11 959	337 150	13 014	368 770

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Overview



SITRANS FVA250 variable area meter

Benefits

- Standard version available at short notice
- Robust all-metal valve with impact-resistant housing cover
- Can also be used for corrosive and flammable media
- Can be used at high pressures and temperatures
- Product and percentage scales
- Can be optionally fitted with heating and cooling sheaths
- Contamination-resistant guiding for float

Application

The devices are particularly suitable for measuring:

- Water
- Liquids
- Anti-corrosives and lubricants
- Solvents
- Saturated and superheated steam
- Food and beverages
- Industrial gases

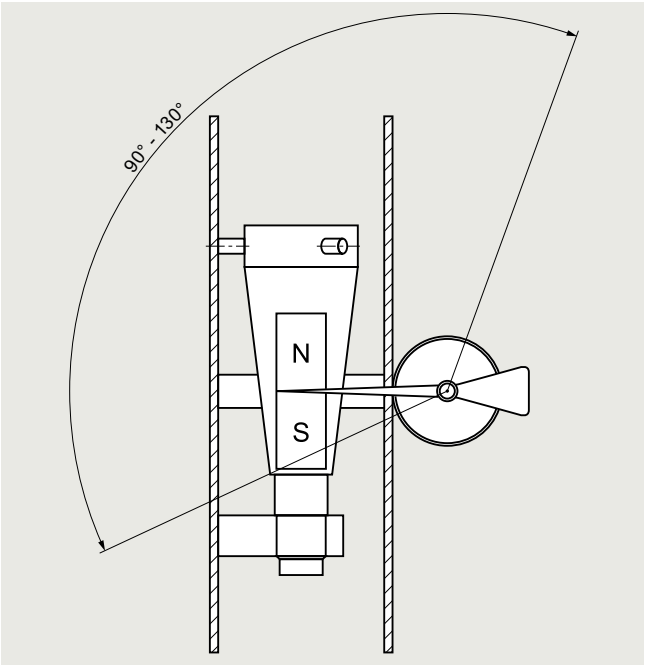
Design

Due to its full metal design, the SITRANS FVA250 variable area meter with a standard length of 250 mm (9.84 inch) can be used to measure many different types of liquids and gases passing through closed piping. The robust design means that it can also be used in harsh conditions. The various types of flange connections, linings and float materials satisfy the requirements of the pharmaceutical and chemical industries.

The measured value is displayed directly on the scale with the standard version. For process monitoring and control, the device can be equipped with a transmitter (MEM) as well as limit switches.

Function

Flow measurement with the SITRANS FVA250 is performed according to the float principle. The flowing medium lifts the conical float in the measuring ring. This increases the ring gap until an equilibrium is established between the buoyant force of the medium and the weight of the float. The height of the float is directly proportional to the flow rate. The movement of the float is transmitted from one magnet to another magnet in the display unit outside of the measuring tube.



Measuring cone/scale angle

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Selection and ordering data

SITRANS FVA250 full metal variable area meter				Article No. 7ME586	● -	● ● ● ● ● -	● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.							
Flow tube							
Liquid	Gas						
5 ... 40 l/h	0.15 ... 1.3 m³/h				1		
50 ... 600 l/h	1.5 ... 17 m³/h				2		
1 000 ... 4 000 l/h	30 ... 110 m³/h				3		
2.5 ... 6 m³/h	70 ... 170 m³/h				4		
4 ... 25 m³/h	30 ... 700 m³/h				5		
16 ... 50 m³/h	460 ... 1 350 m³/h				6		
60 ... 100 m³/h	1 700 ... 3 000 m³/h				7		
Design							
Type: CF-S (standard) Fitting: Stainless steel Flange: Stainless steel Float: Stainless steel						2	
Type: EF-H Fitting: Stainless steel, Hastelloy Flange: Stainless steel, Hastelloy Float: Hastelloy						4	
Type: FF-P Fitting: Stainless steel with PTFE lining Flange: Stainless steel with PTFE lining Float: PTFE						5	
Diameter							
DN 15/ANSI ½"							A
DN 20/ANSI ¾"							B
DN 25/ANSI 1"							C
DN 32/ANSI 1¼"							D
DN 40/ANSI 1½"							E
DN 50/ANSI 2"							F
DN 65/ANSI 2½"							G
DN 80/ANSI 3"							H
DN 100/ANSI 4"							J
Female thread ¼"							Q
Female thread 3/8"							R
Female thread ½"							S
Female thread ¾"							T
Female thread 1"							U
Female thread 1¼"							V
Female thread 1½"							W
Female thread 2"							X
Process connection							
EN 1092-1, PN 16, Form B1							B
EN 1092-1, PN 40, Form B1							D
EN 1092-1, PN 63, Form B2							E
EN 1092-1, PN 100, Form B2							F
ANSI B16.5, class 150 RF							J
ANSI B16.5, class 300 RF							K
ANSI B16.5, class 600 RF							L
ISO 228-1 G pipe thread PN 63							T
ISO 228-1 G pipe thread PN 100							U
ANSI B1.20.1 NPT pipe thread 900 lbs							N
ANSI B1.20.1 NPT pipe thread 1500 lbs							P
Measuring ranges							
Liquids		Gases					
l/h	(USgpm)	m³/h	(scfm)				
0.5 ... 5	(0.0022 ... 0.022)	0.015 ... 0.15	(0.0088 ... 0.088)				1 0

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Selection and ordering data (continued)

SITRANS FVA250 full metal variable area meter				Article No. 7ME586	● -	● ● ● ● ● -	● ● ● ●
0 ... 10	(0.0044 ... 0.044)	0.03 ... 0.3	(0.0177 ... 0.177)			1 1	
1.6 ... 16	(0.007 ... 0.07)	0.045 ... 0.45	(0.0265 ... 0.283)			1 2	
2.5 ... 25	(0.011 ... 0.11)	0.075 ... 0.75	(0.0441 ... 0.441)			1 3	
4 ... 40	(0.018 ... 0.18)	0.13 ... 1.3	(0.0765 ... 0.765)			1 4	
5 ... 50	(0.022 ... 0.22)	0.15 ... 1.5	(0.0883 ... 0.883)			1 5	
7 ... 70	(0.031 ... 0.31)	0.2 ... 2	(0.12 ... 1.24)			1 6	
10 ... 100	(0.044 ... 0.44)	0.3 ... 3	(0.177 ... 1.77)			1 7	
16 ... 160	(0.07 ... 0.7)	0.5 ... 5	(0.29 ... 2.71)			2 0	
25 ... 250	(0.11 ... 1.1)	0.7 ... 7	(0.412 ... 4.12)			2 1	
40 ... 400	(0.176 ... 1.76)	1.0 ... 11	(0.589 ... 6.47)			2 2	
60 ... 600	(0.264 ... 2.64)	1.7 ... 17	(1 ... 10)			2 3	
100 ... 1 000	(0.44 ... 4.4)	2 ... 30	(1.77 ... 17.66)			2 4	
160 ... 1 600	(0.7 ... 7)	3 ... 46	(2.35 ... 27.07)			2 5	
250 ... 2 500	(1.1 ... 11)	6 ... 70	(4.12 ... 41.2)			2 6	
400 ... 4 000	(1.76 ... 17.6)	10 ... 110	(6.47 ... 64.74)			2 7	
600 ... 6 000	(2.64 ... 26.4)	16 ... 170	(10 ... 100)			3 0	
1 000 ... 10 000	(4.4 ... 44)	28 ... 290	(17.1 ... 170.7)			3 1	
1 600 ... 16 000	(7 ... 70)	45 ... 460	(27.1 ... 270.7)			3 2	
2 000 ... 20 000	(8.8 ... 88	55 ... 550	(32.4 ... 323.7)			3 3	
2 500 ... 25 000	(11 ... 110)	69 ... 700	(41.2 ... 412)			3 4	
4 000 ... 40 000	(17.6 ... 176)	109 ... 1 100	(64.7 ... 647.4)			3 5	
5 000 ... 50 000	(22 ... 220)	134 ... 1 350	(79.5 ... 794.6)			3 6	
6 000 ... 60 000	(26.4 ... 264)	169 ... 1 700	(100 ... 1 000)			3 7	
8 000 ... 80 000	(35.2 ... 352)	239 ... 2 400	(141.3 ... 1 413)			4 0	
10 000 ... 100 000	(44 ... ... 440)	299 ... 3 000	(176.6 ... 1 766)			4 1	
Display unit / process temperature							
Standard (aluminum) - up to 200 °C with local display/150 °C with electrical output							0
Standard (aluminum) with displaced display - up to 350 °C with local display and electrical outputs							1
Stainless steel IP66 - up to 200 °C with local display/150 °C with electrical outputs							2
Stainless steel IP66 with displaced display - up to 350 °C with local display and electrical outputs							3
Heating/cooling jacket							
Without (standard)							A
With flange connection EN1092-1 DN 15 PN 40							B
With flange connection ½ " ANSI B16.5 Class 150 RF							C
Display/outputs							
With display							A
With display, 1 limit switch							B
With display, 2 limit switches							C
With display, HART and 4 to 20 mA							D
With display, HART, 4 to 20 mA, 2 limit switches							E
With display, HART, 4 to 20 mA, 1 limit switch							F
With display, PROFIBUS PA							G
Calibration							
Standard calibration							
• Without calibration certificate							0
• With calibration certificate							1

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Selection and ordering data (continued)

Other types of liquid and gas measurement	Order code
Please add "**-Z**" to Article No. and specify Order code.	
Certificates	
Certificate of compliance EN 10204-2.1	**C10**
Factory inspection certificate EN 10204-2.2	**C11**
Material certificate according to EN 10204-3.1	**C12**
Dye penetration test on pressure bearing weldings	**C13**
X-ray test of pressure bearing weldings	**C14**
Pressure test with acceptance test certificate 3.1 according to EN 10204	**C15**
PMI (positive material identification) test of pressure bearing metal parts	**C16**
Float damping	
With float damping	**D01**
Flange sealing surface	
Sealing surface according to EN 1092-1 welding neck flange	
• DN 15	**N11**
• DN 20	**N12**
• DN 25	**N13**
• DN 32	**N14**
• DN 40	**N15**
• DN 50	**N16**
• DN 65	**N17**
• DN 80	**N18**
• DN 100	**N19**
Sealing surface according to ANSI B16.5 welding neck flange	
• ½ inch	**N21**
• ¾ inch	**N22**
• 1 inch	**N23**
• 1¼ inch	**N24**
• 1½ inch	**N25**
• 2 inch	**N26**
• 2½ inch	**N27**
• 3 inch	**N28**
• 4 inch	**N29**
Specification of medium process data (specify in plain text)	
Specification always required for each order: Medium Operating pressure Operating temperature Density (only for customer-specified medium) Viscosity (only for customer-specified medium) Measuring range	**Y01**
TAG plate	
TAG plate in stainless steel (add plain text)	**Y17**
Cleaning to company standard	
Cleaning Class 2, with identification free of oil and grease	**K46**
Cleaning Class 1, with identification free of oil, grease and silicon	**K48**
Approvals	
With ATEX approval	**M51**
Special version (specify in plain text)	**Y99**

Note: For possible combinations of nominal sizes and flow tube, see tables under "Dimensional drawings".

Operating instructions

Description	Article-No.
SITRANS FVA250	
• English	**A5E03821131**
• German	**A5E32108136**

All literature is available to download for free, in a range of languages, at
www.siemens.com/processinstrumentation/documentation

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Technical specifications

SITRANS FVA250	
Application	See under "Application"
Design and function	See under "Design" and "Function"
Principle of measurement	Variable-area flowmeter
Input	
Measuring range	See table on page 3/xx
Pressure ratings	PN 16 ... 100 (232 ... 1 450 psi) depending on the version (see table under "Measuring range availability guide")
Installation / flow direction	Vertical/from bottom to top
Rated conditions	
Ambient temperature	
• With local display	-40 ... +80 °C (-40 ... +176 °F)
• With limit switches	-40 ... +65 °C (-40 ... +149 °F)
• With electric remote encoder (MEM)	-40 ... +70 °C (-40 ... +158 °F)
Measuring accuracy acc. to VDI/VDE 3513-2	
• For liquids	± 1.6 % (q_G = 50 %)
• For gases	± 2.0 % (q_G = 50 %)
Reproducibility	0.5 % of the measuring range limit (URV)
Operating temperature	See table "Measuring range availability guide"

SITRANS FVA250	
Operating pressure	Minimum operating pressure > 2x pressure drop (see table on page 3/xx)
Design	
Flanges	EN 1092-1, ANSI B16.5
Material	
• Fitting	Stainless steel, Hastelloy
• Float	Stainless steel, Hastelloy, PTFE
• Wetted parts materials	Stainless steel, PTFE, Hastelloy depending on version
Degree of protection (display unit)	
• Display unit made of aluminum	IP65
• Display unit made of stainless steel	IP66
Electromagnetic compatibility	
• EN 61000-6-2: 2011	Interference immunity industrial sector
• EN 61000-6-3	Interference immunity residential sector
• EN 55011: 2011	Group 1, Class B
• NAMUR recommendation	NE 21

Classification according to pressure equipment directive (PED 2014/68/EU)			
	Article No. 7ME586.-	**Permissible media**	**Category**
DN 15	xAxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	Article 4.3
DN 20	xBxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	Article 4.3
DN 25	xCxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	Article 4.3
DN 32	xDxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	III
DN 40	xExxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	III
DN 50	xFxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	III
DN 65	xGxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	III
DN 80	xHxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	III
DN 100	xJxxx-xxxx	Gases of fluid group 1 and liquids of fluid group 1	III

Technical specifications of contacts

Limit switch	
Cable gland	M20x1.5
Auxiliary power supply	5 ... 25 V DC
Isolation (2 contacts)	Electrically isolated
Limit switch	SJ3.5-N-BU
• Switching function	NAMUR NC
Nominal voltage U_O	8.2 V DC (R_i approx. 1 kΩ)
Explosion protection	II 2G EEx ia IIC T6 - T4 Gb
EC Type Examination Certificate for Directive 2014/34/EU	PTB 99 ATEX 2219 X

Transmitter (MEM) with 4 to 20 mA, pulse output and limit switch	
Cable gland	M20x1.5
Auxiliary power supply	14 ... 30 V DC
Analog output	4 ... 20 mA (2-wire)
Binary output	Pulses, limit switch
• Pulses	Max. pulse rate 10 Hz
• Limit switch	SJ3.5-N-BU (NAMUR, IEC 60947-5-6:1999)
Temperature influence	≤ ± 0.5% of the measuring range limit (URV)/10 K
Explosion protection	II 2G Ex ia IIC T6 Gb
EC Type Examination Certificate for Directive 2014/34/EU	BVS 07 ATEX E 033

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Technical specifications (continued)

Transmitter (MEM) PROFIBUS PA	
Cable gland	M20x1.5
Auxiliary power supply	10 ... 25 V DC
Basic current	< 16.5 mA
Fault current	< 18 mA
Transfer rate	31.25 Kbaud
Temperature influence	≤ ± 0.5% of the measuring range limit (URV)/10 K
Explosion protection	II 2G Ex ia IIC T6 Gb
EC Type Examination Certificate for Directive 2014/34/EU	BVS 07 ATEX E 033

- Generally for gas measurement
- When air bubbles in the medium cannot be avoided
- When there are pressure surges in the lines caused by a delay in the flow, for example, due to rapid throttling or blocking
- When turbulence, pulsations or other instabilities cause the float to vibrate
- When the flow pressure cannot be built up slowly
- When vibrations in the line cannot be avoided

Float damping

Float damping is recommended

Measuring range availability guide

Version	CF-S	EF-H	FF-P
Wetted parts materials	Mat. No. 1.4404/AISI 316L	Hastelloy	PTFE
Fitting	Mat. No. 1.4404/AISI 316L	≤ DN 25 (1"): Hastelloy > DN 25 (1"):Hastelloy/Mat. No. 1.4404/AISI 316L	Mat. No. 1.4404/AISI 316L with PTFE lining
Flange	Mat. No. 1.4404/AISI 316L	≤ DN 25 (1"): Hastelloy > DN 25 (1"): Hastelloy/Mat. No. 1.4404/AISI 316L	Mat. Nno. 1.4404/AISI 316L with PTFE lining
Float/flow tube	Mat. No. 1.4404/AISI 316L	Hastelloy	PTFE
Max. media temperature	-20 ... +200 °C (-4 ... +392 °F) (optional -80 ... +350 °C (-112 ... +662 °F))	-20 ... +200 °C (-4 ... +392 °F) (optional -80 ... +350 °C (-112 ... +662 °F))	-20 ... +125 °C (-4 ... +257 °F)
Nominal pressure	DN15 ... 50 (1/2" ... 2") PN 40 (580 psi) DN 65 ... 100 (2 1/2" ... 4") PN 16 (232 psi)	DN 15 ... 50 (1/2" ... 2") PN 40 (580 psi) DN 65 ... 100 (2 1/2" ... 4") PN 16 (232 psi)	PN 16 (232 psi)
Reference data for measuring range specifications	Fluid in l/h with density: 1.0 kg/l, temperature 20 °C (68 °F), viscosity 1 mPa.s Gas in m3/h with density: 1.293 kg/m3, temperature 0 °C (32 °F), viscosity: 0.0181 mPa.s, pe = 0 bar (0 psi)	Fluid in l/h with density: 1.0 kg/l, temperature 20 °C (68 °F), viscosity 1 mPa.s Gas in m3/h with density: 1.293 kg/m3, temperature 0 °C (32 °F), viscosity: 0.0181 mPa.s, pe = 0 bar (0 psi)	Fluid in l/h with density: 1.0 kg/l, temperature 20 °C (68 °F), viscosity 1 mPa.s Gas in m3/h with density: 1.293 kg/m3, temperature 0 °C (32 °F), viscosity: 0.0181 mPa.s, pe = 0 bar (0 psi)

Order code	Pressure loss [mbar] Measurement cone							Measuring ranges (dynamic 1:10) Liquids		Gases	
	1	2	3	4	5	6	7	[l/h]	[USgpm]	[m³/h]	[scfm]
10	40[1)]	-	-	-	-	-	-	0.5 ... 5	0.0022 ... 0.022	0.015 ... 0.15	0.0088 ... 0.088
11	44[1)]	-	-	-	-	-	-	0 ... 10	0.0044 ... 0.044	0.03 ... 0.3	0.0177 ... 0.177
12	40[1)]	-	-	-	-	-	-	1.6 ... 16	0.007 ... 0.07	0.045 ... 0.48	0.0265 ... 0.283
13	40[1)]	-	-	-	-	-	-	2.5 ... 25	0.011 ... 0.11	0.075 ... 0.75	0.0441 ... 0.441
14	40[1)]	-	-	-	-	-	-	4 ... 40	0.018 ... 0.18	0.13 ... 1.3	0.0765 ... 0.765
15	-	40[2)]	-	-	-	-	-	5 ... 50	0.022 ... 0.22	0.15 ... 1.5	0.0883 ... 0.883
16	-	40[2)]	-	-	-	-	-	7 ... 70	0.031 ... 0.31	0.2 ... 2.1	0.12 ... 1.24
17	-	60	-	-	-	-	-	10 ... 100	0.044 ... 0.44	0.3 ... 3	0.177 ... 1.77
20	-	60	-	-	-	-	-	16 ... 160	0.07 ... 0.7	0.5 ... 4.6	0.29 ... 2.71
21	-	60	-	-	-	-	-	25 ... 250	0.011 ... 1.1	0.07 ... 7	0.412 ... 4.12
22	-	70	-	-	-	-	-	40 ... 400	0.176 ... 1.76	1.0 ... 11	0.589 ... 6.47
23	-	80	-	-	-	-	-	60 ... 600	0.264 ... 2.64	1.7 ... 17	1 ... 10
24	-	-	60	-	-	-	-	100 ... 1 000	0.44 ... 4.4	2 ... 30	1.77 ... 17.66
25	-	-	70	-	-	-	-	160 ... 1 600	0.7 ... 7	3 ... 46	2.35 ... 27.07
26	-	-	100	50[2)]	-	-	-	250 ... 2 500	1.1 ... 11	6 ... 70	4.12 ... 41.2
27	-	-	240[2)]	120[2)]	80	-	-	400 ... 4 000	1.76 ... 17.6	10 ... 110	6.47 ... 64.74
30	-	-	-	180[2)]	90	-	-	600 ... 6 000	2.64 ... 26.4	16 ... 170	10 ... 100
31	-	-	-	-	110	-	-	1 000 ... 10 000	4.4 ... 44	28 ... 290	17.1 ... 170.7
32	-	-	-	-	230	70	-	1 600 ... 16 000	7 ... 70	45 ... 460	27.1 ... 270.7
33	-	-	-	-	230	70[2)]	-	2 000 ... 20 000	8.8 ... 88	55 ... 550	32.4 ... 323.7
34	-	-	-	-	500[2)]	100	-	2 500 ... 25 000	11 ... 110	69 ... 700	41.2 ... 412
35	-	-	-	-	-	350[2)]	120	4 000 ... 40 000	17.6 ... 176	109 ... 1 100	64.7 ... 647.4

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Technical specifications (continued)

Order code	Pressure loss [mbar] Measurement cone 1	2	3	4	5	6	7	Measuring ranges (dynamic 1:10) Liquids [l/h]	[USgpm]	Gases [m³/h]	[scfm]
36	-	-	-	-	-	350[2]	120[2]	5 000 ... 50 000	22 ... 220	134 ... 1 350	79.5 ... 794.6
37	-	-	-	-	-	-	360[2]	6 000 ... 60 000	26.4 ... 264	169 ... 1 700	100 ...1 000
40	-	-	-	-	-	-	600[2]	8 000 ... 80 000	35.2 ... 352	239 ... 2 400	141.3 ... 1 413
41	-	-	-	-	-	-	600[2]	10 000 ... 100 000	44 ... 440	299 ... 3 000	176.6 ... 1 766

Note: Female thread connector (DIN ISO 228, NPT ANSI B 1.20.1) not available for FF-P.

- Not available

1) Not available for EF-H and FF-P
2) Not available for FF-P

Sensor size availability guide

Type CF-S and EF-H

Order code	Diameter Flange		Flow tube 1	2	3	4	5	6	7
A	DN 15	½"	●[1]	●	●	-	-	-	-
B	DN 20	¾"	●[1]	●	●	-	-	-	-
C	DN 25	1"	●[1]	●	●	●[2]	-	-	-
D	DN 32	1¼"	●[1]	●	●	●	-	-	-
E	DN 40	1½"	●[1]	●	●	●	●[2]	-	-
F	DN 50	2"	●[1]	●	●	●	●	-	-
G	DN 65	2½"	-	-	●	●	●	●[2]	-
H	DN 80	3"	-	-	-	●	●	●	-
J	DN 100	4"	-	-	-	-	●	●	●

Type FF-P

Order code	Diameter Flange		Flow tube 1	2	3	4	5	6	7
A	DN 15	½"	-	●[2]	-	-	-	-	-
B	DN 20	¾"	-	●[3]	-	-	-	-	-
C	DN 25	1"	-	●	●	-	-	-	-
D	DN 32	1¼"	-	-	-	-	-	-	-
E	DN 40	1½"	-	-	-	●	-	-	-
F	DN 50	2"	-	-	-	-	●	-	-
G	DN 65	2½"	-	-	-	-	-	-	-
H	DN 80	3"	-	-	-	-	-	●	-
J	DN 100	4"	-	-	-	-	-	-	●

Type CF-S and EF-H

Order code	Diameter Female thread		Flow tube 1	2	3	4	5	6	7
Q	G ¼"	¼" NPT	●	●	-	-	-	-	-
R	G 3/8"	3/8" NPT	●	●	-	-	-	-	-
S	G ½"	½" NPT	●	●	●	●	-	-	-
T	G ¾"	¾" NPT	●	●	●	●	-	-	-
U	G 1"	1" NPT	●	●	●	●	●	-	-
V	G 1¼"	1¼" NPT	●	●	-	●	●	-	-
W	G 1½"	1½" NPT	-	-	-	●	●	-	-
X	G 2"	2" NPT	-	-	-	-	●	-	-

Note: Female thread not available for type FF-P.

● Available

- Not available

1) Not available for type EF-H
2) Only with EN 1092-1 flange
3) Only with ANSI B16.5 flange

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Technical specifications (continued)

Flange sealing surface selection guide

Order code	Diameter flange EN 1092-1	Flow tube 1	2	3	4	5	6	7
A	DN 15	**N11**	**N11**	**N11**	-	-	-	-
B	DN 20	**N12**	**N12**	**N12**	-	-	-	-
C	DN 25	-	-	**N13**	**N13**	-	-	-
D	DN 32	-	-	-	**N14**	-	-	-
E	DN 40	-	-	-	**N15**	**N15**	-	-
F	DN 50	-	-	-	-	**N16**	-	-
G	DN 65	-	-	-	-	-	**N17**	-
H	DN 80	-	-	-	-	-	**N18**	-
J	DN 100	-	-	-	-	-	-	**N19**

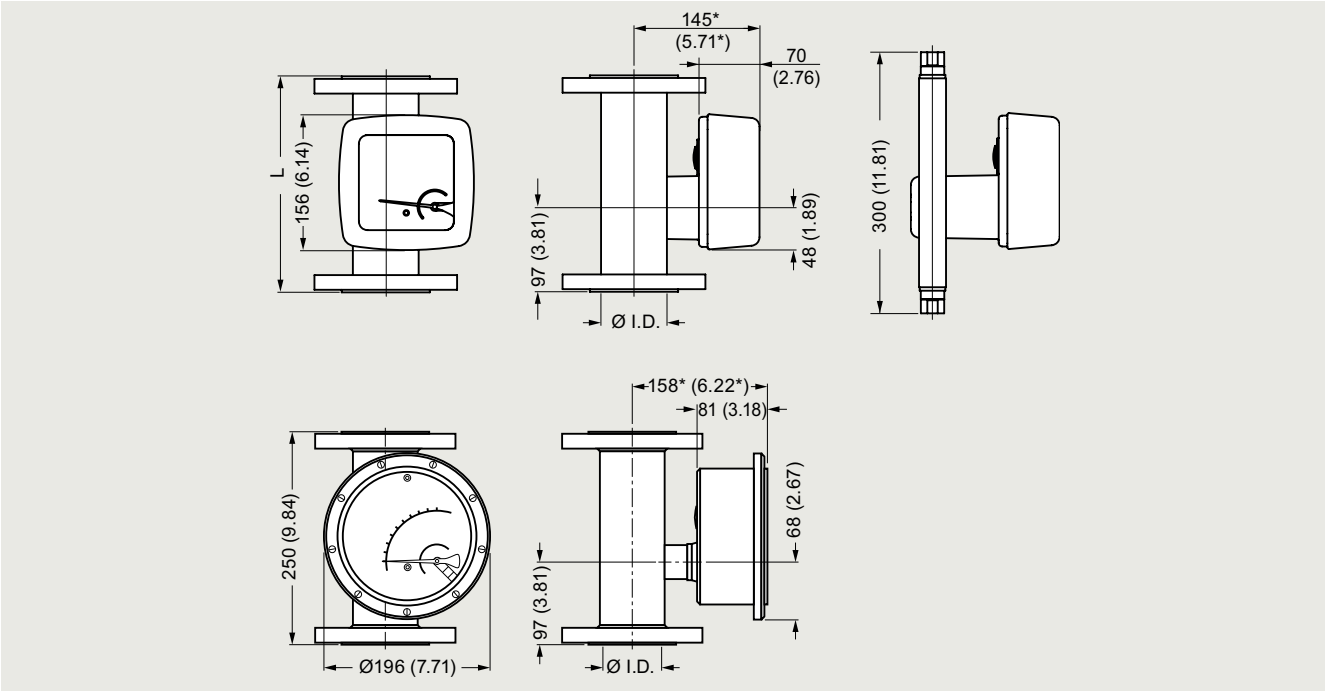
Type FF-P

Order code	Diameter flange ASME B16.5	Flow tube 1	2	3	4	5	6	7
A	½"	**N21**	**N21**	**N21**	-	-	-	-
B	¾"	**N22**	**N22**	**N22**	-	-	-	-
C	1"	-	-	**N23**	-	-	-	-
D	1¼"	-	-	-	**N24**	-	-	-
E	1½"	-	-	-	**N25**	-	-	-
F	2"	-	-	-	-	**N26**	-	-
G	2½"	-	-	-	-	**N27**	-	-
H	3"	-	-	-	-	-	**N28**	-
J	4"	-	-	-	-	-	-	**N29**

- Not available

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Dimensional drawings



SITRANS FVA250, dimensions in mm

Order code	Diameter flange EN 1092-1	Flow tube I.D. [mm]						
		1	2	3	4	5	6	7
A	DN 15	26[1)]	26[1)]	32[1)]	-	-	-	-
B	DN 20	26[1)]	26[1)]	32[1)]	-	-	-	-
C	DN 25	26	26	32[1)]	46[1)]	-	-	-
D	DN 32	26	26	32	46[1)]	-	-	-
E	DN 40	26	26	32	46[1)]	70[1)]	-	-
F	DN 50	26	26	32	46	70[1)]	-	-
G	DN 65	-	-	32	46	70	102[1)]	-
H	DN 80	-	-	-	46	70	102[1)]	-
J	DN 100	-	-	-	-	70	102	125[1)]

- Not available

* +100 mm with pulled-out display unit
1) Flange sealing surface not according to EN 1092-1 (Please select N-option for EN 1092-1 compliant flange sealing surface)

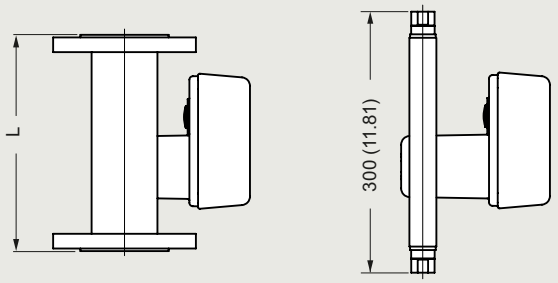
Order code	Diameter flange ANSI B16.5	Flow tube I.D. [inch]						
		1	2	3	4	5	6	7
A	½"	1.02[1)]	1.02[1)]	1.26[1)2)]	-	-	-	-
B	¾"	1.02[1)]	1.02[1)]	1.26[1)]	-	-	-	-
C	1"	1.02	1.02	1.26[1)]	-	-	-	-
D	1¼"	1.02	1.02	1.26	1.81[1)]	-	-	-
E	1½"	1.02	1.02	1.26	1.81[1)]	-	-	-
F	2"	1.02	1.02	1.26	1.81	2.76[1)]	-	-
G	2½"	-	-	1.26	1.81	2.76	-	-
H	3"	-	-	-	1.81	2.76	4.02[1)]	-
J	4"	-	-	-	-	2.76	4.02	4.92[1)]

- Not available

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Dimensional drawings (continued)

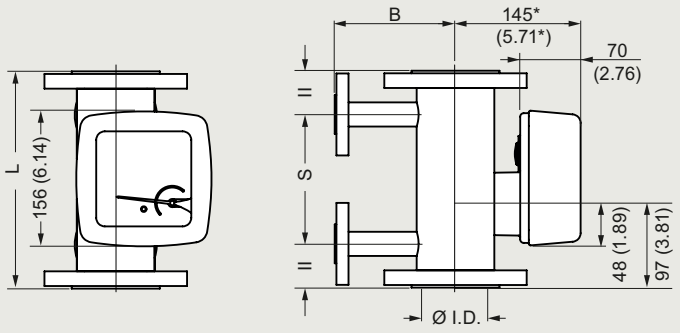
* +3.94 inch with pulled-out display unit
1) Flange sealing surface not according to ANSI B16.5 (Please select N-option for ANSI B16.5 compliant flange sealing surface)
2) Flange with threaded holes



SITRANS FVA250 build-in lenght, dimensions in mm (inch)

Diameter	EN 1092-1 PN 16	PN 16	PN 16	PN 16	Diameter	ANSI B16.5 class 150	class 300	class 600
DN 15	-	250 (9.84)	-	250 (9.84)	½"	250 (9.84)	250 (9.84)	250 (9.84)
DN 20	-	250 (9.84)	-	250 (9.84)	¾"	250 (9.84)	250 (9.84)	250 (9.84)
DN 25	-	250 (9.84)	-	250 (9.84)	1"	250 (9.84)	250 (9.84)	250 (9.84)
DN 32	-	250 (9.84)	-	250 (9.84)	1¼"	250 (9.84)	250 (9.84)	250 (9.84)
DN 40	-	250 (9.84)	-	250 (9.84)	1½"	250 (9.84)	250 (9.84)	250 (9.84)
DN 50	-	250 (9.84)	250 (9.84)	300 (11.81)	2"	250 (9.84)	250 (9.84)	300 (11.81)
DN 65	250 (9.84)	250 (9.84)	-	-	2½"	250 (9.84)	300 (11.81)	300 (11.81)
DN 80	250 (9.84)	250 (9.84)	-	-	3"	250 (9.84)	300 (11.81)	300 (11.81)
DN 100	250 (9.84)	250 (9.84)	-	-	4"	250 (9.84)	300 (11.81)	300 (11.81)

- Not available



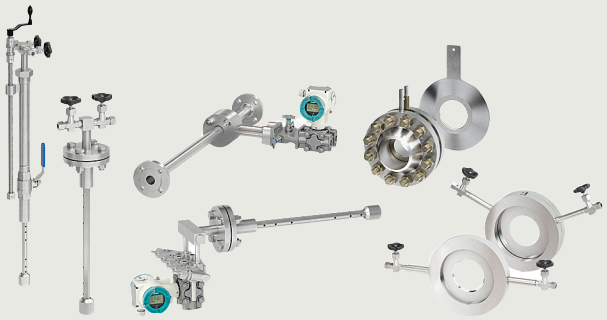
SITRANS FVA250 with heating/cooling jacket, dimensions, in mm (inch)

Diameter	B (flange) mm	inch	B (Ermeto) mm	inch	S mm	inch	Weight kg	lbs
15 (½")	110	4.33	53	2.09	150	5.91	3,0	6.6
20 (¾")	110	4.33	53	2.09	150	5.91	3,0	6.6
25 (1")	110	4.33	58,5	2.3	150	5.91	4,2	9.3
32 (1¼")	110	4.33	58,5	2.3	150	5.91	5,2	11.5
40 (1½")	130	5.12	63	2.48	150	5.91	6,0	13.2
50 (2")	140	5.51	77,5	3.05	150	5.91	7,5	16.5
65 (2½")	140	5.51	77,5	3.05	150	5.91	8,5	18.7
80 (3")	160	6.3	93,5	3.68	150	5.91	13	28.7
100 (4")	175	6.89	110	4.33	120	4.72	18	39.7

* + 100 mm (3.94 inch) with pulled-out display unit

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Overview



With the SITRANS FP product line Siemens offers a complete solution for differential pressure flow measurements. This well-established technology is suitable for all kinds of applications – liquids, dry or humid gases and steam. Due to the robust though variable design it has been and still is one of the main technologies for flow measurement in various industries.

The new product line offers full flexibility for your processes. SITRANS FP is not a simple substitution of our previous orifice program but a completely new setup. A new digital sizing process ensures minimum effort during presales and full traceability in aftersales. The differential pressure portfolio consists of the averaging pitot tube measuring system SITRANS FPS300 and the primary elements according to ISO 5167 (orifices) SITRANS FPS200.

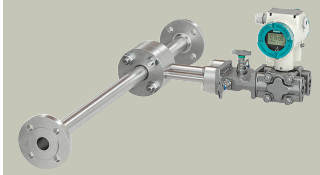
Product overview

SITRANS FP230/FPS200 primary elements according to ISO 5167

Product name	Fluid	Design	Pressure tapping	Nominal size	Article No.
Standard orifice plate with corner pressure tappings Compact orifice plate with integrated corner pressure tappings in carbon or stainless steel 	• Gas • Steam • Liquid	• Remote • Compact	Corner tapping	DN 50 ... 500 (2 ...20 inch)	**7ME171.-.....-....**
Standard orifice plate with annular chamber Standard orifice plate with annular chamber and pressure tapping in carbon or stainless steel 	• Gas • Steam • Liquid	• Remote • Compact	Annular chamber	DN 50 ... 600 (2 ...24 inch)	**7ME172.-.....-....**

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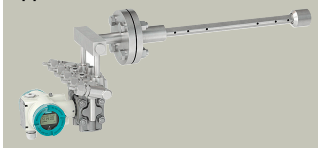
Overview (continued)

Product name	Fluid	Design	Pressure tapping	Nominal size	Article No.
Orifice meter run Orifice meter run with flanges ends in carbon or stainless steel 	• Gas • Steam • Liquid	• Remote • Compact	Annular chamber	DN 10 ... 50 (3/8 ...2 inch)	**7ME173.-.....-....**
Orifice plate Orifice plate for installation between flanges in stainless steel 	• Gas • Steam • Liquid	• Remote	Not included	DN 50 ... 600 (2 ...24 inch)	**7ME174.-.....-....**
Orifice plate with orifice flange Orifice flange pair according to ASME B36.16 with orifice plate in carbon steel (flanges) or stainless steel 	• Gas • Liquid	• Remote	In the flange	DN 50 ... 600 (2 ...24 inch)	**7ME175.-.....-....**

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Overview (continued)

SITRANS FP330/FPS300 averaging pitot tube

Product name	Fuid	Design	Mounting type	Nominal size	Article No.
Averaging pitot tube for gases and liquids 	• Gas • Liquid	• Remote • Compact	Flange, cutting ring	DN 40 ... 4000 (1½" ... 160")	**7ME161.-.....-....**
Averaging pitot tube for steam applications 	• Superheated steam • Saturated steam	• Remote • Compact	Flange	DN 40 ... 2000 (1½" ... 80")	**7ME162.-.....-....**
Averaging pitot tube with FASTLOK The sensor can be assembled and disassembled into the pipe without interrupting plant operation. 	• Dry gas • Wet gas • Liquid	• Remote • Compact	Screwed ball valve	DN 40 ... 2000 (1½" ... 80")	**7ME163.-.....-....**

Sizing procedure

The SITRANS FP sizing tool is available via PIA Life Cycle Portal and supports you in choosing the right device within this portfolio:

pia-portal.automation.siemens.com

After registration you have access to a web-based sizing procedure generating reference IDs which can be used as application data for the ordering process.

Benefits

- Suitable for a vast range of different applications
- Available as pre-mounted compact system as well as remote parts
- Advanced intelligent sizing procedure
- Web-based sizing and data storage enables full traceability and easy communication
- All benefits of SITRANS P320 available

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Application

The SITRANS FP230/330 devices are applicable in a variety of applications:

Chemical industry

- Different materials for aggressive substances
- Namur NE107, self-monitoring and diagnostics
- Namur NE21, increase EMC conformity
- Measurement of various liquid and gas media

Oil & Gas industry

- Complete setup made of stainless steel
- Robust design and well-established technology
- Measurement of liquid and gas hydrocarbons

Power industry

- QAL1 approval for continuous emission monitoring applications according to EN 15267
- Specific design for steam applications
- Measurement of steam, condensate and water

and others

- Cost-effective device
- Easy commissioning

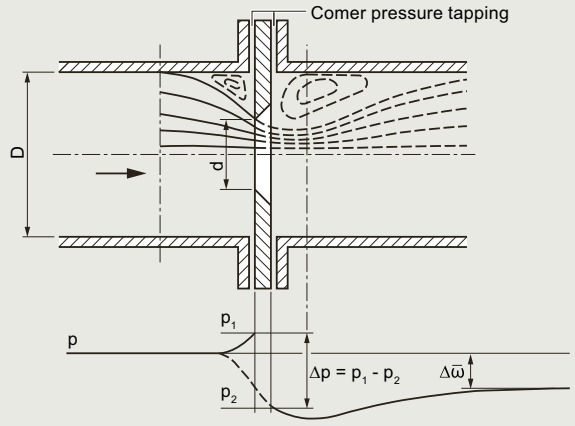
Function

Mode of operation

The so-called primary element (orifice plate, averaging pitot tube, etc.) creates a differential pressure. The pressure is transferred to the measuring cell of the differential pressure transmitter. This can be done through a compact installation where the differential pressure transmitter is installed directly at the primary element or as remote installation through separately installed pipes that connect primary element and differential pressure transmitter.

Different types and designs of primary elements for differential pressure flow measurement have been established historically. Traditional primary elements such as orifice meters are harmonized in the international standard ISO 5167. Other primary elements such as the averaging pitot tube follow the same working principle, they are not standardized but are widely used and accepted.

Principle of the differential pressure method



D Internal diameter of pipe
d Diameter of orifice disk aperture
p Pressure in the pipe
p_1 Pressure immediately upstream of primary device
p_2 Pressure immediately downstream of primary device
Δp Differential pressure
$\Delta\bar{\omega}$ Remaining pressure loss

Principle of the differential pressure method: Pressure curve at orifice plate

The differential pressure method is based on the law of continuity and Bernoulli's energy equation. A primary differential pressure device is installed at the measuring point to measure the flow. The primary element restricts the pipe.

According to the law of continuity, the mass flow of a moving fluid (gas, steam or liquid) in a pipeline is the same at all points. If the cross-section is reduced at one point, the flow velocity must increase at this point. Thus, the restriction causes an overpressure directly in front of the primary element and a drop in pressure behind the primary element. This pressure drop is greatly influenced by the degree of restriction. This degree is usually measured in relation of the diameters of the restriction to the diameter of the pipe, the diameter ratio β:

$$\beta = d / D$$

The difference between overpressure before the primary element and lower pressure after the primary element is called differential pressure (Δp, "delta p"). According to Bernoulli's energy equation, the square-root of the differential pressure is proportional to the flow rate:

$$q \sim \sqrt{\Delta p}$$

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Function (continued)

The created differential pressure is partly recovered with sufficient distance to the primary element but a permanent pressure drop, $\Delta\omega$, remains.

The exact flow equation of ISO 5167 additionally considers the properties of the primary device, the pipe, and the fluid:

$$q = f(C, \Delta p, \rho, \epsilon, \beta)$$

Where:

- q: mass flow
- Δp: differential pressure
- C: "coefficient of discharge"
- ρ: density of fluid before the point of measurement
- ϵ: expansion number
- β: diameter ratio

The C-factor is determined during design of the differential pressure flowmeter. For certain types of flowmeters it is a constant (e.g. Venturi flowmeters), for others it is slightly non-linear and dependent on flow rate (orifice flowmeters).

The expansion number considers the change in fluid properties due to the differential pressure itself.

All factors will be considered during the design of the differential pressure flowmeter.

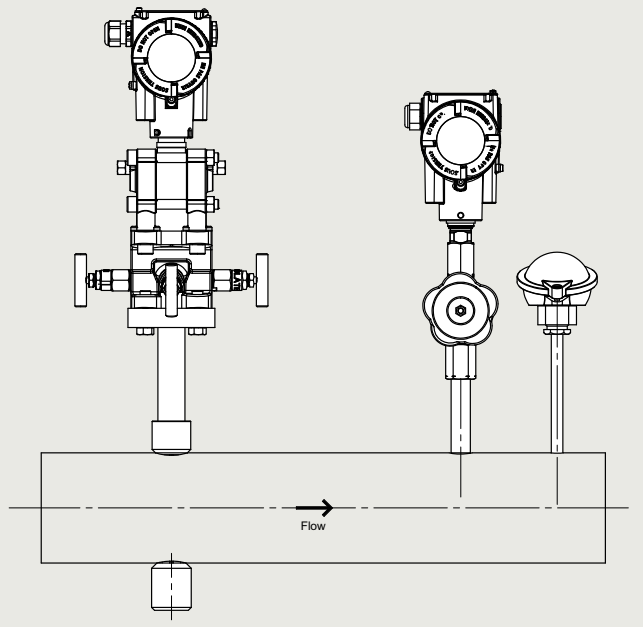
For flow measurement applications where all quantities (density, pressure, temperature, etc.) can – with sufficient accuracy – be considered constant, it can be reduced to the basic relation given above:

$$q \sim \sqrt{\Delta p}$$

Differential pressure flow measurement in practice

A differential pressure flow measurement usually consists of at least 3 components:

- primary element (orifice, pitot tube, etc.)
- manifold (plus primary shut-off valve for remote installations)
- differential pressure transmitter



Function (continued)

The picture above shows all these components installed together in a "compact" arrangement (manifold and differential pressure transmitter sitting on top of the primary element).

Depending on the process the application might require additional components such as:

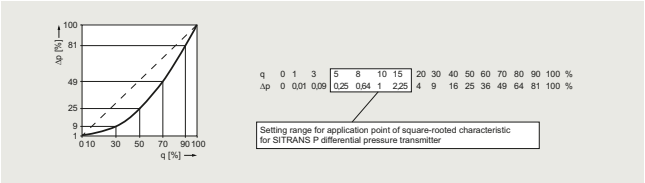
- absolute pressure measurement
- temperature measurement

which are also shown above. If absolute pressure and/or temperature are not constant, these quantities have to be measured as well to calculate the density changes caused by the change of these process conditions. This process is called "compensation" meaning re-calculation of actual fluid density based on actual process conditions as explained above.

Characteristic curves

Based on the relations described above differential pressure measurement systems generally show a square-root relationship between differential pressure and flow. Therefore, a square-root transmitter is required to create a linear flow characteristic. If no square-root characteristic is selected, the transmitter will output a signal proportional to differential pressure.

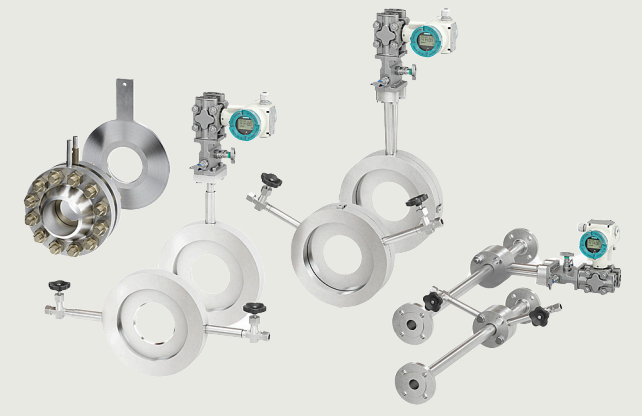
The conversion from differential pressure to flow has to be done in a subsequent system (flow computer, DCS, etc.). This is required if additional measurements such as absolute pressure and/or temperature are connected to such a system to correct for changes in operational density (so called "compensation").



Relationship between flow q and differential pressure Δp

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Overview



Primary differential pressure devices are standardized mechanical flow sensors, often also referred to as differential pressure transducers. The primary differential pressure devices are calculated and manufactured according to EN ISO 5167.

Through constriction of the line diameter in the pressure device, the flow rate creates a differential pressure that is converted with the help of a differential pressure transmitter into a proportional current signal or flow value. The assignment of differential pressure to flow is created by a calculation of the primary differential pressure device.

Primary differential pressure devices are suitable for single-phase media such as gas, steam and liquids without solid components.

Benefits

- Suitable for universal use across the globe and widely accepted in all industries
- Very robust and can be used in a wide range of nominal diameters
- Suitable for high temperature and pressure ranges
- Low uncertainty of measurement
- No wet calibration required as they use an internationally standardized flow rate measurement procedure
- Differential pressure transmitter can be used over a long distance from the measuring location
- Differential pressure method is well known and has a large installed base
- SITRANS P differential pressure transmitter is easy to parameterize again if process data change. They are adapted by recalculating and assigning new parameters to the transmitter or, in case of an orifice plate with annular chamber, by using a new orifice plate

Application

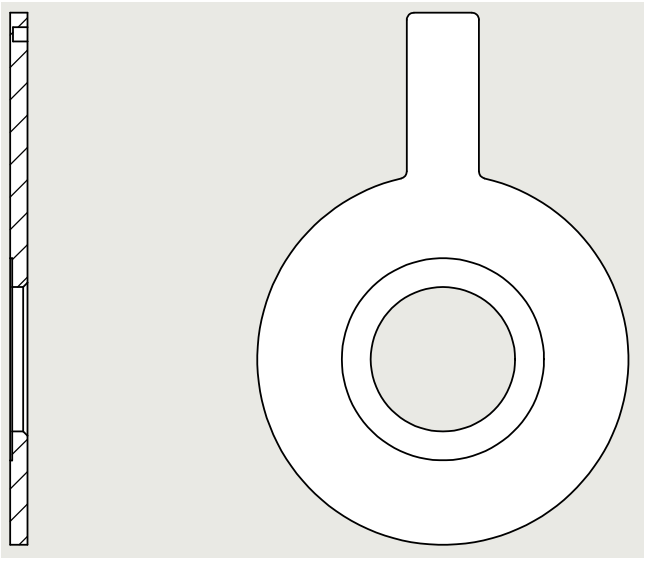
- Technical gases
- Compressed air
- Fresh and combustion air
- Steam/Heat quantities
- Heat transfer fluids
- Water

Design

Basics: Orifices for flow measurement

Orifice plates are usually differentiated by their type of installation, type of differential pressure tapping and the shape of the orifice.

The characteristic differential pressure is created by the orifice bore which is the defined circular opening. It is usually of square edged concentric type according to ISO 5167-2 positioned in the middle of the pipe.



The main features are a sharp edge, a cylindrical bore of a certain length and a conical bevel tapering to the rear. Alternatively, the relevant standards provide for deviating designs, which are used for applications with highly viscous (e.g. quarter-circle nozzles) or contaminated media (e.g. segment orifices).

The standard design is permitted by the standard for an inner diameter of the pipe between 50 mm and 1000 mm. For pipes with smaller inside diameters, standards such as ISO 15377-TR or ASME MFC-14M which go beyond these standards must be taken into account. Orifice plates for pipes with small inside diameters are usually designed as meter tubes.

In order to reduce the uncertainties of these meter tubes, the devices can be calibrated on a flow test bench if required on request.

Types of differential pressure tappings

The differential pressure can be tapped in different ways:

Corner tapping

Directly in front of and behind the orifice plate an opening is placed in the corner of a carrier ring to measure upstream and downstream pressure. Both pressure signals are routed through these openings to the outside.

Corner tapping with annular chamber

The orifice plated is held by an annular chamber. Upstream and downstream pressure are measured through an annular gap opening between carrier ring and orifice plate. Both pressure signals are averaged over the entire circumference and routed outside.

Flange tapping

The orifice plate is held between two so-called orifice flanges. Upstream and downstream pressure signals are measured through flange taps which are drilled into the flanges.

Tapping with distance D, D/2

The orifice plate is held between regular flanges. Upstream and downstream pressure signals are measured through taps in the pipe with distance of D (upstream) and D/2 (downstream) to the orifice plate.

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Design (continued)

Designs

- Standard orifice plate with corner pressure tappings (7ME171)
- Standard orifice plate with annular chamber (7ME172)
- Orifice meter run (7ME173)
- Orifice plate (7ME174)
- Orifice plate with orifice flanges (7ME175)

Mounting arrangements

For more information on installation position and piping, please see the Operating Instructions "SITRANS FPS200" on SIOS.

Integration

The orifice plate is installed between two flanges in the pipeline. Using condensation pots (for steam) and initial shut-off valves, the differential pressure of the high-pressure side and low-pressure side is directed through differential pressure lines to a manifold and to the differential pressure transmitter. For fluids with pressure and temperature fluctuations it makes sense to take an additional measurement of the pressure and temperature in order to correct the flow signal of the transmitter in a subsequent correction computer.

Selection of mounting point

The flow measuring regulations EN ISO 5167 not only consider the design of primary differential pressure devices, but also assume that their installation is in accordance with the standard so that the specified tolerances can be retained. The required inlet and outlet pipe sections according to ISO 5167 can be found in the calculation protocol of the respective orifice plate. Configuration of the pipeline should allow for standardized installation (required inlet and outlet pipe section). Particular attention must be paid to ensure that the primary device can be fitted in a sufficiently long straight section of pipe. Bends, valves and similar should be fitted sufficiently far upstream of the primary device to prevent them having a detrimental effect. Primary devices with a large diameter ratio are particularly sensitive to interferences.

Design of measuring point

The design of the measuring point depends on the medium and on the spatial conditions. The designs for gas and water only differ with regard to the position of the tapping sockets (see section "Tapping sockets"); condensation pots are provided for steam applications.

Orifice meter runs

On lines with small nominal diameters (DN 10 to DN 50) the measurements are influenced by the wall roughness and diameter tolerances of the pipes, more than measurements with larger nominal diameters. These influences are counteracted by using orifice meter runs with fitted inlet and outlet pipe sections made of precision pipes. For exact measurements with orifice meter runs, the flow coefficient C can be determined by means of calibration.

Technical specifications

SITRANS FP230/FPS200	
General design	
Working principle	Differential pressure orifice meter (other ISO 5167 primary elements on request)
Media	• Steam (saturated, superheated) • Gas (dry, up to 100% water saturated) • Liquids (water, non-conductive liquids, oil, etc.)
Transmitter installation	• Compact mount with differential pressure transmitter (acc. to IEC 61518) • Remote mounted differential pressure transmitter
Bidirectional flow	On request
Design	According to ISO 5167-2 (2003); for orifice plates smaller than 50 mm inner diameter according to ISO/TR 15377 or ASME MFC-14M:2003
Accuracy	
Uncertainty at design flow (of Sensor Coefficient of Discharge)	Typically in the range of 0.5 ... 1.2% (depends on application and final design)
Measurement range	Typically between up to 1:5 ... 1:10 (real measurement range depends on transmitter performance and non-linearity of coefficient of discharge)
Operating conditions	
Pressure	Max. PN 100 or Class 600 (higher pressure ratings on request)
Temperature	According to EN 1092-1 or ASME B16.5 (exact maximum temperature depends on sensor design)
Pressure loss	30 ... 80% of differential pressure
Installation conditions	
Straight inlet diameter	Will be calculated by sizing tool (depends on β-coefficient, typically in the range of 16 ... 44 × inner diameter behind 90° elbow, can be reduced with 0.5% added uncertainty)
Straight outlet diameter	Will be calculated by sizing tool (depends on β-coefficient, typically in the range of 6 ... 8 × inner diameter, can be reduced with 0.5% added uncertainty) Note: For detailed calculation of recommended installation pipe length please refer to sizing tool or manual
Design	
Material orifice plate	Standard: • Stainless steel 1.4404/AISI 316L • Carbon steel (other materials on request)
Material orifice flanges / orifice holder	• Stainless steel 1.4404/AISI 316L • Carbon steel (other materials on request)
Pipe diameter	• DIN: DN 10 ... 600 • ASME: 3/8" ... 24" (other sizes on request)
Process connection	Orifice meter runs: Flanges EN 1092-1 B1 or ASME B16.5 RF All other designs: Suitable for installation between flanges EN 1092-1 B1 or ASME B16.5 RF (other process connections on request)
Length	Orifice with carrier ring and pressure tappings: 40 mm (65 mm for compact steam applications) Orifice plate with annular chamber: 65 mm Orifice meter run: depends on pipe diameter (see below) Single piece orifice for orifice flanges (with or without orifice flanges): depends on pipe diameter (see below)
Approvals	
• Hazardous area	(see differential pressure transmitter)
• Enclosure rating	(see differential pressure transmitter)
• Operational safety	(see differential pressure transmitter)

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Accessories

Z-Options for cable glands, plugs, labeling, approvals, blanking plugs, flanges seals, device settings, etc. according to SITRANS P320

Options

Further versions that are available on request:

- Other types of primary differential pressure device: nozzles, venturi nozzles, classic venturi tubes etc.
- Other nominal diameters and nominal pressures to EN, ASME and other standards
- Other lengths, special lengths
- Other materials
- Sealing face with recess or groove
- Flushing rings
- Other tapping sockets, multiple tappings
- Material acceptance test certificates or cold water pressure tests

More information

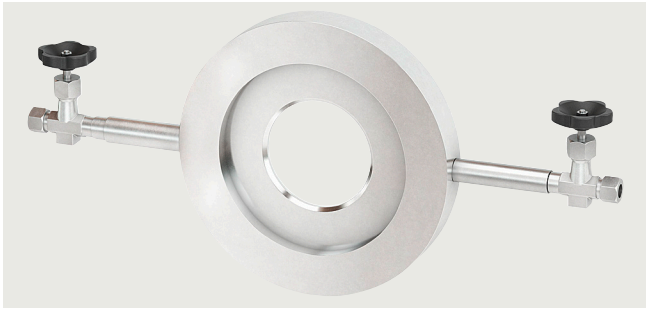
For more information please see the Installation Instructions and the Instruction Manuals SITRANS P on SIOS.

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Application



SITRANS FP230 compact design



SITRANS FPS200 remote design

Compact orifice plate with integrated pressure tappings in carbon or stainless steel for flow measurement of gas, steam and liquid.

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Design

Standard orifice plates with integral tappings are manufactured from a single body and are therefore particularly inexpensive. The pressure tapping takes place at two points and is integrated into the carrier ring. Differential pressure connection can be compact and remote. The instruments are easy to handle and offer good accuracy with reasonable inlet and outlet runs. They are installed between regular flanges.

Nominal size

- EN: DN 50 ... 500
- ASME: 2 ... 20 inch

Nominal pressure

- EN: PN 6 ... 100
- ASME: class 150 ... 600

Differential pressure tapping

- Corner tapping: Measurement of differential pressure at 2 points in the corner of the carrier ring

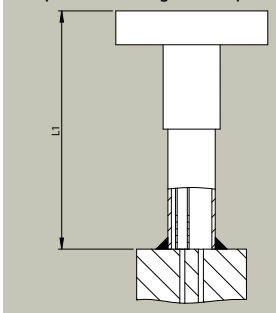
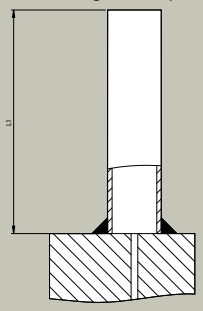
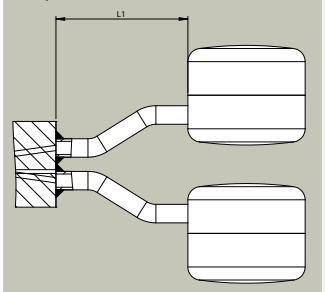
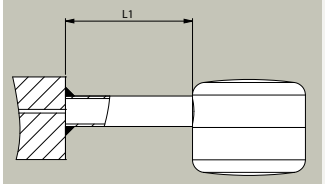
Sealing face

- According to EN 1092-1: flat (for flanges type B1 and B2)
- According to ASME B16.5: flat (for flanges RF and SF)

Material

- Orifice: Carbon steel / orifice edge: ER307
- Orifice: 316L/1.4404 / orifice edge: 316L/1.4404

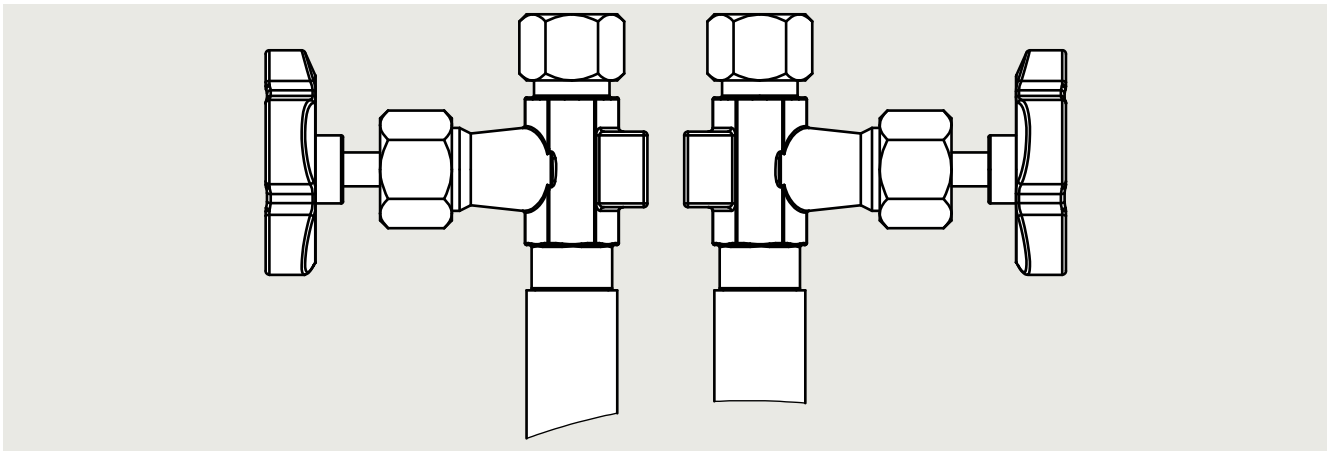
Connection length

Connection length	
Compact mount for gas and liquids 	• L1 = 130 mm • Max. isolation = 110 mm
Remote mount for gas and liquids 	• L1 = 100 mm • Max. isolation = 80 mm
Compact mount for steam 	• L1 = 150 mm • Max. isolation = 110 mm
Remote mount for steam 	• L1 = 150 mm • Max. isolation = 140 mm

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Design (continued)

Tapping sockets
Gases and liquids
Remote design

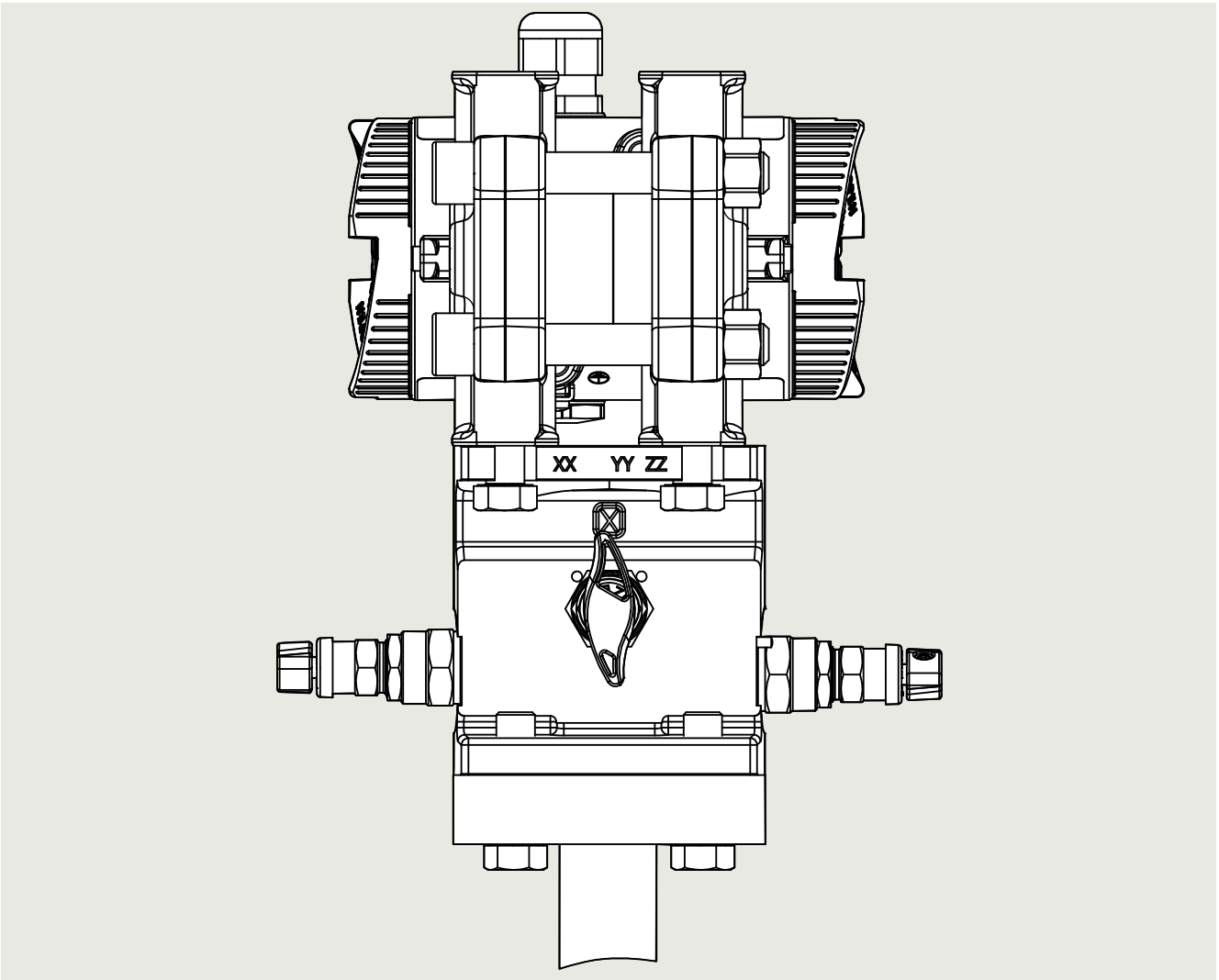


For single body standard orifice plates in remote design, the angle α between the pressure tapppings depends on the pressure rating and the nominal diameter of the flanges.

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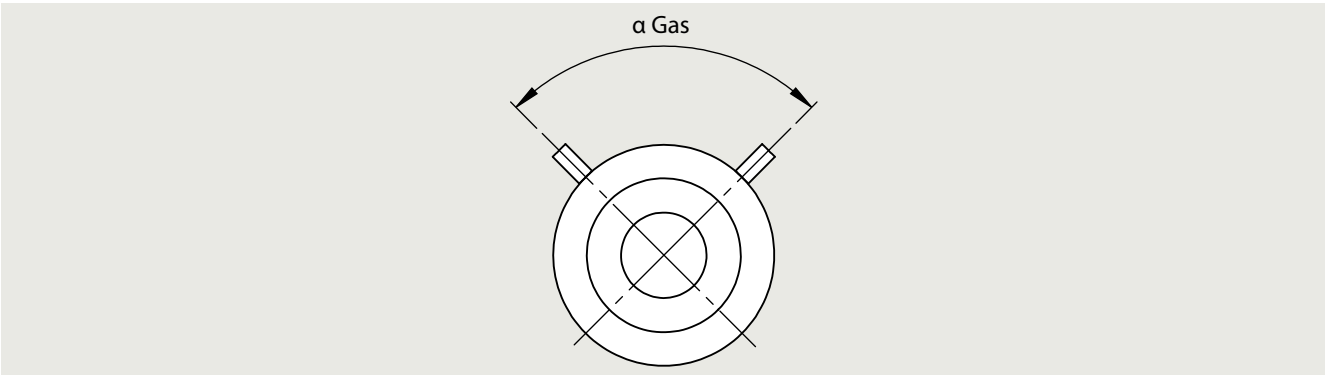
Design (continued)

Compact design



For single body standard orifice plates in compact design, a so-called flange plate is used. The manifold and the differential pressure transmitter are mounted on this flange plate.

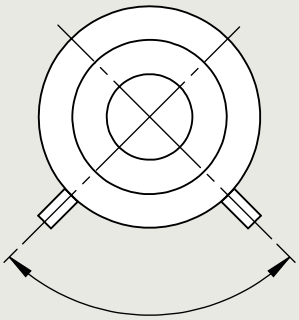
Tap position/angle in horizontal pipe



Tap position/angle in horizontal pipe (gas)

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Design (continued)



Tap position/angle in horizontal pipe (liquid)

Remote design for gases and liquids for DIN flange

Nominal size	DIN flange PN 6	PN 10	PN 16	PN 25	PN 40	PN 64	PN 100
DN 50	135	135	135	135	135	135	135
DN 65	135	135	135*)	90	90	90	90
DN 80	135	90	90	90	90	90	90
DN 100	135	90	90	90	90	90	90
DN 125	90	90	90	90	90	90	90
DN 150	90	90	90	90	90	90	60
DN 175	90	90	90	60	60	60	60
DN 200	90	90	60	60	60	60	60
DN 250	60	60	60	60	60	60	60
DN 300	60	60	60	45	45	45	45
DN 350	60	45	45	45	45	45	45
DN 400	45	45	45	45	45	45	45
DN 450	45	36	36	36	-	-	-
DN 500	36	36	36	36	36	36	36

*) Fitting for DN 65 PN 16 flange with 4 holes. If design for flange with 8 holes is required, please add a comment to the corresponding project within the sizing tool.

Remote design for gases and liquids for ANSI flange

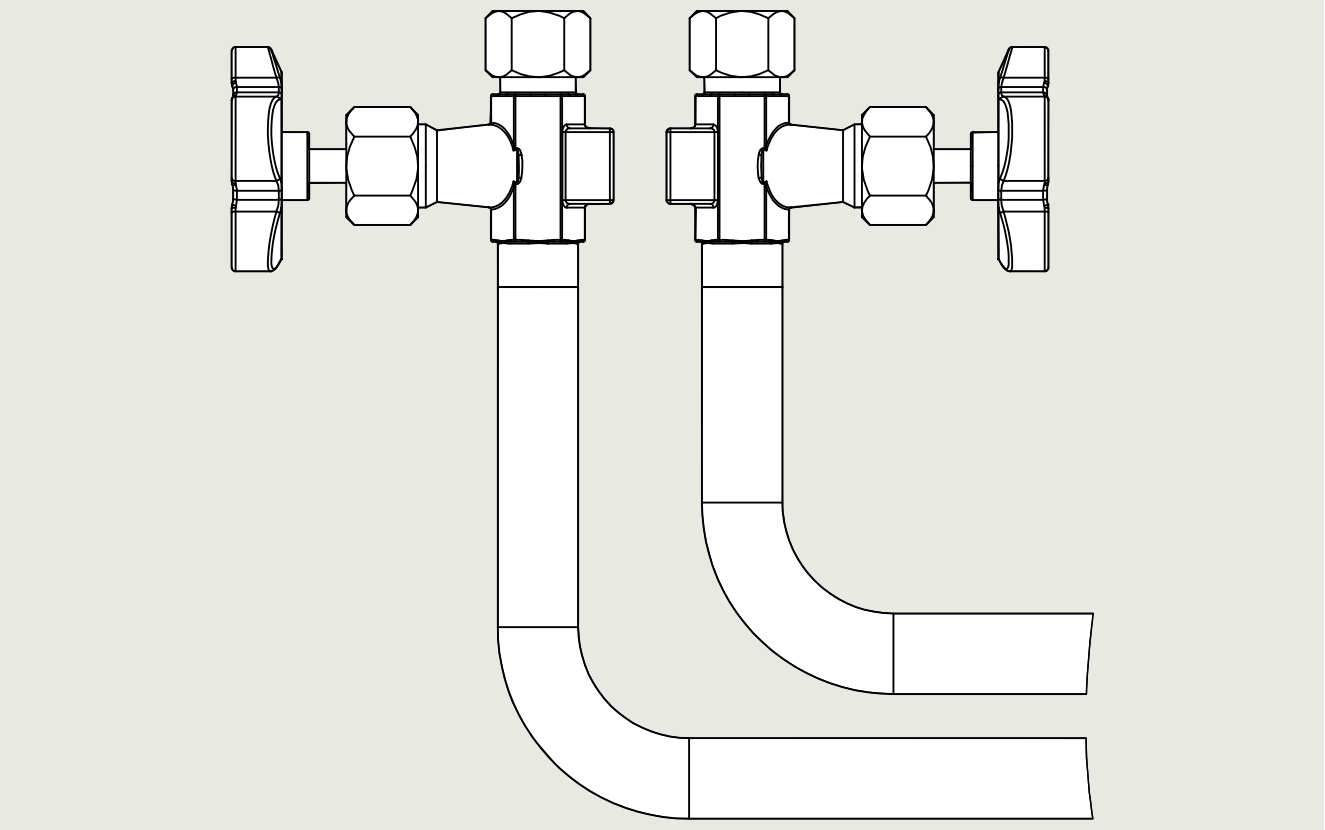
Nominal size	ANSI flange Class 150	Class 300	Class 600
2"	135	90	90
2,5"	135	90	90
3"	135	90	90
4"	90	90	90
5"	90	90	90
6"	90	60	60
8"	90	60	60
10"	60	45	45
12"	60	45	36
14"	60	36	36
16"	45	36	36
18"	45	30	36
20"	36	30	30

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Design (continued)

Wet gases

Remote design

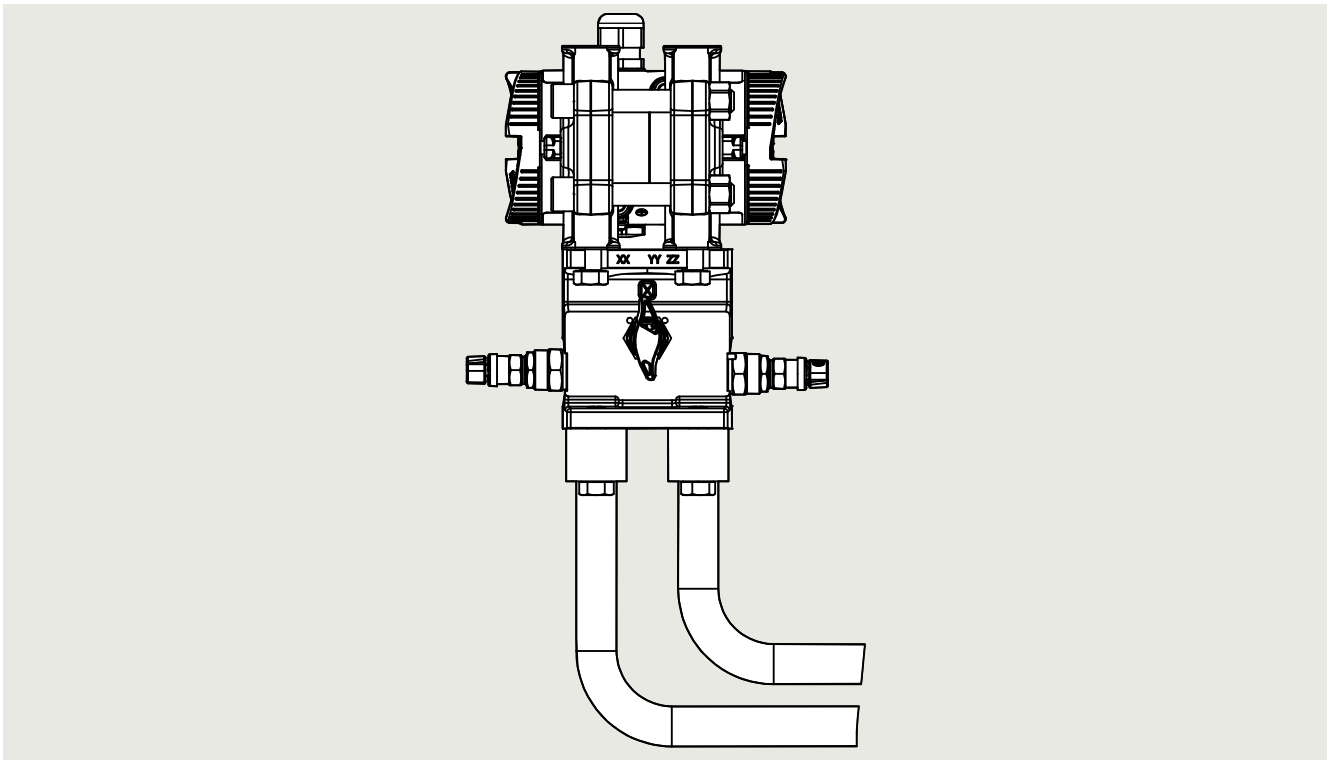


For single body standard orifice plates in remote design for wet gases, nozzles bent at right angles with welded-on valves are used. This design is only necessary for vertical pipes. For horizontal pipes, the design for gases and liquids can be selected because the nozzles point up as listed in the table above.

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Design (continued)

Compact design

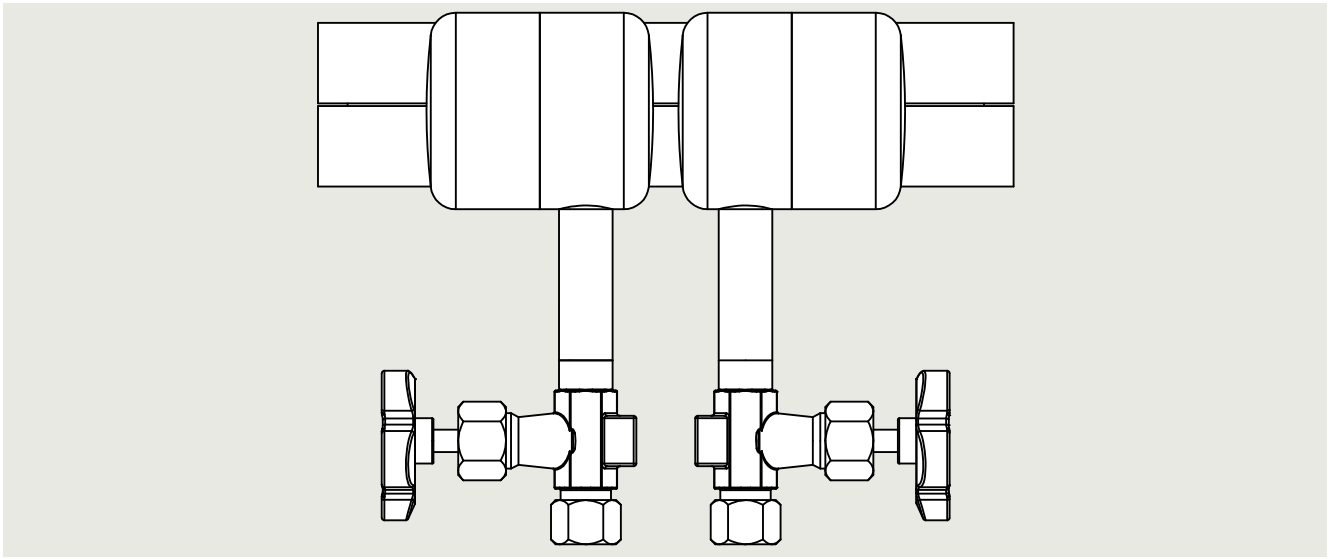


For single body standard orifice plates in compact design for wet gases, nozzles bent at right angles with oval flanges are used. The manifold and the differential pressure transmitter are mounted on these oval flanges. This design is only necessary for vertical pipes.

For horizontal pipes, the design for gases and liquids can be selected because the flange plate with manifold and transmitter always points up.

Steam

Remote design

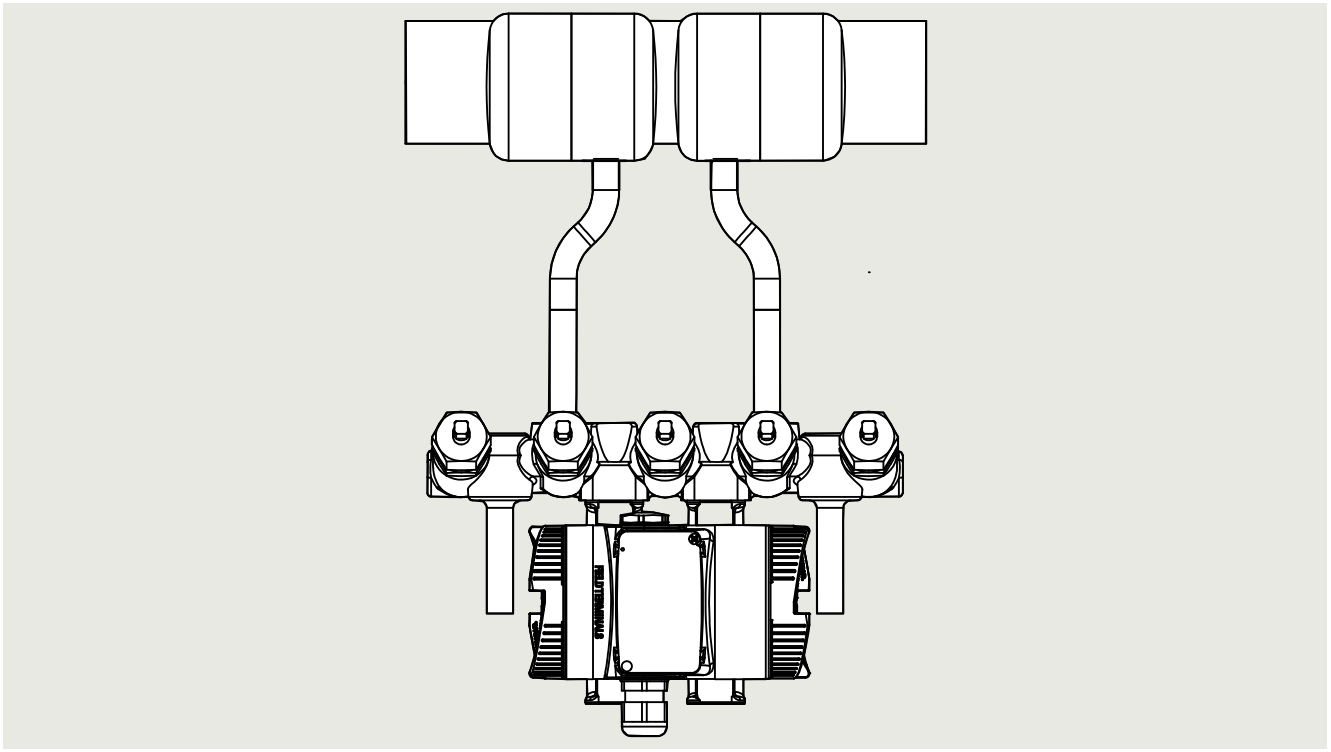


For single body standard orifice plates in remote design for steam, the condensate vessels with shut-off valves are welded at an angle of 180°.

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Design (continued)

Compact remote



For single body standard orifice plates in compact design for steam, the condensate vessels and the manifold are welded-on one side. The orifice has a width of 65 mm in this case (deviating from the standard).

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Selection and ordering data

SITRANS FP230/FPS200 standard orifice plate with corner pressure tappings	Article No. 7ME171	●	-	●	●	●	●	0	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Communication													
HART (4 ... 20 mA)		0											
PROFIBUS PA		1											
FOUNDATION Fieldbus		2											
Without transmitter		8											
Nominal size													
DN 50 (2")				1	D								
DN 65 (2½")				1	E								
DN 80 (3")				1	F								
DN 100 (4")				2	G								
DN 125 (5")				2	H								
DN 150 (6")				2	J								
DN 200 (8")				2	K								
DN 250 (10")				2	L								
DN 300 (12")				2	M								
DN 350 (14")				2	N								
DN 400 (16")				2	P								
DN 450 (18")				2	Q								
DN 500 (20")				2	R								
Nominal pressure													
Flange EN 1092-1 type B1 PN 6						A							
Flange EN 1092-1 type B1 PN 10						B							
Flange EN 1092-1 type B1 PN 16						C							
Flange EN 1092-1 type B1 PN 25						D							
Flange EN 1092-1 type B1 PN 40						E							
Flange EN 1092-1 type B1 PN 64						F							
Flange EN 1092-1 type B1 PN 100						G							
Flange ASME B16.5 Class 150						Q							
Flange ASME B16.5 Class 300						R							
Flange ASME B16.5 Class 600						S							
Wetted parts material													
Orifice: Carbon steel / orifice edge: ER307							0						
Orifice: 316L/1.4404 / orifice edge: 316L/1.4404							1						
System design													
Compact design for dry gases (horizontal and vertical pipes)										0			
Compact design for liquids										1			
Compact design for wet gases (only vertical pipes)										2			
Compact design for steam										3			
Remote design for dry gases										4			
Remote design for liquids										5			
Remote design for wet gases										6			
Remote design for steam										7			
Type of protection of pressure transmitter													
No Ex / without pressure tranmitter											A		
Intrinsic safety											B		
Explosion proof											C		
Intrinsic safety, Explosion proof											D		
Dust ignition proof zone 21/22 (DIP), increased safety zone 2											L		
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2											M		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2											S		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division											T		

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Selection and ordering data (continued)

SITRANS FP230/FPS200 standard orifice plate with corner pressure tappings	Article No. 7ME171 ● - ● ● ● ● 0 - ● ● ● ●
Electrical connections/cable entries of pressure transmitter	
Without pressure transmitter	A
2 × M20 × 1.5	F
2 × 1/2-14 NPT	M
Local operation/display of pressure transmitter	
Without display (closed lid) / without pressure tranmitter	0
With display (closed lid)	1
With display (lid with glass window)	2

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. manifolds	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Inspection certificate (DIN EN 571-1) - dye penetration test of weldings	**C56**
Hydrostatic pressure test of the primary element (EN 13480-5) of weldings	**C58**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH_2O)	**I01**
60 mbar (24.11 inH_2O)	**I02**
250 mbar (100.5 inH_2O)	**I03**
600 mbar (241.1 inH_2O)	**I04**
1600 mbar (643 inH_2O)	**I05**
Shut-off valves	
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C with tube fitting 12 mm	**T50**
With mounted shut-off valves DN8 made of stainless steel, up to 300 °C with tube fitting 12 mm	**T51**
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C and condensate vessel made of carbon steel with tube fitting 12 mm	**T56**
With mounted shut-off valves DN8 made of stainless steel, and condensate vessel made of stainless steel with tube fitting 12 mm	**T57**
Valve manifolds for mounting on primary element	
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U40**
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U41**

	Order code
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U42**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U43**
With mounted manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws and condensate vessel made of carbon steel	**U46**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U50**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U51**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U52**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U53**
With enclosed manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws with tube fitting 12 mm	**U56**
Application data	
ID number of the primary element according to sizing tool	**Y40**

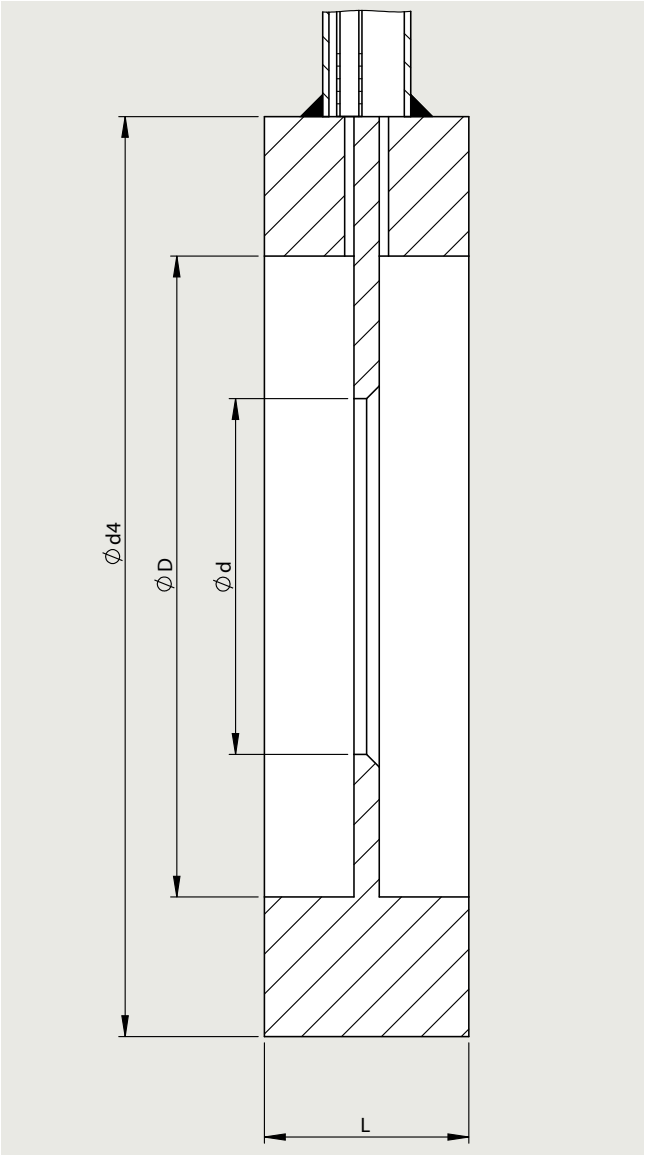
* For further options, please refer to SITRANS P320.

Scope of delivery

- Orifice with pressure tapping in carrier ring
- Condensation pots for steam applications
- Shut-off valves for remote design (options T5x selected in PIA)
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Dimensional drawings



L: Overall length 40 mm (65 mm for compact steam applications)
d: According to sizing calculation
D: According to inner diameter of pipe (sizing tool)
d4: See table below

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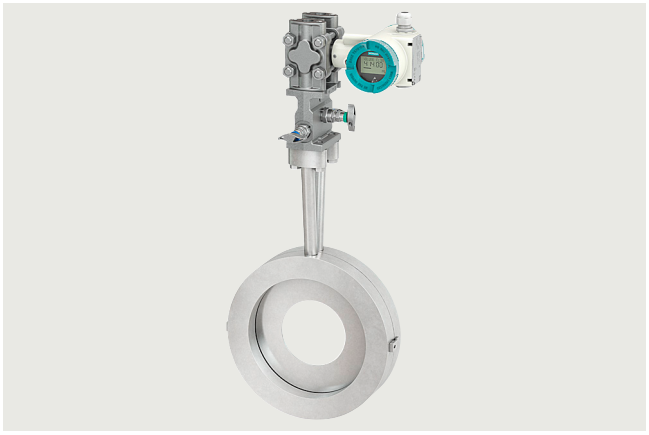
Dimensional drawings (continued)

Nominal size	Outer diameter d4 / Sealing face: flat PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
DN 50	96	107	107	107	107	113	119
DN 65	116	127	127	127	127	138	144
DN 80	132	142	142	142	142	148	154
DN 100	152	162	162	168	168	174	180
DN 125	182	192	192	194	194	210	217
DN 150	207	218	218	224	224	247	257
DN 200	262	273	273	284	290	309	324
DN 250	317	328	329	340	352	364	391
DN 300	373	378	384	400	417	424	458
DN 350	423	438	444	457	474	486	512
DN 400	473	489	495	514	546	543	-
DN 500	578	594	617	624	628	-	-

Nominal size	Outer diameter d4 / Sealing face: flat Class 150	Class 300	Class 600
2"	105	111	111
2,5"	124	130	130
3"	137	149	149
4"	175	181	194
5"	197	216	241
6"	222	251	267
8"	279	308	321
10"	340	362	400
12"	410	422	457
14"	451	486	492
16"	514	540	565
20"	549	597	613

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Application



SITRANS FP230 compact design



SITRANS FPS200 remote design

Orifice plate with annular chamber pressure tapping in carbon or stainless steel for flow measurement of gas, steam and liquid.

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Design

Annular chamber orifice plates consist of two rings pressed together, between which the orifice plate is clamped. The pressure is measured upstream and downstream through an annular chamber. The accuracy is comparable to that of the standard orifice plate.

Orifice plates with annular chamber tappings consist of a two-piece carrier ring with annular chamber and integral tappings and an inserted orifice plate. Pressure before and after the orifice is averaged through the annular chamber. Tapping connections are integrated into each part of the carrier ring. Differential pressure connection can be compact and remote. The instruments are easy to handle and offer good accuracy with reasonable inlet and outlet runs. They are installed between regular flanges. The orifice can be disassembled to replace the inserted orifice plate.

Nominal sizes

- EN: DN 50 ... 600
- ASME: 2 ... 24 inch

Nominal pressure

- EN: PN 6 ... 64 (for steam applications maximum of PN 16 is recommended)
- ASME: class 150 ... 600 (for steam applications maximum of class 150 is recommended)

Pressure tapping

- Annular chamber: Corner tapping through annular chamber

Connection length

- Suitable for gases and liquids for a maximum of approx. 80 mm pipe insulation
- Suitable for steam for a maximum of approx. 140 mm pipe insulation

Sealing face

- According to EN 1092-1: flat (for flanges type B1 and B2)
- According to ASME B16.5: flat (for flanges RF and SF)

Material

- Carrier ring: Carbon steel / orifice plate: 316L/1.4404
- Carrier ring: 316L/1.4404 / orifice plate: 316L/1.4404

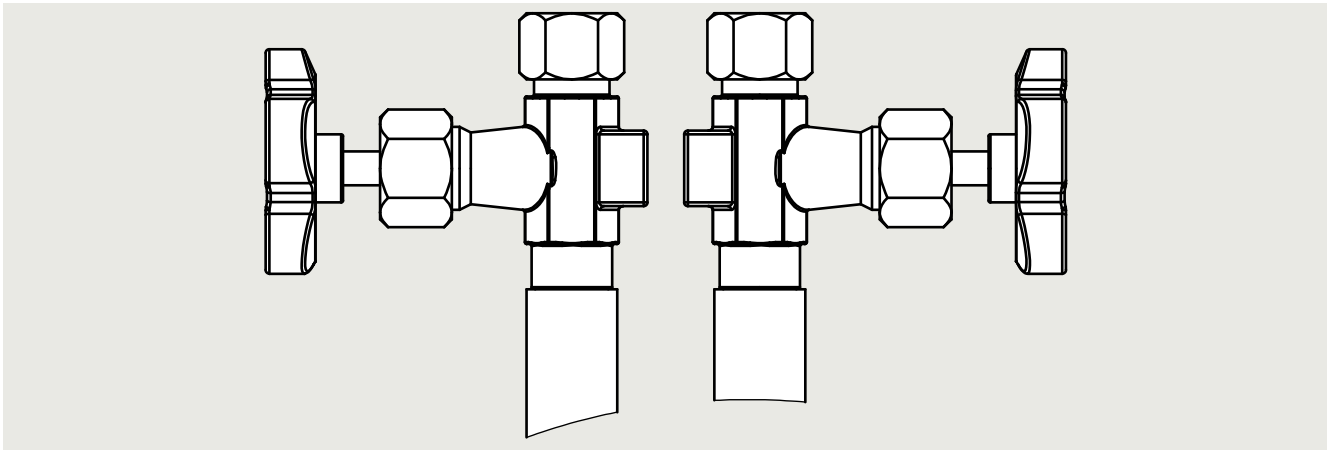
Gaskets

- Gas and liquids: Klingersil C4400
- Steam: Graphite with stainless steel inlay

Tapping sockets

Gases and liquids

Remote design

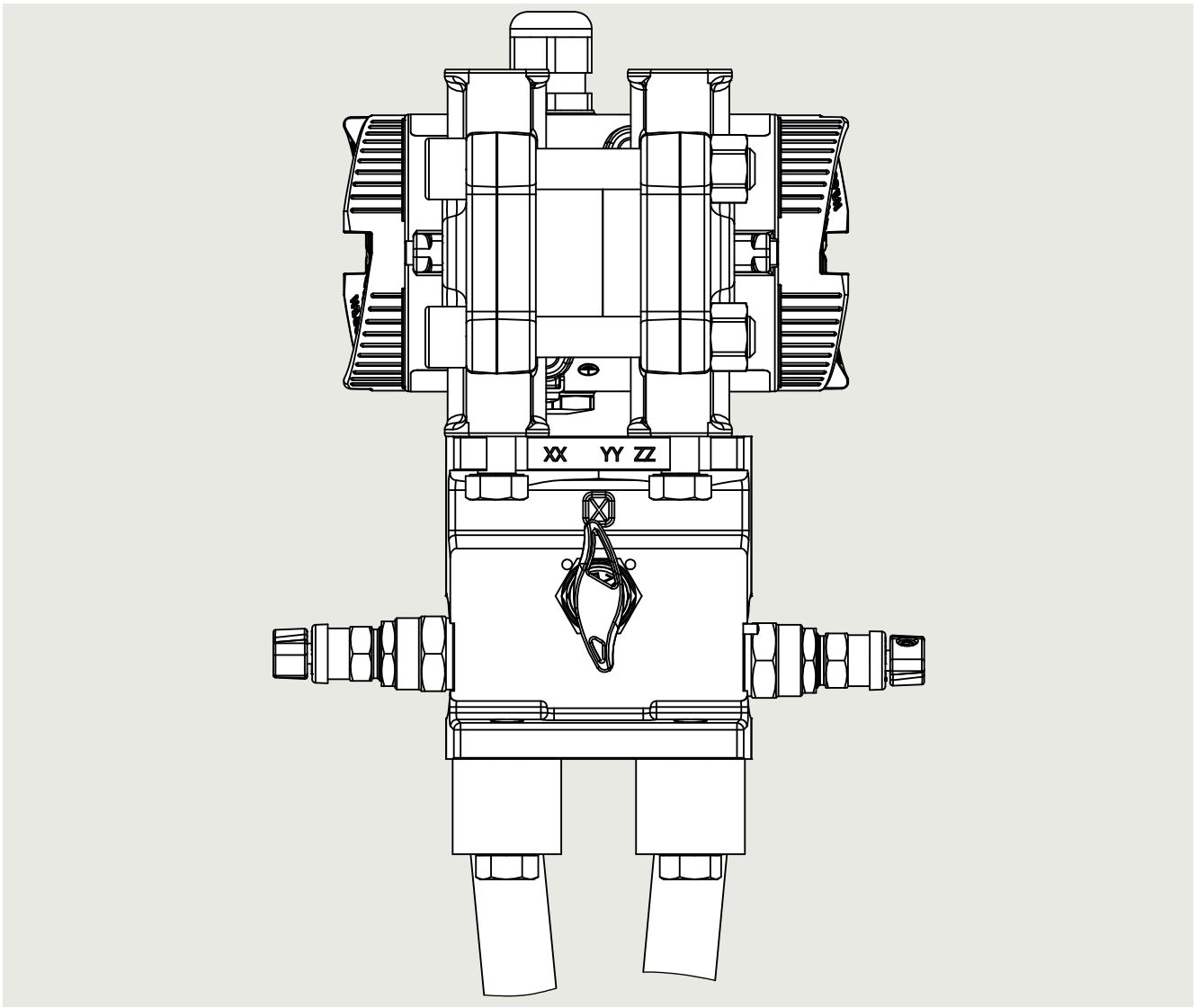


For annular chamber orifice plates in remote design, the angle α between the pressure tap depends on the pressure rating and the nominal size of the flanges.

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Design (continued)

Compact design

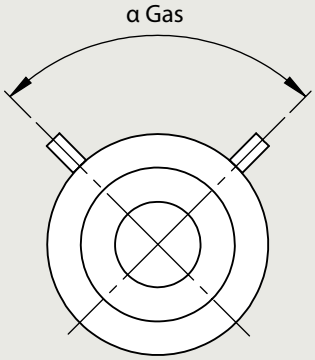


For annular chamber orifice plates in compact design, so-called oval flanges are used. The manifold and the differential pressure transmitter are mounted on these oval flanges.

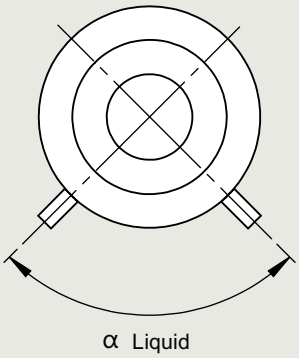
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Design (continued)

Tap position/angle in horizontal pipe



Tap position/angle in horizontal pipe (gas)



Tap position/angle in horizontal pipe (liquid)

Nominal size	DIN flange PN 6	PN 10	PN 16	PN 25	PN 40	PN 64
DN 50	135	135	135	135	135	135
DN 65	135	135	135*)	90	90	90
DN 80	135	90	90	90	90	90
DN 100	135	90	90	90	90	90
DN 125	90	90	90	90	90	90
DN 150	90	90	90	90	90	90
DN 175	90	90	90	60	60	60
DN 200	90	90	60	60	60	60
DN 250	60	60	60	60	60	60
DN 300	60	60	60	45	45	45
DN 350	60	45	45	45	45	45
DN 400	45	45	45	45	45	45
DN 450	45	36	36	36	-	-
DN 500	36	36	36	36	36	36

*) Fitting for DN 65 PN 16 flange with 4 holes. If design for flange with 8 holes is required, please add a comment to the corresponding project within the sizing tool.

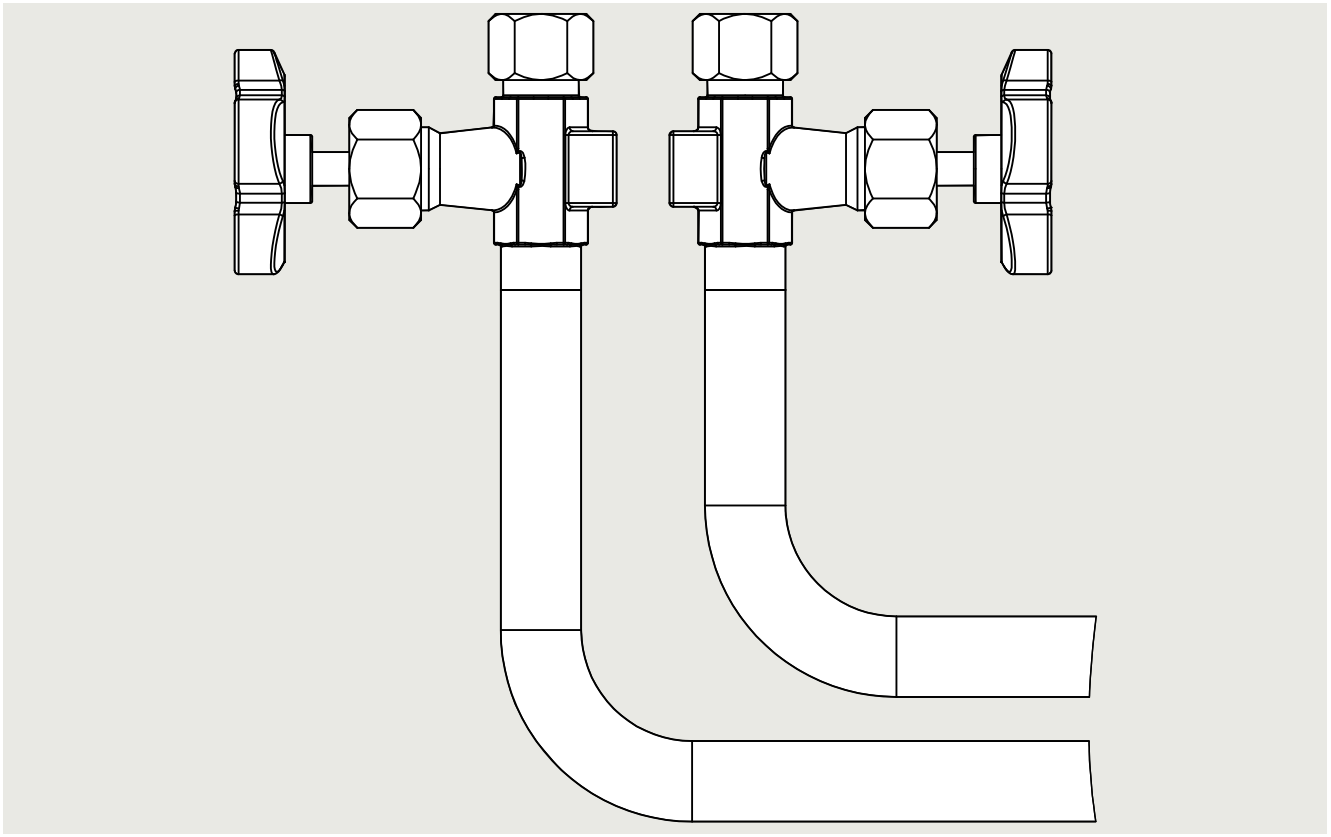
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Design (continued)

Nominal size	ANSI flange Class 150	Class 300	Class 600
2"	135	90	90
2,5"	135	90	90
3"	135	90	90
4"	90	90	90
5"	90	90	90
6"	90	60	60
8"	90	60	60
10"	60	45	45
12"	60	45	36
14"	60	36	36
16"	45	36	36
18"	45	30	36
20"	36	30	30
22"	36	30	30
24"	36	30	30

Wet gases

Remote design

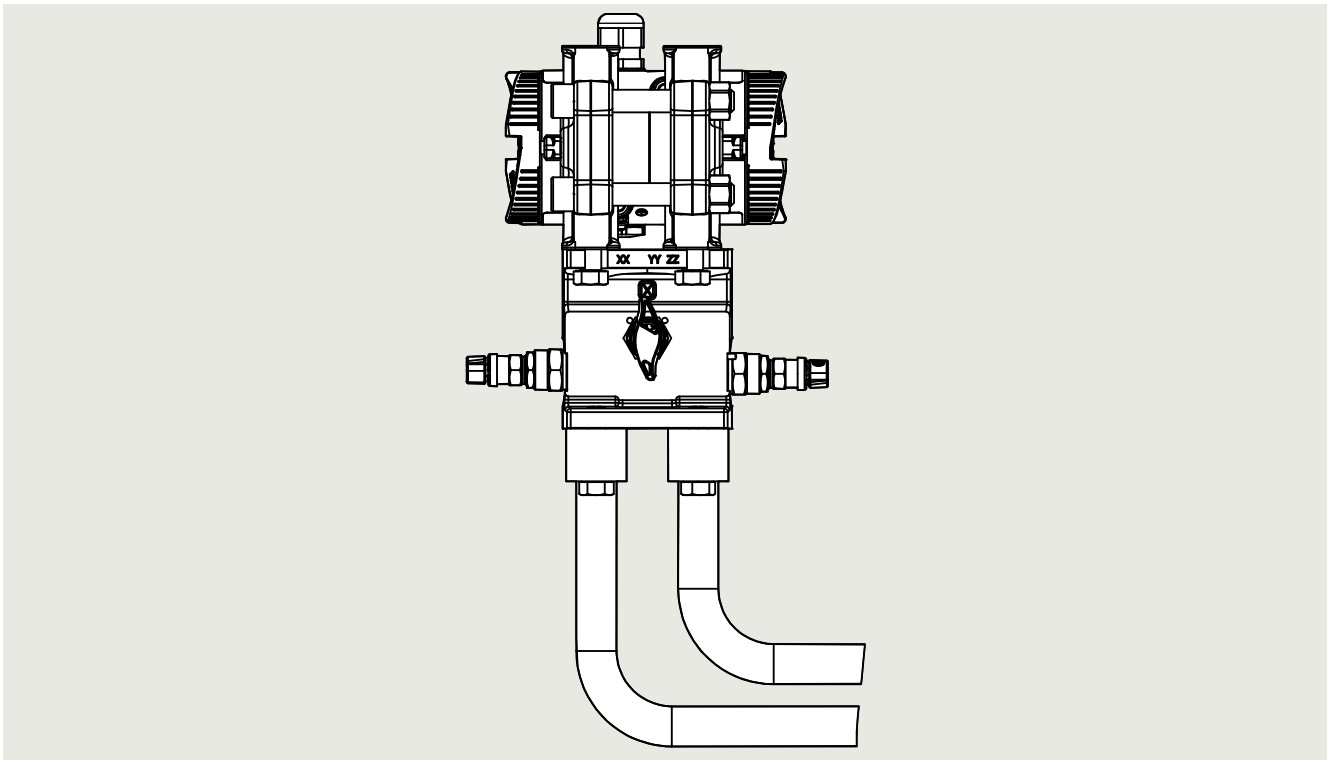


For annular chamber orifice plates in remote design for wet gases, nozzles bent at right angles with welded-on valves are used. This design is only necessary **for vertical pipes**. For horizontal pipes, the design for gases and liquids can be selected because the nozzles point up as listed in the table above.

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Design (continued)

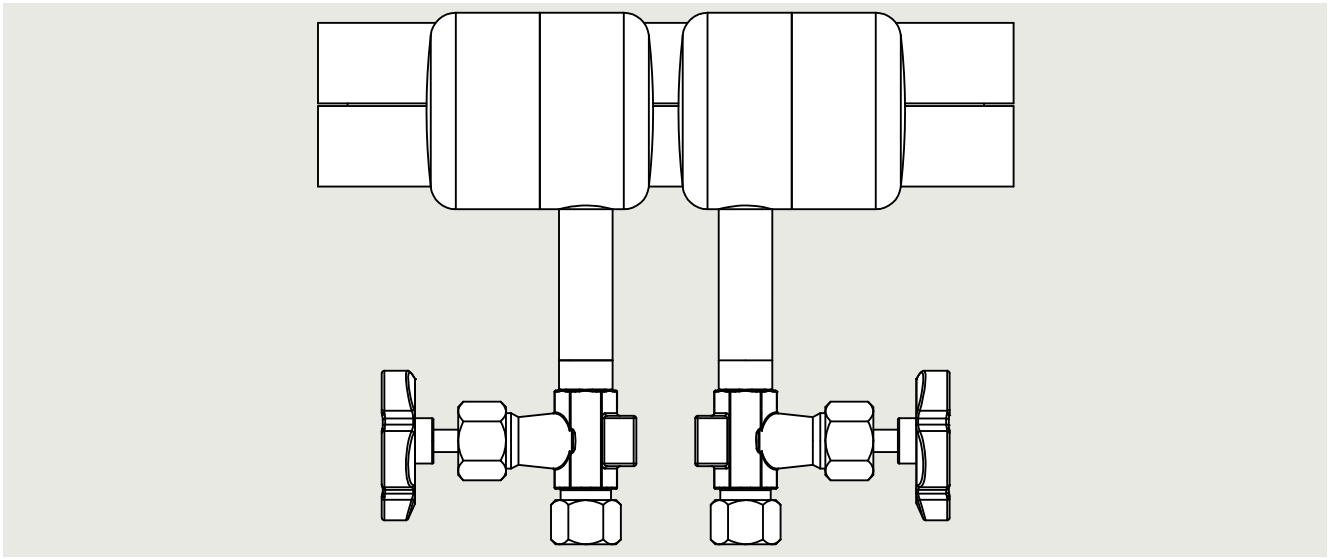
Compact design



For annular chamber orifice plates in compact design for wet gases, nozzles bent at right angles with oval flanges are used. The manifold and the differential pressure transmitter are mounted on these oval flanges. This design is only necessary **for vertical pipes**. For horizontal pipes, the design for gases and liquids can be selected because the flange plate with manifold and transmitter always points up.

Steam

Remote design

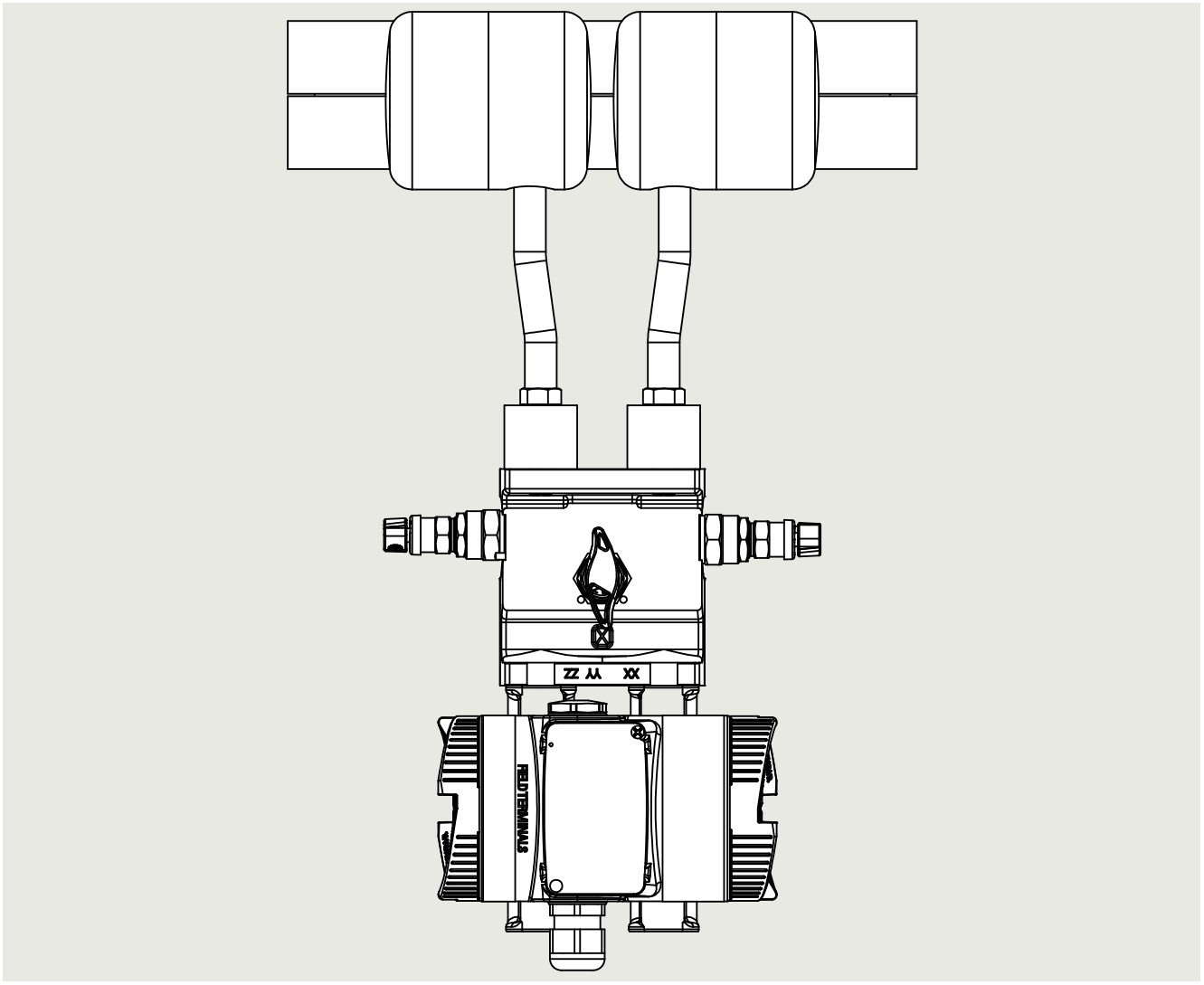


For annular chamber orifice plates in remote design for steam, the condensate vessels with shut-off valves are mounted at an angle of 0°.

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Design (continued)

Compact design



For annular chamber orifice plates in compact design for steam, the condensate vessels are mounted on one side. The manifold and the differential pressure transmitter are mounted to the condensate vessels using oval flanges. The condensate vessels are equipped with filling nozzles, which means a 3-way manifold can be used.

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Selection and ordering data

SITRANS FP230/FPS200 standard orifice plate with annular chamber	Article No. 7ME172	●	-	●	●	●	●	0	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Communication													
HART (4 ... 20 mA)		0											
PROFIBUS PA		1											
FOUNDATION Fieldbus		2											
Without transmitter		8											
Nominal size													
DN 50 (2")				1	D								
DN 65 (2½")				1	E								
DN 80 (3")				1	F								
DN 100 (4")				2	G								
DN 125 (5")				2	H								
DN 150 (6")				2	J								
DN 200 (8")				2	K								
DN 250 (10")				2	L								
DN 300 (12")				2	M								
DN 350 (14")				2	N								
DN 400 (16")				2	P								
DN 450 (18")				2	Q								
DN 500 (20")				2	R								
DN 600 (24")				2	S								
Nominal pressure													
Flange EN 1092-1 type B1 PN 6						A							
Flange EN 1092-1 type B1 PN 10						B							
Flange EN 1092-1 type B1 PN 16						C							
Flange EN 1092-1 type B1 PN 25						D							
Flange EN 1092-1 type B1 PN 40						E							
Flange EN 1092-1 type B1 PN 64						F							
Flange ASME B16.5 Class 150						Q							
Flange ASME B16.5 Class 300						R							
Flange ASME B16.5 Class 600						S							
Wetted part materials													
Carrier ring: Carbon steel / orifice plate: 316L/1.4404							2						
Carrier ring: 316L/1.4404 / orifice plate: 316L/1.4404							3						
System design													
Compact design for dry gases (horizontal and vertical pipes)										0			
Compact design for liquids										1			
Compact design for wet gases (only vertical pipes)										2			
Compact design for steam										3			
Remote design for dry gases										4			
Remote design for liquids										5			
Remote design for wet gases										6			
Remote design for steam										7			
Type of protection of pressure transmitter													
No Ex / without pressure tranmitter											A		
Intrinsic safety											B		
Explosion proof											C		
Intrinsic safety, Explosion proof											D		
Dust ignition proof zone 21/22 (DIP), increased safety zone 2											L		
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2											M		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2											S		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division											T		

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Selection and ordering data (continued)

SITRANS FP230/FPS200 standard orifice plate with annular chamber	Article No. 7ME172 ● - ● ● ● ● 0 - ● ● ● ●
Electrical connections/cable entries of pressure transmitter	
Without pressure transmitter	A
2 × M20 × 1.5	F
2 × 1/2-14 NPT	M
Local operation/display of pressure transmitter	
Without display (closed lid) / without pressure tranmitter	0
With display (closed lid)	1
With display (lid with glass window)	2

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. manifolds	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Inspection certificate (DIN EN 571-1) - dye penetration test of weldings	**C56**
Hydrostatic pressure test of the primary element (EN 13480-5) of weldings	**C58**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH_2O)	**I01**
60 mbar (24.11 inH_2O)	**I02**
250 mbar (100.5 inH_2O)	**I03**
600 mbar (241.1 inH_2O)	**I04**
1600 mbar (643 inH_2O)	**I05**
Shut-off valves	
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C with tube fitting 12 mm	**T50**
With mounted shut-off valves DN8 made of stainless steel, up to 300 °C with tube fitting 12 mm	**T51**
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C and condensate vessel made of carbon steel with tube fitting 12 mm	**T56**
With mounted shut-off valves DN8 made of stainless steel, and condensate vessel made of stainless steel with tube fitting 12 mm	**T57**
Valve manifolds for mounting on primary element	
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U40**
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U41**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U42**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U43**

	Order code
With mounted manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws and condensate vessel made of carbon steel	**U46**
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws and condensation vessels incl. filling union 1/2" NPT made of stainless steel	**U47**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U50**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U51**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U52**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U53**
With enclosed manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws with tube fitting 12 mm	**U56**
Application data	
ID number of the primary element according to sizing tool	**Y40**

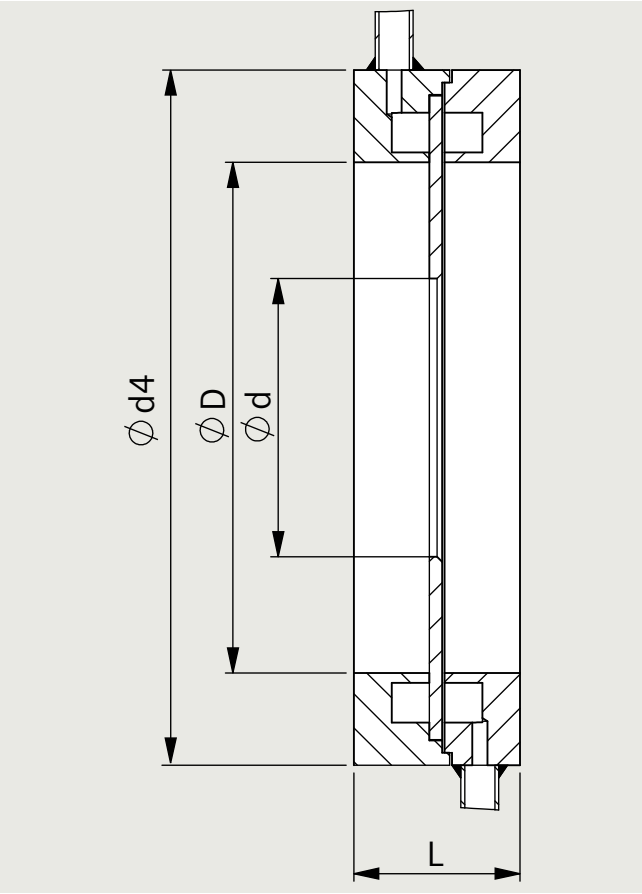
* For further options, please refer to SITRANS P320.

Scope of delivery

- Annular chamber consisting of two pieces, each with integrated pressure tapping
- Orifice plate mounted in annular chamber
- Gasket for annular chamber
- Condensation pots for steam applications
- Shut-off valves for remote design (options T5x selected in PIA)
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Dimensional drawings



d4: See table below

L: Overall length 65 mm
d: According to sizing calculation
D: According to inner diameter of pipe (sizing tool)

Nominal size	Outer diameter d4 / Sealing face: flat PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
DN 50	96	107	107	107	107	113	119
DN 65	116	127	127	127	127	138	144
DN 80	132	142	142	142	142	148	154
DN 100	152	162	162	168	168	174	180
DN 125	182	192	192	194	194	210	217
DN 150	207	218	218	224	224	247	257
DN 200	262	273	273	284	290	309	324
DN 250	317	328	329	340	352	364	391
DN 300	373	378	384	400	417	424	458
DN 350	423	438	444	457	474	486	512
DN 400	473	489	495	514	546	543	-
DN 500	578	594	617	624	628	-	-

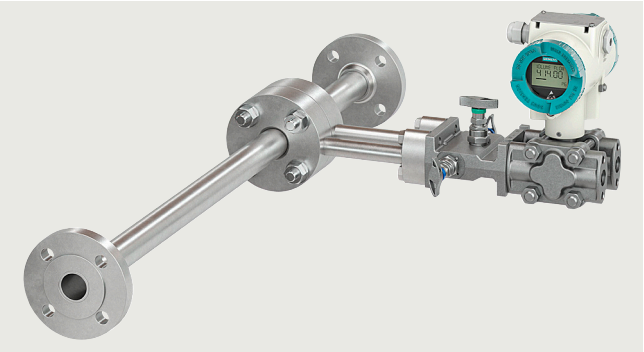
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Dimensional drawings (continued)

Nominal size	Outer diameter d4 / Sealing face: flat Class 150	Class 300	Class 600
2"	105	111	111
2,5"	124	130	130
3"	137	149	149
4"	175	181	194
5"	197	216	241
6"	222	251	267
8"	279	308	321
10"	340	362	400
12"	410	422	457
14"	451	486	492
16"	514	540	565
20"	549	597	613

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Application



SITRANS FP230 compact design



SITRANS FPS200 remote design

Orifice meter run with flanges ends in carbon or stainless steel for flow measurement of gas, steam and liquid.

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Design

Orifice meter runs for small diameter pipes come with partial straight inlet and outlet pipe runs with flanged ends. The pipes are connected to an annular chamber where the orifice plate is mounted. The annular chamber consists of a two-piece carrier ring with annular chamber and integral tappings and an inserted orifice plate.

Pressure before and after the orifice is averaged through the annular chamber. Tapping connections are integrated into each part of the carrier ring. Differential pressure connection can be compact and remote. The instruments are easy to install in the pipe system. Additional straight pipe length may be required before and after the orifice meter run. The orifice can be disassembled to replace the inserted orifice plate.

Nominal sizes

- EN: DN 10 ... 50
- ASME: 3/8 ... 2 inch

Nominal pressure

- EN: PN 6 ... 64
- ASME: class 150 ... 600

Pressure tapping

- Annular chamber: Corner tapping through annular chamber

Connection length

- Suitable for gases for a maximum of approx. 80 mm pipe insulation
- Suitable for steam for a maximum of approx. 140 mm pipe insulation

Sealing face

- According to EN 1092-1: flat (for flanges type B1 and B2)
- According to ASME B16.5: flat (for flanges RF and SF)

Material

- Pipe/Flanges: Carbon steel / orifice plate: 316L/1.4404
- Pipe/Flanges: 316L/1.4404 / orifice plate: 316L/1.4404

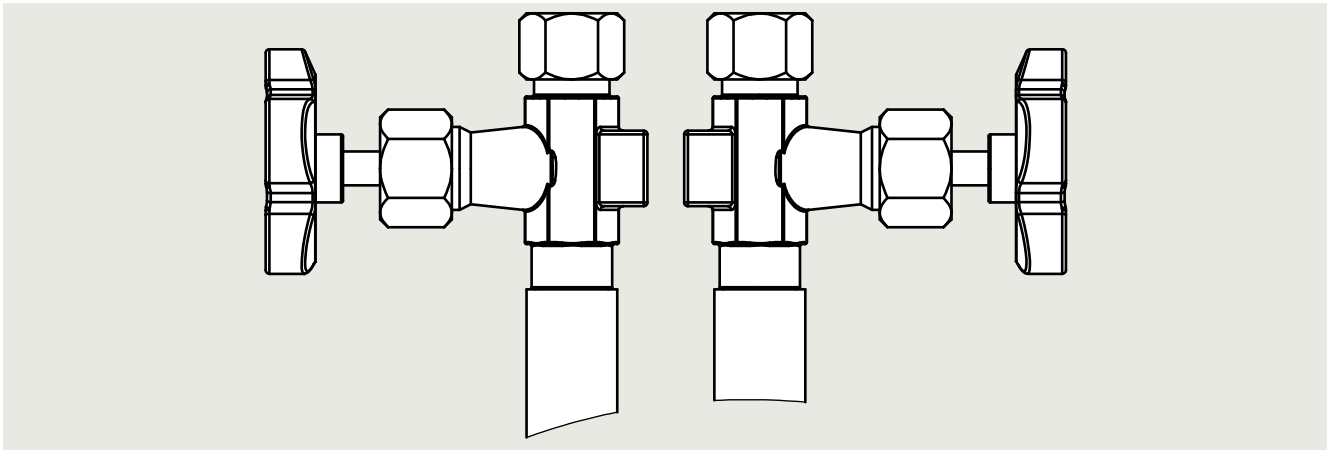
Gaskets

- Gas and liquids: Klingersil C4400
- Steam: Graphite with stainless steel inlay

Tapping sockets

Gases and liquids

Remote design

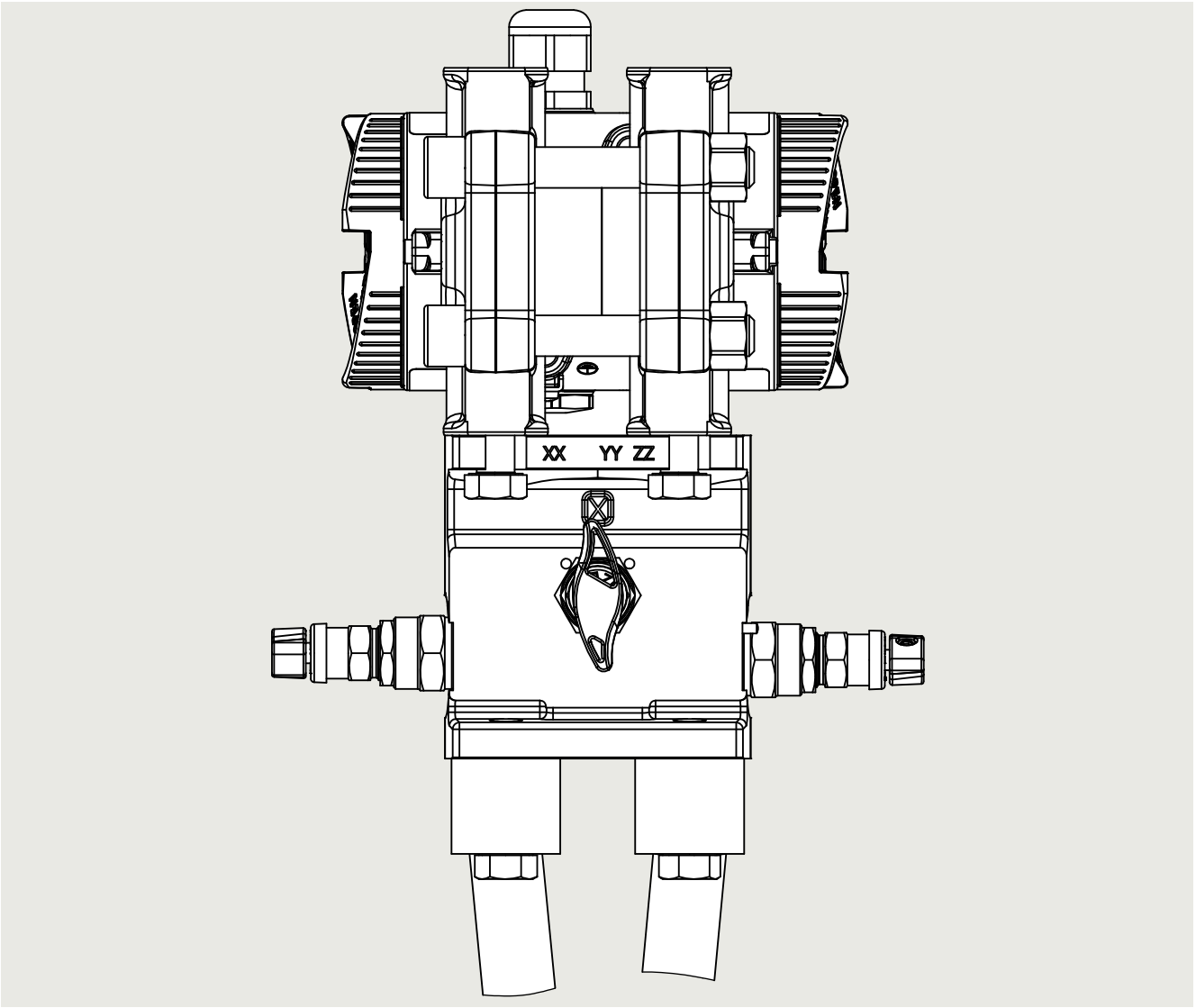


For metering pipes in remote design, the angle α between the pressure taps is 135°.

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Design (continued)

Compact design

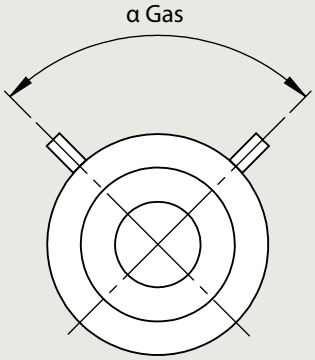


For metering pipes in compact design, so-called oval flanges are used. The manifold and the differential pressure transmitter are mounted on these oval flanges.

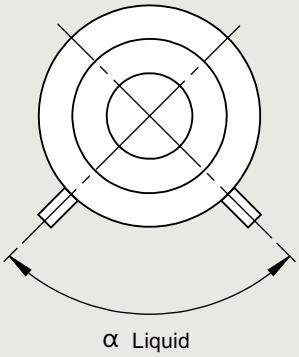
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Design (continued)

Tap position/angle in horizontal pipe



Tap position/angle in horizontal pipe (gas)



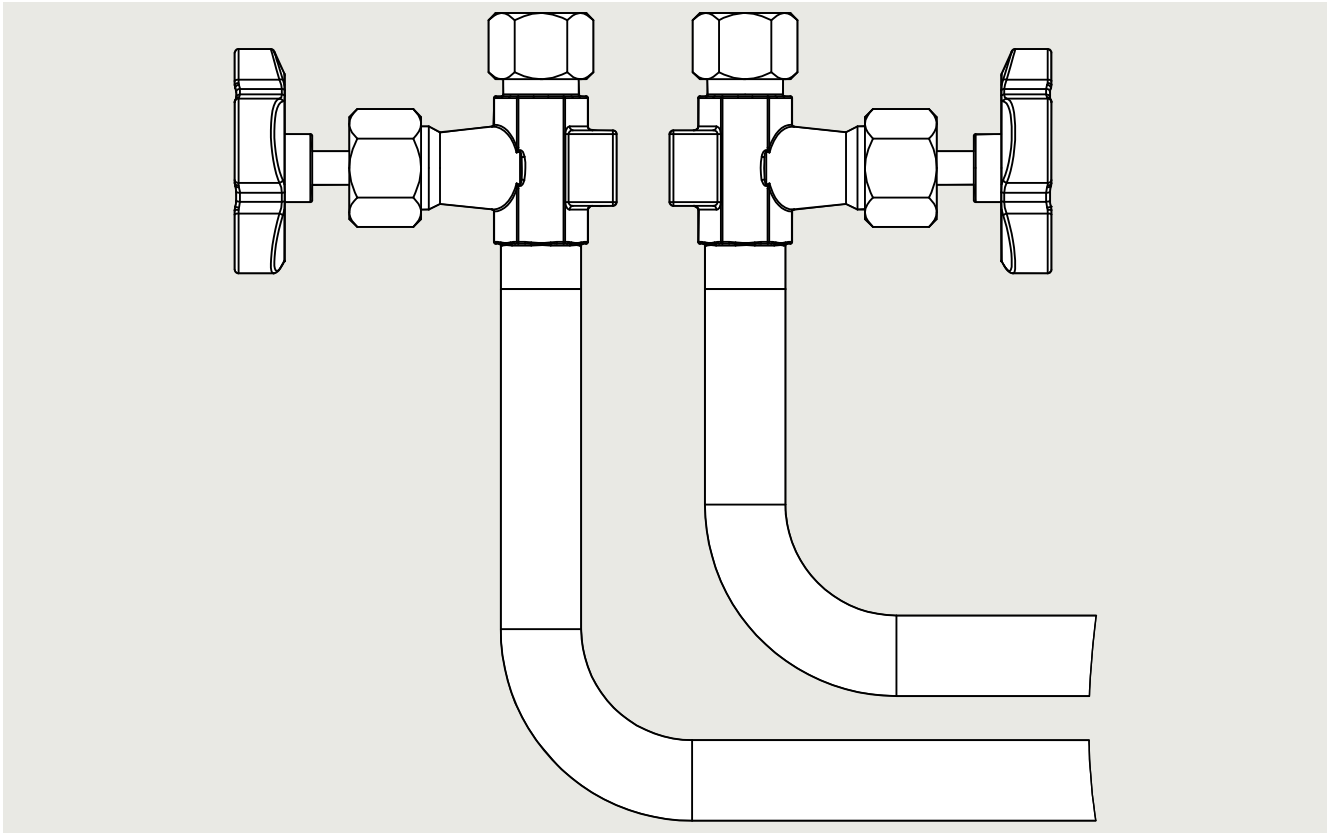
Tap position/angle in horizontal pipe (liquid)

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Design (continued)

Wet gases

Remote design

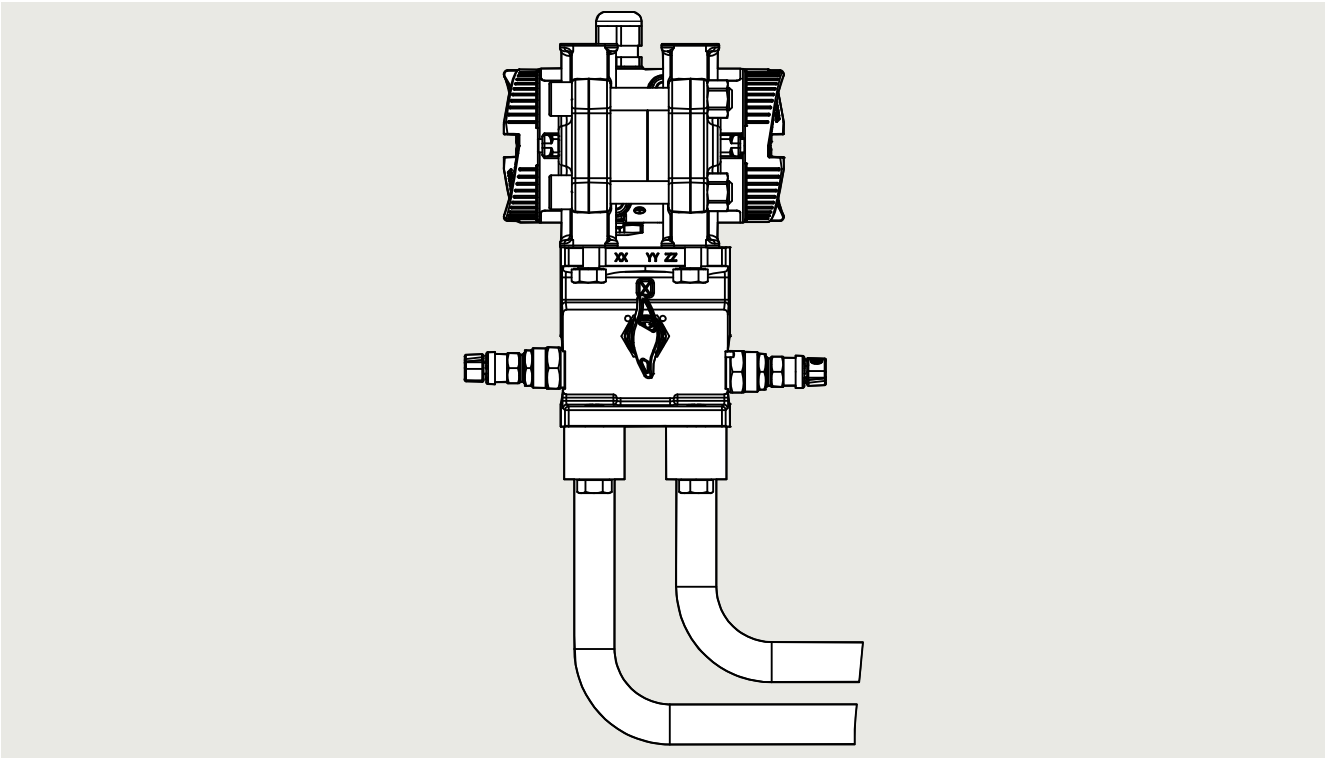


For metering pipes in remote design for wet gases, nozzles bent at right angles with welded-on valves are used. This design is only necessary for vertical pipes. For horizontal pipes, the design for gases and liquids can be selected because the nozzles point up as listed in the table above.

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Design (continued)

Compact design

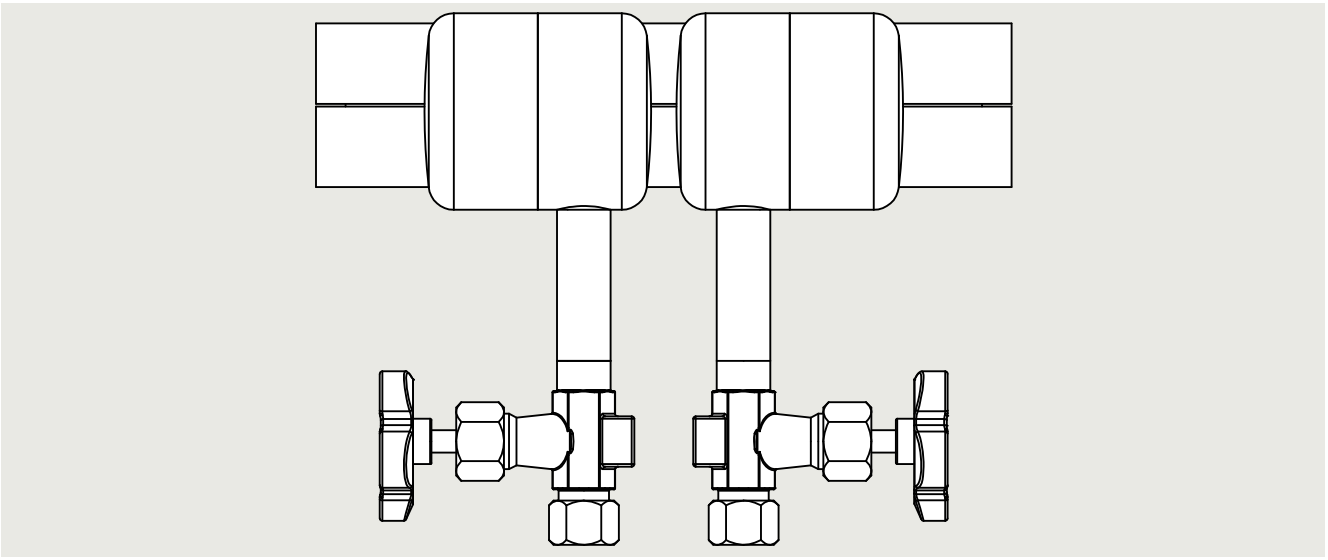


For metering pipes in compact design for wet gases, nozzles bent at right angles with oval flanges are used. The manifold and the differential pressure transmitter are mounted on these oval flanges.

This design is only necessary for vertical pipes. For horizontal pipes, the design for gases and liquids can be selected because the flange plate with manifold and transmitter always points up.

Steam

Remote design

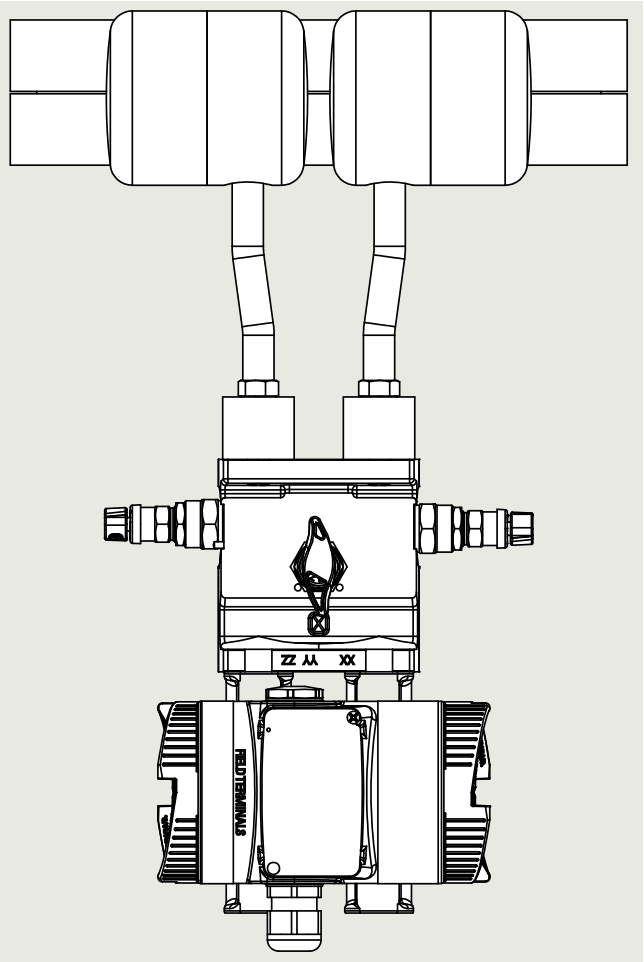


For metering pipes in remote design for steam, the condensate vessels with shut-off valves are mounted at an angle of 180°.

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Design (continued)

Compact design



For metering pipes in compact design for steam, the condensate vessels are mounted on one side. The manifold and the differential pressure transmitter are mounted to the condensate vessels using oval flanges. The condensate vessels are equipped with filling nozzles, which means a 3-way manifold can be used.

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Selection and ordering data

SITRANS FP230/FPS200 orifice meter run	Article No. 7ME173	●	-	●	●	●	●	0	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Communication													
HART (4 ... 20 mA)		0											
PROFIBUS PA		1											
FOUNDATION Fieldbus		2											
Without transmitter		8											
Nominal size													
DN 10 (3/8")				0	A								
DN 15 (½")				0	B								
DN 20 (¾")				0	C								
DN 25 (1")				0	D								
DN 32 (1¼")				0	E								
DN 40 (1½")				1	C								
DN 50 (2")				1	D								
Nominal pressure													
Flange EN 1092-1 type B1 PN 6						A							
Flange EN 1092-1 type B1 PN 10						B							
Flange EN 1092-1 type B1 PN 16						C							
Flange EN 1092-1 type B1 PN 25						D							
Flange EN 1092-1 type B1 PN 40						E							
Flange EN 1092-1 type B1 PN 64						F							
Flange ASME B16.5 Class 150						Q							
Flange ASME B16.5 Class 300						R							
Flange ASME B16.5 Class 600						S							
Wetted parts material													
Pipe/Flanges: Carbon steel / orifice plate: 316L/1.4404							4						
Pipe/Flanges: 316L/1.4404 / orifice plate: 316L/1.4404							5						
System design													
Compact design for dry gases (horizontal and vertical pipes)										0			
Compact design for liquids										1			
Compact design for wet gases (only vertical pipes)										2			
Compact design for steam										3			
Remote design for dry gases										4			
Remote design for liquids										5			
Remote design for wet gases										6			
Remote design for steam										7			
Type of protection of pressure transmitter													
No Ex / without pressure tranmitter											A		
Intrinsic safety											B		
Explosion proof											C		
Intrinsic safety, Explosion proof											D		
Dust ignition proof zone 21/22 (DIP), increased safety zone 2											L		
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2											M		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2											S		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division											T		
Electrical connections/cable entries of pressure transmitter													
Without pressure transmitter												A	
2 × M20 × 1.5												F	
2 × 1/2-14 NPT												M	
Local operation/display of pressure transmitter													
Without display (closed lid) / without pressure tranmitter													0
With display (closed lid)													1
With display (lid with glass window)													2

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Selection and ordering data (continued)

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. manifolds	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Inspection certificate (DIN EN 571-1) - dye penetration test of weldings	**C56**
Hydrostatic pressure test of the primary element (EN 13480-5) of weldings	**C58**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH_2O)	**I01**
60 mbar (24.11 inH_2O)	**I02**
250 mbar (100.5 inH_2O)	**I03**
600 mbar (241.1 inH_2O)	**I04**
1600 mbar (643 inH_2O)	**I05**
Shut-off valves	
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C with tube fitting 12 mm	**T50**
With mounted shut-off valves DN8 made of stainless steel, up to 300 °C with tube fitting 12 mm	**T51**
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C and condensate vessel made of carbon steel with tube fitting 12 mm	**T56**
With mounted shut-off valves DN8 made of stainless steel, and condensate vessel made of stainless steel with tube fitting 12 mm	**T57**
Valve manifolds for mounting on primary element	
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U40**
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U41**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U42**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U43**
With mounted manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws and condensate vessel made of carbon steel	**U46**
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws and condensation vessels incl. filling union 1/2" NPT made of stainless steel	**U47**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U50**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U51**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U52**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U53**
With enclosed manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws with tube fitting 12 mm	**U56**
Application data	
ID number of the primary element according to sizing tool	**Y40**

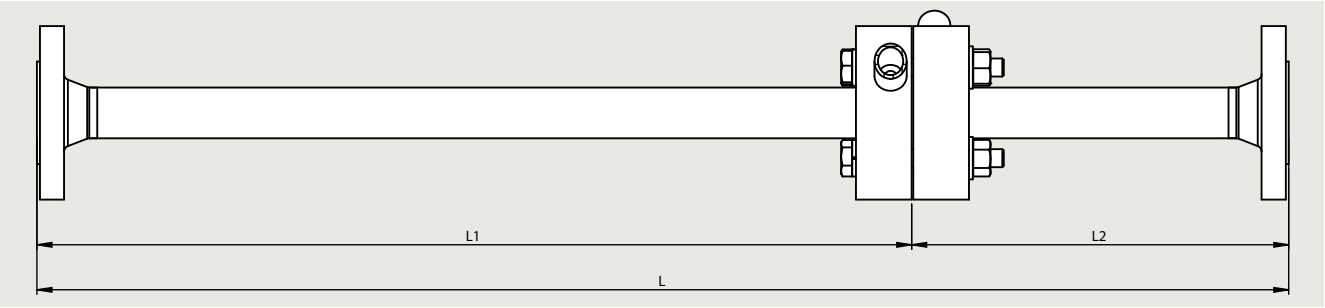
* For further options, please refer to SITRANS P320.

Scope of delivery

- Orifice meter run consisting of 2 parts, each with flanged ends, pipe, and annular chamber with integrated pressure tapping
- Orifice plate mounted in annular chamber
- Gasket for annular chamber
- Screws and nuts for annular chamber
- Condensation pots for steam applications
- Shut-off valves for remote design (options T5x selected in PIA)
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Dimensional drawings



Overall length

Nominal size	DN 10 3/8"	DN 15 ½"	DN 20 ¾"	DN 25 1"	DN 32 1 ¼"	DN 40 1 ½"	DN 50 2"
L	400	550	700	900	1100	1300	1500
L1	230	380	500	650	800	1000	1200
L2	170	170	200	250	300	300	300

Pipe dimensions

Carbon steel Nominal size	PN 16	PN 40	PN 63	Nominal size	Class 150	Class 300	Class 600
DN 10	21.3 × 6.3	21.3 × 6,3	21.3 × 6,3	3/8"	21.3 × 7.47*)	21.3 × 7.47*)	21.3 × 7.47[1)]
DN 15	21.3 × 2.6	21.3 × 2.6	21.3 × 2.6	½"	21.3 × 3.73	21.3 × 3.73	21.3 × 3.73
DN 20	26.9 × 2.6	26.9 × 2.6	26.9 × 2.6	¾"	26.7 × 2.87	26.7 × 2.87	26,7 × 2.87
DN 25	33.7 × 2.6	33,7 × 2.6	33,7 × 2.6	1"	33.4 × 3.38	33.4 × 3.38	33.4 × 3.38
DN 32	42.4 × 2.6	42.4 × 2.6	n/a	1 ¼"	42.2 × 3.56	42.2 × 3.56	42.2 × 3.56
DN 40	48.3 × 2.6	48.3 × 2.6	48.3 × 2.9	1 ½"	48.3 × 3.68	48.3 × 3.68	48.3 × 3.68
DN 50	60.3 × 2.9	60.3 × 2.9	60.3 × 3.6	2"	60.3 × 3.91	60.3 × 3.91	60.3 × 3.91

Stainless steel Nominal size	PN 16	PN 40	PN 63	Nominal size	Class 150	Class 300	Class 600
DN 10	21.3 × 7.47	21.3 × 7.47	21.3 × 7.47	3/8"	21.3 × 2.77*)	21.3 × 2.77*)	21.3 × 2.77[1)]
DN 15	21.3 × 2.77	21.3 × 2.77	21.3 × 3.73	½"	21.3 × 2.77	21.3 × 2.77	21.3 × 2.77
DN 20	26.7 × 2.87	26.7 × 2.87	26.7 × 3.91	¾"	26.7 × 2.87	26.7 × 2.87	26.7 × 2.87
DN 25	33.4 × 3.38	33.4 × 3.38	33.4 × 3.38	1"	33.4 × 3.38	33.4 × 3.38	33.4 × 3.38
DN 32	42.2 × 3.56	42.2 × 3.56	n/a	1 ¼"	42.2 × 3.56	42.2 × 3.56	42.2 × 3.56
DN 40	48.3 × 2.77	48.3 × 2.77	48.3 × 3.68	1 ½"	48.3 × 3.68	48.3 × 3.68	48.3 × 3.68
DN 50	60.3 × 3.91	60.3 × 3.91	60.3 × 3.91	2"	60.3 × 3.91	60.3 × 3.91	60.3 × 3.91

[1)] Orifice meter runs with 3/8" diameter will be built with ½" flanges.

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Application



SITRANS FPS200 remote design

Orifice plate for installation between flanges in stainless steel for flow measurement of gas, steam and liquid.

Design

Orifice plates for the installation with flange tappings consist of the orifice plate with a welded-on marking and grip plate. The plates have no pressure tappings and are therefore normally mounted between measuring flanges containing the pressure tappings.

Pressure tapping

- Not included

Sealing face

- According to EN 1092-1: flat (for flanges type B1 and B2)
- According to ASME B16.5: flat (for flanges RF and SF)

Material

- 316L/1.4404

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Selection and ordering data

SITRANS FP230/FPS200 orifice plate	Article No. 7ME174	●	-	●	●	●	●	0	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Communication													
HART (4 ... 20 mA)		0											
PROFIBUS PA		1											
FOUNDATION Fieldbus		2											
Without transmitter		8											
Nominal size													
DN 50 (2")				1	D								
DN 65 (2½")				1	E								
DN 80 (3")				1	F								
DN 100 (4")				2	G								
DN 125 (5")				2	H								
DN 150 (6")				2	J								
DN 200 (8")				2	K								
DN 250 (10")				2	L								
DN 300 (12")				2	M								
DN 350 (14")				2	N								
DN 400 (16")				2	P								
DN 450 (18")				2	Q								
DN 500 (20")				2	R								
DN 600 (24")				2	S								
Nominal pressure													
Flange EN 1092-1 type B1 PN 6						A							
Flange EN 1092-1 type B1 PN 10						B							
Flange EN 1092-1 type B1 PN 16						C							
Flange EN 1092-1 type B1 PN 25						D							
Flange EN 1092-1 type B1 PN 40						E							
Flange EN 1092-1 type B1 PN 64						F							
Flange EN 1092-1 type B1 PN 100						G							
Flange ASME B16.5 Class 150						Q							
Flange ASME B16.5 Class 300						R							
Flange ASME B16.5 Class 600						S							
Wetted parts material													
Orifice plate: 316L/1.4404							6						
System design													
Without connection for pressure lines										8			
Type of protection of pressure transmitter													
No Ex / without pressure tranmitter											A		
Intrinsic safety											B		
Explosion proof											C		
Intrinsic safety, Explosion proof											D		
Dust ignition proof zone 21/22 (DIP), increased safety zone 2											L		
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2											M		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2											S		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division											T		
Electrical connections/cable entries of pressure transmitter													
Without pressure transmitter												A	
2 × M20 × 1.5												F	
2 × 1/2-14 NPT												M	
Local operation/display of pressure transmitter													
Without display (closed lid) / without pressure tranmitter													0
With display (closed lid)													1
With display (lid with glass window)													2

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Selection and ordering data (continued)

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. manifolds	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH_2O)	**I01**
60 mbar (24.11 inH_2O)	**I02**
250 mbar (100.5 inH_2O)	**I03**
600 mbar (241.1 inH_2O)	**I04**
1600 mbar (643 inH_2O)	**I05**

	Order code
Valve manifolds for mounting on primary element	
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U50**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U51**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U52**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U53**
Application data	
ID number of the primary element according to sizing tool	**Y40**

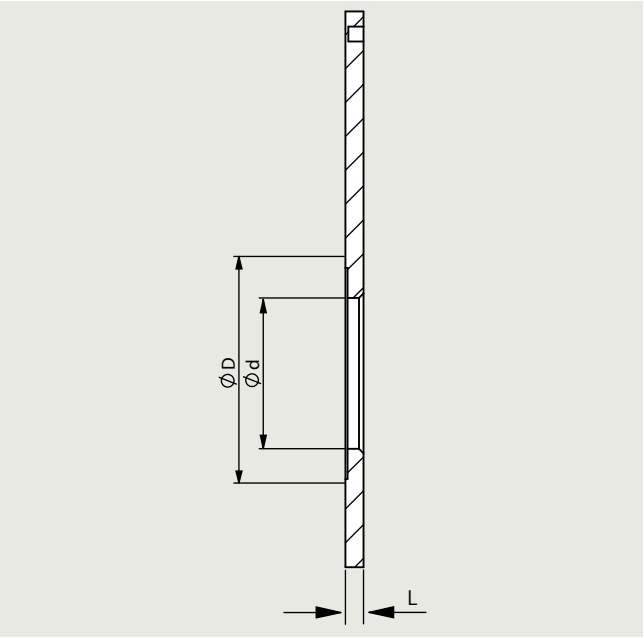
* For further options, please refer to SITRANS P320.

Scope of delivery

- Orifice plate
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Dimensional drawings



D: According to inner diameter of pipe (sizing tool)

L: Overall length
d: According to sizing calculation

Nominal size of orifice plate

DIN/EN

DN	Nominal size, up to 50	65	80	100	125	150	175	200	250	300	350	400	450	500	600
mm	3	3	4	4	4	4	4	4	4	4	4	4	4	6	6

ASME

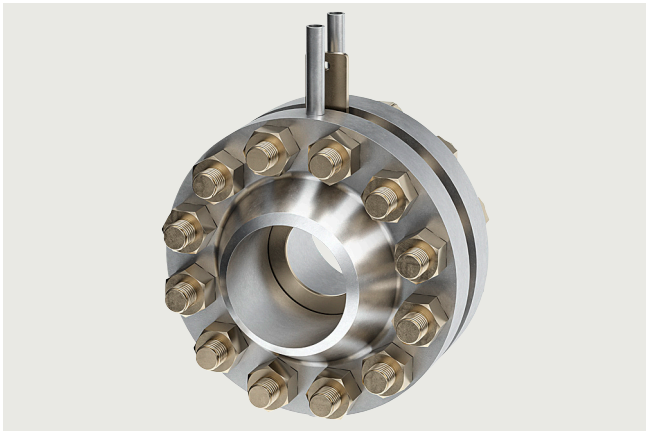
DN	Nominal size, up to 2"	2,5"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	22"	24"
mm	3	3	3	3	3	3	6	6	6	6	6	10	10	10	12	12

*) Not standardized in DIN standard.

Up to DN 50 adjusted for general practice. Nominal width designed for a differential pressure of up to 1000 mbar.

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Application



SITRANS FPS200 remote design

Orifice flange pair according to ASME B16.36 with orifice plate in carbon steel (flanges) or stainless steel for flow measurement of gas and liquid.

Design

The orifice plate is mounted between traditional orifice flanges according to ASME B16.36. The orifice flanges are manufactured with integral pressure tappings. System design is always remote. The orifice plate can be exchanged. The flanges have to be welded into the pipe.

- Design of orifice plate, see Orifice plates

Differential pressure tapping

- In the flange: Differential pressure tapping in special measuring flanges with integrated connectors in the flange, always remote

Tapping sockets

- 0°

Connection length

- For gases and liquids suitable for up to approx. 80 mm pipe insulation

Sealing face

- According to ASME B16.5: flat

Materials

- Flange carbon steel, plate 316L
- Flange and plate 316L

Gaskets

- Spiral graphite

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Selection and ordering data

SITRANS FP230/FPS200 orifice plate with orifice flanges	Article No. 7ME175	●	-	●	●	●	●	0	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Communication													
HART (4 ... 20 mA)		0											
PROFIBUS PA		1											
FOUNDATION Fieldbus		2											
Without transmitter		8											
Nominal size													
DN 50 (2")				1	D								
DN 65 (2½")				1	E								
DN 80 (3")				1	F								
DN 100 (4")				2	G								
DN 125 (5")				2	H								
DN 150 (6")				2	J								
DN 200 (8")				2	K								
DN 250 (10")				2	L								
DN 300 (12")				2	M								
DN 350 (14")				2	N								
DN 400 (16")				2	P								
DN 450 (18")				2	Q								
DN 500 (20")				2	R								
DN 600 (24")				2	S								
Nominal pressure													
Flange ASME B16.5 Class 300						R							
Flange ASME B16.5 Class 600						S							
Wetted parts material													
Flanges: Carbon steel / orifice plate: 316L/1.4404							7						
Flanges: 316L/1.4404 / orifice plate: 316L/1.4404							8						
System design													
Remote design for dry gases										4			
Remote design for liquids										5			
Remote design for wet gases										6			
Type of protection of pressure transmitter													
No Ex / without pressure tranmitter											A		
Intrinsic safety											B		
Explosion proof											C		
Intrinsic safety, Explosion proof											D		
Dust ignition proof zone 21/22 (DIP), increased safety zone 2											L		
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2											M		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2											S		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division											T		
Electrical connections/cable entries of pressure transmitter													
Without pressure transmitter												A	
2 × M20 × 1.5												F	
2 × 1/2-14 NPT												M	
Local operation/display of pressure transmitter													
Without display (closed lid) / without pressure tranmitter													0
With display (closed lid)													1
With display (lid with glass window)													2

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Selection and ordering data (continued)

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. manifolds	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH_2O)	**I01**
60 mbar (24.11 inH_2O)	**I02**
250 mbar (100.5 inH_2O)	**I03**
600 mbar (241.1 inH_2O)	**I04**
1600 mbar (643 inH_2O)	**I05**
Shut-off valves	
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C with tube fitting 12 mm	**T50**
With mounted shut-off valves DN8 made of stainless steel, up to 300 °C with tube fitting 12 mm	**T51**
Valve manifolds for mounting on primary element	
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U50**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U51**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U52**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U53**
Application data	
ID number of the primary element according to sizing tool	**Y40**

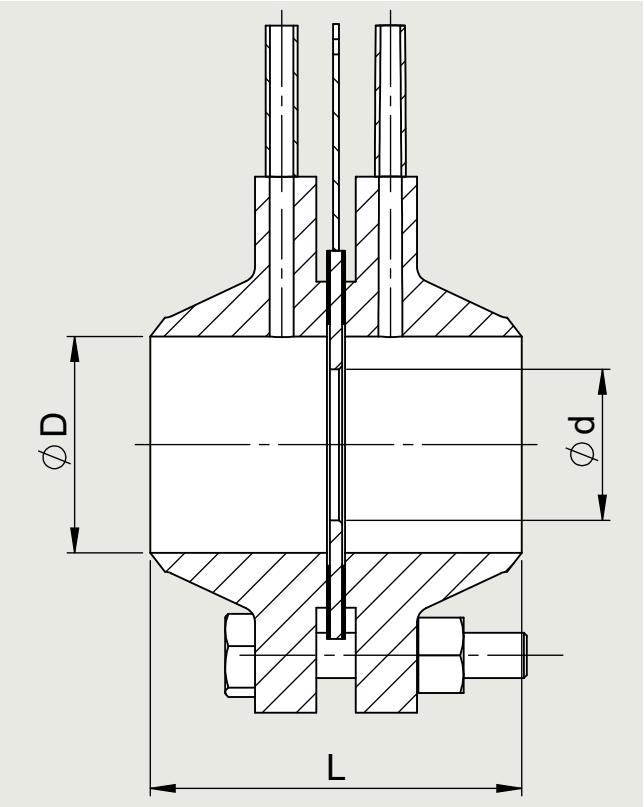
* For further options, please refer to SITRANS P320.

Scope of delivery

- Orifice plate
- Orifice flanges according to ASME B16.36 with pressure tappings
- 2× Gaskets for orifice flanges
- Screws and nuts
- Shut-off valves for remote design (options T5x selected in PIA)
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Dimensional drawings



L: Overall length
d: According to sizing calculation
D: According to inner diameter of pipe (sizing tool)

Overall lenght

DN/Inch	PN/lbs	L	Hex nut bolt	Bolts (pcs.)	Gasket
24	600	433.10	1 7/8	24	2.0
20	600	407.70	1 5/8	24	2.0
18	600	395.00	1 5/8	20	2.0
16	600	382.30	1 1/2	20	2.0
14	600	352.90	1 3/8	20	2.0
12	600	333.60	1 1/4	20	2.0
10	600	327.50	1 1/4	16	2.0
8	600	286.40	1 1/8	12	2.0
6	600	254.40	1	12	2.0
4	600	222.90	7/8	8	2.0
3	600	184.80	3/4	8	2.0
2½	600	184.80	3/4	8	2.0
2	600	178.70	5/8	8	2.0
24	300	350.30	1 1/2	24	2.0
20	300	338.10	1 1/4	24	2.0
18	300	331.50	1 1/4	24	2.0
16	300	306.10	1 1/4	20	2.0
14	300	295.50	1 1/8	20	2.0
12	300	270.10	1 1/8	16	2.0
10	300	244.70	1	16	2.0
8	300	229.50	7/8	12	2.0
6	300	207.16	3/4	12	2.0

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Dimensional drawings (continued)

DN/Inch	PN/lbs	L	Hex nut bolt	Bolts (pcs.)	Gasket
4	300	190.90	3/4	8	2.0
3	300	184.80	3/4	8	2.0
2½	300	184.80	3/4	8	2.0
2	300	178.70	5/8	4	2.0

Nominal size of orifice plate

DIN/EN

DN	Nominal size, up to 50	65	80	100	125	150	175	200	250	300	350	400	450	500	600
mm	3	3	4	4	4	4	4	4	4	4	4	4	4	6	6

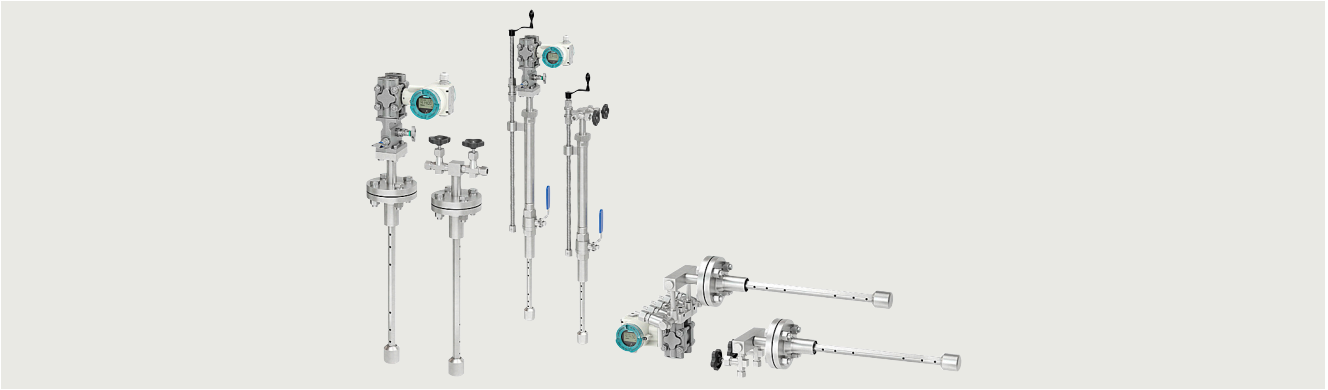
ASME

DN	Nominal size, up to 2"	2.5"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	22"	24"
mm	3	3	3	3	3	3	6	6	6	6	6	10	10	10	12	12

Nominal size designed for a differential pressure of up to 1000 mbar.
The specified dimensions are approximate dimensions, exact dimensions depend on the gasket used.

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Overview



Due to the robust technology and the simple principle of measurement, averaging pitot tubes can be used in many different ways even under difficult conditions and offer considerable advantages over other measuring technology from easy installation to long-term measuring stability.

Further special advantages are the possibilities of bidirectional flow measurement as well as the integration of temperature and pressure measurement.

Benefits

- Easy to retrofit (no rebuilding of the pipe)
- Easy to install
- Good for large nominal diameters
- Wide range of application (media, nominal diameters, process conditions)
- Minor measurement inaccuracy
- Special designs possible for special applications
- Also work in rectangular ducts and pipes

Application

- Technical Gases
- Compressed Air
- Exhaust Air
- Fresh and Combustion Air
- Heat Transfer Fluids
- Water
- Exhaust Gas
- Steam/Heat Quantities

Design

Basics: Averaging pitot tubes for flow measurement

- Mounting by insertion into the pipe (no flange-to-flange instrument)
- Differential pressure generation through forced flow
- Variation of the classic "pitot tube" through multiple metering orifices (so-called "averaging pitot tube")
- Design follows manufacturer guidelines, not standardized

Designs

- Averaging pitot tube for gases and liquids (7ME161)
- Averaging pitot tube for steam applications (7ME162)
- Averaging pitot tube with FASTLOK (7ME163), to remove sensor during operation without interruption of process

System design

- Compact design for dry gases and liquids without integrated temperature measurement
- Compact design for wet gases with or without integrated temperature measurement as well as for dry gases and liquids with integrated temperature measurement
- Compact design for steam with or without integrated temperature measurement
- Remote design for dry or wet gases, liquids and steam

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Function

Design of the averaging pitot tube

Similar to other differential pressure devices averaging pitot tubes create a differential pressure to measure flow. They are not specified in the general standard ISO 5167, but they follow the same technical principle. In contrast to the classic primary elements, averaging pitot tubes are not "in-line" devices but consist of a "profile" that is inserted into the side of the pipeline.

Differential pressure is created when fluid flows around the profile of the averaging pitot tube. Since the constriction of the pipeline by the profile in relation to the cross-sectional area is much smaller than, for example, with an orifice plate, the created differential pressure and the respective permanent pressure drop are smaller.

The flow comes to a complete stop at the upstream side of the averaging pitot tube creating the upstream pressure. At the downstream side a negative pressure is created by the so-called Kármán vortex street. The differential pressure (difference between upstream pressure and negative pressure) is the measurement signal and is proportional to the flow rate. This results in the following basic formula for flow measurement with averaging pitot tubes:

$q_m = A \bullet k \bullet \sqrt{(2 \bullet \Delta p \bullet \rho)}$

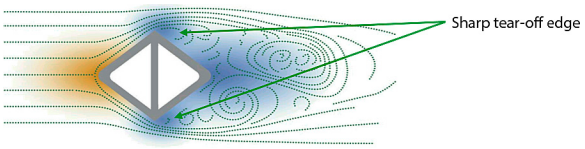
q_m: mass flow

A: cross-sectional area of the pipe

k: device factor of the pitot tube

Δp: differential pressure

ρ: density



The k-factor is the device factor of the averaging pitot tube and is determined, among other things, by the shape of the profile of the pitot tube. Thanks to the sharp-edged shape of the profile, it remains constant over a very wide Reynolds number range and enables linear flow measurement.

The averaging pitot tube features the same number of measuring openings on the front and back. The special distribution of the measuring openings over the cross section allows geometric averaging in case of uneven flow distribution and thus an accurate measurement even with very short inlet and outlet distances. The generated upstream and downstream pressures are averaged in the respective chambers and routed to the differential pressure transmitter.

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Technical specifications

SITRANS FP330/FPS300	
General design	
Working principle	Multi-port averaging pitot tube for round and rectangular pipes
Media	• Steam (saturated, superheated) • Gas (dry, up to 100% water saturated) (automatic purging unit for high dust applications on request) • Liquids (water, non-conductive liquids, oil, etc.)
Transmitter installation	• Compact mount with differential pressure transmitter • Remote mounted differential pressure transmitter
Bidirectional flow	Yes (symmetric sensor design)
Calculation	According to manufacturer standard
Accuracy	
Linearity (of Sensor k-Factor)	Re > 20 000: 1%
Repeatability (of Sensor k-Factor)	Re > 20 000: 0.1%
Measurement range	Typically, up to 1:10 (real measurement range depends on transmitter performance)
Operating conditions	
Pressure	Flange: Max. PN 100 Cutting Ring: Max. PN 40 (max. 180 °C) FASTLOK: Max. PN 16 (max. 180 °C) (higher pressure ratings on request)
Temperature	Stainless Steel sensor: -100 ... 500 °C 16Mo3: -20 ... 530 °C Alloy: -20 ... 700 °C (exact maximum temperature depends on sensor design, feasibility will be calculated by sizing tool)
Pressure loss	generally, <10% of differential pressure
Installation conditions	
Straight inlet diameter	7 × Inner diameter behind 90° elbow
Straight outlet diameter	3 × Inner diameter (for detailed calculation of recommended installation pipe length please refer to sizing tool or manual)
Design	
Material sensor	Standard: Stainless steel 1.4404/ AISI 316L Optional: 1.5415/16Mo3, Alloy C22 (other materials on request)
Diameter	40 ... 4000 mm (larger sensors on request)
Material mounting parts	Standard: Carbon steel Optional: Stainless Steel 1.4404 / AISI 316L (other materials on request)
Process connection	Flange EN 1092-1 B1 Flange ASME B16.5 RF Cutting Ring fitting FASTLOK (retractable design) (other process connections on request)
Thickness of pipe insulation	0 ... 200 mm
Approvals	
Hazardous area	(see differential pressure transmitter)
Enclosure rating	(see differential pressure transmitter)
Operational safety	(see differential pressure transmitter)
QAL1, SIRA	

Accessories

Z-Options for cable glands, plugs, labeling, approvals, blanking plugs, flange seals, device settings, etc.according to SITRANS P320

Options

Further versions that are available on request:

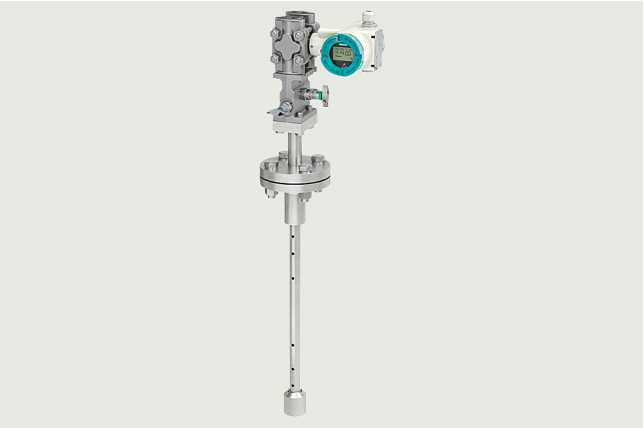
- Weld-in sensor for high pressure steam
- Calibrated metering pipes
- FASTLOK with flange ball valve
- Etc.

More information

For more information please see the Installation Instructions and the Instruction Manuals SITRANS P on SIOS.

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Application



SITRANS FP330 compact design



SITRANS FPS300 remote design

These sensors are using the averaging pitot tube technology and can be used wherever flow rates of gases or liquids are to be measured.

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Design

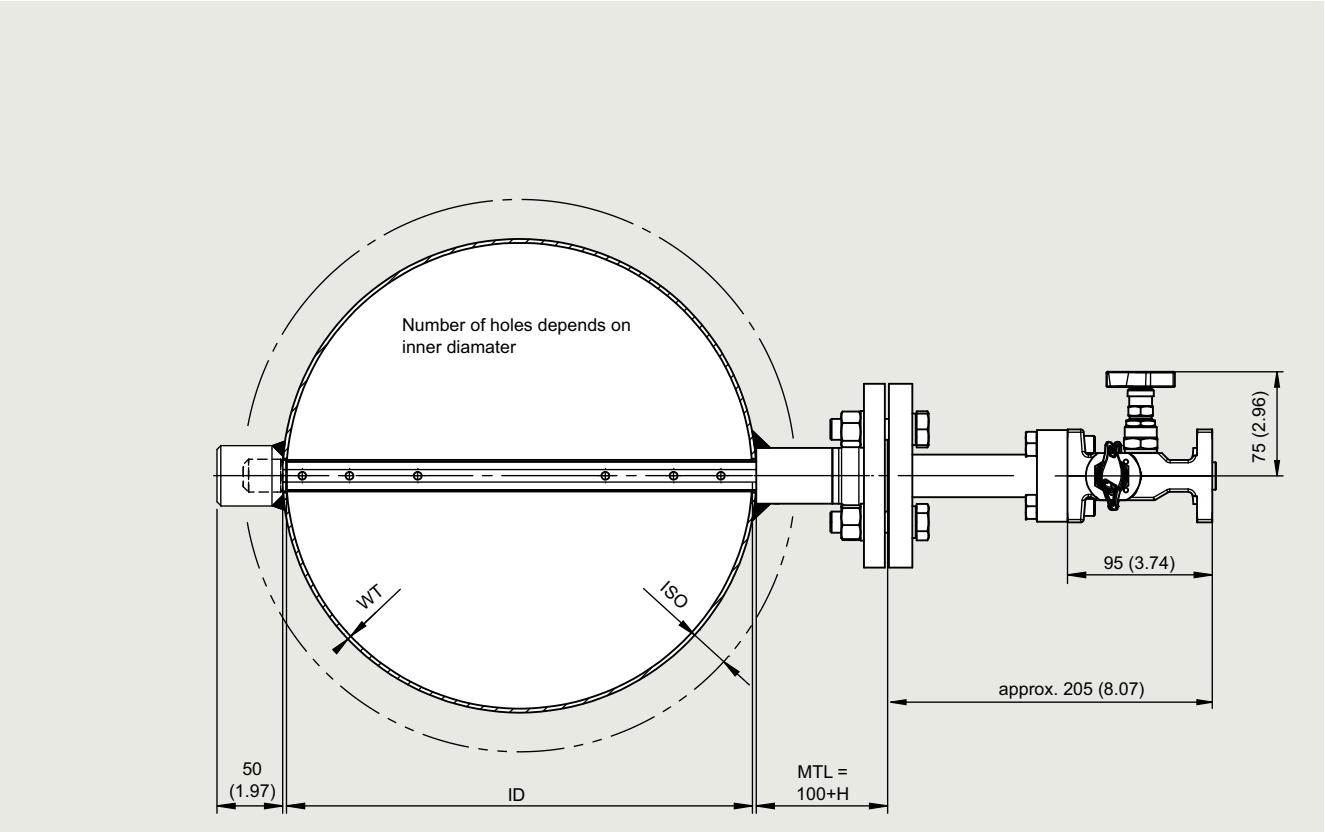
Mounting type

- Flange
- Cutting ring

Material: carbon steel, stainless steel

The averaging pitot tube can be mounted to pipes and ducts either with a traditional flange or a cutting ring fitting:

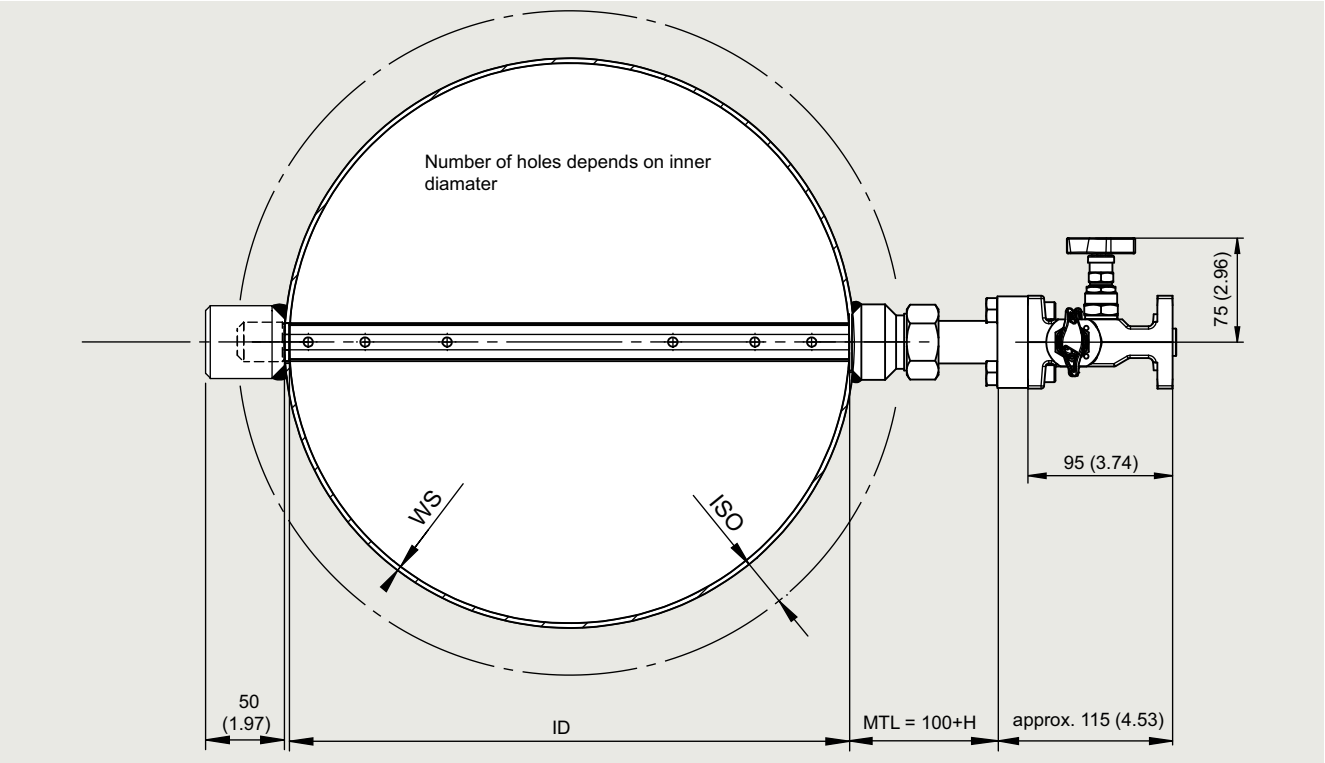
Flange mounting



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Design (continued)

Cutting ring mounting



The required mounting components are always supplied together with the averaging pitot tube.

Flange mounting style can be applied to a large range of applications and is widely accepted. Cutting ring mounting style has a limited temperature and pressure range (see max. pressure and max. temperature below) but provides an economic alternative for simple flow measurement applications.

Dimensions of mounting parts

Flange mounting	Profile 10	Profile 22	Profile 32	Profile 50
PN 16	-	-	-	DN 80
PN 40	DN 15	DN 32	DN 40	On request
PN 100	DN 25	DN 40	DN 40	On request
Class 150	½"	1 ¼"	1 ½"	3"
Class 300	½"	1 ¼"	1 ½"	On request
Class 600	1"	1 ½"	1 ½"	On request

Cutting ring mounting	Profile 10	Profile 22
PN 40	M22	M36

Standard lengths of mounting parts (MTL)

Profile 10	Profile 22	Profile 32	Profile 50
80 mm	100 mm	100 mm	120 mm

Mounting part length can be increased based on thermal pipe insulation in 50 mm steps (H).

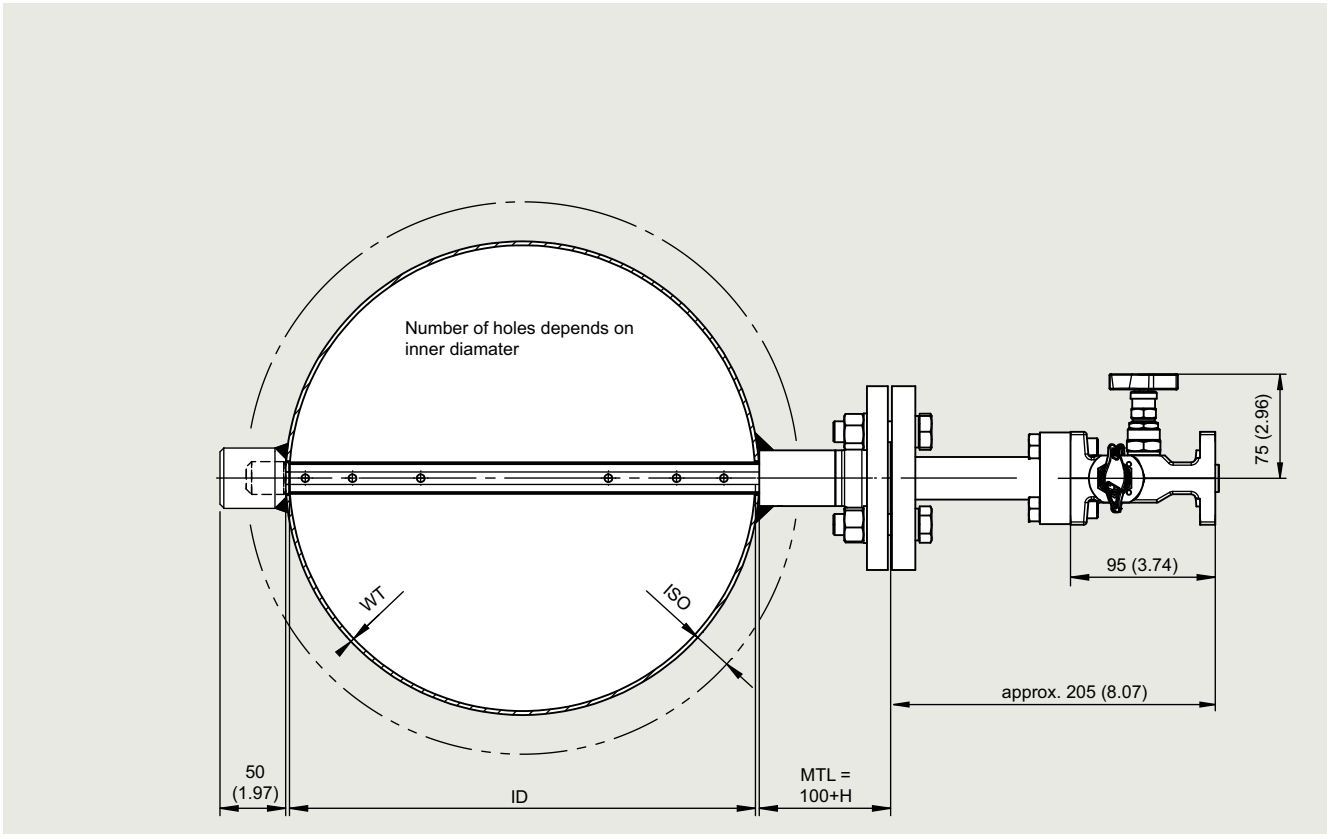
System design of differential pressure connection

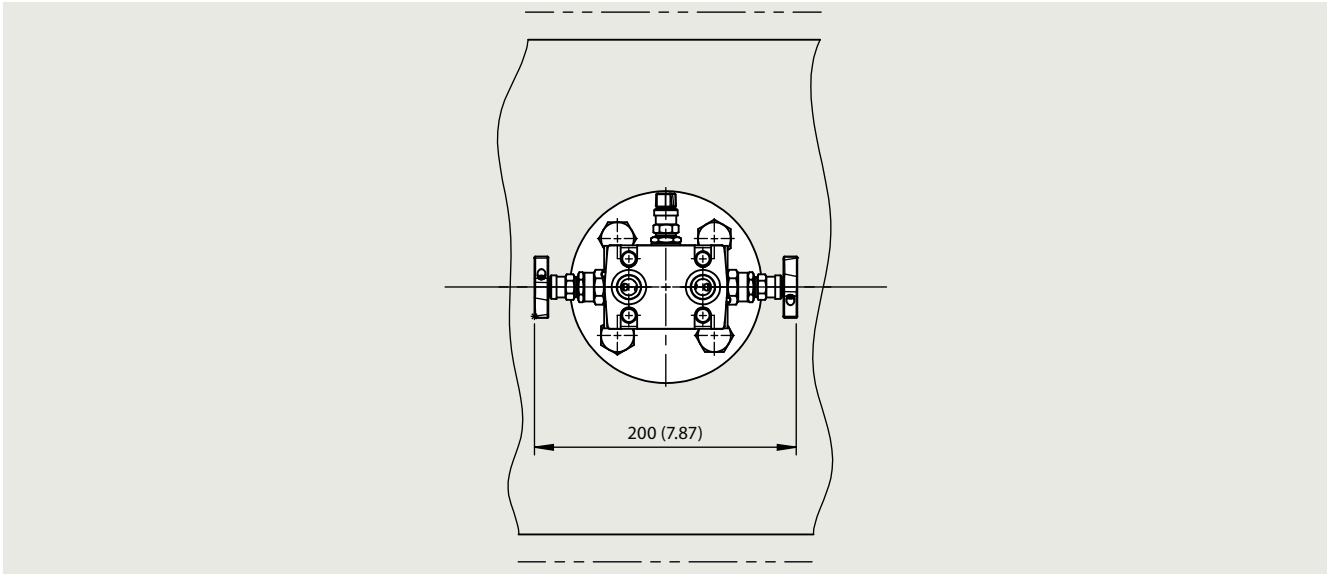
The differential pressure transmitter can be installed in compact design (at the averaging pitot tube) or in remote design.

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Design (continued)

Gas and liquid application, compact design



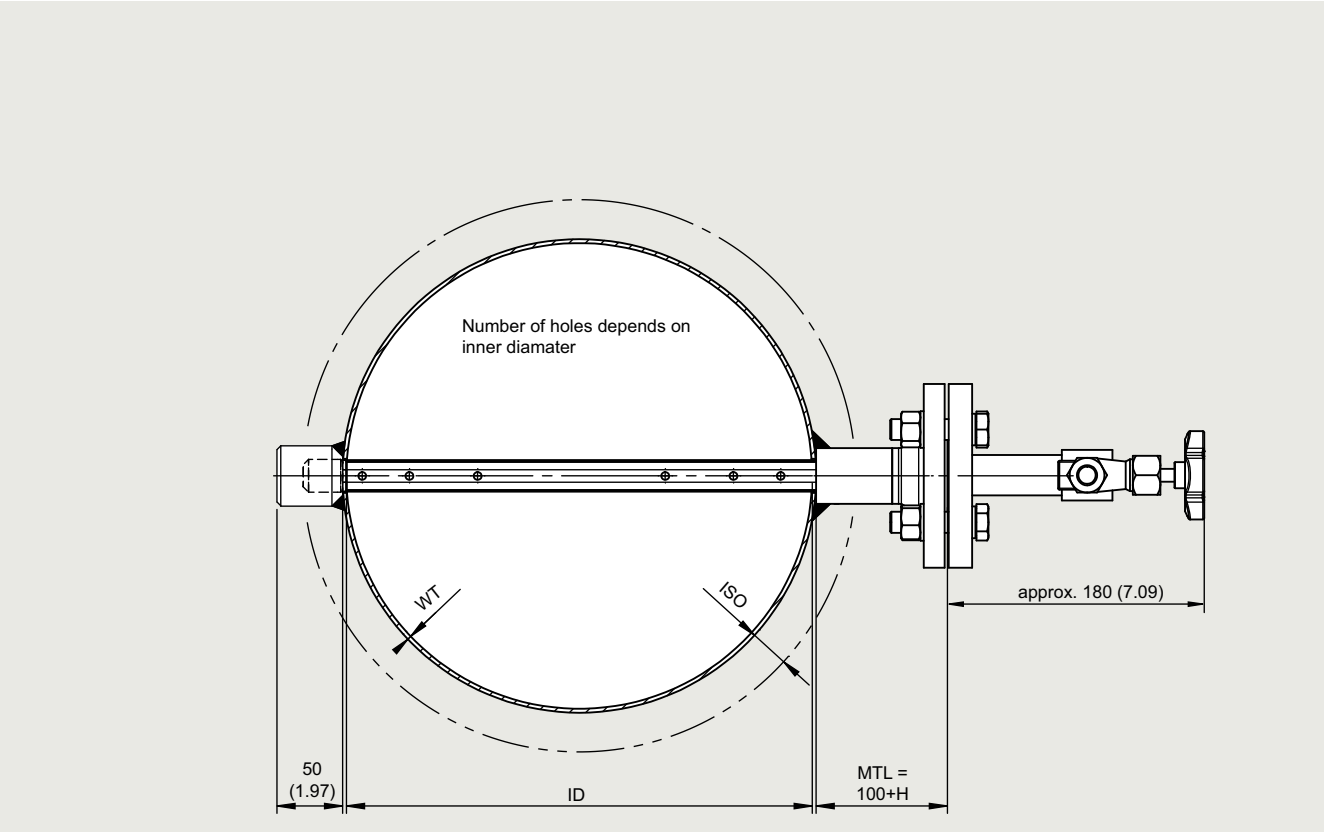


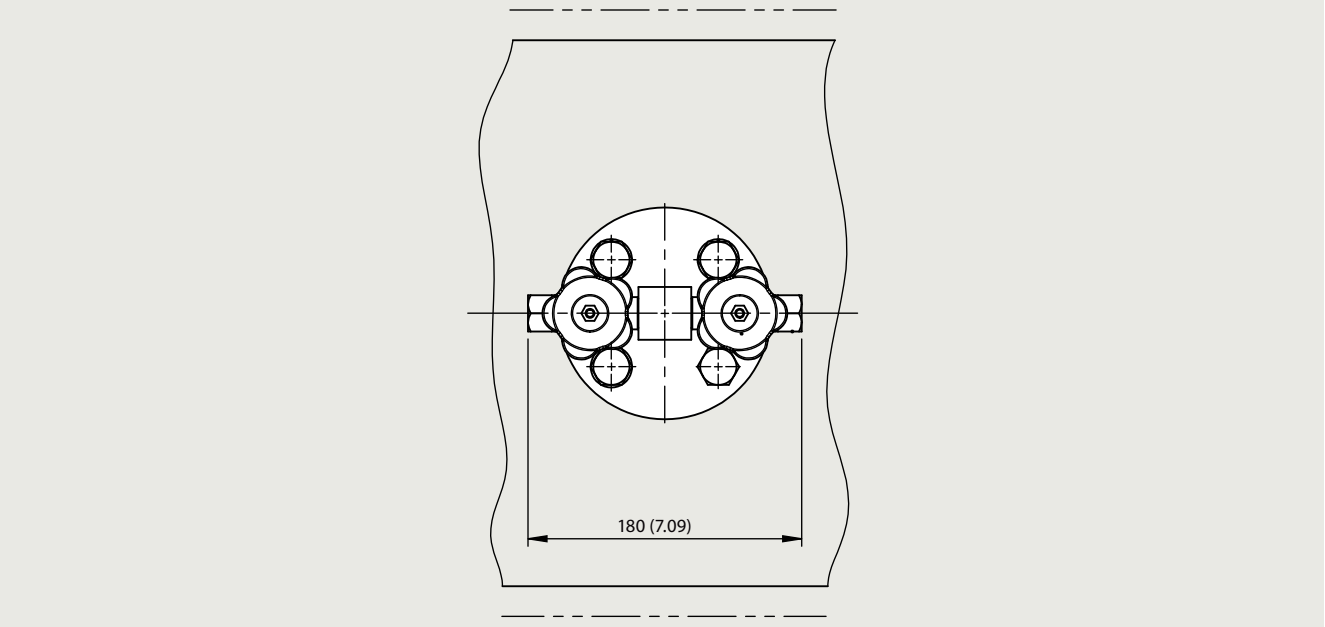
For gas and liquid applications with compact design the averaging pitot tube is equipped with a traditional flange plate to mount manifold and differential pressure transmitter directly at the sensor.

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Design (continued)

Gas and liquid application, remote design



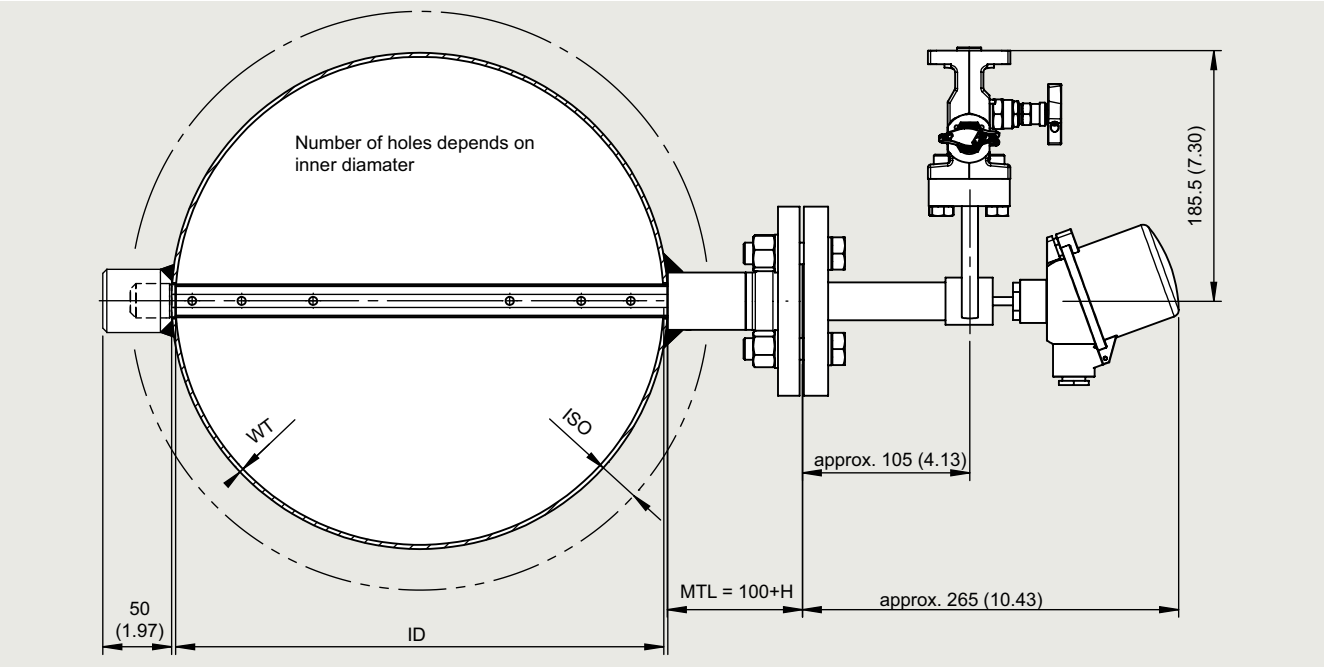


For gas and liquid applications with remote design the averaging pitot tube is equipped with valves mounted directly to the sensor. Impulse pressure piping (not supplied) has to be installed from the valves to the remote mounted manifold and differential pressure transmitter.

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Design (continued)

Gas and liquid application, compact design for wet gases and/or with integrated temperature measurement with PT100



The averaging pitot tube is equipped with a 90° rotated flange plate to mount manifold and differential pressure transmitter directly at the sensor. The rotated flange plate serves the purpose of providing space for the integrated temperature measurement and will also allow condensed water of wet gases to flow back from the outside assembly into the averaging pitot tube. This is particularly useful for installations in vertical pipes, or in horizontal pipes where the averaging pitot tube has to be mounted from the side. If the pitot tube can be mounted from the top, a regular flange plate is sufficient.

Averaging pitot tube materials

- Standard: 1.4404/316L
- Option: Alloy C22

Mounting parts materials

- Carbon steel, 1.4404/316L

Flange gaskets

- Up to PN 40: Klingersil C4400
- As of PN 63: graphite with stainless steel insert

Integrated temperature measurement using PT100

- Can be integrated in averaging pitot tube (> DN 100, only 1.4404, ≤ PN 40)

Max. pressure

- EN 1092-1: up to PN 100 (for flange), PN 40 (for cutting ring)
- ASME B16.5: up to Class 600 (for flange)

Max. temperature

- Mounting parts:
  - Flange: according to EN 1092-1 or ASME B16.5
  - Cutting ring: 200 °C (carbon steel), 400 °C (stainless steel)
- Sensor: will be calculated by sizing tool

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Selection and ordering data

SITRANS FP330/FPS300 averaging pitot tube for gases and liquids	Article No. 7ME161	●	-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Communication													
HART (4 ... 20 mA)		0											
PROFIBUS PA		1											
FOUNDATION Fieldbus		2											
Without transmitter		8											
Nominal size/Sensor type (according to sizing tool)													
DN 40/Sensor type 10				1	C								
DN 50/Sensor type 10				1	D								
DN 65/Sensor type 10				1	E								
DN 80/Sensor type 10				1	F								
DN 100/Sensor type 10				1	G								
DN 125/Sensor type 10				1	H								
DN 100/Sensor type 22				2	G								
DN 125/Sensor type 22				2	H								
DN 150/Sensor type 22				2	J								
DN 200/Sensor type 22				2	K								
DN 250/Sensor type 22				2	L								
DN 300/Sensor type 22				2	M								
DN 350/Sensor type 22				2	N								
DN 400/Sensor type 22				2	P								
DN 450/Sensor type 22				2	Q								
DN 500/Sensor type 22				2	R								
DN 600/Sensor type 22				2	S								
DN 700/Sensor type 22				2	T								
DN 800/Sensor type 22				2	U								
DN 900/Sensor type 22				2	V								
DN 1000/Sensor type 22				2	W								
DN 1100/Sensor type 22				2	X								
DN 1200/Sensor type 22				2	Y								
DN 300/Sensor type 32				3	M								
DN 350/Sensor type 32				3	N								
DN 400/Sensor type 32				3	P								
DN 450/Sensor type 32				3	Q								
DN 500/Sensor type 32				3	R								
DN 600/Sensor type 32				3	S								
DN 700/Sensor type 32				3	T								
DN 800/Sensor type 32				3	U								
DN 900/Sensor type 32				3	V								
DN 1000/Sensor type 32				3	W								
DN 1100/Sensor type 32				3	X								
DN 1200/Sensor type 32				3	Y								
DN 1400/Sensor type 32				4	A								
DN 1500/Sensor type 32				4	B								
DN 1600/Sensor type 32				4	C								
DN 1800/Sensor type 32				4	D								
DN 2000/Sensor type 32				4	E								
DN 2200/Sensor type 32				4	F								
DN 2400/Sensor type 32				4	G								
DN 500/Sensor type 50				5	R								
DN 600/Sensor type 50				5	S								
DN 700/Sensor type 50				5	T								
DN 800/Sensor type 50				5	U								

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Selection and ordering data (continued)

SITRANS FP330/FPS300 averaging pitot tube for gases and liquids	Article No. 7ME161 ● -	●	●	●	●	●	-	●	●	●	●
DN 900/Sensor type 50		5	V								
DN 1000/Sensor type 50		5	W								
DN 1100/Sensor type 50		5	X								
DN 1200/Sensor type 50		5	Y								
DN 1400/Sensor type 50		6	A								
DN 1500/Sensor type 50		6	B								
DN 1600/Sensor type 50		6	C								
DN 1800/Sensor type 50		6	D								
DN 2000/Sensor type 50		6	E								
DN 2200/Sensor type 50		6	F								
DN 2400/Sensor type 50		6	G								
DN 2600/Sensor type 50		6	H								
DN 2800/Sensor type 50		6	J								
DN 3000/Sensor type 50		6	K								
DN 3200/Sensor type 50		6	L								
DN 3400/Sensor type 50		6	M								
DN 3600/Sensor type 50		6	N								
DN 3800/Sensor type 50		6	P								
DN 4000/Sensor type 50		6	Q								
Process connection/wetted parts material											
Flange EN 1092-1 type B1, PN 16/stainless steel 316L/1.4404				C							
Flange EN 1092-1 type B1, PN 40/stainless steel 316L/1.4404				E							
Flange EN 1092-1 type B1, PN 64/100/stainless steel 316L/1.4404				F							
Flange EN 1092-1 type B1, PN 160/stainless steel 316L/1.4404				H							
Flange EN 1092-1 type B1, PN 16/alloy C22 (up to max. 0.5 bar g)				L							
Flange EN 1092-1 type B1, PN 40/alloy C22 (up to max. 0.5 bar g)				M							
Cutting ring PN 40/stainless steel 316L/1.4404				N							
Flange ASME B16.5, Class 150 RF/stainless steel 316L/1.4404				Q							
Flange ASME B16.5, Class 300 RF/stainless steel 316L/1.4404				R							
Flange ASME B16.5, Class 600 RF/stainless steel 316L/1.4404				S							
Flange ASME B16.5, Class 900 RF/stainless steel 316L/1.4404				T							
Flange ASME B16.5, Class 150 RF/alloy C22 (up to max. 0.5 bar g)				W							
Material of welding parts/type of end support											
Carbon steel P235GH/without end support					0						
Stainless steel 316L/1.4404 / without end support					1						
Heat-resistant steel 16Mo3/1.5415 / without end support					2						
Carbon steel P235GH mounting components with closed end support					3						
Stainless steel 316L/1.4404 / closed end support					4						
Heat-resistant steel 16Mo3/1.5415 / closed end support					5						
Carbon steel P235GH/end support with flange					6						
Stainless steel 316L/1.4404 / end support with flange					7						
Thickness of pipe insulation											
Pipe insulation: 0 ... < 50 mm						0					
Pipe insulation: 50 ... < 100 mm						1					
Pipe insulation: 100 ... < 150 mm						2					
Pipe insulation: 150 ... < 200 mm						3					
System design											
Compact design for dry gases and liquids without integrated temperature measurement								0			
Compact design for wet gases with or without integrated temperature measurement as well as for dry gases and liquids with integrated temperature measurement								1			
Remote design for dry gases, wet gases and liquids								3			
Type of protection of pressure transmitter											
No Ex/without pressure tranmitter									A		
Intrinsic safety									B		

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Selection and ordering data (continued)

SITRANS FP330/FPS300 averaging pitot tube for gases and liquids	Article No. 7ME161 ● - ● ● ● ● ● - ● ● ● ●
Explosion proof	C
Intrinsic safety, Explosion proof	D
Dust ignition proof zone 21/22 (DIP), increased safety zone 2	L
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2	M
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2	S
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division	T
Electrical connections/cable entries of pressure transmitter	
Without pressure transmitter	A
2 x M20 x 1.5	F
2 x 1/2-14 NPT	M
Local operation/display of pressure transmitter	
Without display (closed lid)/without pressure tranmitter	0
With display (closed lid)	1
With display (lid with glass window)	2

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. fittings	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Inspection certificate (DIN EN 571-1) - dye penetration test of weldings	**C56**
Hydrostatic pressure test of the primary element (EN 13480-5)	**C58**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH_2O)	**I01**
60 mbar (24.11 inH_2O)	**I02**
250 mbar (100.5 inH_2O)	**I03**
600 mbar (241.1 inH_2O)	**I04**
1600 mbar (643 inH_2O)	**I05**
Integrated temperature measurement	
Integrated temperature measurement with Pt100; cl. A; 3-wire; without head transmitter	**S01**
Integrated temperature measurement with Pt100; cl. A; 3-wire; ATEX II 1/2G Ex ia IIC T5 Ga/Gb; without head transmitter	**S02**
Integrated temperature measurement with Pt100; cl. A; 3-wire; incl. Head transmitter TH320, General Purpose (non Ex) (CE, RCM, FM, CSA) (7NG0310-0BA00-0AA0)	**S03**
Integrated temperature measurement with Pt100; cl. A; 3-wire; ATEX II 1/2G Ex ia IIC T5 Ga/Gb; incl. Head transmitter TH320, Ex i,Ex nA (ec)(Ex- Zone)/IS, NIFW, NI (Class-Div) (ATEX, IECEx, CSA, FM, NEPSI) (7NG0310-0BA00-0NA0)	**S04**
Shut-off valves	
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C with tube fitting 12 mm	**T50**
With mounted shut-off valves DN8 made of stainless steel, up to 300 °C with tube fitting 12 mm	**T51**
With mounted ball valve made of stainless steel, up to 200 °C with tube fitting 12 mm	**T59**
Valve manifolds for mounting on primary element	
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U40**
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U41**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U42**

	Order code
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U43**
With mounted multi-way cock made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U44**
With mounted multi-way cock made of stainless steel, PTFE sealings, stainless steel screws	**U45**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U50**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U51**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U52**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U53**
With enclosed multi-way cock made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U54**
With enclosed multi-way cock made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U55**
Application data	
ID number of the primary element according to sizing tool	**Y40**
Measuring range setting (temperature transmitter): lower range value (max. 5 characters), upper range value (max. 5 characters), unit (C, F)	**Y41**

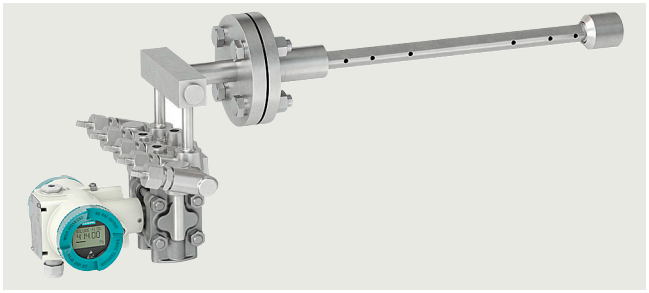
* For further options, please refer to SITRANS P320.

Scope of delivery

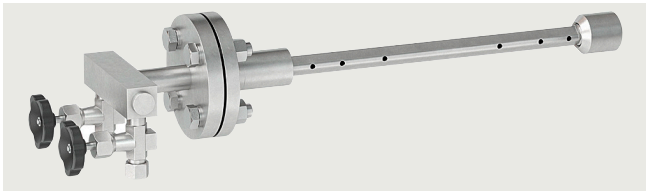
- Averaging pitot tube with differential pressure connections
- Mounting part:
  - Flanged installation: Flanged mounting part including gasket, screws and nuts.
  - Cutting ring installation: Welding socket, cutting ring, nut
- If necessary: closed counter support
- Shut-off valves for remote design (options T5x selected in PIA)
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Application



SITRANS FP330 compact design



SITRANS FPS300 remote design

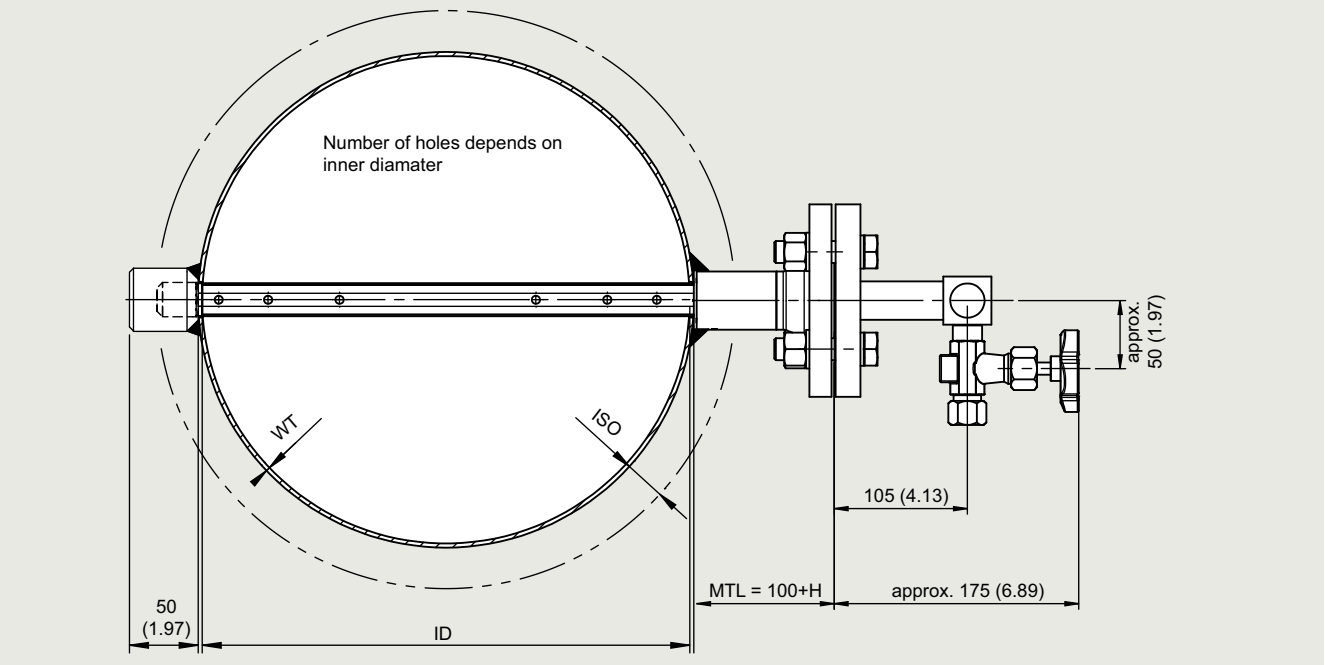
These sensors for steam probes are used wherever flow of superheated or saturated steam is to be measured.

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Design

Mounting type

The averaging pitot tube for steam can be mounted to pipes with a traditional flange:



Dimensions of mounting parts

Flange mounting	Profile 10	Profile 22	Profile 32
PN 40	DN 15	DN 32	DN 40
PN 100	DN 25	DN 40	DN 40
Class 150	½″	1 ¼″	1 ½″
Class 300	½″	1 ¼″	1 ½″
Class 600	1″	1 ½″	1 ½″

Standard lengths of mounting parts

Profile 10	Profile 22	Profile 32
80 mm	100 mm	100 mm

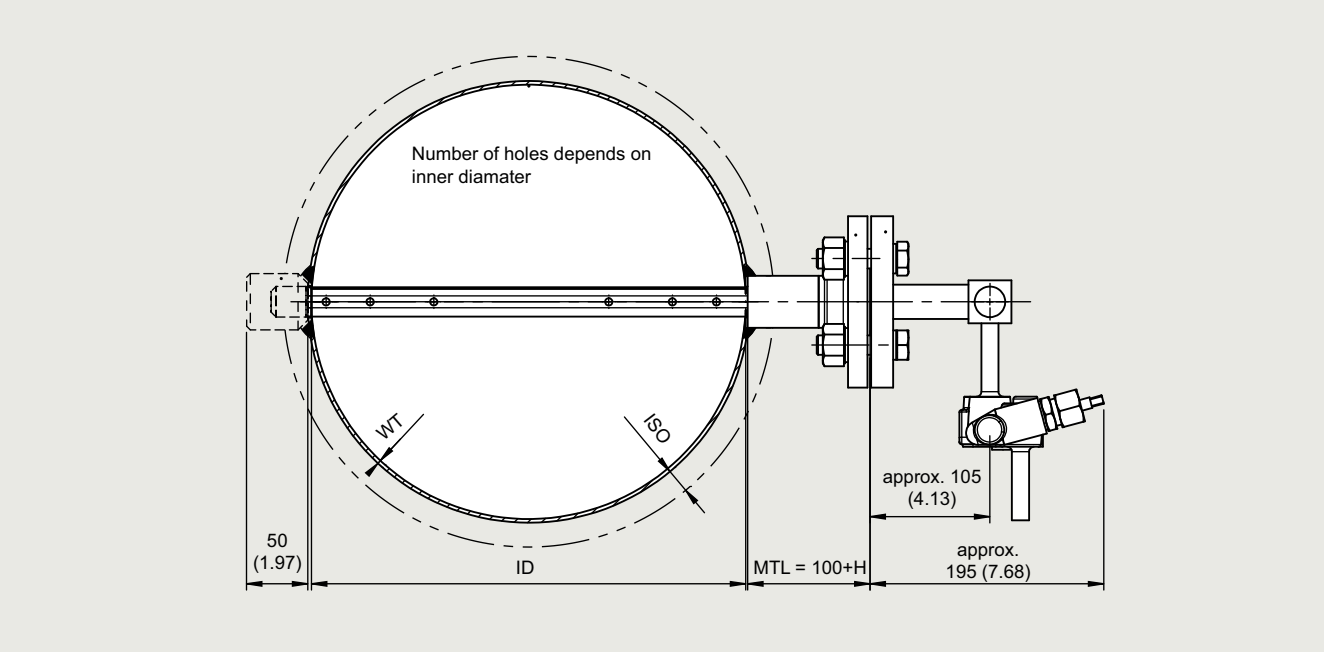
System design of differential pressure connection

The differential pressure transmitter can be installed in compact design (at the averaging pitot tube) or in remote design.

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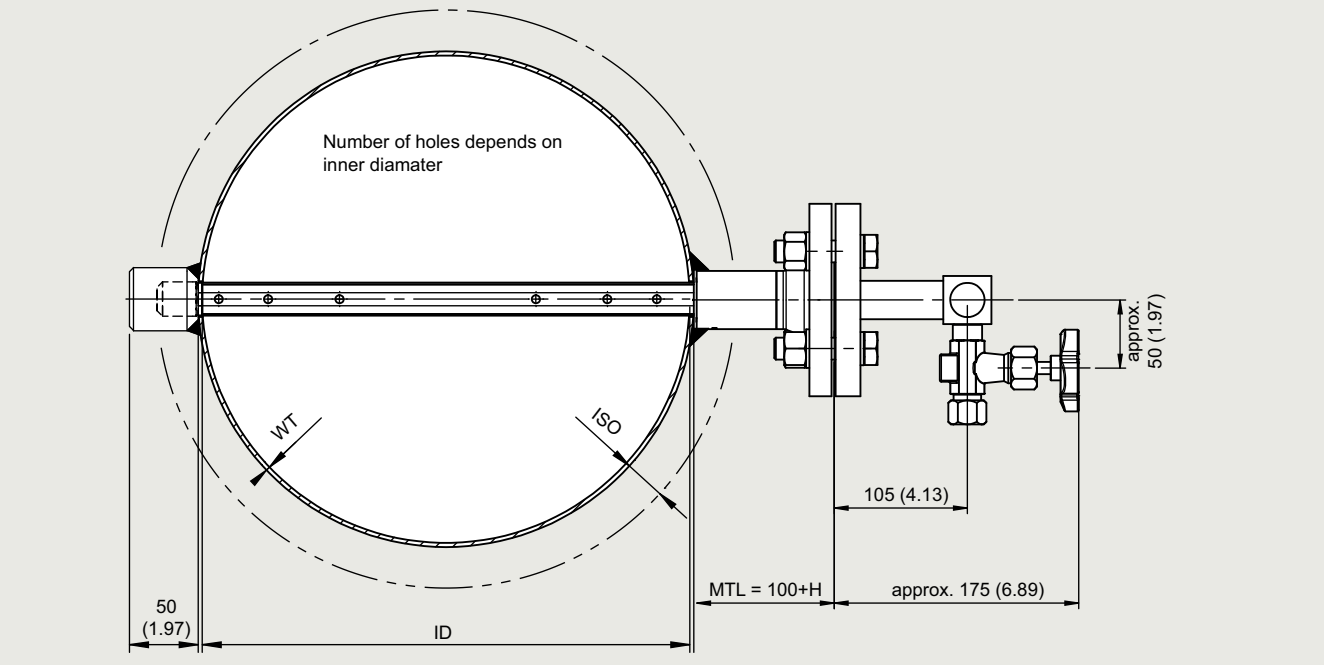
Design (continued)

Steam applications, compact design



For steam applications with compact design the averaging pitot tube sensor is equipped with integrated condensation pots, a 5-way-manifold is welded directly to the sensor.

Steam applications, remote design



For steam applications with remote design the averaging pitot tube sensor is equipped with integrated condensation pots, valves are welded directly to the sensor. Impulse pressure piping (not supplied) has to be installed from the valves to the remote mounted manifold and differential pressure transmitter.

Profile width

- Depending on selected type

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Design (continued)

Averaging pitot tube materials

- Standard: 1.4404/316L
- Option: 16Mo3/1.5415

Mounting parts materials

- Carbon steel, 1.4404/316L

Flange gaskets

- Up to PN 40: graphite
- As of PN 63: graphite with stainless steel insert

Integrated temperature measurement using PT100

- Can be integrated in averaging pitot tube (> DN 100, only 1.4404, ≤ PN 40)

Max. pressure

- EN: up to PN 100
- ASME: up to Class 600

Max. temperature

- Mounting parts: According to EN 1092-1 or ASME B16.5
- Sensor: Will be calculated by sizing tool

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Selection and ordering data

SITRANS FP330/FPS300 averaging pitot tube for steam applications	Article No. 7ME162 ● -	● ● ● ● ● -	● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Communication			
HART (4 ... 20 mA)	0		
PROFIBUS PA	1		
FOUNDATION Fieldbus	2		
Without transmitter	8		
Nominal size/Sensor type (according to sizing tool)			
DN 40/Sensor type 10		1 C	
DN 50/Sensor type 10		1 D	
DN 65/Sensor type 10		1 E	
DN 80/Sensor type 10		1 F	
DN 100/Sensor type 10		1 G	
DN 125/Sensor type 10		1 H	
DN 100/Sensor type 22		2 G	
DN 125/Sensor type 22		2 H	
DN 150/Sensor type 22		2 J	
DN 200/Sensor type 22		2 K	
DN 250/Sensor type 22		2 L	
DN 300/Sensor type 22		2 M	
DN 350/Sensor type 22		2 N	
DN 400/Sensor type 22		2 P	
DN 450/Sensor type 22		2 Q	
DN 500/Sensor type 22		2 R	
DN 600/Sensor type 22		2 S	
DN 700/Sensor type 22		2 T	
DN 800/Sensor type 22		2 U	
DN 900/Sensor type 22		2 V	
DN 1000/Sensor type 22		2 W	
DN 1100/Sensor type 22		2 X	
DN 1200/Sensor type 22		2 Y	
DN 300/Sensor type 32		3 M	
DN 350/Sensor type 32		3 N	
DN 400/Sensor type 32		3 P	
DN 450/Sensor type 32		3 Q	
DN 500/Sensor type 32		3 R	
DN 600/Sensor type 32		3 S	
DN 700/Sensor type 32		3 T	
DN 800/Sensor type 32		3 U	
DN 900/Sensor type 32		3 V	
DN 1000/Sensor type 32		3 W	
DN 1100/Sensor type 32		3 X	
DN 1200/Sensor type 32		3 Y	
DN 1400/Sensor type 32		4 A	
DN 1500/Sensor type 32		4 B	
DN 1600/Sensor type 32		4 C	
DN 1800/Sensor type 32		4 D	
DN 2000/Sensor type 32		4 E	
DN 500/Sensor type 50		5 R	
DN 600/Sensor type 50		5 S	
DN 700/Sensor type 50		5 T	
DN 800/Sensor type 50		5 U	
DN 900/Sensor type 50		5 V	
DN 1000/Sensor type 50		5 W	

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Selection and ordering data (continued)

SITRANS FP330/FPS300 averaging pitot tube for steam applications	Article No. 7ME162 ● -	●	●	●	●	●	-	●	●	●	●
DN 1100/Sensor type 50		5	X								
DN 1200/Sensor type 50		5	Y								
DN 1400/Sensor type 50		6	A								
DN 1500/Sensor type 50		6	B								
DN 1600/Sensor type 50		6	C								
DN 1800/Sensor type 50		6	D								
DN 2000/Sensor type 50		6	E								
Process connection/wetted parts material											
Flange EN 1092-1 type B1, PN 16/stainless steel 316L/1.4404				C							
Flange EN 1092-1 type B1, PN 40/stainless steel 316L/1.4404				E							
Flange EN 1092-1 type B1, PN 64/100/stainless steel 316L/1.4404				F							
Flange EN 1092-1 type B1, PN 160/stainless steel 316L/1.4404				H							
Flange EN 1092-1 type B1, PN 64/100/heat-resistant steel 16Mo3/1.5415				J							
Flange ASME B16.5, Class 150 RF/stainless steel 316L/1.4404				Q							
Flange ASME B16.5, Class 300 RF/stainless steel 316L/1.4404				R							
Flange ASME B16.5, Class 600 RF/stainless steel 316L/1.4404				S							
Flange ASME B16.5, Class 900 RF/stainless steel 316L/1.4404				T							
Flange ASME B16.5, Class 600 RF/heat-resistant steel 16Mo3/1.5415				U							
Material of welding parts/type of end support											
Carbon steel P235GH/without end support					0						
Stainless steel 316L/1.4404 / without end support					1						
Heat-resistant steel 16Mo3/1.5415 / without end support					2						
Carbon steel P235GH mounting components with closed end support					3						
Stainless steel 316L/1.4404 / closed end support					4						
Heat-resistant steel 16Mo3/1.5415 / closed end support					5						
Carbon steel P235GH/end support with flange					6						
Stainless steel 316L/1.4404 / end support with flange					7						
Thickness of pipe insulation											
Pipe insulation: 0 ... < 50 mm						0					
Pipe insulation: 50 ... < 100 mm						1					
Pipe insulation: 100 ... < 150 mm						2					
Pipe insulation: 150 ... < 200 mm						3					
System design											
Compact design for steam with or without integrated temperature measurement								2			
Remote design for dry gases, wet gases and liquids								3			
Type of protection of pressure transmitter											
No Ex/without pressure tranmitter									A		
Intrinsic safety									B		
Explosion proof									C		
Intrinsic safety, Explosion proof									D		
Dust ignition proof zone 21/22 (DIP), increased safety zone 2									L		
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2									M		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2									S		
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division									T		
Electrical connections/cable entries of pressure transmitter											
Without pressure transmitter										A	
2 × M20 × 1.5										F	
2 × 1/2-14 NPT										M	
Local operation/display of pressure transmitter											
Without display (closed lid)/without pressure tranmitter											0
With display (closed lid)											1
With display (lid with glass window)											2

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Selection and ordering data (continued)

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. fittings	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Inspection certificate (DIN EN 571-1) - dye penetration test of weldings	**C56**
Hydrostatic pressure test of the primary element (EN 13480-5)	**C58**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH^2O)	**I01**
60 mbar (24.11 inH^2O)	**I02**
250 mbar (100.5 inH^2O)	**I03**
600 mbar (241.1 inH^2O)	**I04**
1600 mbar (643 inH2O)	**I05**
Integrated temperature measurement	
Integrated temperature measurement with Pt100; cl. A; 3-wire; without head transmitter	**S01**
Integrated temperature measurement with Pt100; cl. A; 3-wire; ATEX II 1/2G Ex ia IIC T5 Ga/Gb; without head transmitter	**S02**
Integrated temperature measurement with Pt100; cl. A; 3-wire; incl. Head transmitter TH320, General Purpose (non Ex) (CE, RCM, FM, CSA) (7NG0310-0BA00-0AA0)	**S03**
Integrated temperature measurement with Pt100; cl. A; 3-wire; ATEX II 1/2G Ex ia IIC T5 Ga/Gb; incl. Head transmitter TH320, Ex i,Ex nA (ec)(Ex- Zone)/IS, NIFW, NI (Class-Div) (ATEX, IECEx, CSA, FM, NEPSI) (7NG0310-0BA00-0NA0)	**S04**
Shut-off valves	
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C with tube fitting 12 mm	**T50**
With mounted shut-off valves DN8 made of stainless steel, up to 300 °C with tube fitting 12 mm	**T51**
With mounted shut off valves DN8 made of carbon steel, up to 550 °C with butt weld end 14 × 2,5 mm	**T58**
Valve manifolds for mounting on primary element	
With mounted manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws	**U46**
With mounted manifold (5-fold) made of carbon steel, up to 550 °C cadmium-plated steel screws with butt weld end 14 × 2,5 mm	**U48**
With enclosed manifold (5-fold) made of carbon steel, up to 300 °C cadmium-plated steel screws with tube fitting 12 mm	**U56**
With enclosed manifold (5-fold) made of carbon steel, up to 550 °C cadmium-plated steel screws with butt weld end 14 × 2,5 mm	**U58**
Application data	
ID number of the primary element according to sizing tool	**Y40**
Measuring range setting (temperature transmitter): lower range value (max. 5 characters), upper range value (max. 5 characters), unit (C, F)	**Y41**

* For further options, please refer to SITRANS P320.

Scope of delivery

- Averaging pitot tube with integrated condensation pots and differential pressure connections
- Flanged mounting part including gasket, screws and nuts
- If necessary: closed counter support
- Shut-off valves for remote design (options T5x selected in PIA)
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Application



SITRANS FP330 compact design



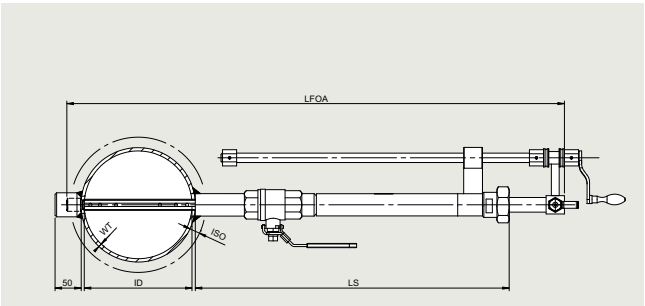
SITRANS FPS300 remote design

In the FASTLOK version the sensor can be assembled and disassembled into the pipe without interrupting plant operation. This pitot tube is used for dry gases, wet gases and liquids. On request it is available in different pressure ratings or with an integrated gear drive.

Design

Mounting type

The averaging pitot tube with FASTLOK mechanism is mounted with a screwed ball valve. A threaded nozzle is welded to the pipe onto which the ball valve is screwed.



Isolation mechanism

- Ball valve with screwed-on threaded pipe with gland packing

Retraction mechanism

- The sensor is inserted or removed into/out of the pipe by turning the operating handle on top of the threaded rod. A gland packing prevents gas or liquid from exiting while the isolation ball valve is opened.

System design of differential pressure connection[1)]

- Compact, remote

Profile width

- Depending on selected type

Averaging pitot tube materials

- 1.4404/316L

Mounting parts materials

- Carbon steel, 1.4404/316L

Ball valve material

- Stainless steel 1.4404

Gasket ball valve

- PTFE

Pressure rating

- PN16

Max. temperature

- Approx. 200 °C

1) For details see Design under the section "Averaging pitot tube for gas and liquids".

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Selection and ordering data

SITRANS FP330/FPS300 averaging pitot tube with FASTLOK	Article No. 7ME163 ● -	● ● ● ● ● -	● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Communication			
HART (4 ... 20 mA)	0		
PROFIBUS PA	1		
FOUNDATION Fieldbus	2		
Without transmitter	8		
Nominal size/Sensor type (according to sizing tool)			
DN 40/Sensor type 10		1 C	
DN 50/Sensor type 10		1 D	
DN 65/Sensor type 10		1 E	
DN 80/Sensor type 10		1 F	
DN 100/Sensor type 10		1 G	
DN 125/Sensor type 10		1 H	
DN 100/Sensor type 22		2 G	
DN 125/Sensor type 22		2 H	
DN 150/Sensor type 22		2 J	
DN 200/Sensor type 22		2 K	
DN 250/Sensor type 22		2 L	
DN 300/Sensor type 22		2 M	
DN 350/Sensor type 22		2 N	
DN 400/Sensor type 22		2 P	
DN 450/Sensor type 22		2 Q	
DN 500/Sensor type 22		2 R	
DN 600/Sensor type 22		2 S	
DN 700/Sensor type 22		2 T	
DN 800/Sensor type 22		2 U	
DN 900/Sensor type 22		2 V	
DN 1000/Sensor type 22		2 W	
DN 1100/Sensor type 22		2 X	
DN 1200/Sensor type 22		2 Y	
DN 300/Sensor type 32		3 M	
DN 350/Sensor type 32		3 N	
DN 400/Sensor type 32		3 P	
DN 450/Sensor type 32		3 Q	
DN 500/Sensor type 32		3 R	
DN 600/Sensor type 32		3 S	
DN 700/Sensor type 32		3 T	
DN 800/Sensor type 32		3 U	
DN 900/Sensor type 32		3 V	
DN 1000/Sensor type 32		3 W	
DN 1100/Sensor type 32		3 X	
DN 1200/Sensor type 32		3 Y	
DN 1400/Sensor type 32		4 A	
DN 1500/Sensor type 32		4 B	
DN 1600/Sensor type 32		4 C	
DN 1800/Sensor type 32		4 D	
DN 2000/Sensor type 32		4 E	
DN 500/Sensor type 50		5 R	
DN 600/Sensor type 50		5 S	
DN 700/Sensor type 50		5 T	
DN 800/Sensor type 50		5 U	
DN 900/Sensor type 50		5 V	
DN 1000/Sensor type 50		5 W	

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Selection and ordering data (continued)

SITRANS FP330/FPS300 averaging pitot tube with FASTLOK	Article No. 7ME163 ● - ● ● ● ● ● - ● ● ● ●
DN 1100/Sensor type 50	5 X
DN 1200/Sensor type 50	5 Y
DN 1400/Sensor type 50	6 A
DN 1500/Sensor type 50	6 B
DN 1600/Sensor type 50	6 C
DN 1800/Sensor type 50	6 D
DN 2000/Sensor type 50	6 E
Process connection/wetted parts material	
Cutting ring PN40/stainless steel 316L/1.4404	N
Material of welding parts/type of end support	
Carbon steel P235GH/without end support	0
Stainless steel 316L/1.4404 / without end support	1
Carbon steel P235GH mounting components with closed end support	3
Stainless steel 316L/1.4404 / closed end support	4
Thickness of pipe insulation	
Pipe insulation: 0 ... < 50 mm	0
Pipe insulation: 50 ... < 100 mm	1
Pipe insulation: 100 ... < 150 mm	2
Pipe insulation: 150 ... < 200 mm	3
System design	
Compact design for dry gases and liquids without integrated temperature measurement	0
Compact design for wet gases with or without integrated temperature measurement as well as for dry gases and liquids with integrated temperature measurement	1
Remote design for dry gases, wet gases and liquids	3
Type of protection of pressure transmitter	
No Ex/without pressure tranmitter	A
Intrinsic safety	B
Explosion proof	C
Intrinsic safety, Explosion proof	D
Dust ignition proof zone 21/22 (DIP), increased safety zone 2	L
Dust ignition proof zone 20/21/22 (DIP), increased safety zone 2	M
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2	S
Intrinsic safety, Explosion proof, Dust ignition proof zone 21/22 (DIP), increased safety zone 2, class division	T
Electrical connections/cable entries of pressure transmitter	
Without pressure transmitter	A
2 × M20 × 1.5	F
2 × 1/2-14 NPT	M
Local operation/display of pressure transmitter	
Without display (closed lid)/without pressure tranmitter	0
With display (closed lid)	1
With display (lid with glass window)	2

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Selection and ordering data (continued)

	Order code
Further designs*	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Certificates of primary element incl. fittings	
Inspection certificate of the primary element (EN 10204-3.1) - material of pressure-containing and wetted parts	**C52**
Factory certificate of the primary element (EN 10204-2.2) - wetted parts (MR 0175-2015)	**C54**
Dimensional record of the primary element	**C55**
Dimensional drawing 1:1 DWG of the primary element	**C59**
Maximum measuring span of pressure transmitter	
20 mbar (8.037 inH_2O)	**I01**
60 mbar (24.11 inH_2O)	**I02**
250 mbar (100.5 inH_2O)	**I03**
600 mbar (241.1 inH_2O)	**I04**
1600 mbar (643 inH_2O)	**I05**
Shut-off valves	
With mounted shut-off valves DN8 made of carbon steel, up to 300 °C with tube fitting 12 mm	**T50**
With mounted shut-off valves DN8 made of stainless steel, up to 300 °C with tube fitting 12 mm	**T51**
With mounted ball valve made of stainless steel, up to 200 °C with tube fitting 12 mm	**T59**
Valve manifolds for mounting on primary element	
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U40**
With mounted manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U41**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U42**
With mounted manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws	**U43**
With mounted multi-way cock made of stainless steel, PTFE sealings, cadmium-plated steel screws	**U44**
With mounted multi-way cock made of stainless steel, PTFE sealings, stainless steel screws	**U45**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U50**
With enclosed manifold (3-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U51**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U52**
With enclosed manifold (5-fold) made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U53**
With enclosed multi-way cock made of stainless steel, PTFE sealings, cadmium-plated steel screws with tube fitting 12 mm	**U54**
With enclosed multi-way cock made of stainless steel, PTFE sealings, stainless steel screws with tube fitting 12 mm	**U55**
Application data	
ID number of the primary element according to sizing tool	**Y40**

* For further options, please refer to SITRANS P320.

Scope of delivery

- Averaging pitot tube with removal mechanism, packing gland, differential pressure connection
- Mounting part threaded welding socket with isolation ball valve
- If necessary: closed counter support
- Shut-off valves for remote design (options T5x selected in PIA)
- Manifold for compact/remote design (options U4x, U5x selected in PIA) incl. mounting brackets

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Overview



SITRANS FEC400 is a universal thermal energy calculator, which meets the requirements EN 1434 and has MID MI-004 approval for heat metering and PTB K7.2 approval for cooling metering.

SITRANS FEC400 has been developed for any SITRANS F flowmeter. SITRANS FEC400 is modular in construction and can be equipped with optional modules customizing the unit to the application.

Benefits

FEC400: Energy meter for versatile applications

The FEC400 is a sophisticated energy meter designed for precise energy measurement across a wide range of applications, including:

- **Commercial buildings / Building technology:** Ideal for monitoring energy consumption in industrial and complex building environments.
- **Near and district heating / District cooling:** Provides accurate data for efficient management of large-scale heating and cooling networks and geothermal plants.
- **Residential construction / Sanitary:** Suitable for energy monitoring in residential settings.

Key applications

- **System integration component:** With its flexible interfaces, FEC400 easily integrates energy data from all thermal applications into existing energy management and building control systems.
- **Heating/Cooling transmission station:** When paired with SIEMENS flow meters, the FEC400 forms a perfect combination for determining performance data in thermal management applications, in distribution stations and larger buildings.

Highlights

Calculator modes

- Volume or mass. Heating, cooling or combined heating and cooling applications for uni-directional and bi-directional volume flow.
- Applications with glycol-based heat carriers, including e.g. solar

Use of any flow transmitter

- Mechanical, ultrasonic, electromagnetic with different sensor type (contact, Reed, NAMUR or active electronic)
- With a pulse frequency of up to 200 Hz
- Integrated 2×3.6 VDC and additional 1×24 VDC sensor supply output

High-precision temperature measurement with temperature sensors

- Pt 100, Pt 500, Pt 1000, RTD compliant
- In two or four-wire configuration

	FEC400 Standard The foundation of efficiency	FEC400 Smart Evolution redefined	FEC400 Advanced Precision at its finest
	Equipped with essential features and a supply range from 24 V AC/DC ro 240 V AC, FEC400 Standard provides comprehensive thermal energy insights. Its real-time monitoring and analysis capabilities empower users to pinpoint energy inefficiencies and streamline system optimization effortlessly, supported by an intuitive interface.	The FEC400 Smart is a variant introducing evolved capabilities in terms of control and efficiency enhancement. Designed for broader compatibility, it supports a 110 ... 240 V AC supply range, delivers a dedicated 24 V/3.6 W power output, and offers expandability through one additional slot for optional function modules.	The FEC400 Advanced is equiped with features that enable state-of-the-art monitoring. With its two power supply outputs and up to six slots for optional function modules, it empowering organizations to anticipate evolving energy demands and achieve superior energy consumption optimization.
Approvals	MID and PTB K7.2		
Temperature sensors	Pt 100, Pt 500, Pt 1000 according to IEC 751 paired in accordance with EN 1434 2-wire or 4-wire connection		
Temperature range			
• Water	0 ... +200 °C		
• Water glycol	-40 ... +180 °C		
Temperature difference	0 ... 199K		
• Type approval	3 ... 190K		
• On demand	1 ... 199K and 2 ... 199K		
Pulse inputs	2, compatible with Reed contacts, passive transistor outputs and NAMUR sensors		
Sensor supply 3.6 VDC	2		
Heat transfer medium	Water / Glycol-based mixtures		

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Overview (continued)

	FEC400 Standard The foundation of efficiency	FEC400 Smart Evolution redefined	FEC400 Advanced Precision at its finest
Heat meter / Calculator functions	• Volume / Mass • Heating or cooling applications • Combined heating and cooling application based on reversed temperature conditions and with a uni-directional volume flow • Combined heating and cooling application based on volume flow reversal for bi-directional flow		
Calculation cycle	1 s		
Protection class	IP54 according to EN 60529		
Display	Multi-function with 8 digits, symbols and short texts for user operation		
Display units	kWh, MWh, MJ, GJ, KBTU, MBTU		
Integrated wired M-Bus communication	1	1	1
Communication RS 485	1	2	2
Protocols on RS 485	• M-Bus • BACnet MS/TP • Modbus RTU		
Integrated radio communication	Wireless M-Bus (wM-Bus)		
Supply range: 24 V AC/DC ... 240 V AC	✓	X	X
Supply range: 110 ... 240 V AC	X	✓	✓
Power supply output: 24 V / 3.6 W	X	1	2
Slots for optional functions modules	1	2	6
Optional modules	• M-Bus • Modbus RTU • BACnet • 2 × Current-Output 0/4 ... 20 mA • 2 × Digital output signal		

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Benefits

Benefits

- Covers all applications: heating, cooling, combined heating/cooling, water/glycol and multi-tariff
- Future-designed communication interface for high flexibility
- Easy commissioning and user-friendly handling

Optimizing commissioning cost with enhanced usability

- Multi-tariffs management
- Datalogger freely programmable with 500 values
- Datalogger features for deep analysis and diagnostics
- Option for on-site calibration settings for easier installation

Full integration reading solutions

Building automation

FEC400 has been developed with full flexibility and many communication options to simplify integration into energy management and building automation systems.

Basic functions

- Prepared for heating, cooling measurement
- Approval for MID MI-004 for heat metering and PTB K7.2 for cooling
- High-accuracy thermal energy metering, meets EN 1434 requirements
- Measured temperature range:
  - -40 ... +180 °C (special heat carrier)
  - 0 ... +200 °C (heat carrier: water)
- Instantaneous values for energy/volume flow
- Mains powered
- Real date and time
- Auto-detection of 2-wire or 4-wire temperature sensors

Additional functions

- 12 freely programmable billing date values
- Advanced functions for cooling/heating applications or the combination
- Record up to 500 data records in a ring buffer at intervals of minutes, hours, days, weeks, months
- Data logger function
- The FEC400 features a "Freeze" command, enabling simultaneous readout of multiple meters in a plant via a broadcast command, thereby eliminating time differences that occur with sequential readings.
- Expandable functionality with 2 optional plug and play add-on modules
- Communication over M-Bus, Modbus RTU, BACnet

Benefits (continued)

Add-on modules

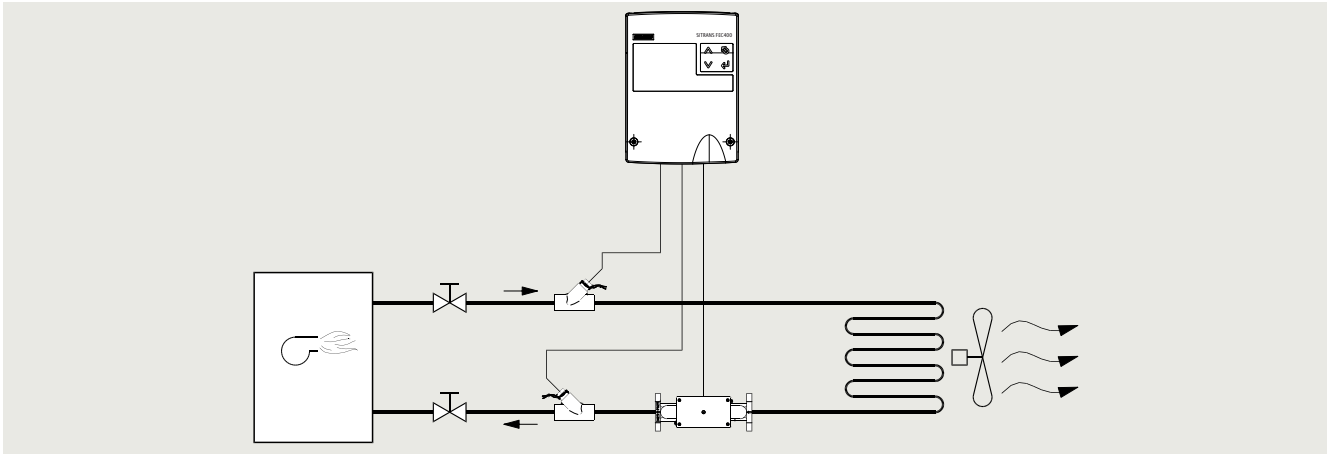
- Plug-in module with 2 analog outputs
- Plug-in module with 2 digital outputs
- Plug-in module for M-Bus communication
- Plug-in module for Modbus RTU communication
- Plug-in module for BACnet communication

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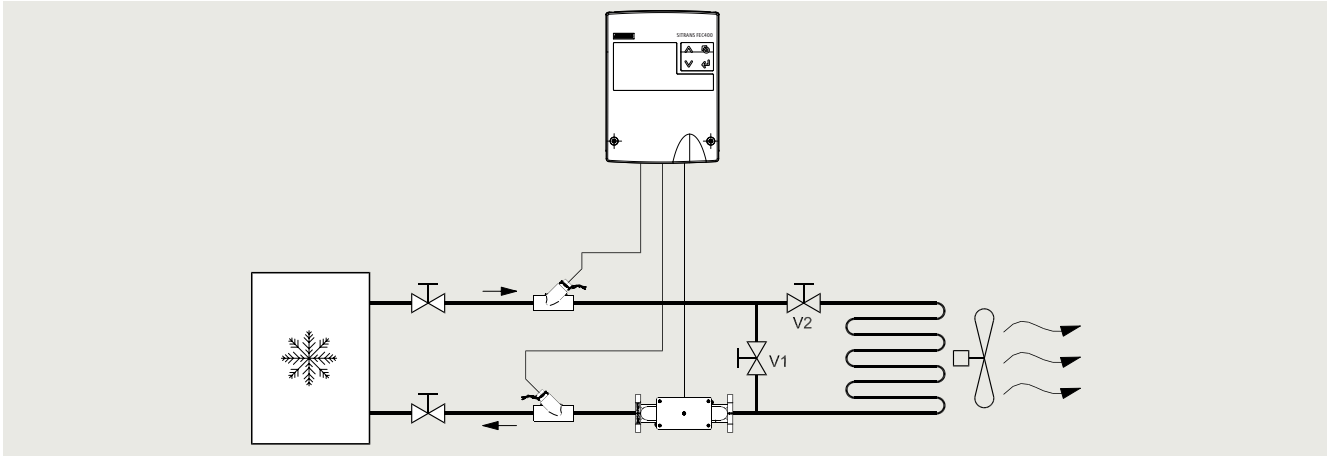
Application

The SITRANS FEC400 is able to handle three kinds of applications, supports energy calculation in:

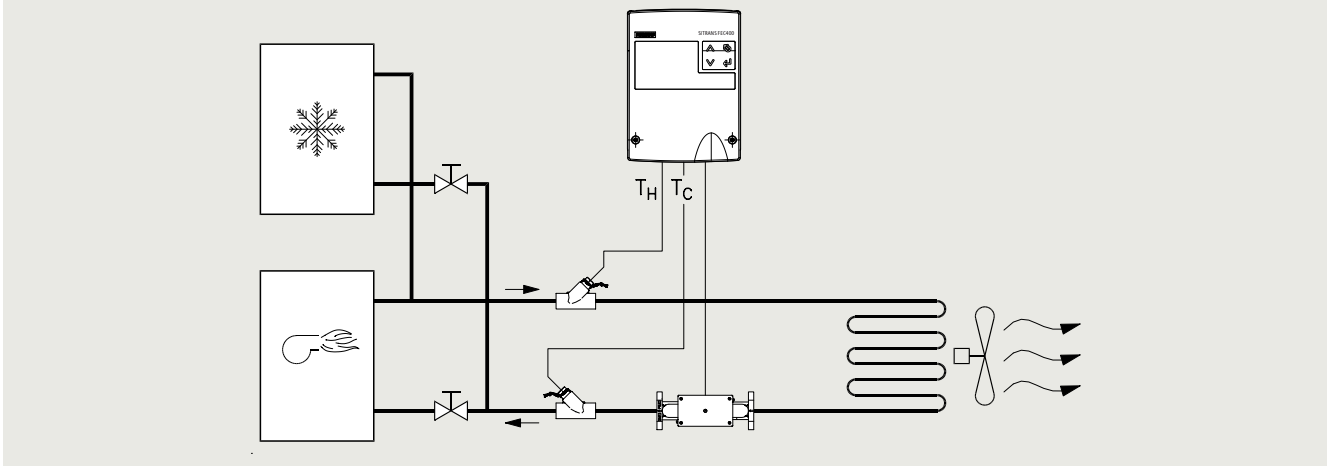
Energy metering in heating, hot water applications



Energy metering in cooling, chilled water applications



Energy metering in combined cooling/heating applications



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Design

SITRANS FEC400 has a backlit multi-function LCD display with 8 digits for easy meter reading. For user operation, the device features clear symbols and concise texts, allowing for straightforward navigation through its functions using dedicated push buttons.

SITRANS FEC400 has four push buttons for simple operation and provides user-friendly control via the various display menu loops. The display will always be configured for the application chosen, and for the selected display settings.

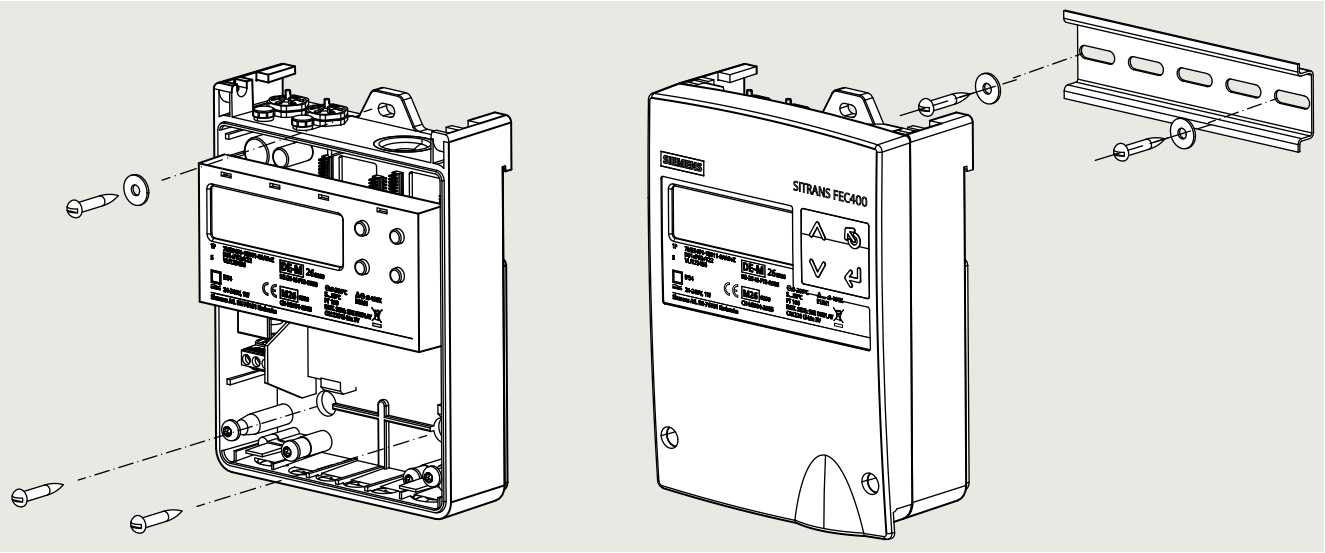
The SITRANS FEC400 has an IP54 plastic housing and is designed for wall or panel mounting. The housing comes with prepared rubber gaskets cable entries for fast and easy installation.

Displays and output pulses

Units volume: 1 ... 0.001m^3, US Gal

Units energy: 1 ... 0.001 kWh, MWh, MJ, GJ, KBTU, MBTU

Units mass: 1 ... 0.001 T



SITRANS FEC400 Mounting

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Function

Technical principle

Calculation of energy is based on the following formula:

Energy = Volume x (T_{Hot} - T_{Cold}) x K_{factor} (T_i)

Volume: Volume [m^3] of a given amount of volume pulses

T_{Hot}: Measured temperature in the hot line

T_{Cold}: Measured temperature in the cold line

K_{factor} (T_i): Thermal coefficient of media enthalpy and heat content

The energy calculation is made by a counter and depends on temperature difference, pulse input frequency and legal requirements.

Values	
• Date/Time	• Volume
• Energy	• Error day counter
• Tariff energy 1	• Maximum monthly flow rate
• Tariff energy 2	• Maximum monthly power
• Tariff definition 1	• Date of maximum monthly flow rate
• Tariff definition 2	• Date of maximum monthly power
• Pulse counter input 1	• Pulse counter input
• Operation hours	

Additional functions	
Data logger	500 values from all readings with a time stamp, stored in ring memory, logger interval, 1 minute, 1 hour, 1 day, 1 week, 1 month
Billing data values	12 freely programmable billing dates to memorize indexes (e.g. monthly) for defined dates. Indexes can be consulted any time.
Glycol-based medium	The "Glycol-based heat transfer medium" option offers an excellent solution for solar-power thermal systems.
On-site settings	One-time on-site setting for calibration-relevant input values
Simultaneous readout	The specific "freeze" command makes it possible to store the desired values, which can then be read out one by one from the system.
Volume based bi-directional energy flow metering (combined heat and cold) with fixed flow direction	The option allows emitted energy to be measured even in twin-conduit networks that perform a combined heating and cooling function. The measurement readings for heating and cooling are recorded separately for their corresponding cost calculation purposes.
Volume based energy flow metering (heat / cold) with bi-directional flow	The option allows the measuring of energy exchange (draw/supply) for interlinked networks and charging / discharging in heat accumulators. The measurement of positive and negative are recorded separately for their corresponding energy consumption.

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Selection and ordering data

SITRANS FEC400 thermal energy calculator	Article No. 7ME349	● -	●	●	●	●	● -	●	●	●	● -	Order code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Transmitter variant FEC400														
Standard, main power 24 V AC/DC ... 240 V AC, 50/60 Hz, 1 W		1												
Smart, main power 110 V ... 240 V AC, 50/60 Hz, 5 W		2												
Advanced, main power 110 V ... 240 V AC, 50/60 Hz, 12 W		3												
Application setting and energy function														
Energy calculator with uni-directional volume flow input, for heating or cooling			1											
Energy calculator with uni-directional mass flow input, for heating or cooling			2											
Energy calculator with a uni-directional volume flow input and automatic heating/cooling energy calculation based on reversed temperature conditions			3											
Energy calculator with bi-directional volume flow input and automatic energy calculation based on flow reversal for heating and cooling			4											
Additional communication module slot #1														
None				A										
Analog output module (2 outputs)				B										
Digital output module (2 outputs)				C										
BACnet MS/TP				D										
Modbus RTU				E										
M-BUS				F										
M-BUS-RS 485				G										
Additional communication module slot #2														
None					A									
Analog output module (2 outputs)					B									
Digital output module (2 outputs)					C									
BACnet MS/TP					D									
Modbus RTU					E									
M-BUS					F									
M-BUS-RS 485					G									
Pattern approvals														
Conformity to CE, without MID						1								
Conformity to CE, including MID MI-004 approval						2								
Conformity to CE, including PTB K7.2 approval						3								
Conformity to CE, including MID MI-004 and PTB K7.2 approval						4								
Heat carrier														
Heat transfer medium: Water							1							
Heat transfer medium: Water and Glycol mixtures (11 predefined sets)							2							
Temperature sensor type (only for programming)														
Device programmed to be used with PT100 temperature sensor								3						
Device programmed to be used with PT500 temperature sensor								4						
Device programmed to be used with PT1000 temperature sensor								5						
Temperature sensors selection (paired)														
Without temperature sensors									A					
Direct Short/Pocket Short Cable Paired, 2-wire, CE MID/PTB, PT100 RTD. Sensor length 45 mm, Sensor diameter 5 mm. Cable length 2.5 m. Installation in ball valve or temperature sensor pocket.									B					
Direct Short/Pocket Short Cable Paired 4-wire CE MID/PTB PT100 RTD. Sensor length 45 mm, Sensor diameter 5 mm. Cable length 10 m. Installation in ball valve or temperature sensor pocket.									C					
Direct Short/Pocket Short Cable Paired 2-wire CE MID/PTB PT500 RTD. Sensor length 45 mm, Sensor diameter 5 mm. Cable length 2.5 m. Installation in ball valve or temperature sensor pocket.									D					
Direct Short/Pocket Short Cable Paired 2-wire CE MID/PTB PT500 RTD. Sensor length 45 mm, Sensor diameter 5 mm. Cable length 10 m. Installation in ball valve or temperature sensor pocket.									E					
Pocket Short Cable Paired 2-wire, CE MID/PTB, PT100 RTD. Sensor length 50 mm, Sensor diameter 6 mm. Cable length 2.5 m. Installation in temperature sensor pocket.									J					
Pocket Short Cable Paired 4-wire, CE MID/PTB, PT100 RTD. Sensor length 50 mm, Sensor diameter 6 mm. Cable length 10 m. Installation in temperature sensor pocket.									K					
Pocket Short Cable Paired 2-wire, CE MID/PTB, PT500 RTD. Sensor length 50 mm, Sensor diameter 6 mm. Cable length 2.5 m. Installation in temperature sensor pocket.									L					
Pocket Short Cable Paired 2-wire, CE MID/PTB, PT500 RTD. Sensor length 50 mm, Sensor diameter 6 mm. Cable length 10 m. Installation in temperature sensor pocket.									N					

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Selection and ordering data (continued)

SITRANS FEC400 thermal energy calculator	Article No. 7ME349 ● - ● ● ● ● ● - ● ● ● ● -	Order code ● ● ●
Pocket Long Head Paired 2 and 4-wire, CE MID, PT100 RTD. Sensor length 105 mm, Sensor diameter 6 mm. Cable not included (length 15 m max approved, permissible max 100 m). Installation in thermowells.	R	
Pocket Long Head Paired 2 and 4-wire, CE MID, PT100 RTD. Sensor length 140 mm, Sensor diameter 6 mm. Cable not included (length 15 m max approved, permissible max 100 m). Installation in thermowells.	S	
Pocket Long Head Paired 2 and 4-wire, CE MID, PT100 RTD. Sensor length 175 mm, Sensor diameter 6 mm. Cable not included (length 15 m max approved, permissible max 100 m). Installation in thermowells.	T	
Pocket Long Head Paired 2 and 4-wire, CE MID, PT100 RTD. Sensor length 230 mm, Sensor diameter 6 mm. Cable not included (length 15 m max approved, permissible max 100 m). Installation in thermowells.	U	
'Temperature pockets selection (paired)		
Without temperature pockets	A	
For DS/PSC RTD. 2 pieces brass sensor pocket. External thread G 1/2", ET 40 mm, packed in bag, with copper seal sensor plastic fitting	B	
For DS/PSC RTD. 2 pieces brass sensor pocket. External thread G 1/2", ET 60 mm, packed in bag, with copper seal sensor plastic fitting	C	
For PLH105 and PSC RTD. 2 pieces stainless steel sensor pocket. External thread G 1/2", ET 85 mm, packed in bag, with copper seal ring	F	
For PLH140 and PSC RTD. 2 pieces stainless steel sensor pocket. External thread G 1/2", ET 120 mm, packed in bag, with copper seal ring	G	
For PLH175 and PSC RTD. 2 pieces stainless steel sensor pocket. External thread G 1/2", ET 155 mm, packed in bag, with copper seal ring	H	
For PLH230 and PSC RTD. 2 pieces stainless steel sensor pocket. External thread G 1/2", ET 210 mm, packed in bag, with copper seal ring	L	
For PLH140 and PSC RTD. 2 pieces stainless steel sensor pocket. Enhanced type for higher flow rates. External thread G 1/2", ET 120 mm, packed in bag, with copper seal ring	M	
For PLH175 and PSC RTD. 2 pieces stainless steel sensor pocket. Enhanced type for higher flow rates. External thread G 1/2", ET 155 mm, packed in bag, with copper seal ring	N	
For PLH230 and PSC RTD. 2 pieces stainless steel sensor pocket. Enhanced type for higher flow rates. External thread G 1/2", ET 210 mm, packed in bag, with copper seal ring	P	
For PLH140 RTD. 2 pieces stainless steel sensor pocket. Reinforced type for welding in. External thread G 1/2", ET 107 mm, packed in bag, with copper seal ring	V	
For PLH175 RTD. 2 pieces stainless steel sensor pocket. Reinforced type for welding in. External thread G 1/2", ET 140 mm, packed in bag, with copper seal ring	W	
For PLH230 RTD. 2 pieces stainless steel sensor pocket. Reinforced type for welding in. External thread G 1/2", ET 200 mm, packed in bag, with copper seal ring	X	
Installation side of flow meter		
Installation in return pipe	1	
Installation in supply pipe	2	
Options		
Additional communication module slot #3		
Analog output module (2 outputs)		F 3 0
Digital output module (2 outputs)		F 3 1
BACnet MS/TP		F 3 2
Modbus RTU		F 3 3
M-BUS		F 3 4
M-BUS-RS485		F 3 5
Additional communication module slot #4		
Analog output module (2 outputs)		F 4 0
Digital output module (2 outputs)		F 4 1
BACnet MS/TP		F 4 2
Modbus RTU		F 4 3
M-BUS		F 4 4
M-BUS-RS485		F 4 5
Additional communication module slot #5		
Analog output module (2 outputs)		F 5 0
Digital output module (2 outputs)		F 5 1
BACnet MS/TP		F 5 2
Modbus RTU		F 5 3
M-BUS		F 5 4
M-BUS-RS485		F 5 5

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Selection and ordering data (continued)

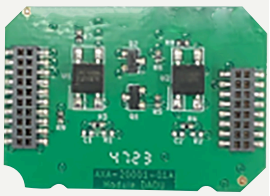
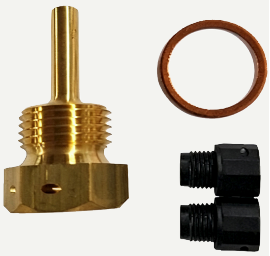
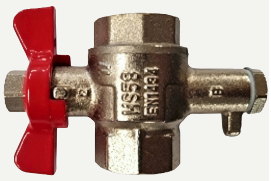
SITRANS FEC400 thermal energy calculator	Article No. 7ME349 ● - ● ● ● ● ● - ● ● ● ● -	Order code ● ● ●
Additional communication module slot #6		
Analog output module (2 outputs)		F 6 0
Digital output module (2 outputs)		F 6 1
BACnet MS/TP		F 6 2
Modbus RTU		F 6 3
M-BUS		F 6 4
M-BUS-RS485		F 6 5
Mounting bracket		
DIN EN50222 mounting rails (Tools and installation material are not included in the delivery)		H 0 1
Certificate		
Paint Wetting Impairment Substances (PWIS) or lackbenetzungsstörende Substanzen (LABS) compliance certificate		W 0 1
Device identification		
Adhesive label sticker for max. 30 characters for programming measuring location		Y 1 1
Device configuration function		
One-time on-site setting for MID and PTB compulsory configuration parameters values		D 0 2
Device units and resolution		
Pulse value and unit (unit volume pulse = unit output pulse) (Default value:1 L)		Y 2 1
Energy display unit (Default value: kWh)		Y 2 2
Energy display decimal (Default value: 00000000.)		Y 2 3
Volume unit and decimal (Default value: 0000000.0 m^3)		Y 2 4
Device settings other		
Datalogger period (Default: 1 month)		Y 3 0
Mass unit and decimal (Default value:00000000. T)		Y 3 1
Instantaneous power displayed in (Default value: kW)		Y 3 2

Temperature sensors

Description	Article No.	
Direct Short/Pocket Short Cable Paired		
• 2-wire, CE MID/PTB, PT100 RTD Sensor length 45 mm, Sensor diameter 5 mm. Cable length 2,5 m. Installation in ball valve or temperature sensor pocket.	SAG:80580	
• 4-wire CE MID/PTB PT100 RTD Sensor length 45 mm, Sensor diameter 5 mm. Cable length 10 m. Installation in ball valve or temperature sensor pocket.	SAG:80764	
• 2-wire CE MID/PTB PT500 RTD Sensor length 45 mm, Sensor diameter 5 mm. Cable length 2,5 m. Installation in ball valve or temperature sensor pocket.	SAG:80579	
• 2-wire CE MID/PTB PT500 RTD. Sensor length 45 mm, Sensor diameter 5 mm. Cable length 10 m. Installation in ball valve or temperature sensor pocket.	SAG:80765	
Pocket Short Cable Paired		
• 2-wire, CE MID/PTB, PT100 RTD Sensor length 50 mm, Sensor diameter 6 mm. Cable length 2,5 m. Installation in temperature sensor pocket.	SAG:97647	
• 4-wire, CE MID/PTB, PT100 RTD Sensor length 50 mm, Sensor diameter 6 mm. Cable length 10 m. Installation in temperature sensor pocket.	SAG:97649	
• 2-wire, CE MID/PTB, PT500 RTD Sensor length 50 mm, Sensor diameter 6 mm. Cable length 2,5 m. Installation in temperature sensor pocket.	SAG:97648	
• 2-wire, CE MID/PTB, PT500 RTD Sensor length 50 mm, Sensor diameter 6 mm. Cable length 10m. Installation in temperature sensor pocket.	SAG:97650	
Pocket Long Head Paired		
• 2 and 4-wire, CE MID, PT100 RTD Sensor length 105 mm, Sensor diameter 6 mm. Cable not included (length 15 m max. approved, permissible max. 100 m). Installation in thermowells.	SAG:80360	

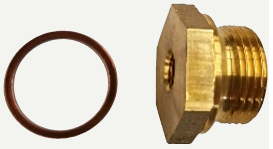
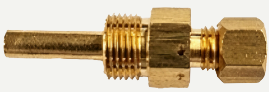
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Selection and ordering data (continued)

Description	Article No.	
• 2 and 4-wire, CE MID, PT100 RTD Sensor length 140 mm, Sensor diameter 6 mm. Cable not included (length 15 m max. approved, permissible max. 100 m). Installation in thermowells.	SAG:80361	
• 2 and 4-wire, CE MID, PT100 RTD Sensor length 175 mm, Sensor diameter 6 mm. Cable not included (length 15 m max. approved, permissible max 100 m). Installation in thermowells.	SAG:80362	
• 2 and 4-wire, CE MID, PT100 RTD Sensor length 230 mm, Sensor diameter 6 mm. Cable not included (length 15 m max. approved, permissible max. 100 m). Installation in thermowells.	SAG:80363	
Communication modules		
Analog output modules (2 outputs)	SAG:95248	
Digital output module (2 outputs)	SAG:98503	
BACnet MS/TP	SAG:95243	
Modbus RTU	SAG:95241	
M-BUS	SAG:95240	
M-BUS-RS485	SAG:95250	
Temperature pockets		
For DS/PSC RTD. 1 piece brass sensor pocket. External thread G 1/2", ET 40 mm, packed in bag, with copper seal sensor plastic fitting	SAG:80490	
For DS/PSC RTD. 1 piece brass sensor pocket. External thread G 1/2", ET 60 mm, packed in bag, with copper seal sensor plastic fitting	SAG:80491	
For PLH105&PSC RTD. 2 pieces stainless steel sensor pocket.External thread G 1/2", ET 85 mm, with copper seal ring	SAG:80059	
For PLH140&PSC RTD. 2 pieces stainless steel sensor pocket. External thread G 1/2", ET 120 mm, with copper seal ring	SAG:80060	
For PLH175&PSC RTD. 2 pieces stainless steel sensor pocket. External thread G 1/2", ET 155 mm, with copper seal ring	SAG:80062	
For PLH230&PSC RTD. 2 pieces stainless steel sensor pocket. External thread G 1/2", ET 210 mm, with copper seal ring	SAG:80064	
For PLH140&PSC RTD. 2 pieces stainless steel sensor pocket. Enhanced type for higher flow rates. External thread G 1/2", ET 120 mm, with copper seal ring	SAG:80790	
For PLH175&PSC RTD. 2 pieces stainless steel sensor pocket. Enhanced type for higher flow rates. External thread G 1/2", ET 155 mm, with copper seal ring	SAG:80791	
For PLH230&PSC RTD. 2 pieces stainless steel sensor pocket. Enhanced type for higher flow rates. External thread G 1/2", ET 210 mm, with copper seal ring	SAG:80077	
For PLH140 RTD. 2 pieces stainless steel sensor pocket. Reinforced type for welding in. External thread G 1/2", ET 107 mm, with copper seal ring	SAG:80266	
For PLH175 RTD. 2 pieces stainless steel sensor pocket. Reinforced type for welding in. External thread G 1/2", ET 140 mm, with copper seal ring	SAG:80267	
For PLH230 RTD. 2 pieces stainless steel sensor pocket. Reinforced type for welding in. External thread G 1/2", ET 200 mm, with copper seal ring	SAG:80268	
Temperature accessories		
For DS/PSC RTD. 1piece nickel-plated brass ball valve with CEN sensor holder (M10×1). Internal thread G1/2"	SAG:2505	
For DS/PSC RTD. 1piece nickel-plated brass ball valve with CEN sensor holder (M10×1). Internal thread G3/4"	SAG:2504	
For DS/PSC RTD. 1piece nickel-plated brass ball valve with CEN sensor holder (M10×1). Internal thread G1"	SAG:2507	
For DS/PSC RTD. 1piece nickel-plated brass ball valve with CEN sensor holder (M10×1). Internal thread G1" 1/4	SAG:80534	
For DS/PSC RTD. 1piece nickel-plated brass ball valve with CEN sensor holder (M10×1). Internal thread G1" 1/2	SAG:80535	

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Selection and ordering data (continued)

Description	Article No.	
For DS/PSC RTD. 1 brass T-piece adapter with CEN sensor holder (M10×1). External thread G 3/8"	SAG:19406	
For DS/PSC RTD. 1 brass T-piece adapter with CEN sensor holder (M10×1). External thread G 1/2"	SAG:80072	
For DS/PSC RTD. 1 brass T-piece adapter with CEN sensor holder (M10×1). External thread G 3/4"	SAG:80073	
For DS/PSC RTD. 1 brass T-piece adapter with CEN sensor holder (M10×1). External thread G 1"	SAG:80074	
For DS/PSC RTD. 1 brass Locking top used with T-piece adapter(M10×1)	SAG:80207	
For DS/PSC RTD. Mounting components for direct mounting or in sensor pocket SP-M 40	SAG:80205	
For DS/PSC RTD. Mounting components for direct mounting or in sensor pocket SP-M 60	SAG:20040	
For DS/PSC RTD. 1 piece brasse sensor pocket. External thread G 3/8", ET 33 mm, packed in bag	SAG:81568	
For DS/PSC RTD. Sensor pocket cap cpl. ATH-33	SAG:20039	
For DS/PSC RTD. Sleeve set Bantam TH 6 × 30	SAG:81710	
For DS/PSC RTD. Sleeve set Bantam TH 6 × 60	SAG:81711	
For DS/PSC RTD. MG-CEN Brass Spacer	SAG:19365	
For PLH and PSC RTD. Screw M5X12 STP	SAG:20061	
For PLH and PSC RTD. Carbon steel welded sleeves with inside thread 1/2" for temperature sensor pockets type SP-E / SP-EV	SAG:81551	
For PLH and PSC RTD. Stainless steel welded sleeves with inside thread 1/2" for temperature sensor pockets type SP-E / SP-EV	SAG:81552	
DIN EN50222 mounting rail (Tools and installation material are not included in the delivery)	SAG:19838	
Temperature sensor cable 10 × 0.5 mm^2 shielded, length 5 m	SAG:20042-5	
Temperature sensor cable 10 × 0.5 mm^2 shielded, length 20 m	SAG:20042-20	
Temperature sensor cable 10 × 0.5 mm^2 shielded, length100 m	SAG:20042-100	
Temperature sensor cable 4 × 0.5 mm^2 shielded, length 5 m	SAG:95423-5	
Temperature sensor cable 4 × 0.5 mm^2 shielded, length 20 m	SAG:95423-20	
Temperature sensor cable 4 × 0.5 mm^2 shielded, length 100 m	SAG:95423-100	
Distributor box for temperature sensor and pulse transmitter	SAG:93331	

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Technical specifications

SITRANS FEC400		
Housing and operating conditions		
Dimensions	**Standard and Smart**	**Advanced**
Length	120.5 mm (4.744 in)	120.5 mm (4.744 in)
Width	54.8 mm (2.156) in)	105 mm (4.13 in)
Height	162.7 mm (6.404 in)	163 mm (6.416 in)
Material		
Housing	Polycarbonate ABS	
Buttons, gaskets, rubber cable bushings	ALCRYN	
Measuring accuracy	**Standard and Smart**	**Advanced**
	Suitable for class 2 heat meter Error limits in accordance with EN 1434-1	Error limits in accordance with EN 1434-1
Environmental conditions		
Mechanical environmental conditions	Class M1	
Electromagnetic environmental conditions	Class E1 (MID) or C (EN 1434)	
Climatic environmental conditions	Class C	
Ambient temperature	+5 ... +55 °C (41 ... 131 °F), EN 1434 class C	
Storage temperature	0 ... 60 °C (32 ... 140 °F)	
Humidity	Max. 95 %	
Operating altitude	Up to 2000 m (6561 ft) above sea level	
Approval	MID approved in accordance with energy meter EN 1434 and PTB K7.2 (German national cooling approval) MI-004 for heat metering	
Protection class	IP54 according to EN 60529	
Terminals	Signal connection: 1.5 mm^2 screw terminals Power connection: 2.5 mm^2 screw terminals	
Lifetime	Operational period 15 years	
Protection against mechanical stress	Vibrations / shock according to EN 1434 – 7.23	
Mounting	Wall mounting with 3 points DIN-rail mounting (DIN EN 50222)	
Cable inlets	**Standard and Smart**	**Advanced**
	• 1 × Ø 4 ... 8 mm power port • 4 × Ø 2.5 ... 5 mm signal port • 1 × Ø 4 ... 8 mm signal port	• 2 × Ø 4 ... 8 mm power port • 8 × Ø 2.5 ... 5 mm signal port • 2 × Ø 4 ... 8 mm signal port
Basic data for calculator		
Temperature measuring range	0 ... +200 °C (30 ... 392 °F) (heat carrier: water) -40 ... +180 °C (-40 ... 356 °F) (special heat carrier)	
Temperature difference	0 ... 199K Type approval 3 ... 190K On demand 1 ... 199K and 2 ... 199K	
Temperature sensor	Pt 100, Pt 500, Pt1000 according to IEC 751 paired in accordance with EN 1434 2-wire or 4-wire connection. Max. sensor cable length 2-wire connection: 10 m (32 ft) Max. sensor cable length 4-wire connection: 100 m (328 ft)	
Temperature measurement resolution	20 bit resolution, typical ± 0.005 K (T_a = 5 ... 55 °C)	
Installation side	Return pipe or supply pipe	
Pulse value of the flow meter	0.001 ... 9999.999 l or m^3	
Pulse values and units for auxiliary inputs and contact outputs	• Volume: 0.001 ... 9999.999 ml, l, m^3 ,Gal • Energy: 0.001 ... 9999.999 Wh, kWh, MWh, MJ, GJ, KBTU, MBTU • Mass: 0.001 ... 9999.999 T, Kg • Unitless mode possible: 0.001 ... 9999.999	
Error limits	Better than those required for calculators in accordance with EN 1434-1. Suitable for combined class 2 heat meters in accordance with EN 1434-1 when used with suitable volume metering units.	
Display		
Display type	Backlit multi-function LCD display with 8 digits for meter reading. Symbols and short texts for user operation purposes.	
Display size	15 × 68 mm	
Display resolution and units volume	1 ... 0.001 m3 , US Gal	
Display resolution and units energy	1 ... 0.001 kWh, MWh, MJ, GJ, KBTU, MBTU	
Display resolution and units mass	1 ... 0.001 T	
Error display	Visible fault state indicator in display. Display blinks red in case of an error. See Troubleshooting for details.	
Additional functions		
Data logger	500 values from all readings with a time stamp, stored in ring memory, logger interval, 1 minute, 1 hour, 1 day, 1 week, 1 month	
Billing data values	12 freely programmable billing dates to memorize indexes (e.g. monthly) for defined dates. Indexes can be consulted any time.	

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Technical specifications (continued)

SITRANS FEC400		
Glycol-based medium	The "Glycol-based heat transfer medium" option offers an excellent solution for solar-power thermal systems.	
On-site settings	One-time on-site setting for calibration-relevant input values	
Simultaneous readout	The specific "freeze" command makes it possible to store the desired values, which can then be read out one by one from the system.	
Volume based bi-directional energy flow metering (combined heat and cold) with fixed flow direction	The option allows emitted energy to be measured even in twin-conduit networks that perform a combined heating and cooling function. The measurement readings for heating and cooling are recorded separately for their corresponding cost calculation purposes.	
Volume based energy flow metering (heat / cold) with bi-directional flow	The option allows the measuring of energy exchange (draw/supply) for interlinked networks and charging / discharging in heat accumulators. The measurement of positive and negative are recorded separately for their corresponding energy consumption.	
Data backup in the event of a power failure	In EEPROM >10 years	
Adjustable low temperature difference ΔT cut-off (LFCO)	Function for stopping the energy calculation when the temperature difference is too low, ΔT LFCO adjustable ΔT = 0-2.99 K	
Limit value monitoring	One-sided or two-sided, hysteresis 0 ... 10 %, action of the output signal is selectable	
Mains version		
Power supply (according to EN 1434)	**Standard**	1 W / 24 V AC/DC ... 240 V AC, 50/60 Hz
	Smart	5 W / 110 ... 240 V AC, 50/60 Hz
	Advanced	12 W / 110 ... 240 V AC, 50/60 Hz
Calculation cycle	1 s	
Backup battery real-time clock	3 V Li-Mn CR1220, 3 months backup	
Low voltage power supply for flow meters		
	Supply voltage	**Flow meter**
Supply voltage	2 × 3.6 V DC, max. 2 mA galvanic isolation max. 48 V DC	2 × 3.6 VDC, max. 2 mA galvanic isolation max. 48 V DC
	1 × 24 V DC, max.150 mA galvanic isolation max.48 V DC	e.g. FM MAG
3.6 V sensor power output	Power supply, galvanically isolated to the system, for external flow meters.	
	$V_{out\ nom}$	3.6 V
	$V_{out\ min}$	3.45 V
	$V_{out\ max}$	3.75 V
	$I_{out\ max}$	10 mA
	V_{Ripple}	50 mV
	Load regulation	±1 % at load steps of 5 mA
	Insulation voltage galvanic isolation	Normative 48 V technical: 312 V AC
	Clearance to other circuits	0.5 mm
24 V sensor power output	Power supply, galvanically isolated to the system, for external flow meters.	
	$V_{out\ nom}$	24 V
	$V_{out\ min}$	22 V
	$V_{out\ max}$	26 V
	$I_{out\ max}$	180 mA
	V_{Ripple}	200 mV
	Load regulation	±6 % at load steps of 100 mA
	Insulation voltage galvanic isolation	Normative 48 V technical: 312 V AC
	Clearance to other circuits	0.5 mm
Pulse inputs		
Standard and Smart • Input #1 (10/11) • Input #2 (54/55)	Connecting a pulse generator according to NAMUR, with potential-free contact (reed relay) or SSR (solid state relay), or for active sensors with the following values.	
Advanced • Input #1 (10/11) • Input #2 (54/55)	Connecting a pulse generator according to NAMUR, with potential-free contact (reed relay) or SSR (solid state relay).	
Pulse input class	2-wire pulse input according to class ID compliant with EN 1434-2 suitable for NAMUR-, "Open Collector" or mechanical pulse sources	
	Supply voltage	8 ... 8.4 V
	Source impedance	1 kΩ
	Switching threshold I_L	2.1 mA
	Switching threshold I_H	1.2 mA
	Pulse length	≥ 2 ms
	Pulse pause	≥ 2.5 ms
	Max. pulse frequency	≤ 200 Hz

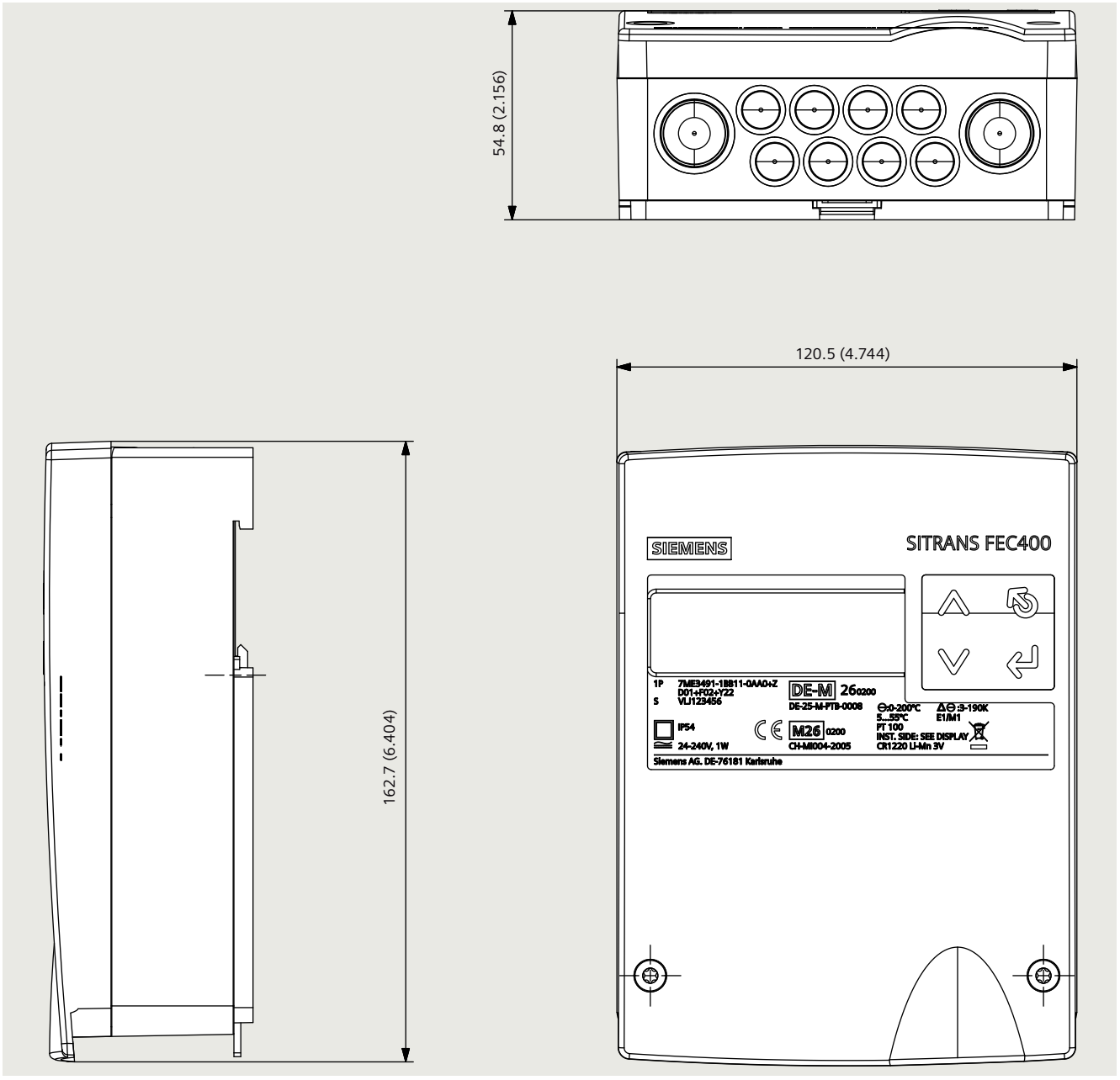
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Technical specifications (continued)

SITRANS FEC400		
Pulse input class	Typical input capacitance	20 nF
Pulse output		
Output #1 (50/51)	Passive digital output	
Pulse output class	Contact rating	48 V DC, 100 mA
	Electrical isolation	48 V
	Contact resistance (on)	<30 Ω
	Contact resistance (off)	>10 MΩ
	Pulse frequency	Max. 10 Hz
	Pulse width	50 ms
M-Bus (on-board or option)		
M-Bus interface	According to EN 13757-2/-3	
Addresses	• Primary address: 0 • Standard secondary address: 99999999	
Baud rate	300, 2400, 9600 Baud	
wM-Bus (on-board or option)		
wM-Bus interface	According to EN 13757-4 / OMS 4.0	
Frequency band	868 MHz (T1 Mode 5 and mode 7) - 25 mW (14 dBm)	
Addresses	OMS address including serial number of the device	
Modbus RTU (option)		
Physical layer and address	RS 485 / address: 1	
Baud rate	300, 2400, 9600, 19200, 38400 Baud	
Address range (slave)	1 ... 247	
Parity	Even	
Function code	03: Read holding register	
BACnet MS/TP (option)		
Physical layer and AMT ID	RS 485 / ID: 431	
BACnet device profile and instance	B - ASC / the last 5 digits of the serial number	
BACnet MAC address	The last 2 digits of the serial number	
Baud rate and mode	Automatic / master	
2 analog outputs AOU (option)		
Output signal	4 ... 20 mA or 0 ... 20 mA	
Supply voltage	6 ... 24 V DC	
Electrical isolation	max. 48 V DC	
Maximum resistance	≤ 837 Ω at 24 V DC, 0 Ω at 6 V	
Maximum transformer error	0.15 % of measured value + 0.15 % of end value	
2 digital outputs DOU (option)		
Contact rating	48 V DC, 100 mA	
Electrical isolation	48 V	
Contact resistance (on)	<30 Ω	
Contact resistance (off)	<10 MΩ	
Pulse frequency	Max. 10 Hz	
Pulse width	50 ms	

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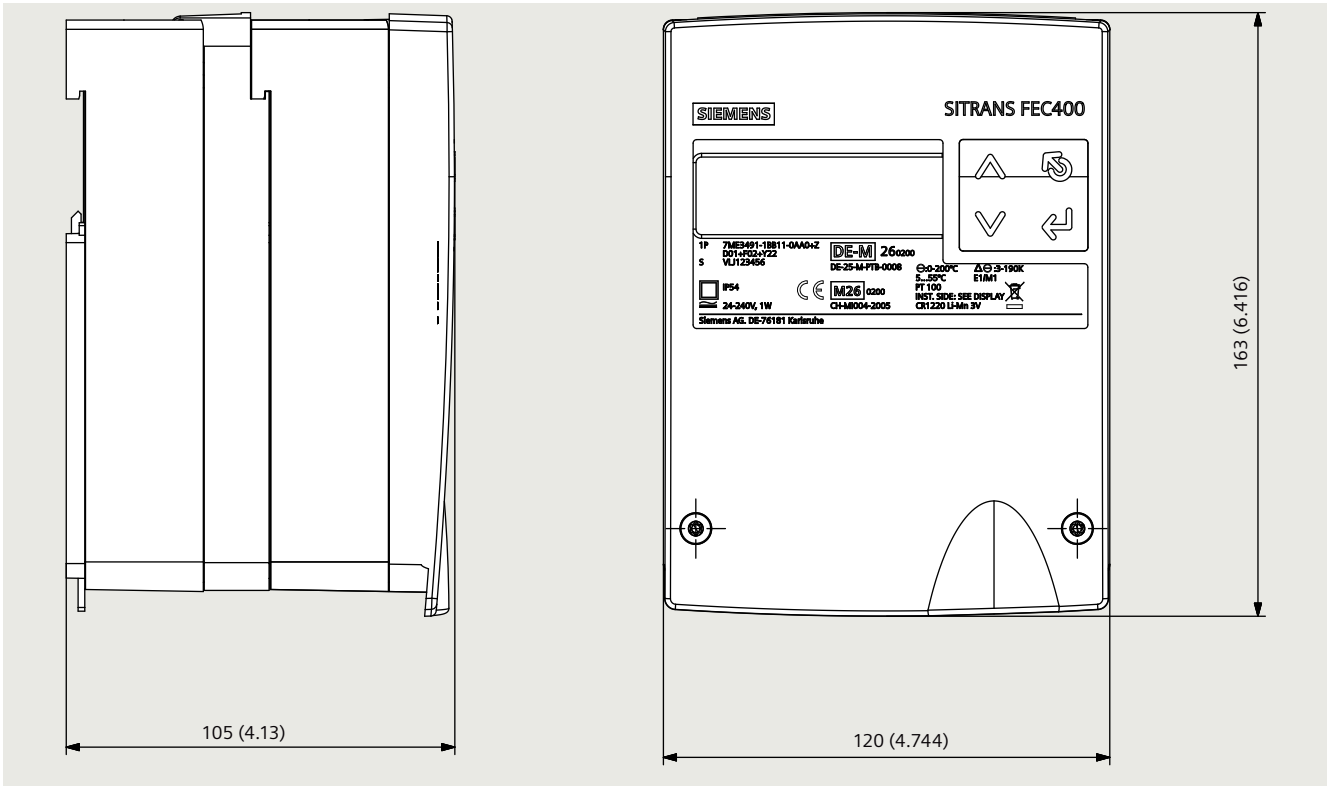
Dimensional drawings



SITRANS FEC400 Standard and Smart, dimensions in mm (inch)

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Dimensional drawings (continued)



SITRANS FEC400 Advanced, dimensions in mm (inch)

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Overview



SITRANS FUE950 is a universal thermal energy calculator, which meets the requirements EN 1434 and has the MID and PTB K7.2 approval for energy metering with the media water.

SITRANS FUE950 has been developed for the MAG 5000/6000 or FST020. SITRANS FUE950 is modular in construction and can by order be fitted with optional modules depending on the application. The FUE950 supports none of the SITRANS FX, FC products and only some of the FUS clamp-on products.

Benefits

Basic functions

- Prepared for heating, cooling measurement
- Approval for MID for heat metering and PTB K7.2 for cooling
- High-accuracy thermal energy metering, meets EN 1434 requirements
- Measured temperature range -20 ... +190 °C (-4 ... +374 °F)
- Instantaneous values for energy/volume flow
- Battery or mains powered
- Battery version with battery lifetime of typically up to 10 years
- Optical data interface
- Real date and time
- Auto-detection of 2-wire or 4-wire temperature sensors

Additional functions

- Individual tariff functions
- Advanced functions for cooling/heating applications or the combination
- Memory for 24 periods (months, weeks, days)
- Data logger function
- Expandable functionality with 2 optional plug and play add-on modules
- Communication over M-Bus, RS 485 or RS 232

Add-on modules

- Plug-in module with 2 extra pulse inputs
- Plug-in module with 2 pulse outputs
- Plug-in module with combination of input and output pulses
- Plug-in module for M-Bus communication
- Plug-in module for RS 232 or RS 485 communication
- Plug-in module with 2 passive current outputs (4 ... 20 mA)

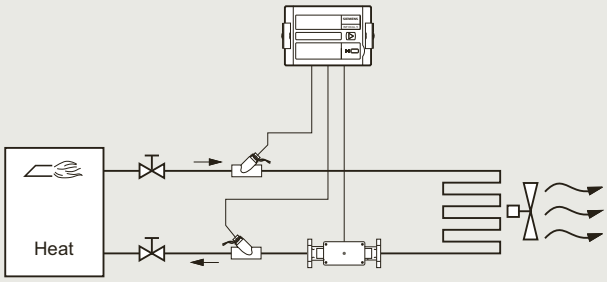
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Application

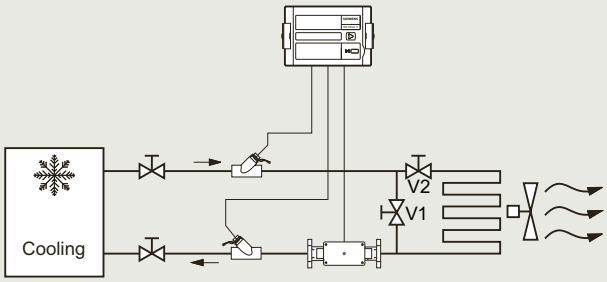
The SITRANS FUE950 is able to handle 3 kinds of applications, means energy calculation in:

- District heating applications
- Chilled water applications
- Combined cooling/heating applications

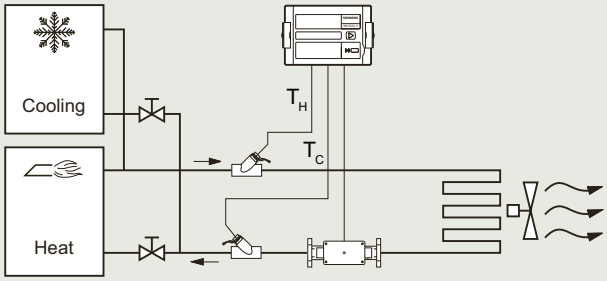
Energy metering in heating, hot water applications (code "A" and "B")



Energy metering in cooling, chilled water applications (code "C" and "D")



Energy metering in combined cooling/heating applications (code "E" and "F")



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Design

SITRANS FUE950 has an easy-read 8-digit LCD display with associated pictograms for the various functions. As the display has been made for several applications, some figures/symbols not used for normal district heating applications will be shown.

SITRANS FUE950 has a push button for simple operation and provides user-friendly control via the various display menu loops. The display will always be configured for the application chosen, and for the selected display settings.

The integrator has an IP54 plastic housing and is designed for wall or panel mounting. The housing comes with prepared rubber gaskets cable entries for fast and easy installation.

Operation menu loop structure

The FUE950 display has six menu loops and the menus are numbered in the display from 1 to 6. Some display menus consist of two values (to maximum seven) that are shown alternately at 4-second intervals.

The main menu loop no. 1 with the current data, e.g. for energy, volume, flow rate and temperature, is preprogrammed as default setting.

In the combined heating/cooling configuration the menu loop no. 5 (tariff menu loop) will be activated additionally.

Displays and output pulses

Units: MWh, GJ, Gcal, MBtu, m^3, gal, m^3/h, GPM, °C, °F and kW; all decimal points are statically (the unit "gal" is shown with factor x 100).

The display unit and the last fractional digit are typical used for the pulse outputs.

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Function

Technical principle

Calculation of energy is based on the following formula:

Energy = Volume x (T_{Hot} - T_{Cold}) x K_{factor} (T_i)

Volume: Volume [m^3] of a given amount of volume pulses

T_{Hot}: Measured temperature in the hot line

T_{Cold}: Measured temperature in the cold line

K_{factor} (T_i): Thermal coefficient of media enthalpy and heat content

The energy calculation is made by a counter and depends on temperature difference, pulse input frequency and legal requirements.

The calculator always carries out at least one energy calculation every 2 seconds. If the connected flowmeter has not sent enough pulses the energy calculation and flow indication is also based on the 8 seconds value.

Data memory

The FUE950 has a history memory of 24 periods (months, weeks, days). The following values are stored monthly, weekly or daily in the EEPROM on the programmed day of 1...31 (via software tool).

Values	
• Date/Time	• Volume
• Energy	• Error day counter
• Tariff energy 1	• Maximum monthly flow rate
• Tariff energy 2	• Maximum monthly power
• Tariff definition 1	• Date of maximum monthly flow rate
• Tariff definition 2	• Date of maximum monthly power
• Pulse counter input 1	• Pulse counter input 2
• Operation hours	

Data logger memory (LOG)

The LOG of the calculator is stored every 24 hours with all cumulative values in the EEPROM. The storage frequency can be selected from various storage intervals (5, 6, 10, 12, 15, 20, 30, 60 minutes or the default setting of 24 hours). The data which are stored in the LOG could be read out using a software tool and can be used for evaluations.

Extract of possible LOG settings

Storage interval	Values	Number of data records	Recording period
5 minutes	• Error status • Overload time temperature • Overload time flow rate • Forward temperature • Return temperature • Date and time • Energy • Tariff energy 1 • Tariff energy 2 • Tariff definition 1 • Tariff definition 2 • Volume • Error day counter	440	36.6 hours
15 minutes		440	110 hours
1 hour		440	18.3 days
24 hours (default setting)		440	440 days

Maximal Values

The integrator creates max. values for power and flow rate based on consumption time, which are stored in the EEPROM. The integration intervals are adjustable to 6, 15, 30 or 60 minutes and 24 h. Default setting is 60 minutes.

Tariff/Accounting date function

The calculator includes two independent memories in which the accumulated energy at two programmable tariff dates are stored.

- Last accounting date
- Last but one accounting date

Values stored

- Energy
- Volume
- Tariff counter 1
- Tariff counter 2
- Pulse counter 1
- Pulse counter 2
- Date

The integrator offers two optional tariff memories for monitoring plant load states. Here it concerns threshold value tariffs. Extensive tariff conditions make it possible to adapt the calculator individually to the required customer-specific applications.

Both tariffs are separately configurable and independent from each other. Energy or time can be measured alternatively per tariff register dependent on the tariff mode adjusted in each case.

With the "time triggered tariff function" the switch-on time and the switch-off time are adjustable independent from each other for each day of the week in steps of 15 minutes.

The following tariff limit types of the tariff are possible:
(This example applies to the display at 3 fractional digits after comma)

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Function (continued)

Type	Description	Limit	Limit resolution
dT	Temperature difference	1 ... 190 °C	1 °C
-dT	Negative temperature difference	1 ... 190 °C	1 °C
TR	Return temperature (low)	1 ... 190 °C	1 °C
TV	Forward temperature (high)	1 ... 190 °C	1 °C
P	Power	10 ... 2500 kW	10 kW
Q	Flow	1 ... 255 m^3/h	1 m^3/h
FE	"Theoretically forward energy" with return temperature of 0 °C		
Z	"Time triggered" counting energy		
E	"External" counting energy		

Error handling and memory

Events such as changes and faults are stored in a non-volatile memory with a capacity of up to 127 entries. The following events are recorded:

- Checksum error
- Temperature measurement error
- Error hours
- Start and end of test mode

If SITRANS FUE950 records an error, this will be automatically indicated by a "alarm symbol" on the display.

To protect the reading data, all the relevant data are saved in a non-volatile memory (EEPROM). This memory saves the measured values, device parameters and types of error at regular intervals.

The following events are recorded:

- Temperature sensor error
- Swapped hot and cold temperature sensors
- Battery low warning
- Power supply failure
- Optical communication warning
- RAM checksum error

Outputs/Inputs/Communication

Communication interfaces:

SITRANS FUE950 is fitted with an optical infra-red send/receive port in accordance with EN 1434/IEC 61107, protocol standard, EN 1434/EN 60870-3 (M-Bus protocol).

A specific optical head with a permanent magnet (IrDA-adapter) in accordance with EN 1434 can be used for readout data or communication with the parameterization software.

2 ports for optionally plug-in modules

The calculator features 2 ports for the plug-in modules.

One slot is for the function modules and the other for the communication modules.

Communication modules

The following communication modules are available as options: RS 232 module, RS 485 module and M-Bus module. The RS 232 and RS 485 communication modules are serial interfaces and permit data exchange with the calculator. For this purpose a special data cable is necessary.

The M-Bus module is a serial interface for communication with external devices (M-Bus Master/Centre). According to the M-Bus structure a number of calculators can be connected to a control centre.

Pulse input module

Two pulse inputs are available. The pulse value and the unit is configurable for energy, water, gas or electrical meter by parameterization software. Data are separate cumulated in different registers and are also stored on the two accounting day's (Tariff registers).

Combined pulse Input/Output module

Two pulse inputs combined with one pulse output are available on one module. The pulse inputs are configurable with value and the unit by parameterization software.

The pulse output is also programmable using the parameterization software.

Pulse output

The calculator provides levels for two optional external pulse outputs, which can be freely programmed using the parameterization software tool.

Default setting is one pulse which occurs per change in the least significant digit in the display with the unit and resolution selected by the device ordering.

Possible pulse output values

- Energy (default setting)
- Volume (default setting)
- Tariff energy 1
- Tariff energy 2
- Tariff condition 1, limit switch
- Tariff condition 2, limit switch
- Energy error
- Volume error
- Volume with specific resolution (0.1, 1.0, 10 or 100)
- Energy with specific resolution (0.1, 1.0, 10 or 100)

Combined current output module

Optional module with 2 passive 4 ... 20 mA outputs.

Possible output values:

- Power (default setting for output #1)
- Flow (default setting for output #2)
- Hot, cold or difference temperature

The settings can be configured by parameterization software. The current output module occupies both ports, means no other plug-in module will possible to plug in.

Module combinations

The calculator has a group of extension modules for communication and another group of extension modules for additional functionality.

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Function (continued)

These modules are available first selected within the calculator, or for retrofitting in the field.

One single function module as well as one single communication module out of following modules is selectable.

Function modules:

- Pulse input module, 2 inputs
- Pulse output module, 2 outputs
- Combined pulse module 2 inputs, 1 output
- Combined current output module, 2 x passive 4 ... 20 mA (occupies both ports)

Communication modules:

- M-Bus (M-Bus protocol according EN 1434-3)
- RS 232 (M-Bus protocol according EN 1434-3)
- RS 485 (M-Bus protocol according EN 1434-3)

Integration

SITRANS FUE950 is a multi-purpose energy calculator for media water which meets the requirements of EN 1434. Further, the energy calculator has been specially developed to process volume pulses from MAG 5000/6000 or FST020 transmitter.

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Selection and ordering data

SITRANS FUE950 energy calculator, MID or PTB K7.2 custody transfer approved			Article No. 7ME3480-											Order code			
			●	●	●	●	●	-	●	●	●	●		●	●	●	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.																	
Flow input setting (IN0) The pulse input value selection must be the same as the pulse output setting of the selected flowmeter. To get optimal function and performance the pulse value must be selected as low as possible according to the maximum flow rate. The following calculation formula can be used for determining the lowest pulse value at a pulse length of 5 ms: L/pulse > Q_{max} (m^3/h)/360. For example Q_{max} = 300 m^3/h; L/pulse > 300/360; L/pulse > 0.83; therefore the pulse value must be 1 l/pulse.																	
Pulse input in l/pulse or in gal/pulse (with option L05)	Flow limit Q_{max} in m^3/h	Flow limit Q_{max} in GPM*) (with option L05)															
1	360	6000	**2**	**A**													
2.5	900	15000	**2**	**B**													
5	1800	30000	**2**	**C**													
10	3600	60000	**3**	**A**													
25	9000	150000	**3**	**B**													
50	18000	300000	**3**	**C**													
100	36000	600000	**4**	**A**													
250	90000	-	**4**	**B**													
500	180000	-	**4**	**C**													
1000	360000	-	**5**	**A**													
*) GPM = Gallons per minute																	
Calculator application/Flowmeter installation place																	
For heating, flowmeter in return pipe (cold pipe), typical standard					**A**												
For heating, flowmeter in forward pipe (hot pipe)					**B**												
For cooling, media water, flowmeter in forward pipe (cold pipe)					**C**												
For cooling, media water, flowmeter in return pipe (hot pipe)					**D**												
For combined cooling/heating, flowmeter in forward pipe (hot pipe as heating) (MID conformity declaration for heating)					**E**												
For combined cooling/heating, flowmeter in return pipe (cold pipe as heating) (MID conformity declaration for heating)					**F**												
Temperature sensor type																	
Pt500 setup, no sensor pair included (standard)						**0**											
Pt500 setup and Pt500 sensor pair (6/140 mm), 4-wire with 5 m connection cable, 6 mm sensor diameter and 140 mm sensor length. MID approved DE-06-MI004-PTB011, PTB approved 22.77/09.01, incl. factory test report (mentioned approvals are only valid if temp. sensors are used with the applicable temperature sensor pockets)						**3**											
Pt500 setup and Pt500 sensor pair (6/230 mm), 4-wire with 5 m connection cable, 6 mm sensor diameter and 230 mm sensor length. MID approved DE-06-MI004-PTB011, PTB approved 22.77/09.01, incl. factory test report (mentioned approvals are only valid if temp. sensors are used with the applicable temperature sensor pockets)						**4**											
Pt100 setup, no sensor pair included						**5**											
Pt 500 setup and PT500 sensor pair (6/50 mm), 2-wire type incl. 5 m cable, 6 mm sensor diameter and 50 mm length, with MID approval (only for use with the applicable temperature sensor pockets)						**6**											
Pt 500 setup and PT500 sensor pair (6/50 mm), 2-wire type incl. 10 m cable, 6 mm sensor diameter and 50 mm length, with MID approval (only for use with the applicable temperature sensor pockets)						**7**											
Temperature sensor pocket sets for 6 mm sensor diameter																	
No pockets (standard)							**0**										
Brass pockets for 6 mm 2-wire sensors, length 82/92 mm, G½ inch, max. PN 16 (2 pcs.)							**2**										
Stainless steel pocket, 120/135 mm length for 6 mm sensor diameter, max. PN 40 and max. 5 m/s (2 pcs. for 140 mm 4-wire sensors above)							**5**										
Stainless steel pockets for 6 mm 2-wire sensors, length 117/127 mm, G½ inch, max. PN 25 (2 pcs.)							**6**										
Stainless steel pocket, 210/225 mm length for 6 mm sensor diameter, max. PN 40 and max 5 m/s (2 pcs. for 230 mm 4-wire sensors above)							**7**										
Stainless steel pockets for 6 mm 2-wire sensors, length 155/168 mm, G½ inch, max. PN 25 (2 pcs.)							**8**										
Voltage supply																	
Battery 3.6 V DC (Litium D-cell type) (standard)									**1**								
Mains power module for 230 V AC supply (incl. back-up battery)									**2**								
Mains power module for 24 V AC supply (incl. back-up battery)									**3**								

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Selection and ordering data (continued)

SITRANS FUE950 energy calculator, MID or PTB K7.2 custody transfer approved	Article No. 7ME3480- ● ● ● ● ● - ● ● ● ●	Order code ● ● ●
No power supply module (power supply ordering separate)	4	
Option modules		
No module (standard)	A	
1 module (communication module)		
M-Bus module	B	
RS 232 module (M-Bus protocol)	C	
RS 485 module (M-Bus protocol)	D	
1 module (function module)		
Pulse output, 2× output (Out1 "Energy" and Out2 "Volume")	E	
Pulse input, 2× input (In1 and In2)	F	
Pulse out-/input combination, 2× input and 1× output	G	
Combination of 2 modules (communication and function module)		
M-Bus module and Pulse output, 2× output (Out1 "Energy" and Out2 "Volume")	H	
M-Bus module and Pulse input, 2× input (In1 and In2)	J	
M-Bus module and Pulse out/-input combination, 2× input and 1× output	K	
RS 232 module (M-Bus) and Pulse output, 2× output (Out1 "Energy" and Out2 "Volume")	L	
RS 232 module (M-Bus) and Pulse input, 2× input (In1 and In2)	M	
RS 232 module (M-Bus) and Pulse out/-input combination, 2× input and 1× output	N	
RS 485 module (M-Bus) and Pulse output, 2× output (Out1 "Energy" and Out2 "Volume")	P	
RS 485 module (M-Bus) and Pulse input, 2× input (In1 and In2)	Q	
RS 485 module (M-Bus) and Pulse out/-input combination, 2× input and 1× output	R	
Combination current output module, 2× passive 4 ... 20 mA (Out 1 "Power", Out 2 "Flow") (occupies both module Ports 1 and 2)	S	
Module 2 Modbus (external power supply for the Modbus Module required 12 ... 24 V AC/DC +/-10%, 500 mW), Modul 1 empty	T	
Module 2 Modbus(external power supply for the Modbus Module required 12 ... 24 V AC/DC +/-10%, 500 mW), Modul 1 Pulse 2 outputs	U	
Module 2 Modbus (external power supply for the Modbus Module required 12 ... 24 V AC/DC +/-10%, 500 mW), Modul 1 pulse 2 input	V	
Module 2 Modbus (external power supply for the Modbus Module required 12 ... 24 V AC/DC +/-10%, 500 mW), Modul 1 pulse 2 input	W	
Display units and resolutions		
MWh & kW, m^3, m^3/h in 2 digit resolution; Temperature: no decimal figures	C	
MWh & kW, m^3, m^3/h in 1 digit resolution; Temperature: no decimal figures	D	
MWh & kW, m^3, m^3/h in 0 digit resolution; Temperature: no decimal figures	E	
GJ & kW, m^3, m^3/h in 2 digit resolution; Temperature: no decimal figures	H	
GJ & kW, m^3, m^3/h in 1 digit resolution; Temperature: no decimal figures	J	
GJ & kW, m^3, m^3/h in 0 digit resolution; Temperature: no decimal figures	K	
Gcal & kW, m^3, m^3/h in 2 digit resolution; Temperature: no decimal figures	M	
Gcal & kW, m^3, m^3/h in 1 digit resolution; Temperature: no decimal figures	N	
Gcal & kW, m^3, m^3/h in 0 digit resolution; Temperature: no decimal figures	P	
MBTU & MBTU/h, m^3, m^3/h in 2 digit resolution; Temperature: no decimal figures	Q	
MBTU & MBTU/h, m^3, m^3/h in 1 digit resolution; Temperature: no decimal figures	R	
MBTU & MBTU/h, m^3, m^3/h in 0 digit resolution; Temperature: no decimal figures	S	
Verification/Approval		
Without type approval mark, neutral label (standard)	0	
With MID type approval mark (only for heating combinations, selection "A, B, E and F")	1	
With MID approval mark and first MID verfication (only for heating, selection A, B, E and F")	2	
Cooling approval mark, German national cooling approval according PTB-TR-K7.2 (only for cooling and media water, selection "C and D")	7	
Cooling approval mark, German national cooling approval according PTB-TR-K7.2 and first verification (only for cooling and media water, selection "C and D")	8	
Further designs		
Please add "**-Z**" to Article No. and specify Order code		

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Selection and ordering data (continued)

SITRANS FUE950 energy calculator, MID or PTB K7.2 custody transfer approved	Article No. 7ME3480- ● ● ● ● ● - ● ● ● ● ●	Order code ● ● ●
Certificate		
Including factory test report (certificate) of FUE950	Always included	
Cooling, setup for non water		
Water/glycol setting for media type "Tyfocor LS (R)" (only with neutral label, no verification and approval)		C 0 2
Optional settings/programming		
Tariff function settings (specify in clear text, up to max. 20 characters)		D 0 2
Pulse output setting of option module (specify in clear text, up to max. 20 characters)		D 0 6
Pulse input setting of option module (specify in clear text, up to max. 20 characters)		D 0 8
Pulse input setting of 4 ... 20 mA option module (please specify 20 mA related type and value in clear text, up to max. 20 characters)		D 1 0
Special display units		
Flow in 'GPM' and Volume in 'gal' (×100) (digits/resolution as selected above, only with 0 digit resolution)		L 0 5
Temperature in deg. F (digit resolution as selected above)		L 3 1

Flowmeter SITRANS FUE950 operating instructions, accessories and spare parts

Operating instructions

Description	Article No.
• English	A5E003424739

This device is shipped with Safety Notes.
All literature is available to download for free, in a range of languages, at
http://www.siemens.com/processinstrumentation/documentation

Accessories

Description	Article No.
Infrared optical head (Bluetooth type) for data acquisition & programming of FUE950	A5E02611768
Bracket for SITRANS FUE950 wall mounting (20 pcs.)	A5E02611769
Cable for data acquisition via RS 232 PC/D-sub 9F/3 wire	A5E02611774

Spare parts

Description	Article No.
Add-on modules for FUE950 (only for 7ME348 versions)	
Pulse input module (2 inputs)	A5E03461432
Pulse output module (2 outputs)	A5E03461436
Combined pulse in-/output module (2 inputs and 1 output)	A5E03461437
RS 232 module (M-Bus protocol)	A5E03461459
RS 485 module (M-Bus protocol)	A5E03461512
M-Bus output module	A5E03461516
Combined current output module, 2 × passive 4 ... 20 mA	A5E03461583
Connection set for option modules (types: Pulse, RS 232/RS 485, M-Bus, mA) (special connection cable with 2 plugs)	A5E03461585
Power supply for FUE950 (only for 7ME348 versions)	
3.6 V D-cell battery for SITRANS FUE950	A5E03461708
230 V AC supply module (incl. internal fuse T50 mA L 250 V and back-up battery) for SITRANS FUE950	A5E03461717
24 V AC supply module for SITRANS FUE950, incl. back-up battery	A5E03461719
Pocket for temperature sensors Pt500 (for related 4-wire Pt500 type only, 1 pc.)	
Stainless steel pocket (1 pc.), 135 mm length for 6 mm sensor diameter, max. PN 40 and max. 5 m/s (recommended for 140 mm sensor length).	A5E03462868
Stainless steel pocket (1 pc.), 225 mm length for 6 mm sensor diameter, max. PN 40 and max. 5 m/s (recommended for 230 mm sensor length).	A5E03462870
Pt500 4-wire temperature sensor pair (as spare part), with MID MI004 and PTB K7.2 approvals and verification (for related 4-wire sensor pocket types only)	
Pt500 sensor pair (6/140 mm), 4-wire with 5 m connection cable, 6 mm sensor diameter and 140 mm sensor length. MID approved DE-06-MI004-PTB011, PTB approved 22.77/09.01 (mentioned approvals are only valid if temp. sensors are used with the applicable temperature sensor pockets).	A5E03462872
PT500 sensor pair (6/230 mm), 4-wire with 5 m connection cable, 6 mm sensor diameter and 230 mm sensor length. MID approved DE-06-MI004-PTB011, PTB approved 22.77/09.01 (mentioned approvals are only valid if temp. sensors are used with the applicable temperature sensor pockets).	A5E03462878
FUE950 enclosure (only for 7ME348 versions)	
Bottom part of FUE950 enclosure (1 pc.)	A5E03461508
Snap fit for FUE950 enclosure (1 pc.)	A5E03461731
Pocket for Pt500 temperature sensors (for corresponding 2-wire Pt500 types only; 1 pc.)	
Brass pocket 6 mm, G½B × 40 mm (PN 16), 1 pc.	A5E02611778
Brass pocket 6 mm, G½B × 85 mm (PN 16), 1 pc.	A5E02611779
Brass pocket 6 mm, G½B × 120 mm (PN 16), 1 pc.	A5E02611780
Stainless steel 6 mm, G½B × 85 mm (PN 25), 1 pc.	A5E02611781

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Selection and ordering data (continued)

Description	Article No.
Stainless steel 6 mm, G½B × 120 mm (PN 25), 1 pc.	**A5E02611783**
Stainless steel 6 mm, G½B × 155 mm (PN 25), 1 pc.	**A5E02611792**
Stainless steel 6 mm, G½B × 210 mm (PN 25), 1 pc.	**A5E02611793**
Pt500 temperature sensor pair, 2-wire cable, 6 mm sensor diameter, with MID/EN-approval (for corresponding 2-wire sensor pocket types only)	
Cable length:	
2 m	**A5E02611794**
3 m	**A5E02611795**
5 m	**A5E02611796**
10 m	**A5E02611798**

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Accessories

Flowmeter SITRANS FUE950 operating instructions, accessories and spare parts

Operating instructions

Description	Article No.
• English	A5E003424739

This device is shipped with Safety Notes.
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http://www.siemens.com/processinstrumentation/documentation

Accessories

Description	Article No.
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Bracket for SITRANS FUE950 wall mounting (20 pcs.)	A5E02611769
Cable for data acquisition via RS 232 PC/D-sub 9F/3 wire	A5E02611774

Spare parts

Description	Article No.
Add-on modules for FUE950 (only for 7ME348 versions)	
Pulse input module (2 inputs)	A5E03461432
Pulse output module (2 outputs)	A5E03461436
Combined pulse in-/output module (2 inputs and 1 output)	A5E03461437
RS 232 module (M-Bus protocol)	A5E03461459
RS 485 module (M-Bus protocol)	A5E03461512
M-Bus output module	A5E03461516
Combined current output module, 2 × passive 4 ... 20 mA	A5E03461583
Connection set for option modules (types: Pulse, RS 232/RS 485, M-Bus, mA) (special connection cable with 2 plugs)	A5E03461585
Power supply for FUE950 (only for 7ME348 versions)	
3.6 V D-cell battery for SITRANS FUE950	A5E03461708
230 V AC supply module (incl. internal fuse T50 mA L 250 V and back-up battery) for SITRANS FUE950	A5E03461717
24 V AC supply module for SITRANS FUE950, incl. back-up battery	A5E03461719
Pocket for temperature sensors Pt500 (for related 4-wire Pt500 type only, 1 pc.)	
Stainless steel pocket (1 pc.), 135 mm length for 6 mm sensor diameter, max. PN 40 and max. 5 m/s (recommended for 140 mm sensor length).	A5E03462868
Stainless steel pocket (1 pc.), 225 mm length for 6 mm sensor diameter, max. PN 40 and max. 5 m/s (recommended for 230 mm sensor length).	A5E03462870
Pt500 4-wire temperature sensor pair (as spare part), with MID MI004 and PTB K7.2 approvals and verification (for related 4-wire sensor pocket types only)	
Pt500 sensor pair (6/140 mm), 4-wire with 5 m connection cable, 6 mm sensor diameter and 140 mm sensor length. MID approved DE-06-MI004-PTB011, PTB approved 22.77/09.01 (mentioned approvals are only valid if temp. sensors are used with the applicable temperature sensor pockets).	A5E03462872

Accessories (continued)

Description	Article No.
PT500 sensor pair (6/230 mm), 4-wire with 5 m connection cable, 6 mm sensor diameter and 230 mm sensor length. MID approved DE-06-MI004-PTB011, PTB approved 22.77/09.01 (mentioned approvals are only valid if temp. sensors are used with the applicable temperature sensor pockets).	A5E03462878
FUE950 enclosure (only for 7ME348 versions)	
Bottom part of FUE950 enclosure (1 pc.)	A5E03461508
Snap fit for FUE950 enclosure (1 pc.)	A5E03461731
Pocket for Pt500 temperature sensors (for corresponding 2-wire Pt500 types only; 1 pc.)	
Brass pocket 6 mm, G½B × 40 mm (PN 16), 1 pc.	A5E02611778
Brass pocket 6 mm, G½B × 85 mm (PN 16), 1 pc.	A5E02611779
Brass pocket 6 mm, G½B × 120 mm (PN 16), 1 pc.	A5E02611780
Stainless steel 6 mm, G½B × 85 mm (PN 25), 1 pc.	A5E02611781
Stainless steel 6 mm, G½B × 120 mm (PN 25), 1 pc.	A5E02611783
Stainless steel 6 mm, G½B × 155 mm (PN 25), 1 pc.	A5E02611792
Stainless steel 6 mm, G½B × 210 mm (PN 25), 1 pc.	A5E02611793
Pt500 temperature sensor pair, 2-wire cable, 6 mm sensor diameter, with MID/EN-approval (for corresponding 2-wire sensor pocket types only)	
Cable length:	
2 m	A5E02611794
3 m	A5E02611795
5 m	A5E02611796
10 m	A5E02611798

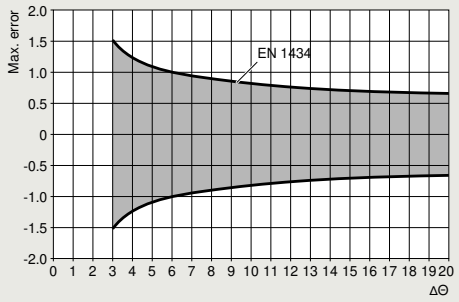
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Technical specifications

SITRANS FUE950	
Approval	MID approved in accordance with energy meter EN 1434 and PTB K7.2 (German national cooling approval)
Approved temperature range	
• Heating	0 ... 180 °C (32 ... 356 °F)
• Cooling	0 ... 105 °C (32 ... 221 °F)
Absolute temperature range	-20 ... +190 °C (-4 ... -374 °F)
Differential temperature	
• Heating	3 ... 177 K (starting at 0.1 K)
• Cooling	3 ... 102 K
Measuring accuracy	Meets requirements of EN 1434 Typically max. ± (0.5 + 3 K/Δθ) [%] of measured value
Measuring rates	
• Battery type D-cell	Volume: 1 s, temperature: 4 s
• Mains versions	Volume: 1/8 s, temperature: 2 s
Flow range	Depends on pulse input value (IN0), see "Selection and Ordering data"
Power range value	Depends on pulse input value as follows:
Pulste input value (I/P or gal/P)	Max power [kW]
1	15000
2.5	15000
5	15000
10	150000
25	150000
50	150000
100	1500000
250 *)	1500000
500 *)	1500000
1000 *)	15000000

*) not available for gal/pulse

Typical accuracy of FUE950



Typical accuracy of FUE950	
User interface (always included)	
Display	8-digit LCD display with associated pictograms/symbols
Units	MWh, GJ, Gcal, MBtu, m^3, m^3/h, GPM, gal, °C, °F, kW, MBtu/h (gal is shown with factor x 100)
Totalizer value range	99 999 999 or 9 999 999.9 (0 and 1 digit after comma). Display digits: Flow in 6 digits; Volume, power and energy in 8 digits
Values	Power, energy, volume, flow rate, temperatures
Push button	Single push button for the menu controlling
Optical interface IrDA interface	ZVEI optical interface with M-Bus protocol as per EN 1434, connection via separate IrDA-adapter baud rate: 300 or 2400

Technical specifications (continued)

Typical accuracy of FUE950	
Rated operation conditions	
Enclosure	IP54 in accordance with IEC 529
Material:	
• Housing	C Lexan 141R (or similar); colors: light gray (top part) and black (bottom part)
• Pipe/wall fitting	PA 6,6 GF25 (or similar)
• Other plastic parts	ABS Cycolac GPM500 (or similar)
• Gaskets	Neoprene and rubber cable bushings: EPDM 50
• Rubber cable bushings	EPDM 50
Temperature:	
• Ambient	5 ... 55 °C (41 ... 131 °F)
• Storage	-25 ... +70 °C (-13 ... +158 °F) Relative ambient humidity < 93 %
Environment class:	
• Mechanic class	M1/M2
• Electromagnetis class	E1/E2 (MID) or C (EN 1434)
Temperature input (always included)	
Function	The temperature sensors must be connected to terminals 1-5 and 6-2 (T_H) and 3-7 and 8-4 (T_C) depending on cable type (2-wire or 4-wire).
Temperature range Absolute measuring range	-20 ... 190 °C (-4 ... 374 °F) for T_H and T_C
Temperature difference	Start 0.1 K, min. 3 K, max. 177 K
Measurement cut-off	0.125 K
Display resolution	T_H and T_C: 0.1 K ΔT: 0.1 K 16-bit digital resolution AD converter
Sensor types	Pt100 or Pt500 as 2-wire or 4-wire; Standard is Pt500. Sensor cable length: up to 10 m (according EN 1434 and MID-type approval).
Sensor connection	4-wire or 2-wire; auto detection of connection version
Flow input (IN0) (always included)	
Function	Used as standard for flow input of the external flowmeter. The input is marked as 10 (+ Flow Pulse), 11 (- Gnd) on the terminal strip. Note: The pulse input value selection must be the same as the pulse output setting of the flowmeter.
Pulse value	1 ... 1000 l/pulse or 1 ... 100 gal/pulse, selection by corresponding order code. Will be shown at the device label
Pulse frequency	≤ 100 Hz (200 Hz)
Pulse ON-time	≥ 3 ms
Pulse OFF-time	≥ 2 ms
Type	Active pulse input
Terminal voltage	3.6 V DC (supplied internally by FUE950)
Flowmeter installation place	The flowmeter installation place can be in the hot line or cold line ("forward or return pipe") selected by corresponding order code. The "installation place" will be shown at the device display and nameplate
Connected cable	Max. 10 m (shielded cables are highly recommended)
Ports for option modules	
Type	The calculator features 2 ports for optional plug-in modules.
Function modules (Port 1 or 2)	• Pulse input module, 2 inputs (In1, In2) • Pulse output module, 2 outputs (Out1, Out2) • Combination module of 2 inputs (In1, In2) and 1 output (Out1)
Current output module (Port 1)	2 passive 4 ... 20 mA (#1, #2) (occupies both port 1 and 2)
Communication modules (Port 1 or 2)	M-Bus, RS 232 or RS 485 (M-Bus protocol, according EN 1434-3)

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Technical specifications (continued)

Typical accuracy of FUE950	
Pulse output	
Function	The module contains connections for 2 pulse outputs, which can be programmed as desired using a software tool. The pulse outputs are marked as standard as O1, 'gnd' and O2, 'gnd' on the terminal strip and Out1 respectively Out2 in the display.
Type	Passive "open collector" pulse output, outputs potential isolated to each other
Pulse value	Last significant digits of the display (unit/pulse), selection by corresponding order code and setting can be read via display menu, settings changeable via software tool
Pulse output 1	
• Pulse frequency	≤ 4 Hz
• Pulse width	125 ms ± 10 %
• Pulse duration	125 ms ± 10 %
• Pulse break	≥ 125 ms -10 %
Pulse output 2	
• Pulse frequency	≤ 100 Hz, depending on the selected pulse length
• Ratio	Pulse duration/pulse break ~ 1:1
Pulse length	5, 10, 50, 100 ms (default: 5 ms)
External voltage supply	3 ... 30 V DC
Current	≤ 20 mA with a residual voltage of ≤ 0.5 V
Possible pulse output selection	• Energy (default setting for 'Out1') • Volume (default setting for 'Out2') • Tariff energy 1 • Tariff energy 2 • Tariff condition 1 (limit switch) • Tariff condition 2 (limit switch) • Energy error • Volume error • Volume with specific display resolution (or with factor 0,1, 10 or 100 thereof) • Energy with specific display resolution (or factor 0.1 thereof)
Pulse input	
Function	Add-on module for two additional counters. The pulse input 1 is marked as I1, 'gnd' and the input 2 as I2, 'gnd' on the terminal strip and indicated in the display as separate registers IN1 and IN2 and can also be transferred via the communication modules.
Type	Passive "open collector" pulse inputs, outputs not potential isolated to each other, data are separate cumulated in different registers and are also stored on the two accounting day's.
Pulse value	Pulse value and the unit are configurable for energy, water, gas or electrical meter by a software tool Default: Pulse input 0.1 m3 or 1 gal (if unit 'gal' is ordered with the Z-option "L05")
Pulse frequency	≤ 8 Hz
Pulse length	≥ 10 ms
External voltage supply	3 V DC (supplied internally by FUE950)
Current	based on R_i = 2.2 MΩ
Cable length	< 10 m connection limit
Current output module	
Function	The module contains connections for 2 passive current outputs, which can be programmed individually using the software tool. The outputs are marked „#1" and „#2" with corresponding polarity „+" and „-" on the terminal strip. The module will be connected on port 1 only, but both ports are occupied by the module.
Terminal voltage	External supply: 10 ... 30 V DC (passive output)

Technical specifications (continued)

Typical accuracy of FUE950	
Signal range	4 ... 20 mA; 4 mA = 0 value and 20 mA = default maximum values (for #1: Power in kW and for #2: Flow with the max. values and selected unit). Defaults: • For power it is the max. selectable value x 100 000 the last digit of display (e. g. 20 mA = 10 000.0 kW (1 digit res.) or 100 000 kW (0 digit res). • For flow it is the max. selectable value x 10 000 the last digit of display (e. g. 20 mA = 1 000.0 m^3/h (1 digit res.) or 10 000 m^3/h (0 digit res.).
Load	Max. 800 Ω
Upper limit	Up to 20.5 mA (exceed causes the error current value)
Signal on alarm	Errors are indicated with 3.5 mA or 22.6 mA (programmable, default: 3.5 mA)
Output values	Power, flow, temperature (configuring via software tool; default: for #1: Power and for #2: Flow)
M-Bus output	
Type	The optional M-Bus plug-in module is a serial interface for communication with external devices (M-Bus Repeater)
Protocol	M-Bus according EN 1434-3
Connection	The connection is not polarity-conscious and is electrically isolated, connection of 2 x max. 2.5 mm^2 wires, 300 or 2400 baud (auto baud detection), current drawn: one M-Bus load. M-Bus address: Each port has its own primary M-Bus address (Prim1 = the last two digits of the serial number; Prim2 = 0). The secondary address is unique for each calculator and is factory-set to equal the serial number.
RS 232 output	
Type	The optional module RS 232 is a serial interface for data transmission with external devices, e.g. PC; baud rate: 300 or 2400. The module contains a 3-pole terminal strip with terminals marked 62 (TX), 63 (RX) and 64 (GND). For this purpose a special data cable is necessary.
Protocol	M-Bus according EN 1434-3
Connection	• The module contains a 3-pole terminal strip with terminals marked 62, 63, 64 (max. 2.5 mm^2); Connected cable length: max 10 m; • For communication with a PC a special adapter cable is required (article no. A5E02611774).
RS 485 output	
Function	The optional RS 485 module is a serial interface for data transmission with external devices, e.g. PC; baud rate: 2400. The module contains a 4-pole terminal strip with terminals marked D+, D-, Vcc and GND.
Protocol	M-Bus protocol according EN 1434-3
Connection	• Terminals D+ and D-; electrically isolated; 2400 baud only. • An external supply of 12 V DC ± 5 V (<5 W) is needed for the module (terminals Vcc and GND). The module terminals are max. for 2.5 mm^2 wires. Connected cable length: max. 10 m
Power consumption	
230 V and 24 V versions	Typical current appr. 0.15 VA
3.6 V D-cell battery	Typical battery lifetime 10 years under normal conditions (no add-on modules, max. 40 °C ambient temperature)
Supply data	Internal voltage 3.6 V by the battery or plug-in power supply module
Battery, 3.6 V type (option)	3.6 V lithium D-cell, battery lifetime typically 16 years with independently powered flowmeter
230 V AC module (option)	Plug-in module for 230 V AC (195 ... 253 V AC), 50/60 Hz (incl. battery backup)

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Technical specifications (continued)

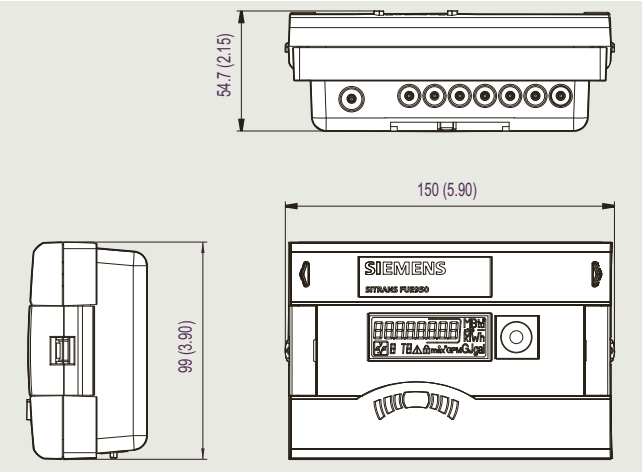
Typical accuracy of FUE950	
24 V AC module (option)	Plug-in module for 24 V AC (12 ... 30 V AC) (incl. battery backup)
Battery backup (option)	Only with mains supply modules by internal 3.0 V lithium battery (type CR 2032) Displayed values, date and time are still updated, but the measuring functions have stopped, including the flow rate measurement. Communication via optional modules M-Bus, RS 485, RS 232 or optical interface is maintained, affecting the backup battery lifetime.

Accessories/Software

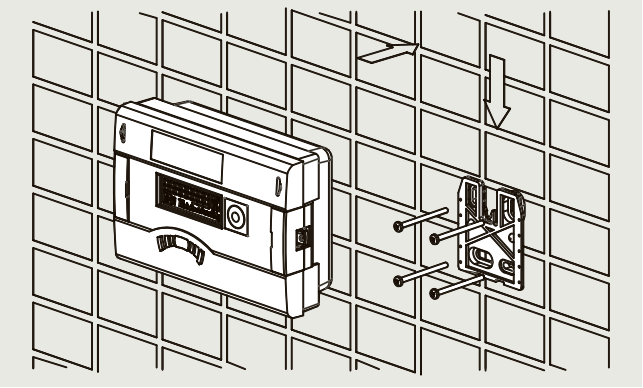
The parameterization software based on the M-Bus is a convenient tool for handling the calculator. It runs on Windows and is used for configuration of the calculator functionality, reading out different memories, printing out calculator logs. For further details please contact your local Siemens representative.

A specific optical head with a permanent magnet in (IrDA adapter with bluetooth) accordance with EN 1434 can be used for programming/altering programming of readout data, configuration data, etc. The reader head can also be used to change measuring data.

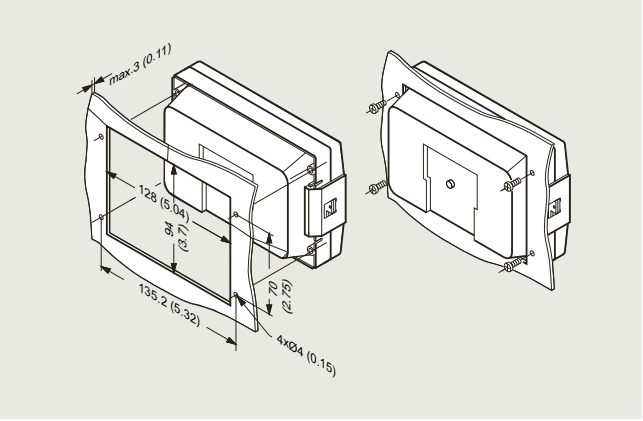
Dimensional drawings



SITRANS FUE950, dimensions in mm (inch)



Wall mounting

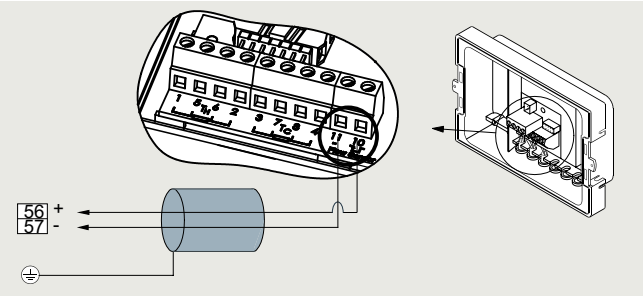


Panel mounting, dimensions in mm (inch)

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Circuit diagrams

Electrical connection for SITRANS FUE950 and MAG 5000/6000/FUE950



The diagram shows the connection between SITRANS FUE950 (terminals 10 and 11) and MAG 5000/6000 (terminals 56 and 57). Temperature sensors must be connected to terminals 5 (1) and 6 (2) (T_H) and 7 (3) and 8 (4) (T_C).

Note:
The right flowmeter pulse output value must be equal to the FUE950 pulse input value and must be checked via the user menu of the transmitter MAG 5000/6000.

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Application

The temperature sensor set is designed for use with the Siemens energy calculator type SITRANS FUE950 for measurement of the energy consumption in a district heating or cooling net.

Temperature sensors are one of the integral components of every thermal energy meter in heating or cooling applications. They are used for determining temperature changes in fluids due to energy taken from or supplied to the loop. The temperature is thus measured by mounting temperature sensors upstream and downstream from the point where the exchange in the thermal energy of the system is.

To ensure an accurate measurement of the temperature difference according to MID (EN 1434) or PTB K7.2 the sensors are delivered as matched pairs.

By selection with the corresponding order code the Pt500 sensor pair sets can be delivered with heating approval or with approvals for combined heating/cooling applications.

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Technical specifications

Temperature sensor pairs

2-wire Pt500

Pt500 2-wire temperature sensor pair (EN 1434)	
Measuring insert	Pt500 temperature sensor, EN 60751, tolerance class B, 2-wire
Pairing	Paired to EN 1434 (10 ... 130 °C/14 ... 266 °F)
Media temperature	0 ... 150 °C (32 ... 302 °F)
Response time $T_{0.5}$	See sensor pocket specifications
Medium	Typically heating water
Pressure rating	See sensor pocket specifications
Protection	IP65
Pipe material	AISI 304 Ti/1.4303
Dimension	⌀ 6 mm
Sensor tube length	50 m
Cable length	Up to 10 m (32.8 ft), fixed connected silicon cable, 2 connection wire terminals, terminal sleeves to DIN 46228

4-wire Pt500

Pt500 4-wire temperature sensor pair (with MID and PTB K7.2 approval)	
Measuring insert	Pt500 temperature sensor, EN 60751, tolerance class to ISO 751 Class B; 4-wire
Pairing	Matched paired according to EN 1434 at 10, 75 and 140 °C (50, 167 and 284 °F)
Type approval	MID (DE-06-MI004-PTB011) and PTB K7.2 (PTB 22.77/09.01). Only to be mounted with related sensor pockets according to the type approvals.
Media temperature	0 ... 150 °C (32 ... 302 °F)
Permissible temp. pair range for ΔT	
• Heating	3 ... 150 K
• Cooling	3 ... 85 K
Medium	Approved for heating/cooling water
Protection	IP65
Environment	
• Meachnic class	M3
• Electromagnetic class	E1 (MID)
Pressure rating	See sensor pocket specifications
Material	
• Protective tube	Stainless steel AISI 304Ti/1.4571 (or similar), diameter of protective tube: 6 mm
• Connector cable	Silicon cable, 4 connection wire terminals, terminal sleeves to DIN 46228
Sensor tube length	140 or 230 mm (5.51 or 9.06 inch)
Cable length	5 m (16.4 ft), fixed connected

Sensor pockets

Stainless steel sensor pocket (for 4-wire Pt500 types only - standard)	
Media temperature	0 ... 150 °C (32 ... 302 °F)
Approval	Approved only together with 4-wire sensors
Medium	Approved for heating/cooling water; up to max. 5 m/s flow velocity
Pressure rating	PN 40
Length	Face-to-face length 120/135 and 210/225 mm (4.72"/5.23" and 8.27"/8.86")
External diameter	Protective tube 8/11 mm (0.32"/0.43")
Internal diameter	Protective tube 6 mm (0.24")
Pipe connection	Thread G 1/2" (with sealing screw for sensor)
Material	Protective tube AISI 316Ti/1.4571 (or similar)
Use	• Use with related 4-wire Pt500 sensors only (according type approval) • For flow velocities up to 5 m/s • Recommended to install with welded sleeve (according to EU standard)

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Technical specifications (continued)

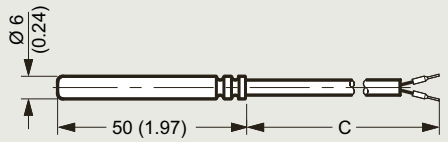
Stainless steel sensor pocket (for 2-wire Pt500 types only, some only available as spare parts)				
Media temperature	0 ... 180 °C (32 ... 356 °F)			
Medium	Approved for heating water			
Response time $T_{0.5}$	Typically 13 s at 0.4 m/s without pasta Typically 5 s at 0.4 m/s with pasta			
Pressure rating	PN 25			
Length (in mm)				
• L1	92	127	168	223
• L	82	117	155	210
Material	Stainless steel: AISI 316Ti/1.4571			
Use	For 2-wire Pt500 types only			

Brass sensor pocket (for 2-wire Pt500 types only, some only available as spare part)			
Media temperature	0 ... 150 °C (32 ... 302 °F)		
Medium	Approved for heating water		
Response time $T_{0.5}$	Typically 9 s at 0.4 m/s without pasta Typically 5 s at 0.4 m/s with pasta		
Pressure rating	PN 16		
Length (in mm)			
• L1	47	92	127
• L	40	82	117
Material	Brass: $CuZn_{40}Pb_2$ (Ms58)		
Use	For 2-wire Pt500 types only		

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Dimensional drawings

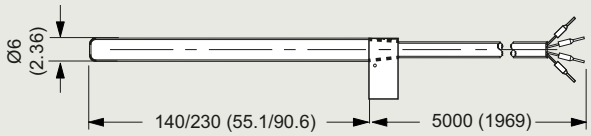
Pt500 2-wire temperature sensor pair (EN 1434)



Pt 500 2-wire temperature sensor, dimensions in mm (inch)

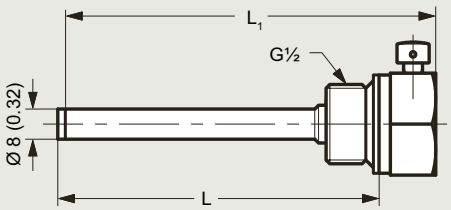
Pt500 temperature sensor pair (EN 1434)	
Cable length	2, 3, 5 or 10 m ('C' at the dimensional drawing)

Pt500 4-wire temperature sensor pair (with MID and PTB K7.2 approval)



Pt500 4-wire temperature sensor, dimensions in mm (inch)

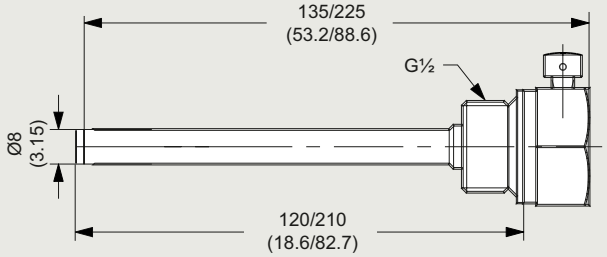
Stainless steel sensor pocket (for 2-wire Pt500 types only, some only available as spare parts)



Sensor pocket (for 2-wire Pt500 types only), stainless steel, dimensions in mm (inch)

Stainless steel sensor pocket (for 2-wire Pt500 types only)				
Lenght L_1 (mm)	98	133	168	223
Length L (mm)	85	120	155	210

Stainless steel sensor pocket (for 4-wire Pt500 types only - standard)

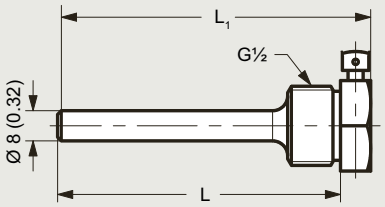


Stainless steel sensor pocket, dimensions in mm (inch)

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Dimensional drawings (continued)

Brass sensor pocket (for 2-wire Pt500 types only, some only available as spare part)



Sensor pocket, brass (for 2-wire Pt500 types only), dimensions in mm (inch)

Brass sensor pocket (for 2-wire Pt500 types only)			
Lenght L_1 (mm)	47	92	127
Length L (mm)	40	82	117

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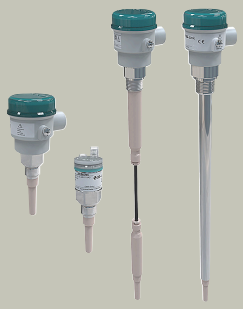
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Overview

	Application	Device description	Programming Software
Point level measurement - Capacitance switches			
 SITRANS LCS100	A point level switch that detects point level in liquids, solids, slurries, foam, and interface detection.	**SITRANS LCS100** • It works in all types of vessels, pipes, and silos. • Factory calibrated to work in most applications without tuning. • Active shield and tunable to compensate for build-up.	
	An ultra compact, capacitance switch for point level detection in constricted spaces, water based liquids, slurries, and foam.	**SITRANS LCS050** • Easy installation with no need for adjustment. • Low maintenance with no moving parts. • Highly visible 360 degree status indication.	
Point level measurement - RF Capacitance switches			
	Powerful range of level switches suitable for a variety of industries.	**Pointek CLS200/CLS300** • CLS200: a versatile inverse frequency shift capacitance level switch with optional rod/cable choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces; digital version (with PROFIBUS PA) includes a display and provides additional diagnostic features. Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511. • CLS300: inverse frequency shift capacitance level switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam and interfaces in demanding conditions where high pressure and temperatures are present; digital version (with PROFIBUS PA) includes a display and provides additional diagnostic features.	SIMATIC PDM SIMATIC PDM
Point level measurement - Vibrating switches			
	Reliable vibrating point level switches for liquid and slurry applications across all industries.	**SITRANS LVL100/LVL200** • LVL100: compact vibrating level switch for use in liquid and slurry applications such as overflow, high, low, and demand level applications. Also ideal for dry run protection. • LVL200: advanced vibrating level switch for use in liquid and slurry applications. Suited for most hazardous area applications such as: overflow, high, low, demand, and dry run protection. Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511.	- -
	Reliable vibrating point	**SITRANS LVS100/LVS200/LVS300**	

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Overview (continued)

	Application	Device description	Programming Software
	level switches for bulk solids in a wide variety of applications.	• LVS100: vibrating point level switch designed to be impervious to external vibrations and to provide reliable performance in demanding bulk solids applications. • LVS200: vibrating point level switch designed to be impervious to external vibrations and to provide reliable performance in demanding bulk solids applications. • LVS300: vibrating rod point level switch for high, low, or demand level detection of bulk solids. Durable probe, ideal for larger granule sizes.	- -
Point level measurement - Rotating paddle switches 	Reliable rotating point level switches for bulk solids in a wide variety of applications.	**SITRANS LPS200** • Rotating paddle switch for detection of high, low, and demand levels in a wide variety of bulk solids industries. Unique engineering provides long-lasting, reliable performance. • Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511.	-
Continuous level measurement - Controllers 	SITRANS LT500 is a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.	**SITRANS LT500** • Level, volume, and flow measurements in open channels, differential control, extended pump control, and alarm functions. • Easy to use HMI display with local four-button programming, menu-driven parameters, and wizard support for key applications.	-
Continuous level measurement - Ultrasonic transmitters 	Ultrasonic level transmitter with HART, 4 to 20 mA is ideal for level, volume, and volume flow measurements. It works with liquids, slurries, and bulk materials up to 12 meters (40 feet).	**SITRANS Probe LU240** • Continuous level measurement up to 12 m (40 ft) range. • Next generation Process Intelligence signal processing. • Auto False-Echo Suppression for fixed obstruction avoidance. • Fast and easy configuration with quick start wizards.	SIMATIC PDM
Continuous level measurement - Ultrasonic transducers	ST-H: ETFE or PVDF transducer for chemicals	**ST-H/EchoMax XRS-5** • ST-H: the narrow design of the ST-H allows the sensor to be mounted using a 2 inch connection.	-

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Overview (continued)

	Application	Device description	Programming Software
	XRS-5: Standard transducer for applications to 8 m (26 ft)	• XRS-5: narrow beam angle of only 10°, measuring range maximum 8 m (26 ft) for measurement of liquids, solids, and slurries.	-
	Transducers for liquids and bulk solids XPS series: Hermetically sealed PVDF enclosure for chemical immunity	**EchoMax XPS** • XPS series offers versions for various distances up to 30 m (100 ft) and up to a maximum temperature of 95 °C (203 °F).	-
Continuous level measurement - Radar transmitters			
	SITRANS LR100: a compact radar transmitter for continuous level measurement of liquids and slurries to a range of 8 m (26 ft).	**SITRANS LR100** • Bluetooth connectivity for easy setup with SITRANS mobile IQ. • Chemically resistant PVDF enclosure. • W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications. • 5 mm accuracy.	SITRANS mobile IQ
	SITRANS LR110: a compact radar transmitter for continuous level measurement of liquids, slurries, or solids to a range of 15 m (49.2 ft).	**SITRANS LR110** • Bluetooth connectivity for easy setup with SITRANS mobile IQ. • Chemically resistant PVDF enclosure. • W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications. • HART 7.0 or Modbus RTU communication for intelligent integration into your application. • 2 mm accuracy and zero near range distance yields optimum inventory management capability.	SITRANS mobile IQ
	Compact radar transmitter for continuous level measurement of liquids and solids to a range of 30 m (98.4 ft).	**SITRANS LR120** • Bluetooth connectivity for easy setup with SITRANS mobile IQ. • Chemically resistant PVDF enclosure. • W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications. • HART 7.0 or Modbus RTU communication for intelligent integration into your application. • Submergence shield accessory prevents build up on sensor during flooding conditions. • 2 mm accuracy and zero near range distance yields optimum inventory management capability.	SITRANS mobile IQ
	SITRANS LR140: a 2 wire loop powered radar transmitter for continuous level measurement of liquids and slurries to a range of 8 m (26 ft).	**SITRANS LR140** • Bluetooth connectivity for easy setup with SITRANS mobile IQ. • Chemically resistant PVDF sensor. • W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications.	SITRANS mobile IQ

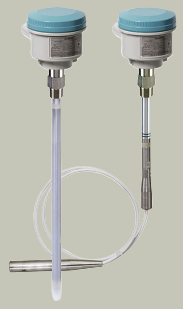
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Overview (continued)

	Application	Device description	Programming Software
	SITRANS LR150: a compact radar transmitter for continuous level measurement of liquids, slurries, and solids to a range of 15 m (49.2 ft), with optional HMI.	**SITRANS LR150** • Bluetooth connectivity for easy setup with SITRANS mobile IQ. • Optional HMI with pushbutton programming and local diagnostic data. • Chemically resistant PVDF sensor. • W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications.	SITRANS mobile IQ
	2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).	**SITRANS LR200** • Program without opening the lid, even in hazardous areas, using patented infrared IS handheld programmer. • Special Uni-Construction hermetically sealed polypropylene rod antenna has integrated threaded connection. • Built-in alphanumeric display with support in four languages.	SIMATIC PDM AMS SITRANS DTM
	2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft); antenna designs ideal for small vessels, low dielectric media, food & beverages and corrosive/aggressive media.	**SITRANS LR250** • Simple operation using the graphical local user interface (LUI). • Plug-and-play setup using the intuitive Quick Start Wizard. • 25 GHz high frequency allows for small horn antennas and easy mounting in nozzles. • Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions.	SIMATIC PDM AMS SITRANS DTM
	4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft); ideal for measurement in extreme dust and high temperature applications	**SITRANS LR460** • Process Intelligence for advanced signal processing and quick and easy adjustment. • Self-guided Quick Start Wizard for plug and play startup. • 100 m (328 ft) range for long-range and difficult applications.	SIMATIC PDM
	80 GHz radar level transmitters for continuous monitoring of liquids, slurries, and solids in storage and process vessels including high temperature and pressure, to a range of 120 m (393 ft).	**SITRANS LR500 series** • Continuous level measurement up to 120 m (393 ft). • Programming using 4-button HMI, mobile IQ app using Bluetooth, or SIMATIC PDM. • IQ Guard for health monitoring, NE107 diagnostic messaging and quality verification report. • Available in four antenna types: - Threaded lens antenna - Flanged encapsulated antenna - Polymeric horn antenna - Flanged lens antenna	SITRANS mobile IQ SIMATIC PDM

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Overview (continued)

	Application	Device description	Programming Software
	2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids and liquids to a range of 100 m (328 ft); easy to install, plug and play, virtually no maintenance	**SITRANS LR560** • Rugged stainless steel design • 78 GHz high frequency provides very narrow beam, virtually no mounting nozzle noise, and optimal reflection from sloped solids • Aimer option to direct beam to area of interest, such as draw point of cone • Air purge connection is included for self-cleaning of extremely sticky solids • Lens antenna is highly resistant to product buildup • Local display interface (LDI) allows local programming and diagnostics	SIMATIC PDM AMS SITRANS DTM
Continuous level measurement - Guided wave radar transmitters 	Guided wave radar transmitters for short- and medium-range level, level/interface, and volume measurement of liquids, slurries, and solids. The four LG models are unaffected by changes in process conditions, high temperatures and pressures, and provide a wide range of hygienic options.	**SITRANS LG240/250/260/270** • Measures accurately on materials with dielectric (dK) as low as 1.4 • Guided wave radar measurement for up to 2 mm (0.08 inch) accuracy • Measures level, level/interface, and volume of solids, slurries, and liquids • 4 button programming for quick setup • Reliable level measurement on harsh applications with pressure up to 400 bar g (40 000 kPa) and temperatures as high as 450 °C (842 °F)	SIMATIC PDM SITRANS DTM
Continuous level measurement - Capacitance transmitters 	For liquids and solids applications, ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage, and mining, aggregate and cement industries.	**SITRANS LC300** • Sophisticated, but easy-to-adjust microprocessor combined with field-proven probes • Active shield technology ensures measurements are unaffected by vapors, product deposits, dust, and condensation	-
Communications 		**SmartLinx Module, Dolphin Plus software** • Optional communication modules, SmartLinx, provide direct digital connection to popular industrial fieldbus systems • Dolphin Plus for quick and easy configuring, monitoring, tuning, and diagnostics of Siemens devices	- -

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Overview (continued)

Level Measurement Selector Continuous Level Conditions	Ultrasonic	Radar	Guided Wave Radar	Capacitance	Gravimetric	Hydrostatic pressure
Measurement						
Level	×	×	×	×	•	×
Interface (liquid/liquid)			×	•		×
Interface (liquid/solid)	•			•		
Volume	×	×	×	•	•	×
Mass					×	×
Flow (open channel)	×	•				
Level Applications						
Changing density	×	×	×	×		
Changing dielectric	×	×	×	•	×	×
Aggressive chemicals	×	×	×	×	×	×
Pressure/vacuum		×	×	×	×	×
High temperature		×	×	×	×	×
Cryogenic			×		×	
Turbulence	×	×	•	•	×	×
Steam		•	×	•	×	×
Hydrocarbon vapors/solvents		×	×	×	×	×
Foam	•	•	•	•	×	×
Buildup	•	•	•	•	×	•
High viscosity	×	×	•	•	×	•
Dust	•	×	×	×	×	
Solids powders	•	×	•	•	×	
Solids granules/pellets < 25 mm (1 inch)	×	×	•	•	×	
Solids > 25 mm (1 inch)	×	×			×	
High angle of repose	•	×	×	•	×	

× preferred
• condition dependent

Level Measurement Selector Point Level Conditions	Vibration	Capacitance	Paddle
Measurement			
Level	×	×	×
Interface (liquid/liquid)		×	
Interface (liquid/solid)	•		
Volume			
Mass			
Flow (open channel)			
Level Applications			
Changing density	×	×	×
Changing dielectric	×	•	×
Aggressive chemicals	×	×	•
Pressure/vacuum	×	×	×
High temperature	×	×	×
Cryogenic	×		
Turbulence	•	•	
Steam	×	•	×
Hydrocarbon vapors/solvents	×	•	
Foam	•	•	
Buildup	•	•	×
High viscosity	•	•	•
Dust	×	×	×
Solids powders	×	•	×

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Overview (continued)

Level Measurement Selector Point Level Conditions	Vibration	Capacitance	Paddle
Solids granules/pellets < 25 mm (1 inch)	×	•	×
Solids > 25 mm (1 inch)	•	•	×
High angle of repose	×	×	×

× preferred
• condition dependent

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Overview

Introduction

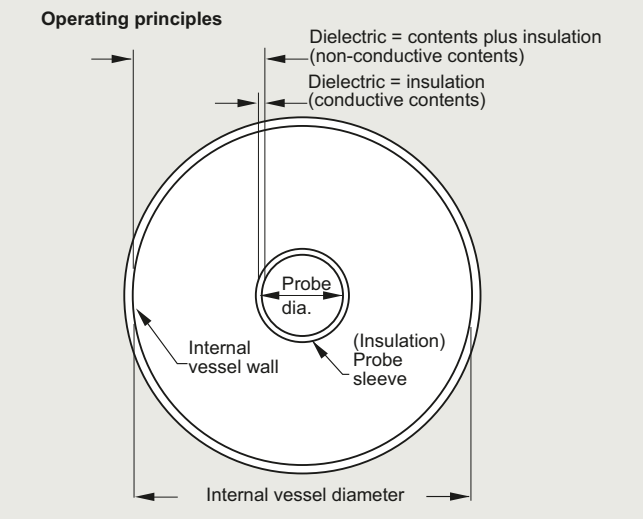
Inverse frequency shift capacitance point level and material detection switches are designed to withstand the harsh environments of high pressure and high temperature applications.

Inverse Frequency Technology

Siemens inverse frequency shift capacitance devices incorporate a unique frequency-based approach to level measurement. The capacitance units monitor the effect of capacitance based on frequency change. The relationship between capacitance and frequency is inverse. Because small level changes result in a large frequency change, the result is excellent resolution and accuracy.

Principle of Operation

Inverse frequency shift capacitance devices require two components: a reference electrode of a variable capacitor and the measurement electrode. In capacitive level measurement, the environment (typically the vessel wall) acts as the reference electrode, while the probe supplies the measurement electrode. The dielectric is composed of the vessel contents and, if the measurement electrode is insulated, the insulating layer.



Inverse frequency shift capacitance operation

Capacitance is affected by the surface area of the electrodes, the separation distance between the electrodes and the dielectric constant of the vessel contents. The dielectric constant is the measure of a material's ability to store energy. The relative dielectric constant of air (vacuum) is 1; all other materials have a higher value.

Mode of operation

Common Terms

Capacitance

The property of a system of conductors and dielectrics that permits the storage of electricity when a potential difference exists between the conductors. Its value is expressed as the ratio of a quantity of electricity to a potential difference and the unit is a Farad.

Capacitor

A device in a circuit that has the potential to store an electric charge. Typically a capacitor has two conductors or electrodes separated by a layer of a non-conducting material called a dielectric. With the conductors on opposite sides of the dielectric layer oppositely charged by a source of voltage, the electrical energy of the charged system is stored in the polarized dielectric.

Dielectric constant

The ability of a dielectric to store electrical potential energy under the influence of an electric field. This is measured by a ratio which compares the capacitance of a condenser with the material as dielectric to its capacitance with a vacuum/dry air as dielectric: the dielectric constant of air is 1.

Active shield

The portion of the probe isolated from the active measurement section. The sensor signal is connected to the active shield portion of the probe, eliminating the electrical potential difference between the shield and the measurement section. So, the shield portion of the probe near the process connection is not affected by changes in vapor concentration, material buildup, dust, or condensation.

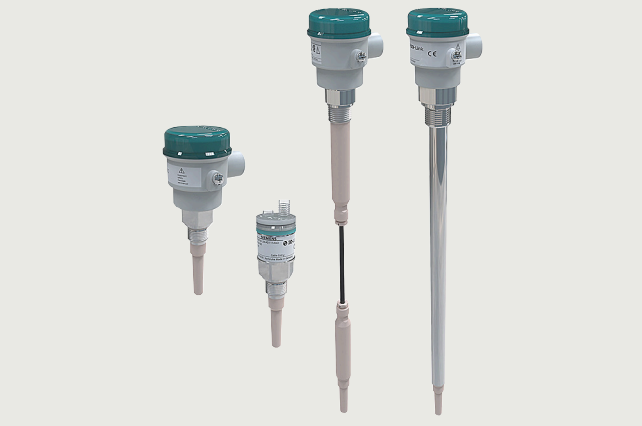
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Technical specifications

Point Level Measurement Criteria	SITRANS LCS100	SITRANS LCS050	Pointek CLS200	Pointek CLS300
Typical applications	Liquids, slurries, powders, granules, applications in constricted spaces	Liquid applications in narrow or tight spaces with short insertion such as thin pipelines. Multi-sensor point level and temperature.	Liquids, slurries, powders, granules, foam, food, and pharmaceuticals, petrochemicals	Liquids, slurries, powders, granules, relatively high pressure, and temperature, hazardous areas
Max. length including sensor	• Compact version: 92 mm (3.6 inch) • Rod version: 300 ... 4 000 mm (11.8 ... 157 inch) • Cable version: 400 ... 20 000 mm (15.7 ... 787 inch)	15 mm	Rod: 5.5 m (18 ft) Cable: up to 30 m (98 ft)	Rod: 1 m (40 inch) Cable: 25 m (82 ft)
Process temperature (Temperature ratings are pressure dependent. See Pressure/Temperature curves for respective product.)	-40 ... +125 °C (-40 ... +257 °F), configuration dependent	-20 ... +100 °C (-4 ... +212 °F)	• -40 ... +85 °C (-40 ... +185 °F) • With thermal isolator: -40 ... +125 °C (-40 ... +257 °F)	• -40 ... +200 °C (-40 ... +392 °F) • HT version: -40 ... +400 °C (-40 ... +752 °F)
Process pressure (Pressure ratings are temperature dependent. See Pressure/Temperature curves for respective product.)	• Stainless process connection: -1 ... 25 bar (363 psi) • Rod extensions: -1 ... 25 bar (363 psi) • PPS process connection: -1 ... 10 bar (146 psi) • Cable extensions: -1 ... 10 bar (146 psi)	-1 ... 25 bar/-100 ... 2 500 kPa (-14.5 ... 363 psig)	• Rod versions: Up to 25 bar g (365 psi g) • Cable version: Up to 10 bar g (146 psi g)	Up to 35 bar g (511 psi g)
Output	Compact or extended version: • 2-wire with 8/16 or 4 ... 20 mA loop • Solid-state output • Relay output	Transistor output PNP/NPN	Standard: • 1 SPDT Form C relay, solid-state switch Digital: • Solid-state switch included	Standard: • 1 SPDT Form C relay, solid-state switch Digital: • Solid-state switch included
Communications	IO-Link	IO-Link acc. to IEC 61131-9	Standard: • 3 LED indicators Digital: • PROFIBUS PA; SIMATIC PDM compatible	Standard: • 3 LED indicators Digital: • PROFIBUS PA; SIMATIC PDM compatible
Power Specifications	• 9 ... 33 V DC, 0.7W, including 10 % of EN 61010-1 • IO-Link / PNP / NPN 10 ... 30 V DC, including10 % of EN 61010-1 Intrinsically safe • 10.8 ... 30 V DC, 0.7W, including 10 % of EN 61010-1, intrinsically safe barrier required	12 ... 35 V DC	Standard: • 12 ... 250 V AC/DC, 0 ... 60 Hz, 2 W max. Digital: • Bus voltage: 12 ... 30 V DC, IS version: 12 ... 24 V DC • Current consumption: 12.5 mA	Standard: • 12 ... 250 V AC/DC, 0 ... 60 Hz, 2 W max. Digital: • Bus voltage: 12 ... 30 V DC, IS version: 12 ... 24 V DC • Current consumption: 12.5 mA
Approvals	CE, CSA, FM, ATEX, RCM, WHG	Ordinary location, FDA / VO (EG) 1935/2004	CSA, FM, CE, ATEX, RCM, Lloyds Register, WHG, Vlarem II	CSA, FM, CE, ATEX, RCM, Lloyds Register, WHG, Vlarem II

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Overview



SITRANS LCS100 is a point level switch that detects point level in liquids, solids, slurries, foam, and interface detection. Its compact design is ideal for confined spaces with plastic or stainless steel process connections and flexible rod and cable probe extensions. SITRANS LCS100 is used for overflow, high, low, and demand applications as well as pump protection. It works in all types of vessels, pipes, and silos in a broad range of industries including food, pharmaceuticals, chemical, petrochemical, water, and machine building.

Benefits

- Potted construction provides protection from shock and vibration
- Factory calibrated to work in most applications without tuning
- Active shield and tunable to compensate for build-up
- Optional IO-link communication and remote testing
- Options for plastic or Stainless steel enclosure and M12 connection

Application

SITRANS LCS100's flexible insertion length, starting at 92 mm (3.6 inch), and its versatility in various applications and in vessels or pipes make it a good fit for most point level applications.

Its advanced design provides accurate, repeatable, switchpoint performance. The PPS (Polyphenylene sulfide) probe [optional PVDF (Polyvinylidene Fluoride)] and optional peek are chemically resistant with an effective process operating temperature range from -40 to +125 °C (-40 to +257 °F). The fully potted design ensures reliability in a vibrating environment such as agitated tanks. When used with a SensGuard protection cover, the LCS100 is protected from shearing, impact, and abrasion in tough primary processes.

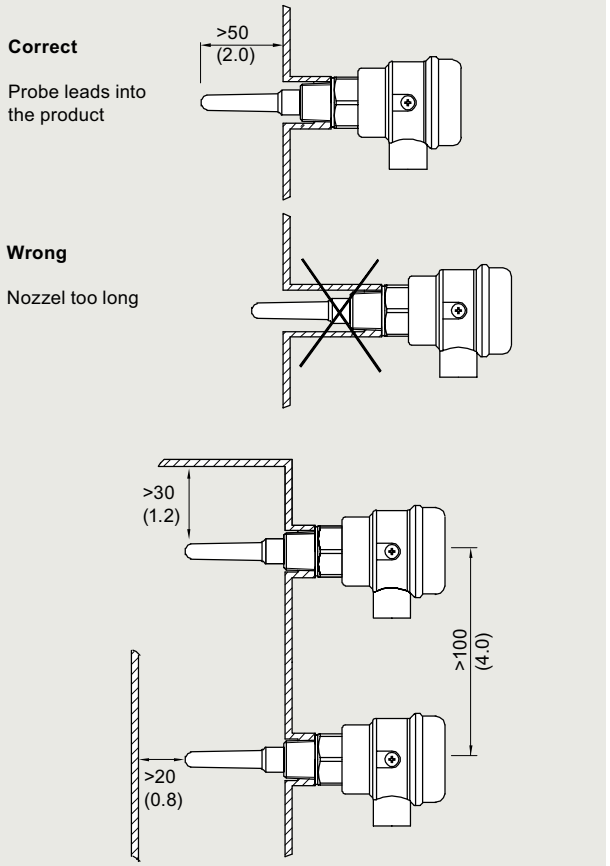
The SITRANS LCS100 is available with either a stainless steel enclosure or a polyester enclosure and stainless steel or PPS process connection options.

- Key Applications: liquids, slurries, powders, granules, food and pharmaceuticals, chemicals, hazardous areas

Configuration

Probe distance

- Observe nozzle length (probe should lead into the product).
- Observe minimum distance between two probes, and to the metal vessel wall.



SITRANS LCS100 Installation, dimensions in mm (inch)

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Selection and ordering data

SITRANS LCS100 Point level switch Compact, versatile point level switch, detects level in liquids and solids. For use with overflow, high, low, and demand applications as well as pump protection. Compact design is ideal for confined spaces with plastic process connections. Supports IO-link communications.	Article No. 7ML700	●	-	0	●	●	●	●	-	●	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Electronic													
2-wire (8/16 mA or 4 ... 20 mA), 4-wire relay (general purpose) or transistor (intrinsically safe)		1											
¾-wire, IO-Link, PNP, NPN, Push/Pull[1]		2											
Process connection													
Thread G 1" DIN ISO 228-1					A	D							
Thread NPT ¾" ASME B 1.20.1					A	E							
Material of sensor													
PPS							1						
PVDF[2]							2						
Material of process connection[3]													
PPS								1					
PVDF[2]								2					
Enclosure													
Enclosure Ø65 mm (2.56 inch), internal terminal block, cable gland M20 x 1.5 (attached)										1			
Enclosure Ø65 mm (2.56 inch), internal terminal block, conduit NPT ½"										2			
Enclosure Ø65 mm (2.56 inch), M12-plug (mounted in M20 x 1.5)[1]										3			
Enclosure Ø35 mm, M12-plug[4]										4			
Approvals													
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA											A		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, FM, CSA											B		
ATEX II 1G Ex ia IIC T* Ga, IECEx Ex ia IIC T* Ga; ATEX II 1/2G Ex ia IIC T* Ga/Gb, IECEx Ex ia IIC T* Ga/Gb; ATEX II 1/2D Ex ia IIIC T_{200}* Da/Db, IECEx Ex ia IIIC T_{200}* Da/Db											C		
FM/CSA IS Cl. I, II, III Div. 1 Gr. A-G											D		

Selection and ordering data	Order code
Further designs	
Please add "-**Z**" to Article No. and specify Order code(s).	
Stainless steel tag [70 x 13 mm (2.76 x 0.51 inch)]:	
Tag (max. 27 characters), plate, stainless steel 304/1.4301	**Y17**
Wetted seals	
FFKM seal O-ring[5]	**A22**
Test certificates	
Declaration of compliance 2.1 (EN 10204) - delivery meets order requirements	**C19**
Inspection certificate 3.1 (EN 10204) - material of pressure-containing and wetted parts	**C12**
Approvals and Certificates	
EAC Ex-Approval[10]	**E24**
INMETRO Ex-Approval[7]	**E25**
CCC Ex-Approval Ex ia IIC Ga Ga/Gb and Ex ia IIIC Da/Db[9]	**E27**
WHG/VLAREM Overfill and Leakage certificate	**E61**

Selection and ordering data	Order code
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	
Adapter, G1" (F) TO G1.5" (M), 316L	**A5E54245949**
Adapter, NPT, ¾" (F) TO 1 ½" (M), 316L	**A5E54245950**
Adapter, NPT, ¾" (F) TO 1 ¼" (M), 316L	**A5E54245951**
Welding socket (30 dia.), EHEDG, G½, 316L	**A5E54245952**
Spare parts	
Sensguard G 1" DIN ISO 228-1 PPS (Internal Thread ¾" NPT)[8]	**A5E53337203**
Sensguard NPT ¾" ASME B 1.20.1 PPS (Internal Thread ¾" NPT)[8]	**A5E53337200**

[1] Available only with Approval options A and B.
[2] Available only with Approval option A.
[3] The material of the sensor and material of the process connection must be the same.
[4] With Ex-approvals intrinsically safe: Electronic connection only with 2-wire.

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Selection and ordering data (continued)

5) Ambient and process temperatures are limited to -20 °C (-4 °F).
6) Max. process pressure: -1 ... +25 bar (-15 ... 363 psi).
7) Available only with Approval option C; specific INMETRO Ex-marking.
8) Available only with Process connection NPT ¾", max. process pressure: -1 ... 10 bar (146 psi)
9) Available only with Approval option C; specific CCC Ex-marking.
10) Available only with Approval option C; specific EAC Ex-marking.

SITRANS LCS100 Point level switch Versatile, compact point level switch, detects level in liquids and solids. For use with overflow, high, low, and demand applications as well as pump protection. ideal for use in confined spaces with stainless steel process connections. Supports IO-link communications.	**Article No. 7ML701**	●	-	●	●	●	●	●	-	●	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Electronic													
2-wire (8/16 mA or 4 ... 20 mA), 4-wire relay (general purpose) or transistor (intrinsically safe)		1											
¾-wire, IO-Link, PNP, NPN, Push/Pull[1)]		2											
Extension length													
Standard length 92 mm (3.6 inch)				0									
Extended length 120 mm (4.7 inch)[13)]				1									
Process connection													
Thread G ½" DIN ISO 228-1, hygienic					A	A							
Thread G ½" DIN ISO 228-1					A	B							
Thread G ¾" DIN ISO 228-1					A	C							
Thread G 1" DIN ISO 228-1					A	D							
Thread NPT ¾" ASME B 1.20.1					A	E							
Tri-clamp DN25 (1") /DN40 (1 ½")DIN 32676 Type A (DIN 11851), DIN 32676 Type C (ASME BPE 2009)					A	F							
Tri-clamp DN50 (2") DIN 32676 Type A (DIN 11851), DIN 32676 Type C (ASME BPE 2009)					A	G							
Flange DN 25, PN 16/40 EN 1092-1 Type A flat faced[2)]					A	H							
Flange DN 40, PN 16/40 EN 1092-1 Type A flat faced[2)]					A	J							
Flange DN 50, PN 16/25/40 EN 1092-1 Type A flat faced[2)]					A	K							
Flange 1" 150 lb ASME B16.5, raised face[2)]					A	L							
Flange 1" 300 lb ASME B16.5, raised face[2)]					A	M							
Flange 1 ½" 150 lb ASME B16.5, raised face[2)]					A	N							
Flange 1 ½" 300 lb ASME B16.5, raised face[2)]					A	P							
Flange 2" 150 lb ASME B16.5, raised face[2)]					A	Q							
Flange 2" 300 lb ASME B16.5, raised face[2)]					A	R							
Material of sensor													
PPS[3)]							1						
PVDF[3)]							2						
PEEK[4)]							3						
Material of process connection													
1.4404 (316L)								3					
Enclosure													
Enclosure Ø65 mm (2.56 inch), internal terminal block, cable gland M20 x 1.5 (attached)										1			
Enclosure Ø65 mm (2.56 inch), internal terminal block, conduit NPT ½"										2			
Enclosure Ø65 mm (2.56 inch), M12-plug (mounted in M20 x 1.5)[1)]										3			
Enclosure Ø35 mm (1.38 inch), M12-plug[5)]										4			
Approvals													
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA											A		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, FM, CSA											B		

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Selection and ordering data (continued)

SITRANS LCS100 Point level switch Versatile, compact point level switch, detects level in liquids and solids. For use with overflow, high, low, and demand applications as well as pump protection. ideal for use in confined spaces with stainless steel process connections. Supports IO-link communications.	Article No. 7ML701	●	-	●	●	●	●	●	-	●	●	A	0
ATEX II 1G Ex ia IIC T* Ga, IECEx Ex ia IIC T* Ga; ATEX II 1/2G Ex ia IIC T* Ga/Gb, IECEx Ex ia IIC T* Ga/Gb; ATEX II 1/2D Ex ia IIIC T_{200}* Da/Db, IECEx Ex ia IIIC T_{200}* Da/Db											C		
FM/CSA IS Cl. I, II, III Div. 1 Gr. A-G											D		

Selection and ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [70 x 13 mm (2.76 x 0.51 inch)]:	
Tag (max. 27 characters), plate, stainless steel 304/1.4301	**Y17**
Wetted seals	
FFKM seal O-ring[6)]	**A22**
Test certificates	
Declaration of compliance 2.1 (EN 10204) - delivery meets order requirements	**C19**
Inspection certificate 3.1 (EN 10204) - material of pressure-containing and wetted parts	**C12**
Approvals certificates	
EAC Ex-Approval[14)]	**E24**
INMETRO Ex-Approval[10)]	**E25**
CCC Ex-Approval Ex ia IIC Ga Ga/Gb and Ex ia IIIC Da/Db[12)]	**E27**
WHG/VLAREM Overfill and Leakage certificate	**E61**
EHEDG[4)]	**E86**
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	
Adapter, G1" (F) TO G1.5" (M), 316L	**A5E54245949**
Adapter, NPT, ¾" (F) TO 1 ½" (M), 316L	**A5E54245950**
Adapter, NPT, ¾" (F) TO 1 ¼" (M), 316L	**A5E54245951**
Welding socket (30 dia.), EHEDG, G½, 316L	**A5E54245952**

Selection and ordering data	Order code
Spare parts	
Sensguard G 1" DIN ISO 228-1 PPS (Internal Thread ¾" NPT)[11)]	**A5E53337203**
Sensguard NPT 3/4" ASME B 1.20.1 PPS (Internal Thread ¾" NPT)[11)]	**A5E53337200**

[1)] Available only with Approvals options A and B.
[2)] Flange is screwed to the process connection.
[3)] Not available with Process connection option AA, G ½" hygienic.
[4)] Available only with Process connection option AA, G ½" hygienic.
[5)] With Ex-approvals intrinsically safe: Electronic connection ONLY with 2-wire.
[6)] Ambient and process temperatures are limited to -20 °C (-4 °F).
[7)] Max. process pressure: -1 ... +25 bar (-15 ... 363 psi).
[8)] Available only with Process connection option AA, G ½" hygienic, and EHEDG Hygiene certificate E86.
[9)] Available only with Process connection option AB, G ½", max. process pressure: -1 ... 10 bar (146 psi).
[10)] Available only with Approvals option C; specific INMETRO Ex-marking.
[11)] Available only with Process connection NPT ¾", max. process pressure: -1 ... 10 bar (146 psi).
[12)] Available only with Approval option C; specific CCC Ex-marking.
[13)] Available only with Electronic option 1, Process connection options AC, AD, AE, and AH ... AR, Material of sensor options 1 and 2, and Approvals options A and B.
[14)] Available only with Approval option C; specific EAC Ex-marking.

SITRANS LCS100 Point level switch Rod extended, versatile point level switch, detects level in liquids and solids. For use with overflow, high, low, and demand applications as well as pump protection. Supports IO-link communications.	Article No. 7ML702	●	-	●	●	●	●	●	-	●	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Electronic													
2-wire (8/16 mA or 4 ... 20 mA), 4-wire relay (general purpose)[1)]		1											
¾-wire, IO-Link, PNP, NPN, Push/Pull[2)]		2											

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Selection and ordering data (continued)

SITRANS LCS100 Point level switch Rod extended, versatile point level switch, detects level in liquids and solids. For use with overflow, high, low, and demand applications as well as pump protection. Supports IO-link communications.	Article No. 7ML702	●	-	●	●	●	●	●	-	●	●	A	0
Extension length													
Fix extension 300 mm (11.81 inch)				1									
Fix extension 500 mm (19.69 inch)				2									
Fix extension 1 000 mm (39.37 inch)				3									
Add order code Y01 and plain text: "Insertion length ... mm"													
301 ... 1 000 mm (11.85 ... 39.37 inch)				4									
1 001 ... 2 000 mm (39.41 ... 78.74 inch)				5									
2 001 ... 3 000 mm (78.78 ... 118.11 inch)				6									
3 001 ... 4 000 mm (118.15 ... 157.48 inch)				7									
Process connection													
Thread G ¾" DIN ISO 228-1					A	C							
Thread G 1" DIN ISO 228-1					A	D							
Thread NPT ¾" ASME B 1.20.1					A	E							
Flange DN 25, PN 16/40 EN 1092-1 type A flat faced[3)]					A	H							
Flange DN 40, PN 16/40 EN 1092-1 type A flat faced[3)]					A	J							
Flange DN 50, PN 16/25/40 EN 1092-1 type A flat faced[3)]					A	K							
Flange 1" 150 lb ASME B16.5, raised face[3)]					A	L							
Flange 1" 300 lb ASME B16.5, raised face[3)]					A	M							
Flange 1 ½" 150 lb ASME B16.5, raised face[3)]					A	N							
Flange 1 ½" 300 lb ASME B16.5, raised face[3)]					A	P							
Flange 2" 150 lb ASME B16.5, raised face[3)]					A	Q							
Flange 2" 300 lb ASME B16.5, raised face[3)]					A	R							
Material of sensor													
PPS							1						
PVDF							2						
Material of process connection and extension													
1.4404 (316L)								1					
Enclosure													
Enclosure Ø65 mm (2.56 inch), internal terminal block, cable gland M20 x 1.5 (attached)										1			
Enclosure Ø65 mm (2.56 inch), internal terminal block, conduit NPT ½"										2			
Enclosure Ø65 mm (2.56 inch), M12-plug (mounted in M20 x 1.5)[2)]										3			
Approvals													
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA											A		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, FM, CSA											B		
ATEX II 1G Ex ia IIC T* Ga, IECEx Ex ia IIC T* Ga; ATEX II 1/2G Ex ia IIC T* Ga/Gb, IECEx Ex ia IIC T* Ga/Gb; ATEX II 1/2D Ex ia IIIC T_{200}* Da/Db, IECEx Ex ia IIIC T_{200}* Da/Db											C		
FM/CSA IS Cl. I, II, III Div.1 Gr. A-G											D		

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Selection and ordering data (continued)

Selection and ordering data	
Further designs	
Please add "**-Z**" to Order No. and specify Order code(s).	
Total insertion length	
Custom insertion length: enter total length, min. 301 mm (11.85 inch), max. 4 000 mm (157.48 inch). Specify in plain text.	**Y01**
Sliding sleeve [max.process pressure -1 ... 10 bar (-14 ... 146 psi)][4)5)]	
Sliding sleeve G1 ¼", DIN ISO 228-1 1.4404 (316L)	**P12**
Sliding sleeve G1 ½", DIN ISO 228-1 1.4404 (316L)	**P13**
Sliding sleeve NPT1 ¼", ASME B 1.20.1 1.4404 (316L)	**P14**
Sliding sleeve NPT1 ½", ASME B 1.20.1 1.4404 (316L)	**P15**
Stainless steel tag [70 x 13 mm (2.76 x 0.51 inch)]:	
Tag (max. 27 characters), plate, stainless steel 304/1.4301	**Y17**
Wetted seals	
FFKM seal O-ring[6)]	**A22**
Test certificates	
Declaration of compliance 2.1 (EN 10204) - delivery meets order requirements	**C19**
Inspection certificate 3.1 (EN 10204) - material of pressure-containing and wetted parts	**C12**
Approvals[1)] and certificates	
EAC Ex-Approval[10)]	**E24**
INMETRO Ex-Approval[8)]	**E25**
CCC Ex-Approval Ex ia IIC Ga Ga/Gb and Ex ia IIIC Da/Db[9)]	**E27**
WHG/VLAREM Overfill and Leakage certificate	**E61**

Selection and ordering data	
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	
Adapter, G1" (F) TO G1.5" (M), 316L	**A5E54245949**
Adapter, NPT, ¾" (F) TO 1 ½" (M), 316L	**A5E54245950**
Adapter, NPT, ¾" (F) TO 1 ¼" (M), 316L	**A5E54245951**
Welding socket (30 dia.), EHEDG, G½, 316L	**A5E54245952**

[1)] With Ex-approvals intrinsically safe: Electronic connection ONLY with 2-wire.
[2)] Available only with Approvals options A and B.
[3)] Flange is screwed to process connection.
[4)] Process connection of the unit is ¾" (Process connection options AC or AE). Sliding sleeve has process connections as selected in this position.
[5)] Minimum extension length for sliding sleeve: 500 mm (19.69 inch).
[6)] Ambient and process temperatures are limited to -20 °C (-4 °F).
[7)] Max. process pressure: -1 ... +25 bar (-15 ... 363 psi).
[8)] Available only with Approvals option C; specific INMETRO Ex-marking.
[9)] Available only with Approval option C; specific CCC Ex-marking.
[10)] Available only with Approval option C; specific EAC Ex-marking.

SITRANS LCS100 Point level switch Cable extended, versatile point level switch, detects level in liquids and solids. For use with overflow, high, low, and demand applications as well as pump protection. Supports IO-link communications.	**Article No. 7ML703** ●	-	●	●	●	●	●	-	●	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.												
Electronic												
2-wire (8/16 mA or 4 ... 20 mA), 4-wire relay (general purpose)[1)]		**1**										
Extension length												
Fix extension 500 mm (19.69 inch)				**0**								
Fix extension 1 000 mm (39.37 inch)[2)]				**1**								
Fix extension 1 500 mm (59.06 inch)[2)]				**2**								
Fix extension 2 000 mm (78.74 inch)[2)]				**3**								
Add order code Y01 and plain text: "Insertion length ... mm"												
501 ... 1 000 mm (19.72 ... 39.37 inch)[3)]				**4**								
1 001 ... 5 000 mm (39.41 ... 196.85 inch)[3)]				**5**								
5 001 ... 10 000 mm (39.41 ... 196.85 inch)				**6**								
10 0001 ... 15 000 mm (196.89 ... 393.70 inch)				**7**								
15 001 ... 20 000 mm (590.59 ... 787.40 inch)				**8**								
Process connection												
Thread G ¾" DIN ISO 228-1					**A**	**C**						
Thread G 1" DIN ISO 228-1					**A**	**D**						
Thread NPT ¾" ASME B 1.20.1					**A**	**E**						
Flange DN 25, PN 16/40 EN 1092-1 type A flat faced[4)]					**A**	**H**						

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Selection and ordering data (continued)

SITRANS LCS100 Point level switch Cable extended, versatile point level switch, detects level in liquids and solids. For use with overflow, high, low, and demand applications as well as pump protection. Supports IO-link communications.	Article No. 7ML703	●	-	●	●	●	●	●	-	●	●	A	0
Flange DN 40, PN 16/40 EN 1092-1 type A flat faced[4]					A	J							
Flange DN 50, PN 16/25/40 EN 1092-1 type A flat faced[4]					A	K							
Flange 1" 150 lb ASME B16.5, raised face[4]					A	L							
Flange 1 ½" 150 lb ASME B16.5, raised face[4]					A	N							
Flange 2" 150 lb ASME B16.5, raised face[4]					A	Q							
Material of sensor													
PPS							1						
Material of process connection and extension													
PPS, extension cable FEP, extension cable fixing PPS[5]								1					
1.4404 (316L), extension cable FEP, extension cable fixing PPS								3					
Enclosure													
Enclosure Ø65 mm (2.56 inch), internal terminal block, cable gland M20 x 1.5 (attached)										1			
Enclosure Ø65 mm (2.56 inch), internal terminal block, conduit NPT ½"										2			
Enclosure Ø65 mm (2.56 inch), M12-plug (mounted in M20 x 1.5)[6]										3			
Approvals													
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA											A		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, FM, CSA											B		
ATEX II 1G Ex ia IIC T* Ga, IECEx Ex ia IIC T* Ga; ATEX II 1/2G Ex ia IIC T* Ga/Gb, IECEx Ex ia IIC T* Ga/Gb											C		
FM/CSA IS Cl. I Div.1 Gr. A-D											D		

Selection and ordering data	
Further designs	
Please add "**-Z**" to Order No. and specify Order code(s).	
Total insertion length	
Custom insertion length: enter total length, min. 501 mm (19.72 inch), max. 20 000 mm (787.40 inch). Specify in plain text.	**Y01**
Stainless steel tag [70 x 13 mm (2.76 x 0.51 inch)]:	
Tag (max. 27 characters), plate, stainless steel 304/1.4301	**Y17**
Wetted seals	
FFKM seal O-ring[7]	**A22**
Test certificates	
Declaration of compliance 2.1 (EN 10204) - delivery meets order requirements	**C19**
Inspection certificate 3.1 (EN 10204) - material of pressure-containing and wetted parts	**C12**
Approvals and Certificates	
EAC Ex-Approval[11]	**E24**
INMETRO Ex-Approval[9]	**E25**
CCC Ex-Approval Ex ia IIC Ga Ga/Gb and Ex ia IIIC Da/Db[10]	**E27**
WHG/VLAREM Overfill and Leakage certificate	**E61**
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	

Selection and ordering data	
Accessories	
Adapter, G1" (F) TO G1.5" (M), 316L	**A5E54245949**
Adapter, NPT, ¾" (F) TO 1 ½" (M), 316L	**A5E54245950**
Adapter, NPT, ¾" (F) TO 1 ¼" (M), 316L	**A5E54245951**
Welding socket (30 dia.), EHEDG, G½, 316L	**A5E54245952**

[1] With Ex-approvals intrinsically safe: Electronic connection ONLY with 2-wire.

[2] Length can be shortened by customer with use of the Shortening kit for extension cable, found in Accessories.

[3] Can be used with Shortening kit for extension cable, found in Accessories.

[4] Flange is screwed to process connection.

[5] Available only with Process connection option AD, with Thread G1" and option AE, Thread NPT ¾".

[6] Available with Approval options A and B only.

[7] Ambient and process temperatures are limited to -20 °C (-4 °F).

[8] Max. process pressure: -1 ... +25 bar (-15 ... 363 psi).

[9] Available only with Approvals option C; specific INMETRO Ex-marking.

[10] Available only with Approval option C; specific CCC Ex-marking.

[11] Available only with Approval option C; specific EAC Ex-marking.

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Technical specifications

	Compact (7ML701 and 7ML700)	Extended (7ML702 and 7ML703)
Mode of Operation		
Measuring principle	Capacitive level detection	Capacitive level detection
Input		
Measured variable	Change in picoFarad (pF)	Change in picoFarad (pF)
Output		
Output signal		
• Alarm output	8/16 mA or 4 ... 20 mA , 2-wire loop or IO-Link, PNP, NPN	8/16 mA or 4 ... 20 mA, 2-wire loop or IO-Link, PNP, NPN *IO-Link not available with Cable version
• Switch output	4-wire relay (general purpose) or transistor (intrinsically safe)	4-wire relay (general purpose) or transistor (intrinsically safe)
• Fail-safe mode	Min. or max.	Min. or max.
Accuracy		
Repeatability	2 mm (0.08 inch)	2 mm (0.08 inch)
Rated operating conditions[1]		
Installation conditions		
• Location	Indoor and outdoor	Indoor and outdoor
Ambient conditions		
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	-40 ... +85 °C (-40 ... +185 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I	I
• Pollution degree	4	4
Medium conditions		
• Relative dielectric constant ϵ_r	Min. 1.5	Min. 1.5
• Process temperature – configuration dependent	-40 ... +125 °C (-40 ... +257 °F), see temperature curve	-40 ... +125 °C (-40 ... +257 °F), see temperature curve
• Pressure (vessel) – configuration dependent	-1 ... 25 bar (363 psi) – Stainless Process connection	-1 ... 25 bar (363 psi) - Rod extensions
	-1 ... 10 bar (146 psi) – PPS process connection	-1 ... 10 bar (146 psi) - Cable extensions
• Degree of protection		
- Enclosure Ø65 mm	Type 4X/IP68	Type 4X/IP68
- Enclosure Ø35 mm	Type 4X/IP68	Not applicable
• Cable inlet	½" NPT or M20 x 1.5	½" NPT or M20 x 1.5
Device version		
Material		
• Body (enclosure version)	Thermoplastic polyester	Thermoplastic polyester
• Lid (enclosure version)	Transparent thermoplastic polycarbonate (PC)	Transparent thermoplastic polycarbonate (PC)
• Enclosure Ø35 mm	316L stainless steel	Not applicable
Sensor length (nominal)	92 mm (3.6 inch)	300 ... 4 000 mm (11.8 ... 157 inch) - Rod version 400 ... 20 000 mm (15.7 ... 787 inch) - Cable version

Technical specifications (continued)

	Compact (7ML701 and 7ML700)	Extended (7ML702 and 7ML703)
Process connection material of probe/wetted parts[2]	Connection: 316L stainless steel or PPS; Process seal: FKM (optional FFKM); Sensor: PEEK or PPS or PVDF	Connection: 316L stainless steel or PPS; Process seal: FKM (optional FFKM); Sensor: PPS or PVDF Extension: Pipe 316L Cable: FEP jacketed
Connection (Enclosure 65 mm)	Terminal block, terminals 0.14 ... 1.5 mm² (AWG 28 ... 16) or M12 x 1 according to IEC 61076-2-101, male, 4-pole, coding A-standard	Terminal block, terminals 0.14 ... 1.5 mm² (AWG 28 ... 16) or M12 x 1 according to IEC 61076-2-101, male, 4-pole, coding A-standard
Connection (Enclosure 35 mm)	M12 x 1 according to IEC 61076-2-101, male, 4-pole, coding A-standard	Not applicable
Process connection	Thread: G ½", G ¾", G 1", NPT ¾" Tri-clamp DN25 (1"), DN40 (1 1/2"), DN50 (2") DIN 32676 Type A (DIN 11851) and DIN 32676 Type C (ASME BPE 2009) Flange (screwed) DN 25, 40, 50; ASME 1", 1 ½", 2"	Thread: G ¾", G 1", NPT ¾" Flange: DN 25, 40, 50; ASME 1", 1 ½", 2" Adapters for G 1 ½", NPT 1 ¼", NPT 1 ½"
Power supply		
Standard	• 4-wire with relay supply: 9 ... 33 V DC, 0.7W including 10 % of EN 61010-1 • 2-wire with 8/16 or 4 ... 20 mA loop: 9 ... 33 V DC, 0.7W including 10 % of EN 61010-1 • IO-Link / PNP / NPN 10 ... 30 V DC, incl. 10 % of EN 61010-1	• 4-wire with relay supply: 9 ... 33 V DC, 0.7W including 10 % of EN 61010-1 • 2-wire with 8/16 or 4 ... 20 mA loop: 9 ... 33 V DC, 0.7W including 10 % of EN 61010-1 • IO-Link / PNP / NPN 10 ... 30 V DC, incl. 10 % of EN 61010-1
Intrinsically Safe	• 2-wire with 8/16 or 4 ... 20 mA loop: 10.8 ... 30 V DC, 0.7W incl. 10 % of EN 61010-1, intrinsically safe barrier required • 4-wire with relay: 10.8 .... 30 V DC, 0.7W incl. 10 % of EN 61010-1, intrinsically safe barrier required	• 2-wire with 8/16 or 4 ... 20 mA loop: 10.8 ... 30 V DC, 0.7W incl. 10 % of EN 61010-1, intrinsically safe barrier required
Certificates and approvals	• General purpose: CE, UKCA, FM, CSA • ATEX II 1G, 1/2G Ex ia IIC • ATEX II 1D, 1/2D Ex ia IIIC • IEC Ex ia IIC • IEC Ex ia IIIC • FM/CSA IS Class I, II, III, Div. 1, Groups A ... G • Overfill protection: WHG (Germany) VLAREM	• General purpose: CE, UKCA, FM, CSA • ATEX II 1G, 1/2G Ex ia IIC • ATEX II 1D, 1/2D Ex ia IIIC • IEC Ex ia IIC • IEC Ex ia IIIC • FM/CSA IS Class I, II, III, Div. 1, Groups A ... G • Overfill protection: WHG (Germany) VLAREM

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves.

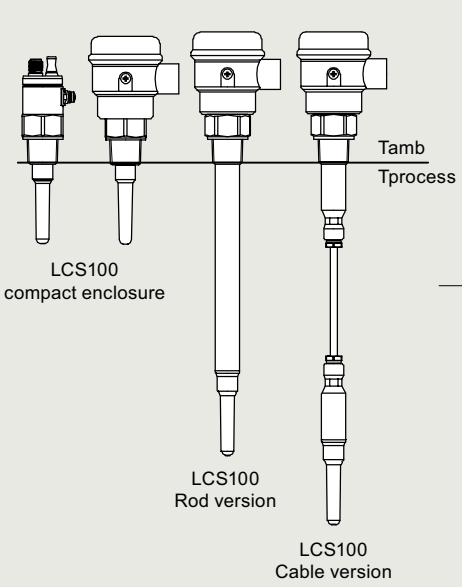
[2] For caustic materials, consult a local sales person for alternative O-rings. For more information, please visit http://www.automation.siemens.com/aspa_app.

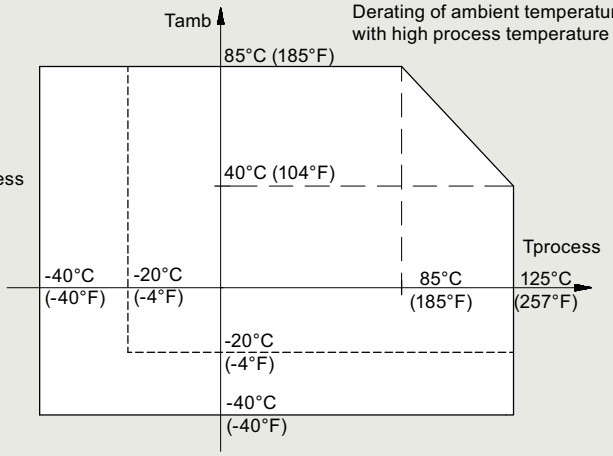
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Characteristic curves

Ambient and process temperature (Non-Ex version)

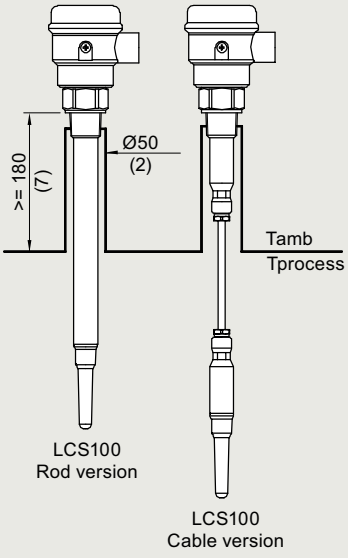
Mounting with short socket

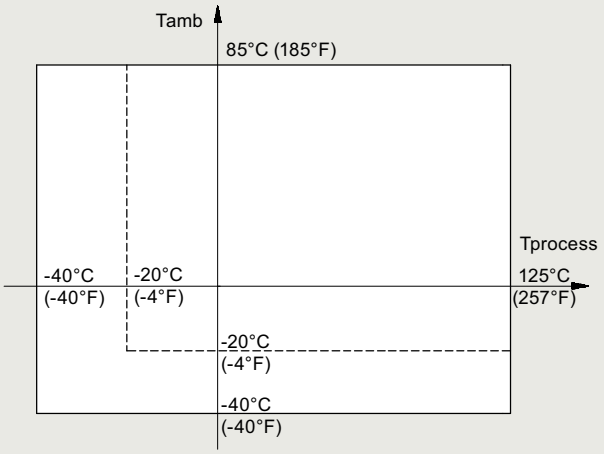




Ambient- and process temperature
limited to -20°C (-4°F) with option FFKM seal O-ring

Mounting with long socket





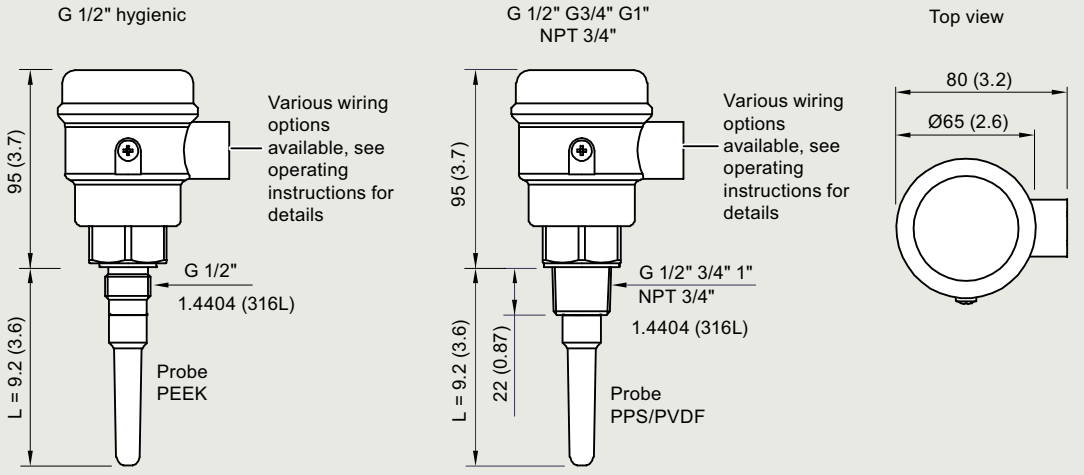
Ambient- and process temperature
limited to -20°C (-4°F) with option FFKM seal O-ring

SITRANS LCS100 Ambient and process temperature, dimensions in mm (inch)

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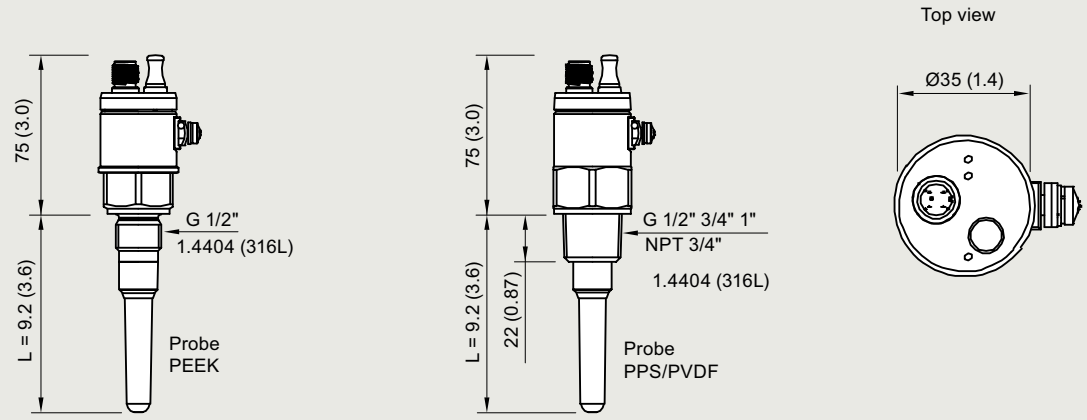
Dimensional drawings

Compact version: Stainless steel process connection, enclosure Ø65 mm (2.56 inch)



Note: Short extension length version with stainless steel process connection are available with certificate EHEDG EL class I

Compact version: Stainless steel process connection, enclosure Ø35 mm (1.38 inch)



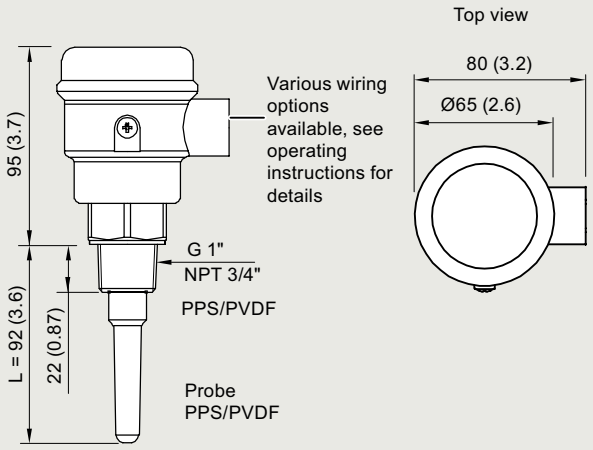
Note: Short extension length version with stainless steel process connection are available with certificate EHEDG EL class I

SITRANS LCS100, Compact stainless steel, dimensions in mm (inch)

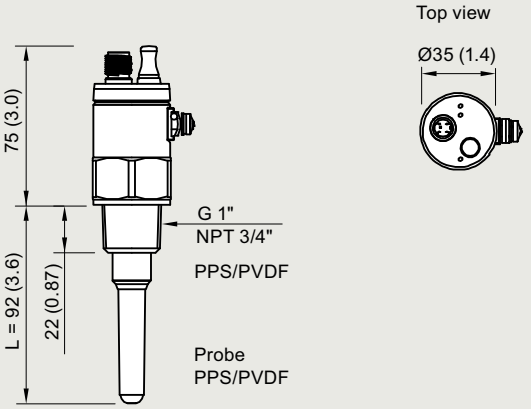
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Dimensional drawings (continued)

Compact version: Plastic process connection, enclosure Ø65 mm (2.56 inch)



Compact version: Plastic process connection, enclosure Ø35 mm (1.38 inch)

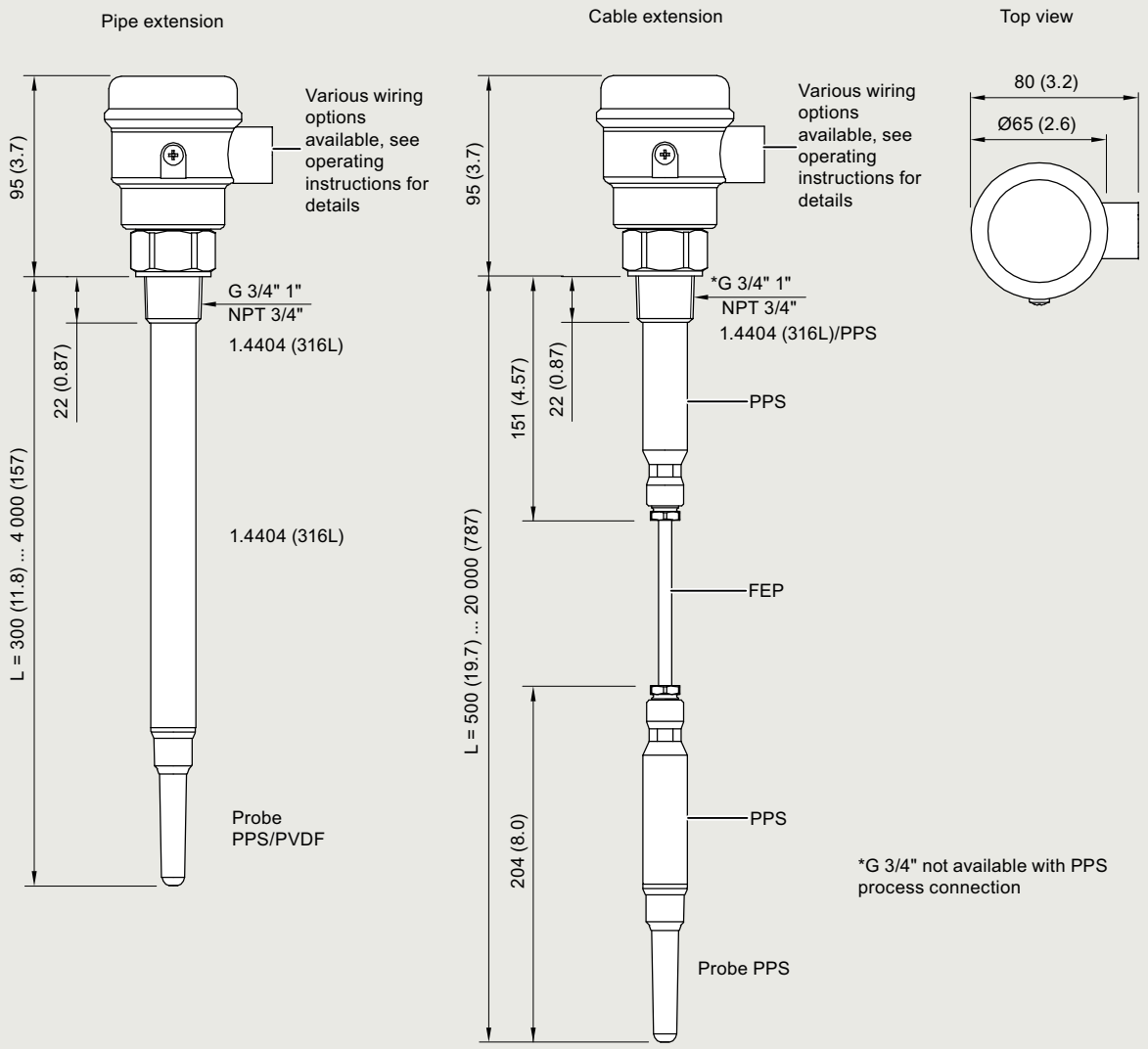


SITRANS LCS100, Compact with plastic process connection, dimensions in mm (inch)

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Dimensional drawings (continued)

Pipe extension and cable extension



SITRANS LCS100, Pipe and cable extension, dimensions in mm (inch)

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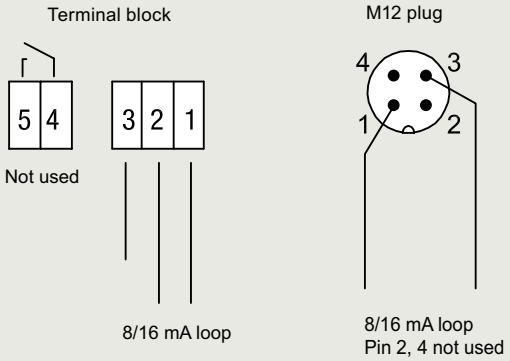
Circuit diagrams

2- wire operation with 8/16 mA loop

8/16 mA loop: 9 .. 33 V DC, 0,7W incl. 10% of EN 61010-1

External resistor in loop: The above stated voltage is the resulting voltage on the unit. Any voltage drop on an external series resistance must be considered.
Rmax = (Vsupply -9 V)/ 16 mA

Example: 24 V supply allows Rmax of 938 Ohms



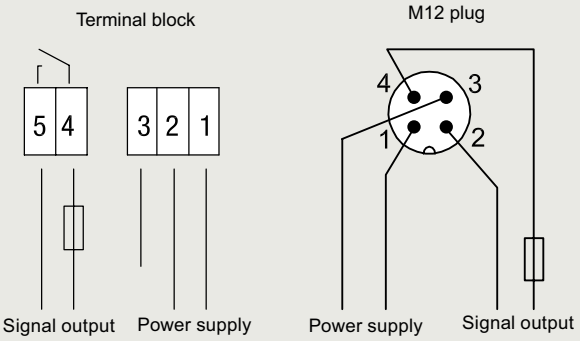
4-wire operation with DC supply and relay (signal output)

Power supply: 9 .. 33 V DC, 0,7W incl. 10% of EN 61010-1

Signal output: Floating relay SPST

Max. 60 V DC or 30 V AC; Limited to 35 V DC or 16 V AC in wet locations
Max. 1 A, 60 W

External fuse: max.1A, fast or slow, HBC, 250V



SITRANS LCS100, Standard connections

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Circuit diagrams (continued)

Intrinsically safe version: 2-wire operation with 8/16 mA loop

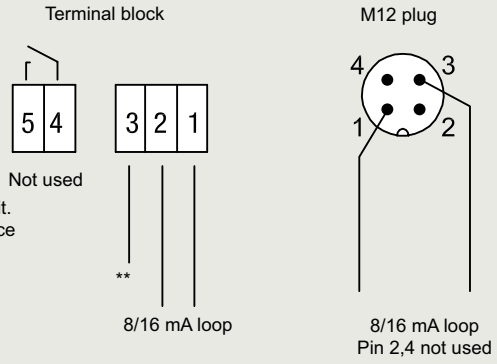
8/16 mA loop: 10.8 .. 30 V DC,
0,7W incl. 10% of EN 61010-1

Intrinsically safe supply required
(barrier or signal conditioning
instruments): Ui=30 V Ii=160 mA
Pi=0,8 W, Ci=7,6 nF Li =0,3 mH

External resistor in loop: The above
stated voltage is the resulting voltage on the unit.
Any voltage drop on an external series resistance
must be considered.

Rmax = (Vsupply -10.8 V)/ 16 mA

Example: 24 V supply allows
Rmax of 825 Ohms



Intrinsically safe version: 4-wire operation with DC supply and solid state relay (signal output)

This operation is only available for LCS100 compact
with enclosure Ø65 mm (2.56 inch) and connection via
terminal block (Solid state relay integrated).

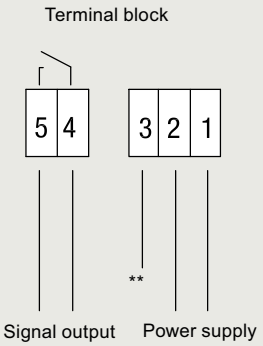
Power supply: 10.8 .. 30 V DC, 0,7W incl. 10% of
EN 61010-1

Intrinsically safe barrier required: Ui=30 V Ii=160 mA
Pi=0,8 W, Ci=7,6 nF Li =0,3 mH

Signal output: Solid state relay

Max. switching voltage / current: 30 V DC / 82mA

For connection to an intrinsically safe "switch amplifier
for contact input" or to an intrinsically safe PLC
with integrated input card for contact input.
Ui=30 V Ii=200 mA Pi=350 mW, Ci=4,2 nF, Li=0



SITRANS LCS100, Intrinsically safe connections

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Overview



SITRANS LCS050 is an ultra-compact, capacitance switch for point level detection in constricted spaces, water-based liquids, slurries, and foam.

Benefits

- Easy installation with no need for adjustment
- Low maintenance with no moving parts
- Highly visible 360-degree status indication
- M12 connector for ease of installation
- IO-Link communication option for advanced monitoring and configuration

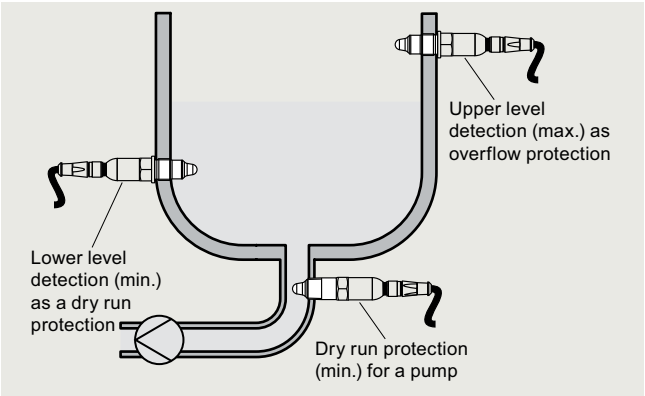
Application

The SITRANS LCS050's ultra-compact design, short insertion length of 15 mm (0.59 inch), and versatility in various applications in vessels or pipes, makes it a good replacement for traditional point level switches.

Its advanced alternating capacitance field at the sensor tip ensures material detection based on changes in capacitance, providing repeatable performance. The PEEK probe is chemically resistant with an effective process operating temperature range from -20 to +100 °C (-4 to +212 °F) and supports sterilization in place at 135 °C (275 °F) for up to 1 hour. The product design ensures reliability in a vibrating environment such as agitated tanks up to 5 g.

- Key Applications: water-based liquids with > 10 % water (alcohols, acids, cleaning agents), slurries and foam for point level, overfill and dry run protection including small pipes due to its compact design.

Configuration



SITRANS LCS050, installation examples

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Selection and ordering data

SITRANS LCS050 Point level switch Compact, point level switch, detects level in liquids. For use with overflow, high, low, and demand applications as well as pump protection. Compact design is ideal for confined spaces. Support for IO-Link communications.	Article No. 7ML577-2-	●	●	●	●	0	-	0	A	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Approvals											
Ordinary location		1									
With FDA, Regulation (EC) No. 1935/2004		2									
Process connection											
Thread M24 x 1.5 PN 25, DIN 13 / 316L, EPDM			A	A							
Thread G ½" PN 25, DIN 3852-A / 316L			A	B							
Thread G ½" PN 25, ISO228-1 / 316L (Ra < 0.76 µm); for ½" hygiene adapter			A	C							
Thread ½" NPT PN 25, ASME B1.20.1 / 316L			A	D							
Thread G ¾" PN 25, DIN 3852-A / 316L			A	E							
Thread ¾" NPT PN 25, ASME B1.20.1 / 316L			A	F							
Thread G 1" PN 25, DIN 3852-A / 316L			A	G							
Thread G 1" PN 25, ISO228-1, hygiene design / 316L (Ra < 0.76 µm), EPDM, for hygiene adapter sealing with O-ring			A	H							
Thread 1" NPT PN 25, ASME B1.20.1 / 316L			A	J							
Thread G 1" PN 25, ISO228-1, cone 40° / 316L (Ra < 0.76 µm); for hygiene adapter metallically sealing			A	K							
Electronics											
Three-wire transistor with IO-Link					1						

Selection and ordering data	
Accessories	
Hygienic adapter for G ½" is available, contact factory for pricing.	
Welded socket, suitable for LCS050 series, with threaded fittings or hygienic connections is available, contact factory for pricing	
Operating instructions	
Note: due to ATEX regulations one Quick start manual is included with every product. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	

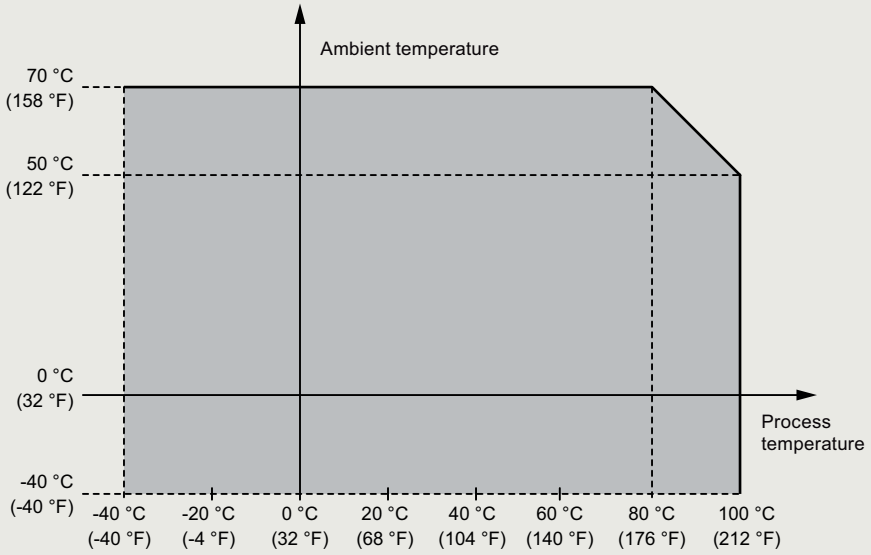
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Technical specifications

SITRANS LCS050	
Mode of operation	
Measuring principle	Capacitance level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal	
• Alarm output	Transistor (PNP/NPN) IO-Link acc. to IEC 61131-9
• Fail-safe mode	Min. or max.
Accuracy	
Hysteresis	Approx. 1 mm (0.04 inch)
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +70 °C (-40 ... +158 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
• Relative dielectric constant ϵ_r	Min. 2
• Process temperature	-20 ... +100 °C (-4 ... +212 °F) up to 1 hour, 135 °C (275 °F)
• Pressure (vessel)	-1 ... 25 bar/-100 ... 2 500 kPa (-14.5 ... 363 psig)
• Degree of protection	
- M 12x 1 plug	IP66/IP67/IP69
Design	
	Enclosure/integral cable version
Material	
• Body	316L and plastic (polycarbonate)
Sensor length	15 mm (0.59 inch)
Process connection material of probe/wetted parts	• Connection: 316L stainless steel • Device seal: FKM (hygienic version EPDM) • Sensor tip: PEEK
Connection (Enclosure version)	M12 x 1 plug
Process connection	Pipe thread, cylindrical (DIN 3852-A) G½, G¾, G1pipe thread, conical (ASME B1.20.1) ½ NPT, ¾ NPT, 1 NPT metric fine thread, cylindrical M24 x 1.5
Power supply	
Standard	12 ... 35 V DC
Certificates and approvals	General: CE, UKCA

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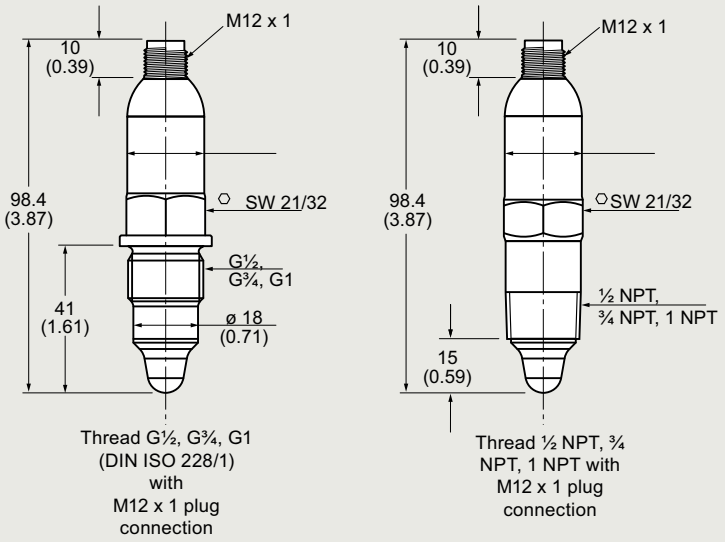
Characteristic curves



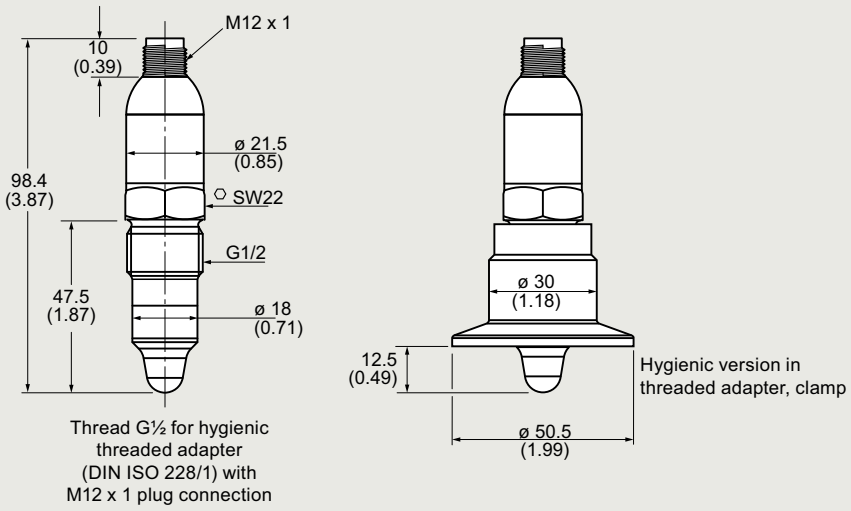
SITRANS LCS050 ambient temperature/process temperature curve

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Dimensional drawings

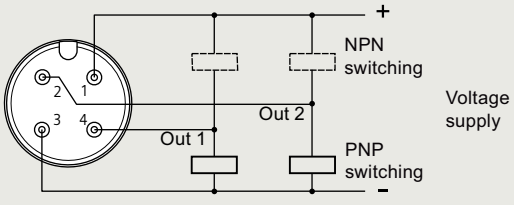


SITRANS LCS050, standard version - thread, dimensions in mm (inch)



SITRANS LCS050, hygienic version - thread, dimensions in mm (inch)

Circuit diagrams



SITRANS LCS050 connections

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Overview



Pointek CLS200 (standard version) is a versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces and has the ability to tune out buildup on the probe.

Benefits

- Potted construction protects signal circuit from shock, vibration, humidity, and/or condensation
- High chemical resistance
- Level detection independent of tank or pipe earth reference
- Insensitive to product buildup due to high frequency oscillation
- 3 LED indicators for sensor status, output status, and power
- Suitable for API 2350

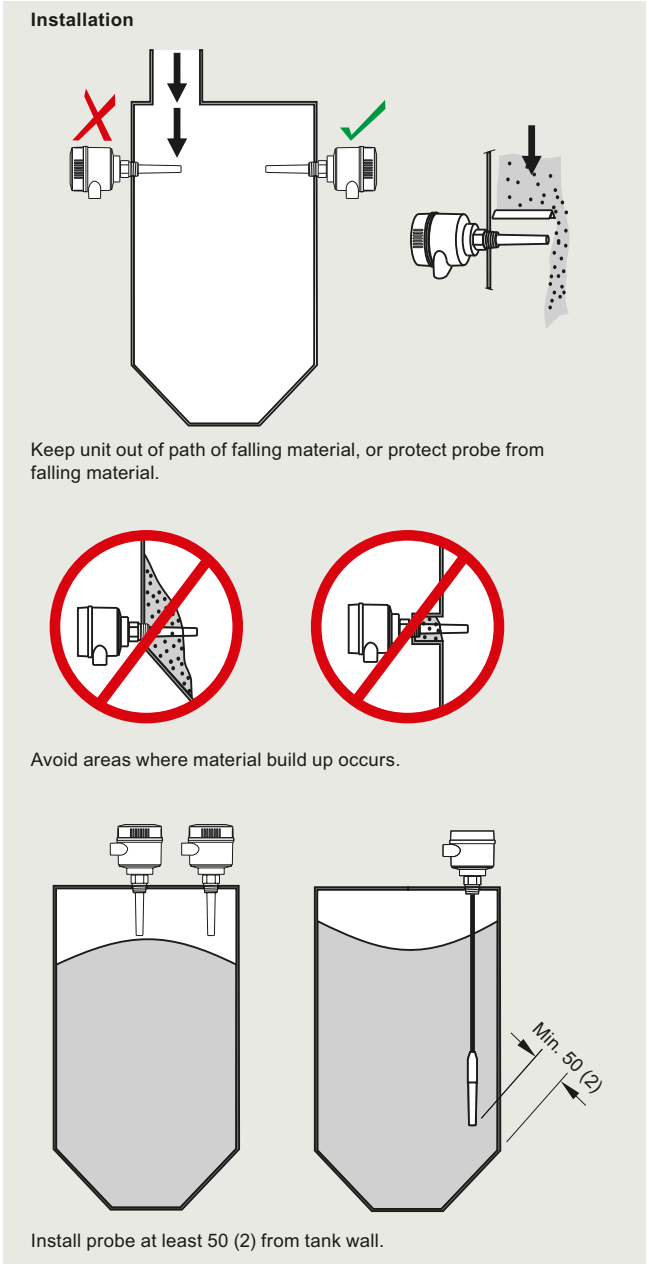
Application

Pointek CLS200 standard version has 3 LED indicators with basic relay and solid-state switch alarms. Universal switch for solids/liquids and interface.

The power supply is galvanically isolated and accepts a wide range of voltages (12 to 250 V AC/DC). When used with thermal isolator, the stainless steel and PPS (PVDF optional) materials used in the probe construction provide a temperature rating up to 125 °C (257 °F) on the process wetted portion of the probe. The switch responds to any material with a dielectric constant of 1.5 or more by detecting a change in oscillating frequency, and it can be set to detect before contact or on contact with the probe. The CLS200 operates independently of the tank wall or pipe so it does not require an external reference electrode for level detection in a non-conductive vessel such as concrete or plastic (EMC regulations applicable in some regions).

- Key Applications: liquids, slurries, powders, granules, pressurized applications, hazardous areas

Configuration



Pointek CLS200 installation, dimensions in mm (inch)

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Selection and ordering data

Pointek CLS200 RF Capacitance point level switch, rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563- 0-	●	●	●	●	●	-	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		0	A								
1" NPT [(Taper), ASME B1.20.1]		0	B								
1¼" NPT [(Taper), ASME B1.20.1]		0	C								
1½" NPT [(Taper), ASME B1.20.1]		0	D								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	A								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	B								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	D								
G ¾" [(BSPP), EN SO 228-1/PF (JIS-P), JIS B 0202]		3	A								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	B								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	D								
Welded flange, 316L stainless steel, raised face											
1" ASME, 150 lb		5	A								
1" ASME, 300 lb		5	B								
1" ASME, 600 lb		5	C								
1½" ASME, 150 lb		5	D								
1½" ASME, 300 lb		5	E								
1½" ASME, 600 lb		5	F								
2" ASME, 150 lb		5	G								
2" ASME, 300 lb		5	H								
2" ASME, 600 lb		5	J								
3" ASME, 150 lb		5	K								
3" ASME, 300 lb		5	L								
3" ASME, 600 lb		5	M								
4" ASME, 150 lb		5	N								
4" ASME, 300 lb		5	P								
4" ASME, 600 lb		5	Q								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		6	A								
DN 25, PN 40		6	B								
DN 40, PN 16		6	C								
DN 40, PN 40		6	D								
DN 50, PN 16		6	E								
DN 50, PN 40		6	F								
DN 80, PN 16		6	G								
DN 80, PN 40		6	H								
DN 100, PN 16		6	J								
DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		6	K								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Compact [threaded 120 mm (4.72 inch), Flanged 98 mm (3.86 inch)]				A							
Extended rod, 250 mm (9.84 inch)				B							
Extended rod, 350 mm (13.78 inch)				C							
Extended rod, 500 mm (19.69 inch)				D							
Extended rod, 750 mm (29.53 inch)				E							
Extended rod, 1 000 mm (39.37 inch)				F							
Extended rod, 1 250 mm (49.21 inch)				G							
Extended rod, 1 350 mm (53.15 inch)				H							
Extended rod, 1 500 mm (59.06 inch)				J							

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563- 0-	●	●	●	●	●	-	●	●	●	0
Extended rod, 1 750 mm (68.90 inch)				K							
Extended rod, 2 000 mm (78.74 inch)				L							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, 210 ... 1 000 mm (8.27 ... 39.37 inch)				M							
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)				N							
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)				P							
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)				Q							
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)				R							
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)				S							
Thermal isolator											
Without thermal isolator					0						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					1						
Remote mount electronics and mounting bracket											
With 2 m (79 inch) of cable[1)2)]					2						
With 5 m (197 inch) of cable[1)2)]					3						
Wetted seals											
FKM						0					
FFKM [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
316L stainless steel with PPS probe body								0			
316L stainless steel with PVDF probe body								1			
Approvals											
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									D		
Flameproof Enclosure with IS Probe, with Overfill Protection: CE, UKCA, RCM, WHG, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									E		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div.1 Gr. E, F, G T4									F		
Explosion Proof Enclosure with IS Probe CSA/ FM Class I, II, III Div.1 Gr.A, B, C, D, E, F, G T4									G		
General Purpose (CSA, FM)									H		

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563- 0-	●	●	●	●	●	-	●	●	●	0
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									J		
Ordinary Locations/General Purpose (Non-Ex) with Overfill Protection: CSA, FM, CE, UKCA, RCM, WHG									K		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet IP68										D	

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.
[2] Available with Approval options F, G, and H.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC 61508 Declaration of Conformity [SIL 2 (overspill)]	**C20**
EAC Ex-Approval[1]	**E24**

Selection and Ordering data	Order code
INMETRO[2]	**E34**
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1] Available only with Approvals options C, D, and E; specific EAC Ex-marking.
[2] Available only with Approvals options C, D, E.

Pointek CLS200 RF Capacitance point level switch, cable design Detects level and interface in liquids, solids, slurries, and foam. Cable extension options to 30 m (98.43 ft), adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563- 1-	●	●	●	●	●	-	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		0	A								
1" NPT [(Taper), ASME B1.20.1]		0	B								
1¼" NPT [(Taper), ASME B1.20.1]		0	C								
1½" NPT [(Taper), ASME B1.20.1]		0	D								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	A								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	B								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	D								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	A								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	B								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	D								
Welded flange, 316L stainless steel, raised face											
1" ASME, 150 lb		5	A								
1" ASME, 300 lb		5	B								
1" ASME, 600 lb		5	C								
1½" ASME, 150 lb		5	D								
1½" ASME, 300 lb		5	E								

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, cable design Detects level and interface in liquids, solids, slurries, and foam. Cable extension options to 30 m (98.43 ft), adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563-1-	●	●	●	●	●	-	●	●	●	0
1½" ASME, 600 lb		5	F								
2" ASME, 150 lb		5	G								
2" ASME, 300 lb		5	H								
2" ASME, 600 lb		5	J								
3" ASME, 150 lb		5	K								
3" ASME, 300 lb		5	L								
3" ASME, 600 lb		5	M								
4" ASME, 150 lb		5	N								
4" ASME, 300 lb		5	P								
4" ASME, 600 lb		5	Q								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		6	A								
DN 25, PN 40		6	B								
DN 40, PN 16		6	C								
DN 40, PN 40		6	D								
DN 50, PN 16		6	E								
DN 50, PN 40		6	F								
DN 80, PN 16		6	G								
DN 80, PN 40		6	H								
DN 100, PN 16		6	J								
DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		6	K								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Extended cable, 3 000 mm (118.11 inch), length can be determined by customer on assembly[1)]				A							
Extended cable, 6 000 mm (236.22 inch), length can be determined by customer on assembly[1)]				B							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended cable, 500 ... 5 000 mm (19.69 ... 196.85 inch)				C							
Extended cable, 5 001 ... 1 000 mm (196.89 ... 393.70 inch)				D							
Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)				E							
Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.4 inch)				F							
Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)				G							
Extended cable, 25 001 ... 30 000 mm (984.29 ... 1 181.1 inch)				H							
Thermal isolator											
Without thermal isolator					0						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					1						
Remote mount electronics and mounting bracket											
With 2 m (79 inch) of cable[2)]					2						
With 5 m (197 inch) of cable[2)]					3						
Wetted seals											
FKM and PTFE						0					
FFKM and PTFE [for process temperatures above -20 °C) (-4 °F)]						1					
Probe material											
FEP jacketed cable with PPS probe body								0			
FEP jacketed cable with PVDF probe body								1			

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, cable design Detects level and interface in liquids, solids, slurries, and foam. Cable extension options to 30 m (98.43 ft), adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563-1-	●	●	●	●	●	-	●	●	●	0
Approvals											
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									D		
Flameproof Enclosure with IS Probe, with Overfill Protection: CE, UKCA, RCM, WHG, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									E		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div.1 Gr. E, F, G T4									F		
Explosion Proof Enclosure with IS Probe CSA/ FM Class I, II, III Div.1 Gr.A, B, C, D, E, F, G T4									G		
General Purpose (CSA, FM)									H		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									J		
Ordinary Locations/General Purpose (Non-Ex) with Overfill Protection: CSA, FM, CE, UKCA, RCM, WHG									K		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	

[1] Sensor detached to allow customer to set desired cable length.
[2] Available with Approvals options F ... H.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC 61508 Declaration of Conformity [SIL 2 (overspill)]	**C20**
EAC Ex-Approval[1)]	**E24**
INMETRO[2)]	**E34**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1)] Available only with Approvals options C, D, and E; specific EAC Ex-marking.

[2)] Available only with Approvals options C, D, E.

Pointek CLS200 RF Capacitance point level switch, sanitary rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe.	**Article No.** 7ML563-2-	●	●	●	●	●	-	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection Sanitary 316L stainless steel											
1" sanitary fitting clamp		**8**	**A**								
1½" sanitary fitting clamp		**8**	**B**								
2" sanitary fitting clamp		**8**	**C**								
2½" sanitary fitting clamp		**8**	**D**								
3" sanitary fitting clamp (Note: Sanitary connection dimensionally corresponds to the applicable ISO 2852 standard)		**8**	**E**								
Probe length (length from process connection face) Note: No Y01 needed in Order code for standard lengths											
Compact, 98 mm (3.86 inch)				**A**							
Extended rod, 250 mm (9.84 inch)				**B**							
Extended rod, 350 mm (13.78 inch)				**C**							
Extended rod, 500 mm (19.69 inch)				**D**							
Extended rod, 750 mm (29.53 inch)				**E**							
Extended rod, 1 000 mm (39.37 inch)				**F**							
Extended rod, 1 250 mm (49.21 inch)				**G**							
Extended rod, 1 350 mm (53.15 inch)				**H**							
Extended rod, 1 500 mm (59.06 inch)				**J**							
Extended rod, 1 750 mm (68.90 inch)				**K**							
Extended rod, 2 000 mm (78.74 inch)				**L**							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, 110 ... 350 mm (4.3 ... 13.78 inch)				**M**							
Extended rod, 351 ... 1 000 mm (13.78 ... 39.37 inch)				**N**							
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)				**P**							
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)				**Q**							
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)				**R**							
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)				**S**							
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)				**T**							
Thermal isolator											
Thermal isolator					**0**						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					**1**						
Remote mount electronics and mounting bracket											
Remote mount electronics and mounting bracket					**2**						
Remote mount electronics with 5 m (197 inch) of cable					**3**						

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, sanitary rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563-2-	●	●	●	●	●	-	●	●	●	0
Wetted seals											
FKM						0					
FFKM [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
316L stainless steel with PPS probe body								0			
316L stainless steel with PVDF probe body								1			
Approvals											
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									D		
Flameproof Enclosure with IS Probe, with Overfill Protection: CE, UKCA, RCM, WHG, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									E		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div.1 Gr. E, F, G T4									F		
Explosion Proof Enclosure with IS Probe CSA/ FM Class I, II, III Div.1 Gr.A, B, C, D, E, F, G T4									G		
General Purpose (CSA, FM)									H		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									J		
Ordinary Locations/General Purpose (Non-Ex) with Overfill Protection: CSA, FM, CE, UKCA, RCM, WHG									K		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC 61508 Declaration of Conformity [SIL 2 (overspill)]	**C20**
EAC Ex-Approval[1)]	**E24**
INMETRO[2)]	**E34**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1)] Available only with Approvals options C, D, and E; specific EAC Ex-marking.

[2)] Available only with Approvals options C, D, E.

Pointek CLS200 RF Capacitance point level switch, sliding coupling design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe.	**Article No. 7ML563-3-** ●	●	●	●	●	-	●	●	●	0
Process connection Threaded, 316L stainless steel										
¾" NPT [(Taper), ASME B1.20.1]	**0**	**A**								
1" NPT [(Taper), ASME B1.20.1]	**0**	**B**								
1¼" NPT [(Taper), ASME B1.20.1]	**0**	**C**								
1½" NPT [(Taper), ASME B1.20.1]	**0**	**D**								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	**1**	**A**								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	**1**	**B**								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	**1**	**D**								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	**3**	**A**								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	**3**	**B**								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	**3**	**D**								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths										
Extended rod, 350 mm (13.78 inch)			**C**							
Extended rod, 500 mm (19.69 inch)			**D**							
Extended rod, 750 mm (29.53 inch)			**E**							
Extended rod, 1 000 mm (39.37 inch)			**F**							
Extended rod, 1 250 mm (49.21 inch)			**G**							
Extended rod, 1 350 mm (53.15 inch)			**H**							
Extended rod, 1 500 mm (59.06 inch)			**J**							
Extended rod, 1 750 mm (68.90 inch)			**K**							
Extended rod, 2 000 mm (78.74 inch)			**L**							
Add Order code Y01 and plain text: "Insertion length ... mm"										
Extended rod, 350 ... 1 000 mm (13.78 ... 39.37 inch)			**M**							
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)			**N**							
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)			**P**							
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)			**Q**							
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)			**R**							
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)			**S**							
Thermal isolator										
Without thermal isolator				**0**						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]				**1**						
Remote mount electronics and mounting bracket										
With 2 m (79 inch) of cable[1)]				**2**						
With 5 m (197 inch) of cable[1)]				**3**						

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, sliding coupling design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe.	Article No. 7ML563-3-	●	●	●	●	●	-	●	●	●	0
Wetted seals											
FKM and PTFE						0					
FFKM and PTFE [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
316L stainless steel with PPS probe body								0			
316L stainless steel with PVDF probe body								1			
Approvals											
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									D		
Flameproof Enclosure with IS Probe, with Overfill Protection: CE, UKCA, RCM, WHG, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									E		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div.1 Gr. E, F, G T4									F		
Explosion Proof Enclosure with IS Probe CSA/ FM Class I, II, III Div.1 Gr.A, B, C, D, E, F, G T4									G		
General Purpose (CSA, FM)									H		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									J		
Ordinary Locations/General Purpose (Non-Ex) with Overfill Protection: CSA, FM, CE, UKCA, RCM, WHG									K		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	

[1] Available with Approvals options F ... H.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC 61508 Declaration of Conformity [SIL 2 (overspill)]	**C20**
EAC Ex-Approval[1)]	**E24**
INMETRO[2)]	**E34**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1)] Available only with Approvals options C, D, and E; specific EAC Ex-marking.
[2)] Available only with Approval options C, D, E.

Technical specifications

Pointek CLS200 - Standard	
Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal	
• Relay output	1 SPDT Form C relay
- Max. contact voltage	• 30 V DC • 250 V AC
- Max. contact current	• 5 A DC • 8 A AC
- Max. switching capacity	150 W DC 2 000 VA AC
- Time delay (ON and/or OFF)	1 ... 60 s
• Solid-state output	
- Output	Galvanically isolated
- Protection	Against reversed polarity (bipolar)
- Max. switching voltage	• 30 V DC • 30 V peak AC
- Max. load current	82 mA
- Voltage drop	< 1 V, typical at 50 mA
- Time delay (pre or post switching)	1 ... 60 s
Rated operating conditions[1)]	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)[2)]
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
• Installation category	II
• Pollution degree	4
Medium conditions	Liquids, bulk solids, slurries and interfaces
• Relative dielectric constant ϵ_r	Min. 1.5
• Process temperature	
- Without thermal isolator	-40 ... +85 °C (-40 ... +185 °F)[2)]
- With thermal isolator	-40 ... +125 °C (-40 ... +257 °F)
• Process pressure (rod version)	-1 ... +25 bar g (-14.6 ... +365 psi g) (nominal)
• Process pressure (cable version)[3)]	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)
• Process pressure (sliding coupling version)	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)

Pointek CLS200 - Standard	
Electromagnetic compatibility	To comply with CE and UKCA EMC regulations (where applicable); the CLS200 should be installed per the instruction manual.
Design	
Material	
• Enclosure	Epoxy-coated aluminum with gasket
• Optional thermal isolator	316L stainless steel
Connection	Removable terminal block, max. 2.5mm²
Degree of protection	IP65/Type 4/NEMA 4 (optional IP68)
Cable inlet	2 x M20 x 1.5 thread (option: 2 x ½" NPT conduit entry including 1 plugged entry)
Power supply	12 ... 250 V AC/DC, 0 ... 60 Hz max. 2 W
Certificates and approvals	
General Purpose	CSA, FM, CE, UKCA, RCM
Dust Ignition Proof	ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TXDa/Db, ATEX III 2(1) D Ex ia tb [ia Da] IIIC TX Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TXDa/Db, UKEX III 2(1) D Ex ia tb [ia Da] IIIC TX Db
Flameproof Enclosure With IS Probe	ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb
Dust Ignition Proof with IS Probe	CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Explosion Proof Enclosure With IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, and ENV5
Overfill Protection	WHG (Germany) VLAREM II
Others	Pattern Approval (China), SIL

[1)] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also CLS200 pressure/temperature curves.
[2)] Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)
[3)] Pressure rating of process seal is temperature dependent. See also CLS200 pressure/temperature curves.

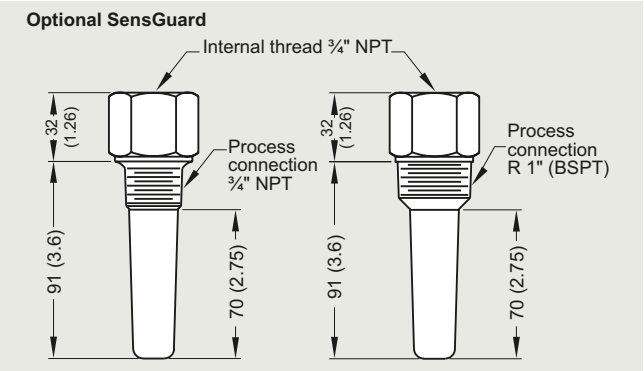
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Technical specifications (continued)

Design: Probe	Rod version	Sanitary version	Cable version	Sliding Coupling version
Max. length	5 500 mm (216.53 inch)	5 500 mm (216.53 inch)	• 30 000 mm (1 181.1 inch) liquids and slurries • 5 000 mm (196.85 inch) solids (under loads)	5 500 mm (216.53 inch)
Process connection	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steelASME/EN flange	1½", 2" sanitary fitting clamp 316L stainless steel	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steel ASME/EN flange	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
Extension material	316L stainless steel optional PFA coated[1]	316L stainless steel	Fluoroethylene propylene (FEP) cable with stainless steel core	316L stainless steel
Sensor wetted parts	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)
O-ring seal material	FKM (optional FFKM)[2]	FKM (optional FFKM)[2]	FKM (optional FFKM)[2]	FKM (optional FFKM)[2]
Thermal isolator[3]	Optional	Optional	Optional	Optional
Extension	User selected length	User selected length	Cable extension	User selected length

1) PFA coating (7ML5634 and 7ML5644) has 120 micron thickness
2) For caustic materials, consult a local sales person for alternative O-rings. For more information, please visit http://www.automation.siemens.com/aspa_app.
3) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)

Options

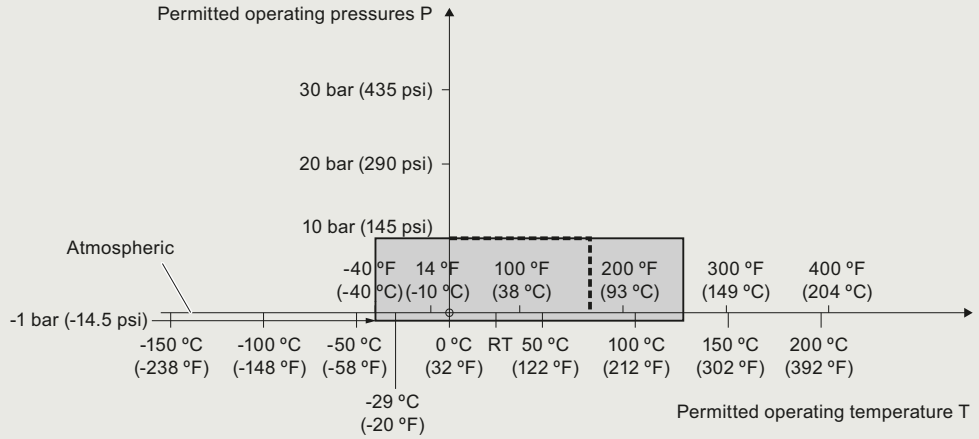


Optional SensGuard, dimensions in mm (inch)

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Characteristic curves

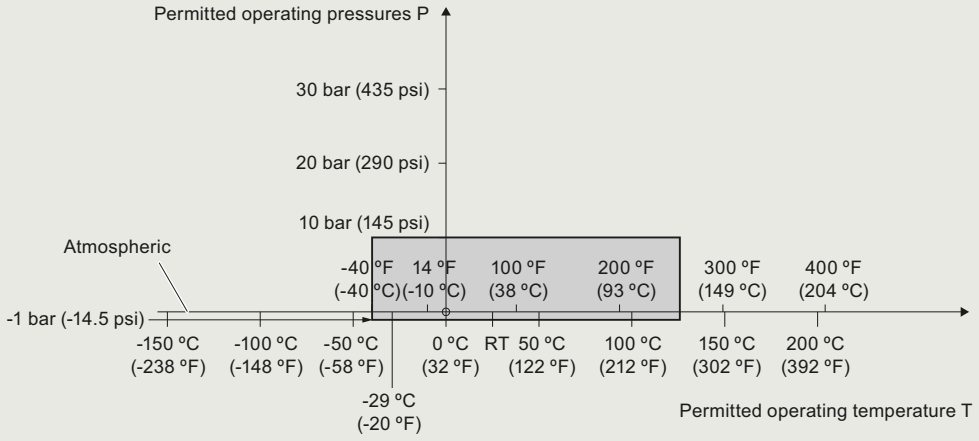
**Pressure/temperature curve
CLS200 sliding coupling
threaded process connections
(7ML5633 and 7ML5643)**



---- Example:
Permitted operating pressure = 10 bar (145 psi) at 75 °C

Pointek CLS200 process pressure/temperature derating curves (7ML5633 and 7ML5643)

**Pressure/temperature curve
CLS200 cable
Threaded process connections
(7ML5631 and 7ML5641)**

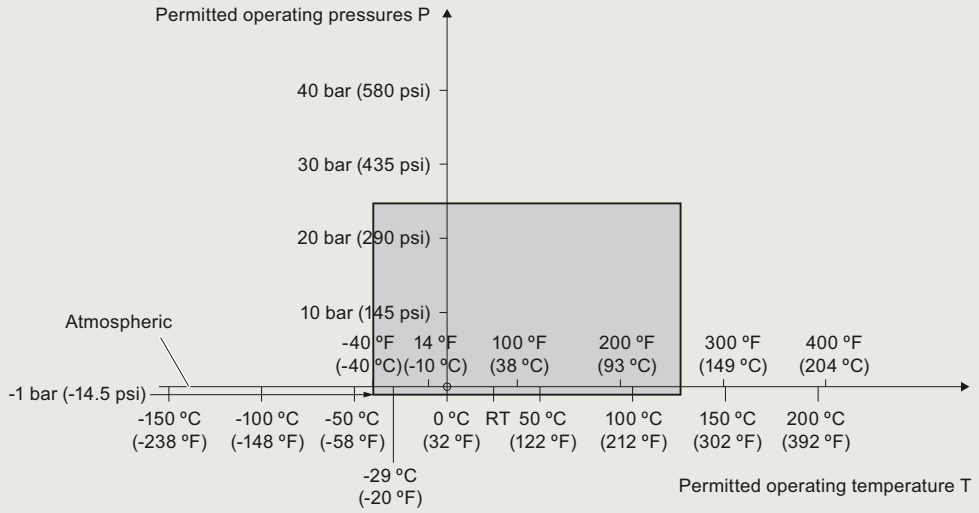


Pointek CLS200 process pressure/temperature derating curves (7ML5631 and 7ML5641)

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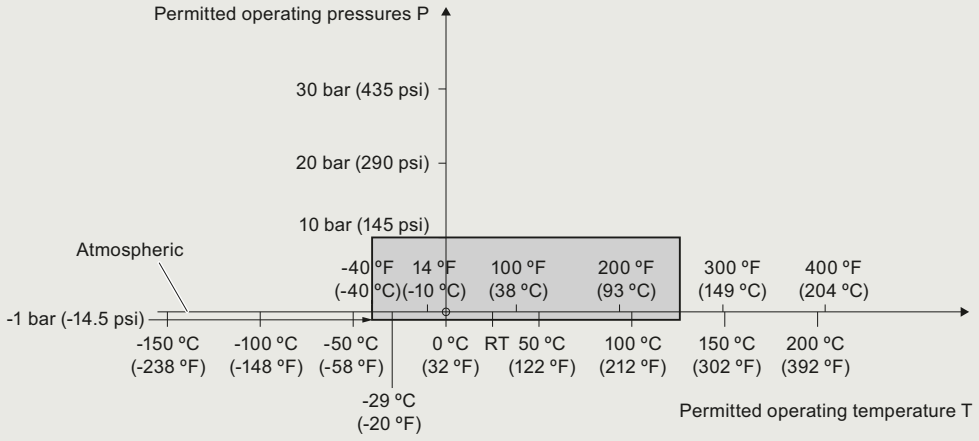
Characteristic curves (continued)

Pressure/temperature curve
CLS200 compact and extended rod
Threaded process connections
(7ML5630 and 7ML5640)



Pointek CLS200 process pressure/temperature derating curves (7ML5630 or 7ML5640)

Pressure/temperature curve
CLS200 compact and extended sanitary type
Sanitary process connections
(7ML5632 and 7ML5642)

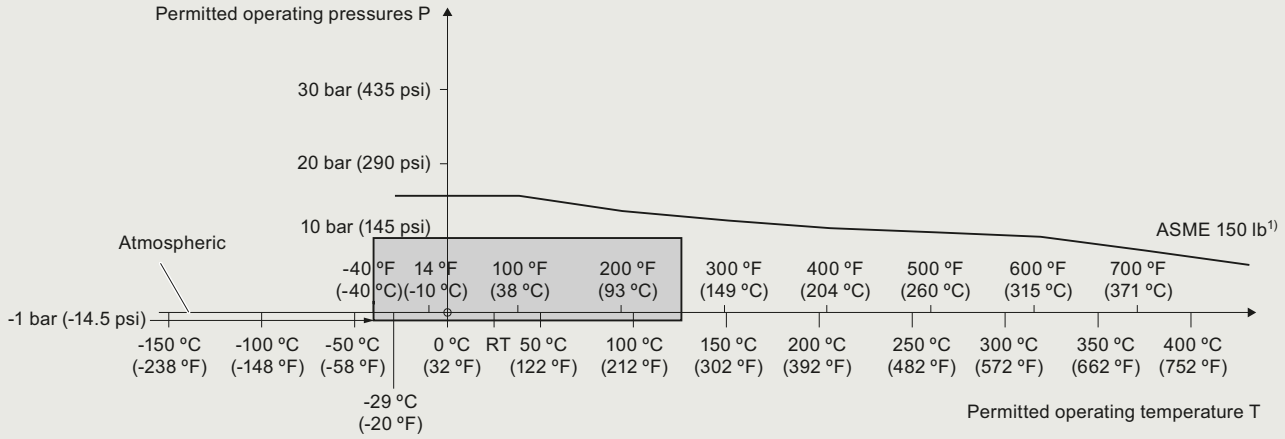


Pointek CLS200 process pressure/temperature derating curves (7ML5632 and 7ML5642)

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Characteristic curves (continued)

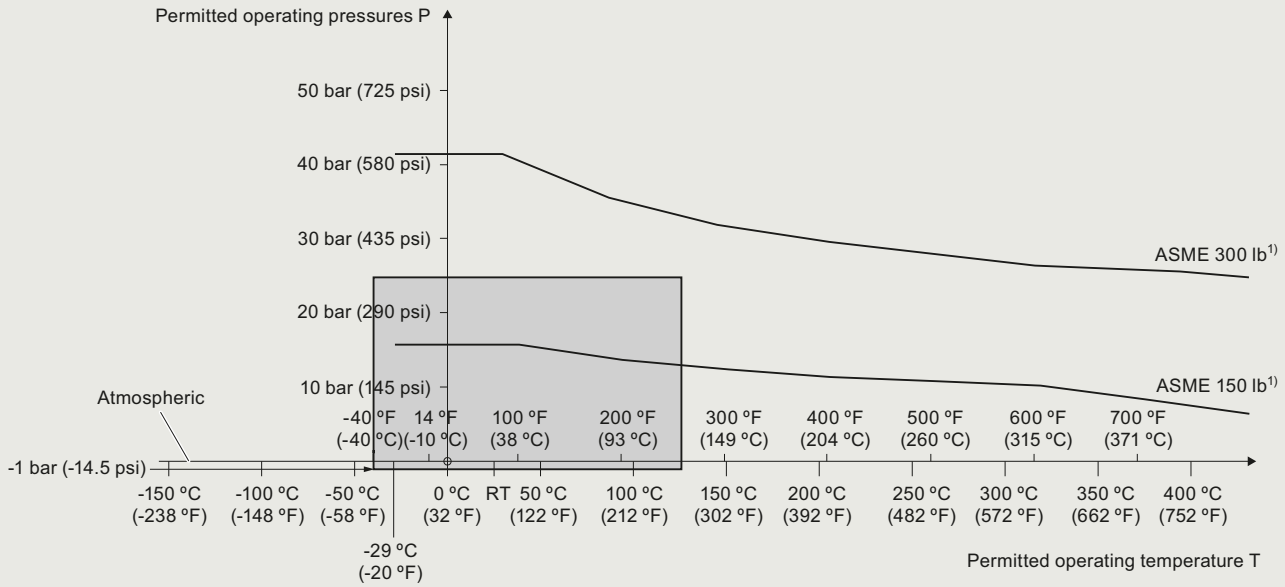
Pressure/temperature curve
CLS200, cable
ASME flanged process connections
(7ML5631 and 7ML5641)



1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5631 and 7ML5641)

Pressure/temperature curve
CLS200 compact and extended rod
ASME flanged process connections
(7ML5630 and 7ML5640)



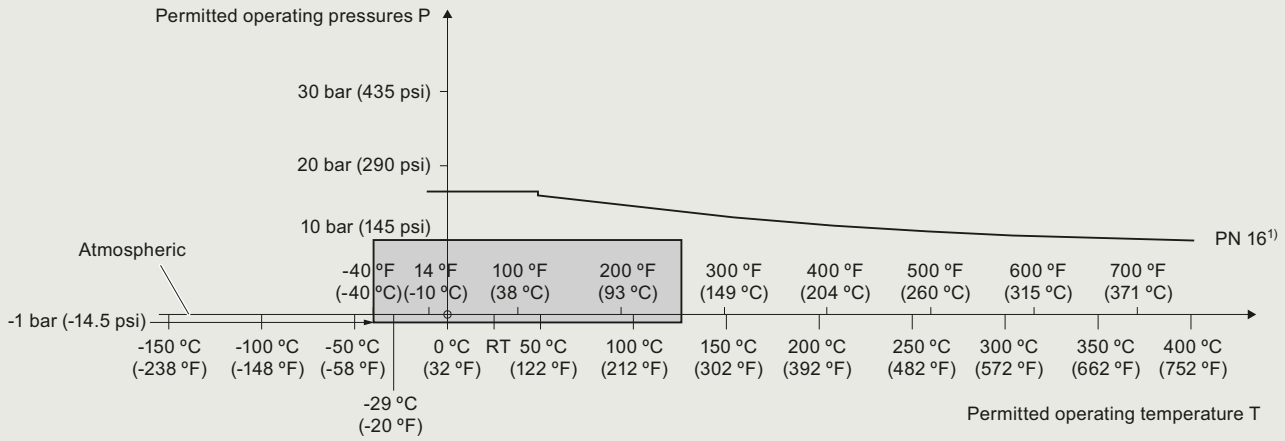
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5630 and 7ML5640)

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Characteristic curves (continued)

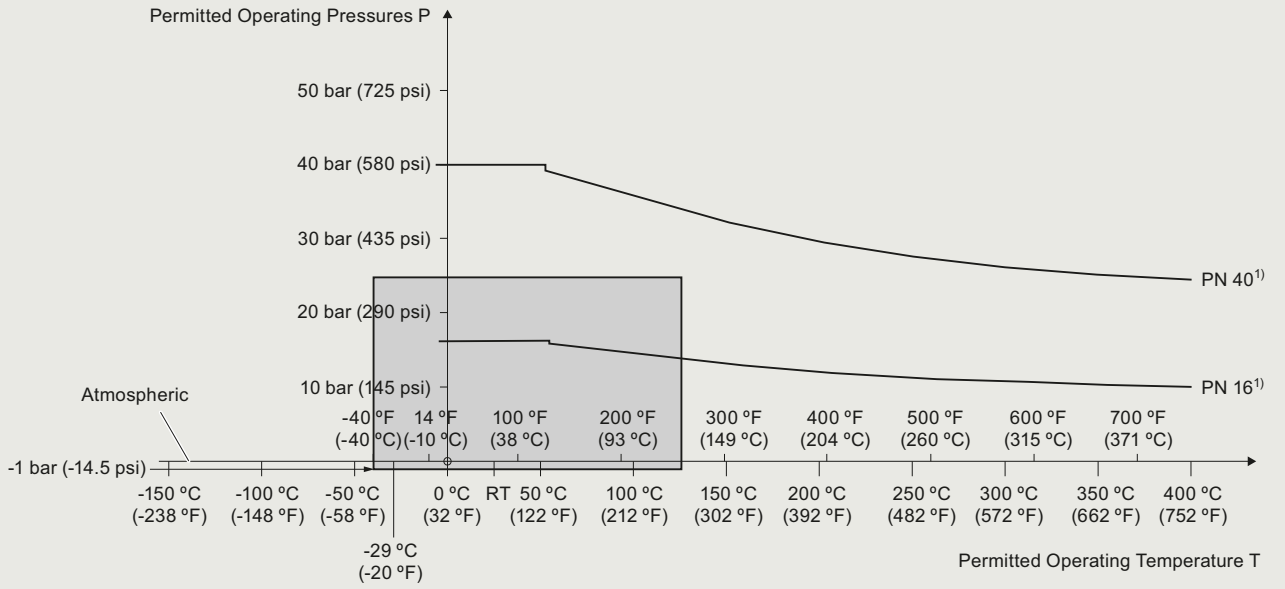
Pressure/temperature curve
CLS200 cable
EN flanged process connections
(7ML5631 and 7ML5641)



1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5631 and 7ML5641)

Pressure/Temperature Curve
CLS200 Compact and Extended Rod
EN Flanged Process Connections
(7ML5630 and 7ML5640)



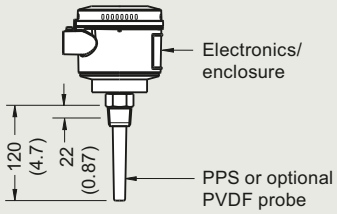
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5630 and 7ML5640)

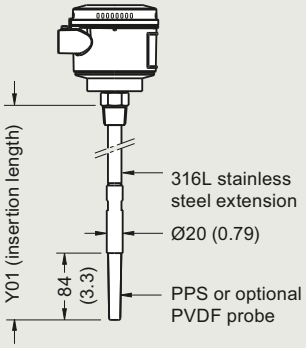
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Dimensional drawings

Compact version
Threaded
(7ML5630 and 7ML5640)

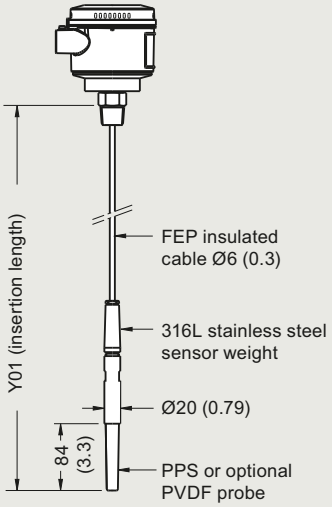


Extended rod version
Threaded
(7ML5630 and 7ML5640)



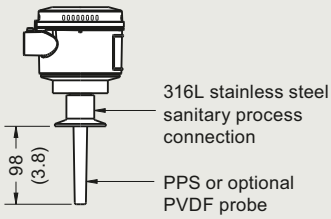
Min. insertion length = 200 (7.87)
Max. insertion length = 5 500 (216)

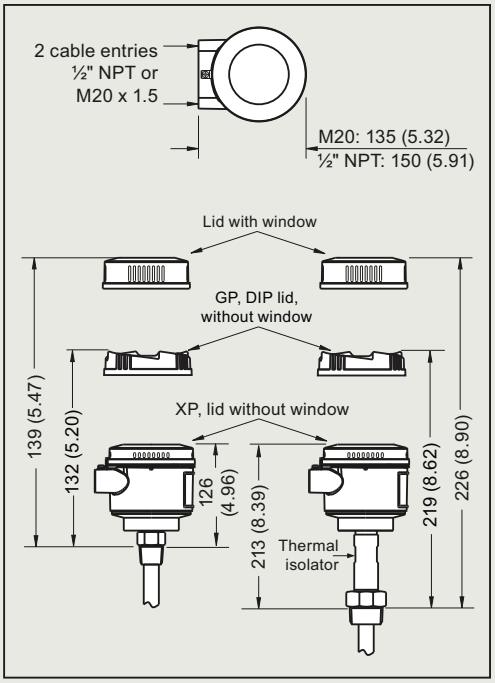
Extended cable version
Threaded
(7ML5631 and 7ML5641)



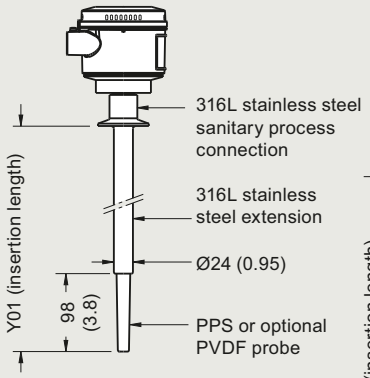
Min. insertion length = 500 (19.69)
Max. insertion length = 30 000 (1 181)
Applicable for liquids and solids applications. Cable can be shortened on site.

Sanitary compact version
Sanitary fitting
(7ML5632 and 7ML5642)



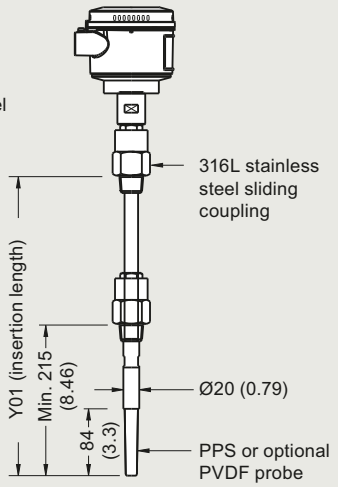


Sanitary extended version
Sanitary fitting
(7ML5632 and 7ML5642)



Min. insertion length = 110 (4.3)
Max. insertion length = 5 500 (216)

Sliding coupling version
Threaded
(7ML5633 and 7ML5643)



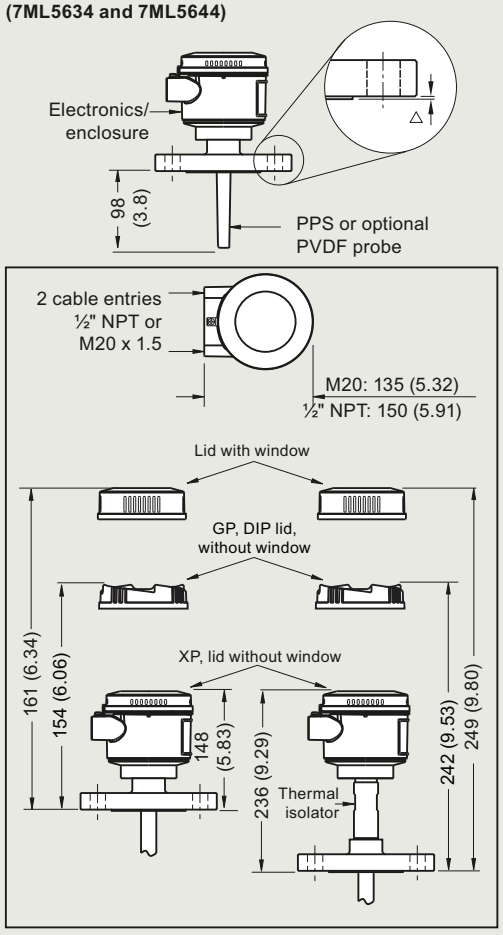
Min. insertion length = 350 (13.82)
Max. insertion length = 5 500 (216)

Pointek CLS200 threaded/sanitary process connection, dimensions in mm (inch)

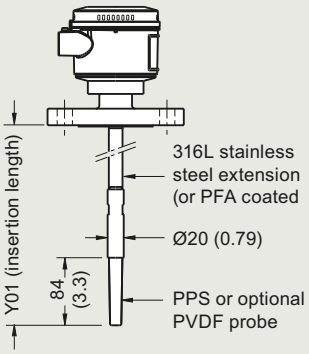
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Dimensional drawings (continued)

Compact version
Welded Flange (7ML5630 and 7ML5640)
Welded Flange, PFA coated
(7ML5634 and 7ML5644)

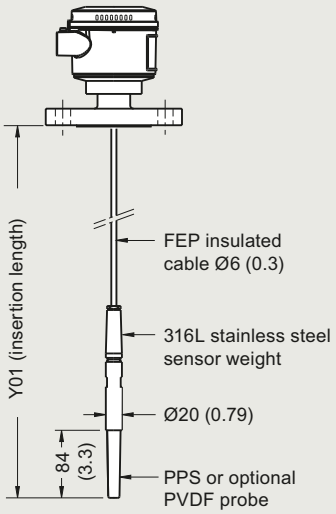


Extended rod version
Welded Flange (7ML5630 and 7ML5640)
Welded Flange, PFA coated
(7ML5634 and 7ML5644)



Min. insertion length = 200 (7.87)
Max. insertion length = 5 500 (216)

Extended cable version
Welded Flange
(7ML5631 and 7ML5641)



Min. insertion length = 500 (19.69)
Max. insertion length = 30 000 (1 181)
Applicable for liquids and solids applications. Cable can be shortened on site.

Flange Facing (raised face)	
Flange Class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

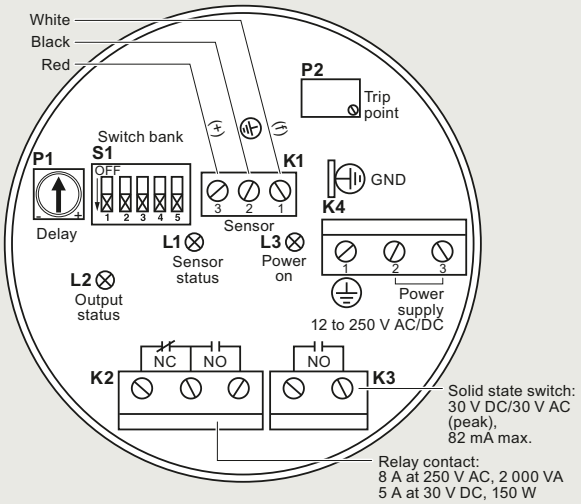
Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

Pointek CLS200 flanged process connections, dimensions in mm (inch)

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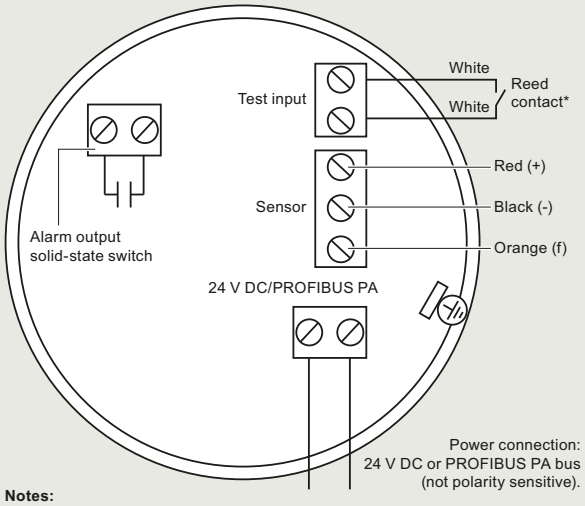
Circuit diagrams

Wiring: Pointek CLS200 standard



Notes:
- Identification label is on underside of lid. Switch and potentiometer settings are for illustration purposes only (refer to operation/setup in manual).
- All field wiring must have insulation suitable for at least 250 V.
- Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
- Maximum working voltage between adjacent relay contacts shall be 250 V.
- Refer to the Instruction Manual or contact Siemens representative for detailed wiring information.

Wiring: Pointek CLS200 Digital



Notes:
Refer to the instruction manual or contact a Siemens representative for detailed wiring information.

***Magnet activated sensor Test**
A magnet can be used to test the sensor without opening the lid of the Pointek CLS200 Digital version. Bring the magnet close to the test area indicated on the enclosure. The sensor test starts and finishes automatically after 10 seconds.



Pointek CLS200 connections

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Overview



Pointek CLS200 (digital version) is a versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces and has the ability to tune out buildup on the probe. The digital version includes PROFIBUS PA, an LCD display, and advanced diagnostic features.

Benefits

- Potted construction protects signal circuit from shock, vibration, humidity, and/or condensation
- High chemical resistance
- Level detection independent of tank or pipe earth reference
- Insensitive to product buildup due to high frequency oscillation
- High sensitivity allows installation in a wide range of liquids, solids or slurry applications
- Integral LCD display allows for easy menu-driven setup
- PROFIBUS PA communication (SIMATIC PDM compatible)

Application

Pointek CLS200 digital version provides an integral LCD display for stand-alone use, and also provides PROFIBUS PA communication (Profile version 3.0, Class B) for connection to a network.

The power supply is galvanically isolated and accepts a wide range of voltages (12 to 30 V DC). When used with thermal isolator, the stainless steel and PPS (PVDF optional) materials used in the probe construction provide a temperature rating up to 125 °C (257 °F) on the process wetted portion of the probe. The switch responds to any material with a dielectric constant of 1.5 or more by detecting a change in oscillating frequency, and it can be set to detect before contact or on contact with the probe. The menu-driven setup allows precise control of the switch point signal damping and alarm functions.

When connected to the PROFIBUS network, advanced diagnostics and set up using SIMATIC PDM are possible.

The CLS200 operates independently of the tank wall or pipe so it does not require an external reference electrode for level detection in a non-conductive vessel such as concrete or plastic (EMC regulations applicable in some regions).

- Key Applications: liquids, slurries, powders, granules, pressurized applications, hazardous areas

Configuration



Pointek CLS200 installation, dimensions in mm (inch)

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Selection and ordering data

Pointek CLS200 RF Capacitance point level switch, digital, rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	**Article No. 7ML564-0-**	●	●	●	●	●	-	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		**0**	**A**								
1" NPT [(Taper), ASME B1.20.1]		**0**	**B**								
1¼" NPT [(Taper), ASME B1.20.1]		**0**	**C**								
1½" NPT [(Taper), ASME B1.20.1]		**0**	**D**								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**A**								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**B**								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**D**								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**A**								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**B**								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**D**								
Welded flange, 316L stainless steel, raised face											
1" ASME, 150 lb		**5**	**A**								
1" ASME, 300 lb		**5**	**B**								
1" ASME, 600 lb		**5**	**C**								
1½" ASME, 150 lb		**5**	**D**								
1½" ASME, 300 lb		**5**	**E**								
1½" ASME, 600 lb		**5**	**F**								
2" ASME, 150 lb		**5**	**G**								
2" ASME, 300 lb		**5**	**H**								
2" ASME, 600 lb		**5**	**J**								
3" ASME, 150 lb		**5**	**K**								
3" ASME, 300 lb		**5**	**L**								
3" ASME, 600 lb		**5**	**M**								
4" ASME, 150 lb		**5**	**N**								
4" ASME, 300 lb		**5**	**P**								
4" ASME, 600 lb		**5**	**Q**								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		**6**	**A**								
DN 25, PN 40		**6**	**B**								
DN 40, PN 16		**6**	**C**								
DN 40, PN 40		**6**	**D**								
DN 50, PN 16		**6**	**E**								
DN 50, PN 40		**6**	**F**								
DN 80, PN 16		**6**	**G**								
DN 80, PN 40		**6**	**H**								
DN 100, PN 16		**6**	**J**								
DN 100, PN 40 (Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		**6**	**K**								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Compact [threaded 120 mm (4.72 inch), Flanged 98 mm (3.86 inch)]				**A**							
Extended rod, 250 mm (9.84 inch)				**B**							
Extended rod, 350 mm (13.78 inch)				**C**							
Extended rod, 500 mm (19.69 inch)				**D**							
Extended rod, 750 mm (29.53 inch)				**E**							
Extended rod, 1 000 mm (39.37 inch)				**F**							
Extended rod, 1 250 mm (49.21 inch)				**G**							

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, digital, rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	Article No. 7ML564-0-	●	●	●	●	●	-	●	●	●	0
Extended rod, 1 350 mm (53.15 inch)				H							
Extended rod, 1 500 mm (59.06 inch)				J							
Extended rod, 1 750 mm (68.90 inch)				K							
Extended rod, 2 000 mm (78.74 inch)				L							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, 210 ... 1 000 mm (8.27 ... 39.37 inch)				M							
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)				N							
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)				P							
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)				Q							
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)				R							
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)				S							
Thermal isolator											
Without thermal isolator					0						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					1						
Remote mount electronics and mounting bracket											
With 2 m (79 inch) of cable[2)]					2						
With 5 m (197 inch) of cable[2)]					3						
Wetted seals											
FKM						0					
FFKM [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
316L stainless steel with PPS probe body								0			
316L stainless steel with PVDF probe body								1			
Approvals											
Non-Sparking: CE, UKCA, RCM, ATEX II 3 G Ex ec IIC T6 ... T4, ATEX II 2 D IP6x T100°C UKEX II 3 G Ex ec IIC T6 ... T4, UKEX II 2 D IP6x T100°C									B		
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Intrinsically Safe:[1)] CE, UKCA, RCM, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 2 D Ex ia IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 2 D Ex ia IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									D		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb,									E		

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, digital, rod design Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	Article No. 7ML564- ● ● ● ● ● - ● ● ● 0 0-
UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db	
Non-incendive CSA/ FM Class I, II, III Div. 2 Gr. A, B, C, D, F, G T4 or T6	F
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1 Gr. E, F, G T4	G
Intrinsically Safe:[1] CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4 or T6	H
Explosion Proof with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4	J
General Purpose (CSA, FM)	K
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM	L
Enclosure and lid	
Aluminum epoxy coated	
2 x ½" NPT via adapter - cable inlet, IP65	A
2 x M20 x 1.5 cable inlet, IP65	B
2 x ½" NPT via adapter - cable inlet, IP68	C
2 x M20 x 1.5 cable inlet, IP68	D

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.
[2] Available with Approvals options F, G, H, J, and K.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1]	**E24**
INMETRO[2]	**E34**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1] Available only with Approvals options B, C, D and E; specific EAC Ex-marking.
[2] Available only with Approvals options C and E.

Pointek CLS200 RF Capacitance point level switch, digital, cable design Detects level and interface in liquids, solids, slurries, and foam. Cable extension options to 30 m (98.43 ft), adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	Article No. 7ML564- ● ● ● ● ● - ● ● ● 0 1-
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection Threaded, 316L stainless steel	
¾" NPT [(Taper), ASME B1.20.1]	0 A
1" NPT [(Taper), ASME B1.20.1]	0 B
1¼" NPT [(Taper), ASME B1.20.1]	0 C
1½" NPT [(Taper), ASME B1.20.1]	0 D
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 B
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 B
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
Welded flange, 316L stainless steel, raised face	

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, digital, cable design Detects level and interface in liquids, solids, slurries, and foam. Cable extension options to 30 m (98.43 ft), adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	Article No. 7ML564-1-	●	●	●	●	●	-	●	●	●	0
1" ASME, 150 lb		5	A								
1" ASME, 300 lb		5	B								
1" ASME, 600 lb		5	C								
1½" ASME, 150 lb		5	D								
1½" ASME, 300 lb		5	E								
1½" ASME, 600 lb		5	F								
2" ASME, 150 lb		5	G								
2" ASME, 300 lb		5	H								
2" ASME, 600 lb		5	J								
3" ASME, 150 lb		5	K								
3" ASME, 300 lb		5	L								
3" ASME, 600 lb		5	M								
4" ASME, 150 lb		5	N								
4" ASME, 300 lb		5	P								
4" ASME, 600 lb		5	Q								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		6	A								
DN 25, PN 40		6	B								
DN 40, PN 16		6	C								
DN 40, PN 40		6	D								
DN 50, PN 16		6	E								
DN 50, PN 40		6	F								
DN 80, PN 16		6	G								
DN 80, PN 40		6	H								
DN 100, PN 16		6	J								
DN 100, PN 40		6	K								
(Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)											
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Extended cable, 3 000 mm (118.11 inch), length can be determined by customer on assembly				A							
Extended cable, 6 000 mm (236.22 inch), length can be determined by customer on assembly				B							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended cable, 500 ... 5 000 mm (19.69 ... 196.85 inch)				C							
Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch)				D							
Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)				E							
Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.40 inch)				F							
Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)				G							
Extended cable, 25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)				H							
Thermal isolator											
Without thermal isolator					0						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					1						
Remote mount electronics and mounting bracket											
With 2 m (79 inch) of cable[2)]					2						
With 5 m (197 inch) of cable[2)]					3						
Wetted seals											
FKM and PTFE						0					
FFKM and PTFE [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
FEP jacketed cable with PPS probe body								0			

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, digital, cable design Detects level and interface in liquids, solids, slurries, and foam. Cable extension options to 30 m (98.43 ft), adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	Article No. 7ML564-1-	●	●	●	●	●	-	●	●	●	0
FEP jacketed cable with PVDF probe body								1			
Approvals											
Non-Sparking: CE, UKCA, RCM, ATEX II 3 G Ex ec IIC T6 ... T4, ATEX II 2 D IP6x T100°C UKEX II 3 G Ex ec IIC T6 ... T4, UKEX II 2 D IP6x T100°C									B		
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Intrinsically Safe:[1] CE, UKCA, RCM, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 2 D Ex ia IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 2 D Ex ia IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									D		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									E		
Non-incendive CSA/ FM Class I, II, III Div. 2 Gr. A, B, C, D, F, G T4 or T6									F		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1 Gr. E, F, G T4									G		
Intrinsically Safe:[1] CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4 or T6									H		
Explosion Proof with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4									J		
General Purpose (CSA, FM)									K		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									L		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.

[2] Available with Approvals options F, G, H, J, and K.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1)]	**E24**
INMETRO[2)]	**E34**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1)] Available only with Approvals options B, C, D and E; specific EAC Ex-marking.

[2)] Available only with Approvals options C and E.

Pointek CLS200 RF Capacitance point level switch, digital, sanitary rod design. Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	**Article No. 7ML564-2-**	●	●	●	●	●	-	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection											
Sanitary 316L stainless steel											
1" sanitary fitting clamp		**8**	**A**								
1½" sanitary fitting clamp		**8**	**B**								
2" sanitary fitting clamp		**8**	**C**								
2½" sanitary fitting clamp		**8**	**D**								
3" sanitary fitting clamp (Note: Sanitary connection dimensionally corresponds to the applicable ISO 2852 standard.)		**8**	**E**								
Probe length											
(length from process connection face)											
Note: No Y01 needed in Order code for standard lengths											
Compact, 98 mm (3.86 inch)				**A**							
Extended rod, 250 mm (9.84 inch)				**B**							
Extended rod, 350 mm (13.78 inch)				**C**							
Extended rod, 500 mm (19.69 inch)				**D**							
Extended rod, 750 mm (29.53 inch)				**E**							
Extended rod, 1 000 mm (39.37 inch)				**F**							
Extended rod, 1 250 mm (49.21 inch)				**G**							
Extended rod, 1 350 mm (53.15 inch)				**H**							
Extended rod, 1 500 mm (59.06 inch)				**J**							
Extended rod, 1 750 mm (68.90 inch)				**K**							
Extended rod, 2 000 mm (78.74 inch)				**L**							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, 110 ... 350 mm (4.3 ... 13.78 inch)				**M**							
Extended rod, 351 ... 1 000 mm (13.82 ... 39.37 inch)				**N**							
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)				**P**							
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)				**Q**							
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)				**R**							
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)				**S**							
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)				**T**							
Thermal isolator											
Without thermal isolator					**0**						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					**1**						
Remote mount electronics and mounting bracket											
With 2 m (79 inch) of cable[2)]					**2**						
With 5 m (197 inch) of cable[2)]					**3**						
Wetted seals											
FKM						**0**					

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, digital, sanitary rod design. Detects level and interface in liquids, solids, slurries, and foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	**Article No. 7ML564-2-**	●	●	●	●	●	-	●	●	●	0
FFKM [for process temperatures above -20 °C (-4 °F)]						**1**					
Probe material											
316L stainless steel with PPS probe body								**0**			
316L stainless steel with PVDF probe body								**1**			
Approvals											
Non-Sparking: CE, UKCA, RCM, ATEX II 3 G Ex ec IIC T6 ... T4, ATEX II 2 D IP6x T100°C UKEX II 3 G Ex ec IIC T6 ... T4, UKEX II 2 D IP6x T100°C									**B**		
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									**C**		
Intrinsically Safe:[1] CE, UKCA, RCM, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 2 D Ex ia IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 2 D Ex ia IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									**D**		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									**E**		
Non-incendive CSA/ FM Class I, II, III Div. 2 Gr. A, B, C, D, F, G T4 or T6									**F**		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1 Gr. E, F, G T4									**G**		
Intrinsically Safe:[1] CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4 or T6									**H**		
Explosion Proof with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4									**J**		
General Purpose (CSA, FM)									**K**		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									**L**		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										**A**	
2 x M20 x 1.5 cable inlet, IP65										**B**	
2 x ½" NPT via adapter - cable inlet, IP68										**C**	
2 x M20 x 1.5 cable inlet, IP68										**D**	

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.

[2] Available with Approvals options F, G, H, J, and K.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1)]	**E24**
INMETRO[2)]	**E34**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1)] Available only with Approvals options B, C, D and E; specific EAC Ex-marking.

[2)] Available only with Approvals options C and E.

Pointek CLS200 RF Capacitance point level switch, digital, sliding coupling design. Detects level and interface in liquids, solids, slurries, and, foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	**Article No. 7ML564-3-**	●	●	●	●	●	-	●	●	●	0
Process connection Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		**0**	**A**								
1" NPT [(Taper), ASME B1.20.1]		**0**	**B**								
1¼" NPT [(Taper), ASME B1.20.1]		**0**	**C**								
1½" NPT [(Taper), ASME B1.20.1]		**0**	**D**								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**A**								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**B**								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**D**								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**A**								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**B**								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**D**								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Extended rod, 350 mm (13.78 inch)				**C**							
Extended rod, 500 mm (19.69 inch)				**D**							
Extended rod, 750 mm (29.53 inch)				**E**							
Extended rod, 1 000 mm (39.37 inch)				**F**							
Extended rod, 1 250 mm (49.21 inch)				**G**							
Extended rod, 1 350 mm (53.15 inch)				**H**							
Extended rod, 1 500 mm (59.06 inch)				**J**							
Extended rod, 1 750 mm (68.90 inch)				**K**							
Extended rod, 2 000 mm (78.74 inch)				**L**							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, 350 ... 1 000 mm (13.82 ... 39.37 inch)				**M**							
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)				**N**							
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)				**P**							
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)				**Q**							
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)				**R**							
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)				**S**							
Thermal isolator											
Without thermal isolator					**0**						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					**1**						
Remote mount electronics and mounting bracket											
With 2 m (79 inch) of cable[2)]					**2**						
With 5 m (197 inch) of cable[2)]					**3**						

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Selection and ordering data (continued)

Pointek CLS200 RF Capacitance point level switch, digital, sliding coupling design. Detects level and interface in liquids, solids, slurries, and, foam. Adjustable, 5.5 m (18.04 ft), insertion, adaptable sensitivity, with the ability to tune out build-up on probe. With display and digital communications.	Article No. 7ML564-3-	●	●	●	●	●	-	●	●	●	0
Wetted seals											
FKM and PTFE						0					
FFKM and PTFE [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
316L stainless steel with PPS probe body								0			
316L stainless steel with PVDF probe body								1			
Approvals											
Non-Sparking: CE, UKCA, RCM, ATEX II 3 G Ex ec IIC T6 ... T4, ATEX II 2 D IP6x T100°C UKEX II 3 G Ex ec IIC T6 ... T4, UKEX II 2 D IP6x T100°C									B		
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Intrinsically Safe:[1)] CE, UKCA, RCM, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 2 D Ex ia IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 2 D Ex ia IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db									D		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, ATEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da , ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb, UKEX II 2(1) D Ex ia tb [ia Da] IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da , UKEX II 1/2 D Ex ia IIIC TX Da/Db									E		
Non-incendive CSA/ FM Class I, II, III Div. 2 Gr. A, B, C, D, F, G T4 or T6									F		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1 Gr. E, F, G T4									G		
Intrinsically Safe:[1)] CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4 or T6									H		
Explosion Proof with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4									J		
General Purpose (CSA, FM)									K		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									L		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	

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Selection and ordering data (continued)

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.
[2] Available with Approvals options F, G, H, J, and K.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1]	**E24**
INMETRO[2]	**E34**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	**See accessories shown following CLS200 Digital selection and ordering data.**

[1] Available only with Approvals options B, C, D and E; specific EAC Ex-marking.
[2] Available only with Approvals options C and E.

Selection and Ordering data	Article No.
Accessories	
SensGuard, ¾" NPT (PPS). Only available for CLS200 with ¾" NPT thread.	**7ML1830-1DL**
SensGuard, R 1" (BSPT) (PPS). Only available for CLS200 with ¾" NPT thread.	**7ML1830-1DM**
One metallic cable gland M20 x 1.5, -40 ... +80 °C (-40 ... +176 °F), Dust Ignition Proof, with integrated shield connection (available for PROFIBUS PA)	**7ML1930-1AQ**
General Purpose	
½" NPT General Purpose Cable Entry IP68/IP69K NEMA 6, -40 ... +80 °C (-40 ... +176 °F), Dust Ignition Proof, cable size 6 ... 12 mm (0.236 ... 0.472 inch)	**7ML1830-1JA**
M20 x 1.5 General Purpose Cable Entry IP68/IP69K NEMA 6, -40 ... +80 °C (-40 ... +176 °F), Dust Ignition Proof, cable size 7 ... 12 mm (0.275 ... 0.472 inch)	**7ML1830-1JC**
Hazardous Locations	
1/2" NPT EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX and UKEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	**7ML1830-1JB**
M20 EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX and UKEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22 and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	**7ML1830-1JD**
Blind threaded flanges are available. Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.	
Pointek Specials	**See Pointek Specials following the CLS300 Digital selection and ordering data.**

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Technical specifications

Pointek CLS200 - Digital	
Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal	
• Solid-state output	
- Output	Galvanically isolated
- Protection	Against reversed polarity (bipolar)
- Max. switching voltage	• 30 V (DC) • 30 V peak (AC)
- Max. load current	82 mA
- Voltage drop	< 1 V, typical at 50 mA
- Time delay (ON and/or OFF)	Programmable by user (0 ... 100 s)
• Fail-safe mode	Min. or max.
• Connection	Removable terminal block
Rated operating conditions[1]	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)[2]
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
• Installation category	II
• Pollution degree	4
Medium conditions	Liquids, bulk solids, slurries, and interfaces
• Relative dielectric constant ϵ_r	Min. 1.5
• Process temperature	
- Without thermal isolator	-40 ... +85 °C (-40 ... +185 °F)[2]
- With thermal isolator	-40 ... +125 °C (-40 ... +257 °F)
• Process pressure (rod version)	-1 ... +25 bar g (-14.6 ... +365 psi g) (nominal)
• Process pressure (cable version)[3]	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)
• Process pressure (sliding coupling version)	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)
Design	
Material	
• Enclosure	Epoxy-coated aluminum with gasket
• Optional thermal isolator	316L stainless steel
Connection	Removable terminal block, max. 2.5 mm²
Degree of protection	IP65/Type 4/NEMA 4 (optional IP68)
Cable inlet	2 x M20 x 1.5 thread (option: 2 x ½" NPT conduit entry including 1 plugged entry)
Electromagnetic compatibility	To comply with CE EMC regulations (where applicable); the CLS200 should be installed per the instruction manual.
Power supply	
Bus voltage	Standard: 12 ... 30 V DC Intrinsically Safe: 12 ... 24 V DC
Current consumption	12.5 mA
Certificates and approvals	
General Purpose	CSA, FM, CE, UKCA, RCM
Dust Ignition Proof	ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, ATEX III 2(1) D Ex ia tb [ia Da] IIIC TX Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX III 2(1) D Ex ia tb [ia Da] IIIC TX Db
Dust Ignition Proof with IS Probe	CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Flameproof Enclosure with IS Probe	ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 2(1) G Ex db ia [ia Ga] IIC TX Gb

Pointek CLS200 - Digital	
Explosion Proof with IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Intrinsically Safe[4]	ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 2 D Ex ia IIIC TX Db, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1 D Ex ia IIIC TX Da, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 2 D Ex ia IIIC TX Db, UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1 D Ex ia IIIC TX Da, UKEX II 1/2 D Ex ia IIIC TX Da/Db
Non-incendive	CSA/FM Class I, Div. 2, Groups A, B, C, D CSA/FM Class II, Div. 2, Groups F, G CSA/FM Class III T4 or T6
Non-Sparking	ATEX II 3 G Ex ec IIC T6 ... T4 ATEX II 2 D IP6X T100 °C UKEX II 3 G Ex ec IIC T6 ... T4 UKEX II 2 D IP6x T100°C
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, and ENV5
Others	Pattern Approval (China)
Communication	PROFIBUS PA (IEC 61158 CPF3 CP3/2) Bus physical layer: IEC 61158-2 MBP (IS) Device profile: PROFIBUS PA profile for Process Control Devices Version 3.0, Class B FISCO field device

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also CLS200 pressure/temperature curves.
2) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)
3) Pressure rating of process seal is temperature dependent. See also CLS200 pressure/temperature curves.
4 Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

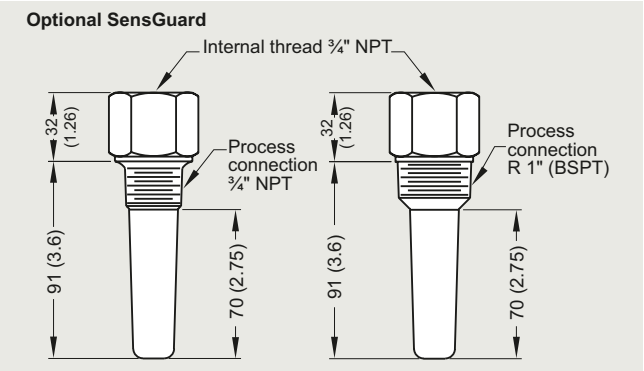
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Technical specifications (continued)

Design: Probe	Rod version	Sanitary version	Cable version	Sliding Coupling version
Max. length	5 500 mm (216.53 inch)	5 500 mm (216.53 inch)	• 30 000 mm (1 181.1 inch) liquids and slurries • 5 000 mm (196.85 inch) solids (under loads)	5 500 mm (216.53 inch)
Process connection	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steel ASME/EN flange	1½", 2" sanitary fitting clamp 316L stainless steel	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steel ASME/EN flange	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
Extension material	316L stainless steel optional PFA coated[1)]	316L stainless steel	Fluoroethylene propylene (FEP) cable with stainless steel core	316L stainless steel
Sensor wetted parts	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)
O-ring seal material	FKM (optional FFKM)[2)]	FKM (optional FFKM)[2)]	FKM (optional FFKM)[2)]	FKM (optional FFKM)[2)]
Thermal isolator[3)]	Optional	Optional	Optional	Optional
Extension	User selected length	User selected length	Cable extension	User selected length

1) PFA coating (7ML5634 and 7ML5644) has 120 micron thickness
2) For caustic materials, consult a local sales person for alternative O-rings. For more information, please visit http://www.automation.siemens.com/aspa_app.
3) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F).

Options

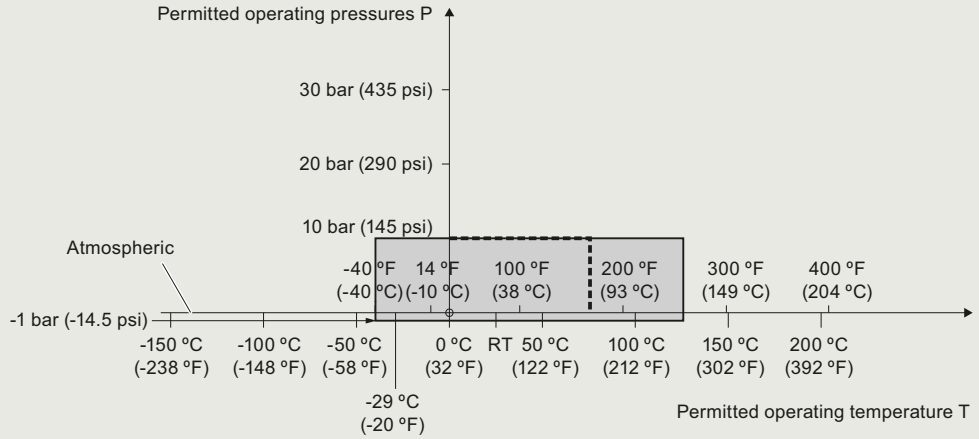


Optional SensGuard, dimensions in mm (inch)

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Characteristic curves

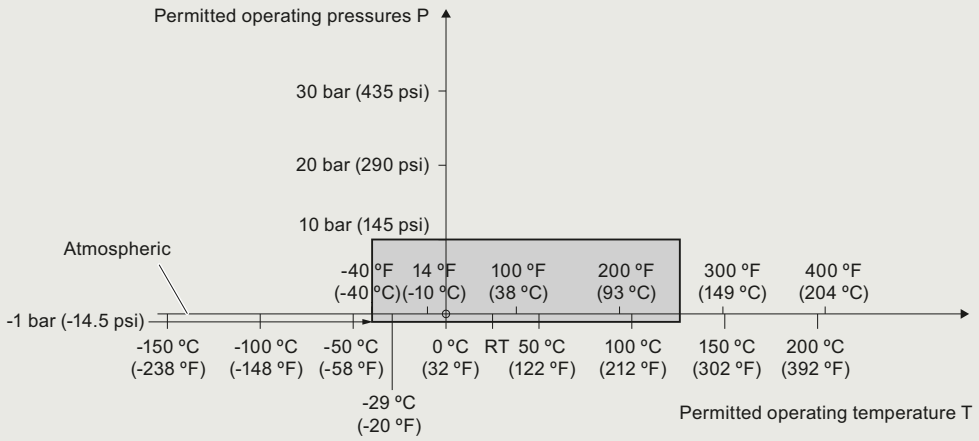
**Pressure/temperature curve
CLS200 sliding coupling
threaded process connections
(7ML5633 and 7ML5643)**



---- Example:
Permitted operating pressure = 10 bar (145 psi) at 75 °C

Pointek CLS200 process pressure/temperature derating curves (7ML5633 and 7ML5643)

**Pressure/temperature curve
CLS200 cable
Threaded process connections
(7ML5631 and 7ML5641)**

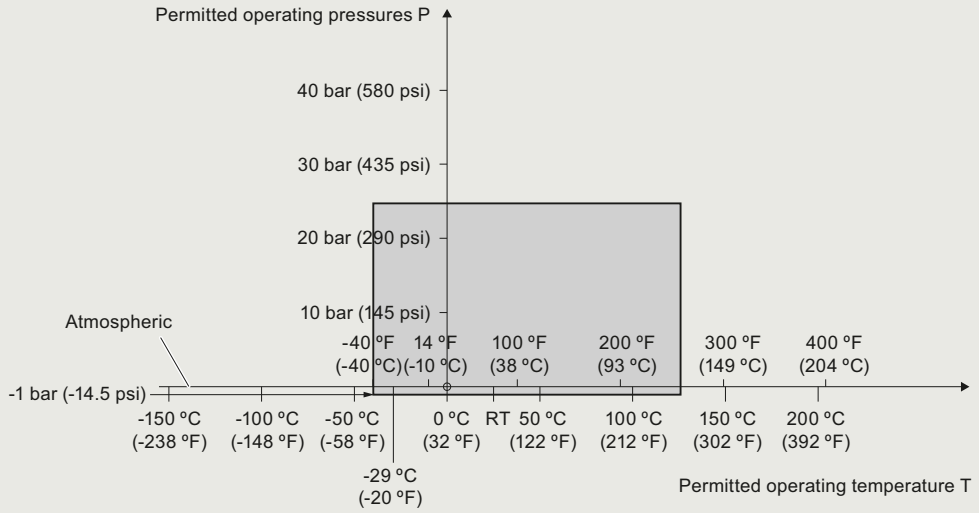


Pointek CLS200 process pressure/temperature derating curves (7ML5631 and 7ML5641)

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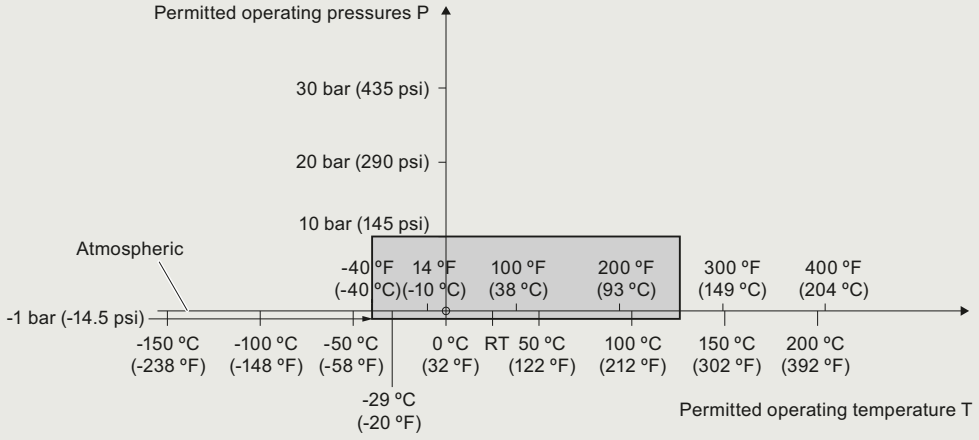
Characteristic curves (continued)

Pressure/temperature curve
CLS200 compact and extended rod
Threaded process connections
(7ML5630 and 7ML5640)



Pointek CLS200 process pressure/temperature derating curves (7ML5630 or 7ML5640)

Pressure/temperature curve
CLS200 compact and extended sanitary type
Sanitary process connections
(7ML5632 and 7ML5642)

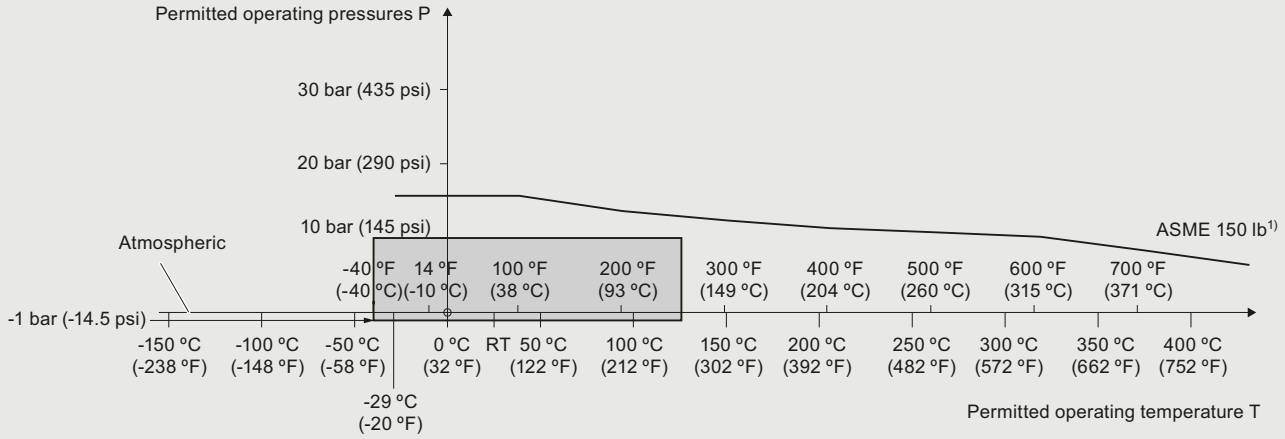


Pointek CLS200 process pressure/temperature derating curves (7ML5632 and 7ML5642)

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Characteristic curves (continued)

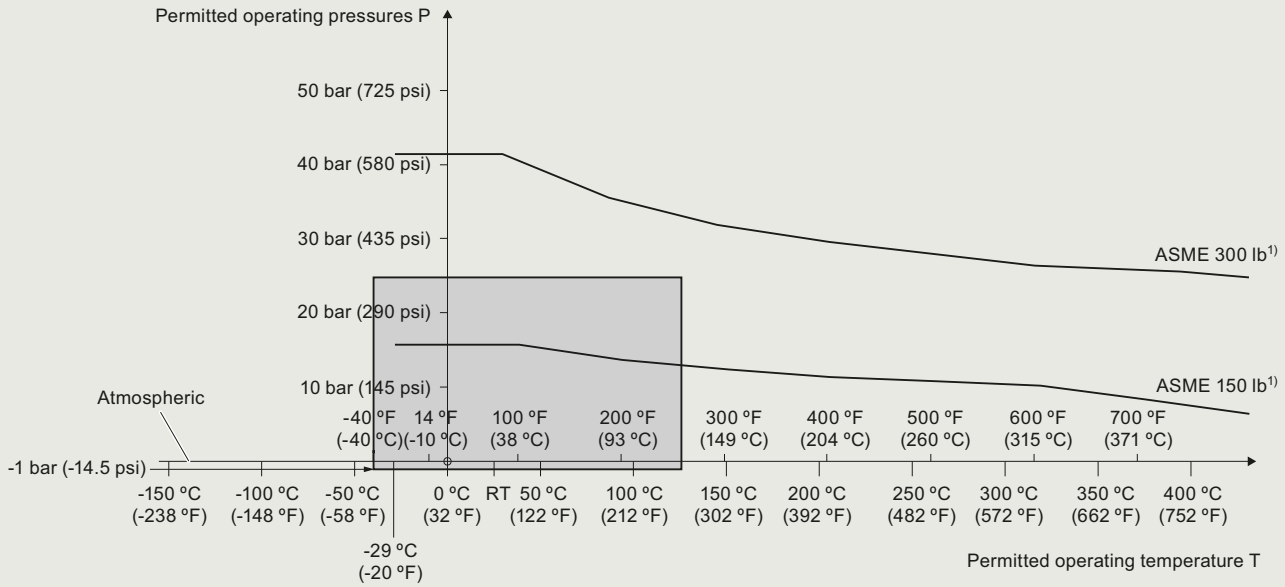
Pressure/temperature curve
CLS200, cable
ASME flanged process connections
(7ML5631 and 7ML5641)



1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5631 and 7ML5641)

Pressure/temperature curve
CLS200 compact and extended rod
ASME flanged process connections
(7ML5630 and 7ML5640)



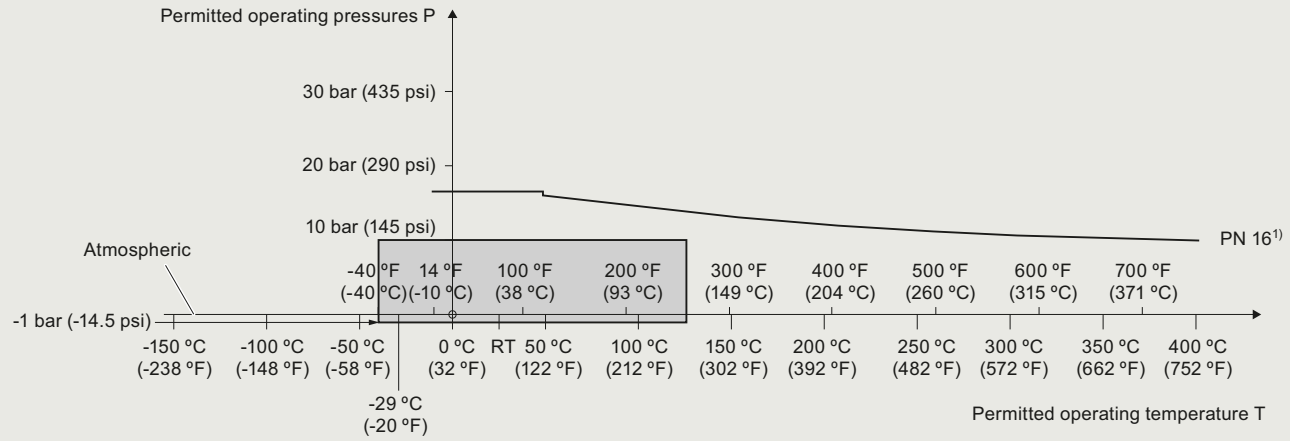
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5630 and 7ML5640)

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Characteristic curves (continued)

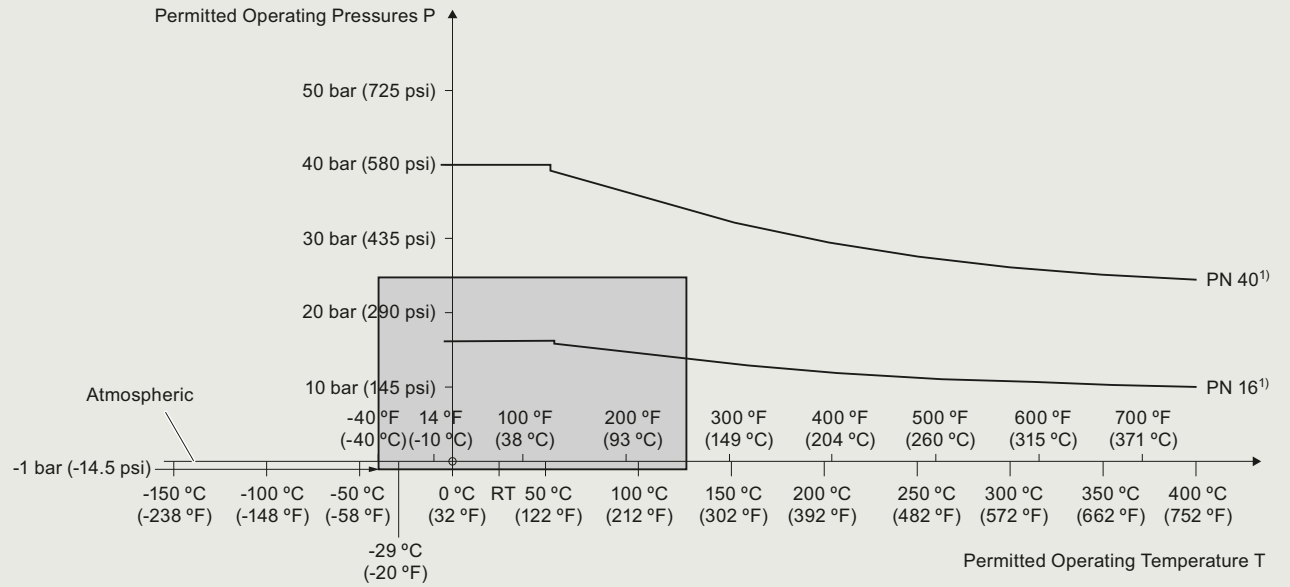
Pressure/temperature curve
CLS200 cable
EN flanged process connections
(7ML5631 and 7ML5641)



[1)] The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5631 and 7ML5641)

Pressure/Temperature Curve
CLS200 Compact and Extended Rod
EN Flanged Process Connections
(7ML5630 and 7ML5640)



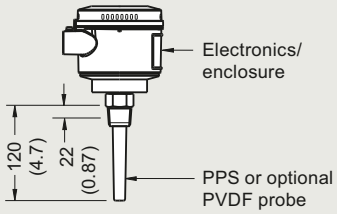
[1)] The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 process pressure/temperature derating curves (7ML5630 and 7ML5640)

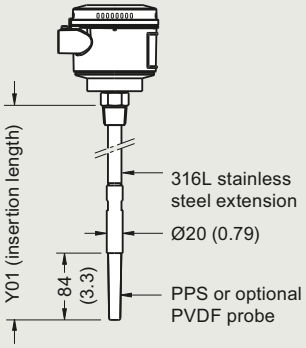
© Siemens AG 2026

Dimensional drawings

Compact version
Threaded
(7ML5630 and 7ML5640)

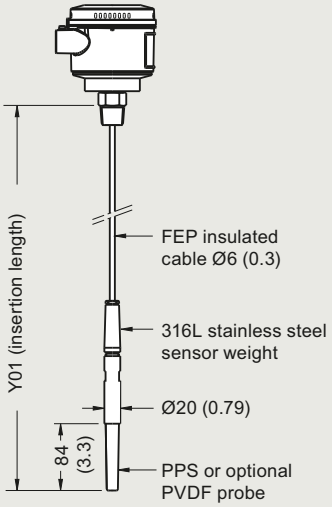


Extended rod version
Threaded
(7ML5630 and 7ML5640)



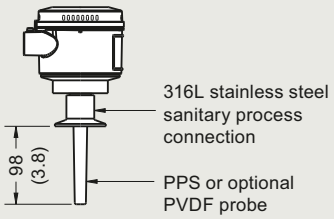
Min. insertion length = 200 (7.87)
Max. insertion length = 5 500 (216)

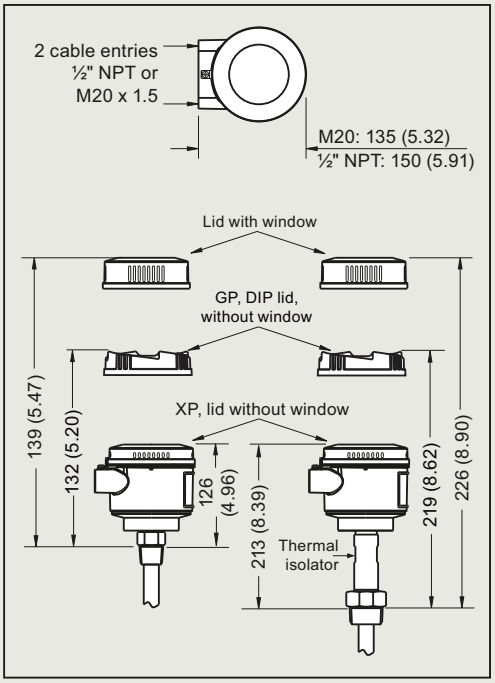
Extended cable version
Threaded
(7ML5631 and 7ML5641)



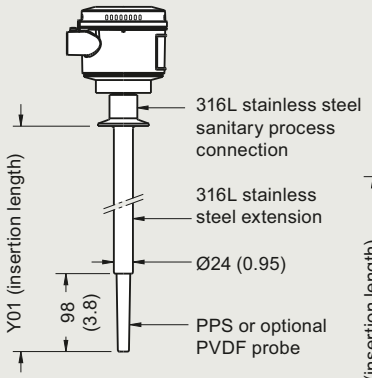
Min. insertion length = 500 (19.69)
Max. insertion length = 30 000 (1 181)
Applicable for liquids and solids applications. Cable can be shortened on site.

Sanitary compact version
Sanitary fitting
(7ML5632 and 7ML5642)



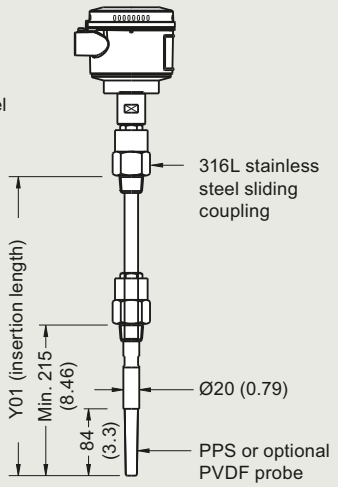


Sanitary extended version
Sanitary fitting
(7ML5632 and 7ML5642)



Min. insertion length = 110 (4.3)
Max. insertion length = 5 500 (216)

Sliding coupling version
Threaded
(7ML5633 and 7ML5643)



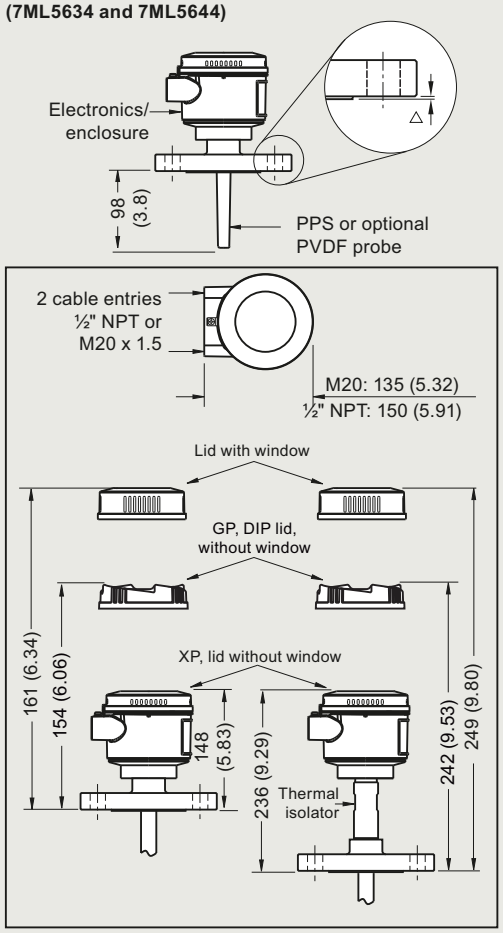
Min. insertion length = 350 (13.82)
Max. insertion length = 5 500 (216)

Pointek CLS200 threaded/sanitary process connections, dimensions in mm (inch)

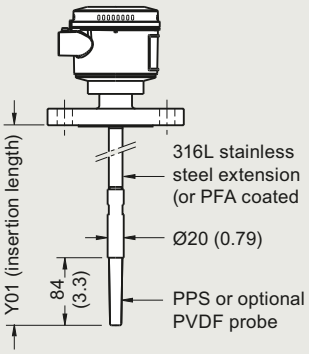
© Siemens AG 2026

Dimensional drawings (continued)

Compact version
Welded Flange (7ML5630 and 7ML5640)
Welded Flange, PFA coated
(7ML5634 and 7ML5644)

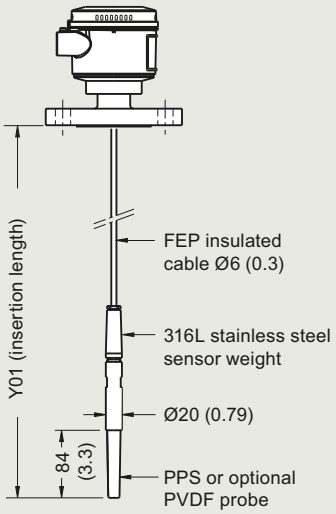


Extended rod version
Welded Flange (7ML5630 and 7ML5640)
Welded Flange, PFA coated
(7ML5634 and 7ML5644)



Min. insertion length = 200 (7.87)
Max. insertion length = 5 500 (216)

Extended cable version
Welded Flange
(7ML5631 and 7ML5641)



Min. insertion length = 500 (19.69)
Max. insertion length = 30 000 (1 181)
Applicable for liquids and solids applications. Cable can be shortened on site.

Flange Facing (raised face)	
Flange Class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

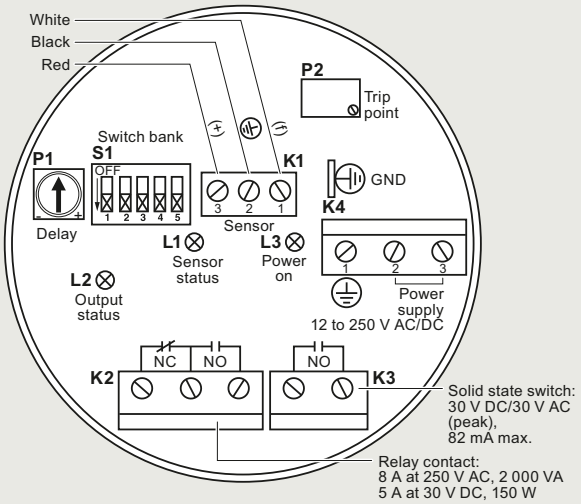
Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

Pointek CLS200 flanged process connections, dimensions in mm (inch)

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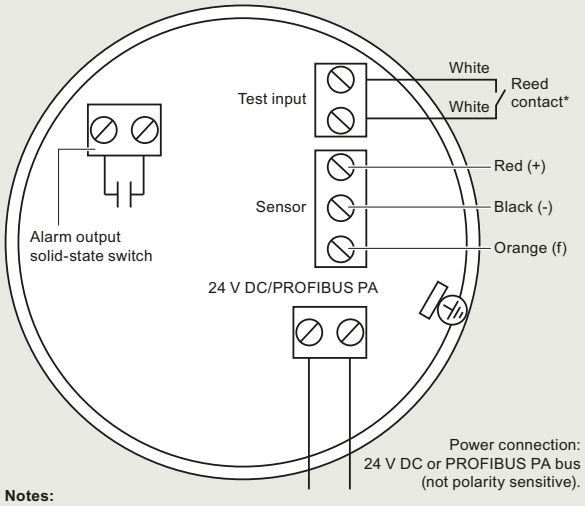
Circuit diagrams

Wiring: Pointek CLS200 standard



Notes:
- Identification label is on underside of lid. Switch and potentiometer settings are for illustration purposes only (refer to operation/setup in manual).
- All field wiring must have insulation suitable for at least 250 V.
- Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
- Maximum working voltage between adjacent relay contacts shall be 250 V.
- Refer to the Instruction Manual or contact Siemens representative for detailed wiring information.

Wiring: Pointek CLS200 Digital



Notes:
Refer to the instruction manual or contact a Siemens representative for detailed wiring information.

***Magnet activated sensor Test**
A magnet can be used to test the sensor without opening the lid of the Pointek CLS200 Digital version. Bring the magnet close to the test area indicated on the enclosure. The sensor test starts and finishes automatically after 10 seconds.



Pointek CLS200 connections

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Overview



Pointek CLS300 (standard version) is an inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out buildup on the probe.

Benefits

- Active-Shield technology so measurement is unaffected by material buildup or nozzle interference in active shield section
- Performs in extremely abrasive conditions because of solid rod construction
- Three LED indicators for adjustment control, output status, and power
- High-temperature version up to 400 °C (752 °F)

Application

Pointek CLS300 standard version has three LED indicators with basic relay and solid-state switch alarms.

The robust design of CLS300 makes it specifically applicable for heavy solids applications where abrasive materials occur as in the mining industry. The fully potted electronics are unaffected by condensation, dust or vibration.

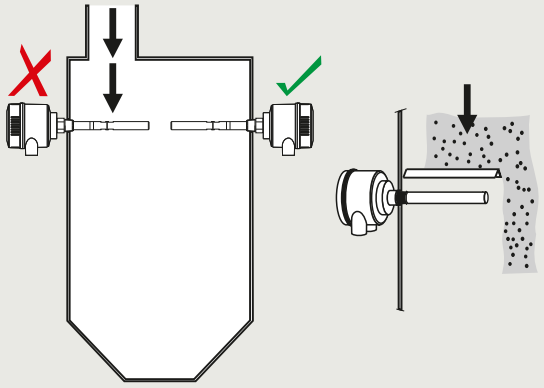
Wetted parts are made of stainless steel with a PFA shield for high chemical resistance, and of ceramic and stainless steel for high temperature version. Materials with low or high dielectric constants can be accurately detected. The unique Active Shield suppresses interference from material buildup or long installation nozzles.

The unique modular design of the Pointek CLS300 provides a wide range of configurations, process connections, extensions and approvals to meet the temperature and pressure requirements of specific applications. The modular design makes ordering easier and reduces stocking requirements. A wide range of probe configurations are available, including rod and cable versions.

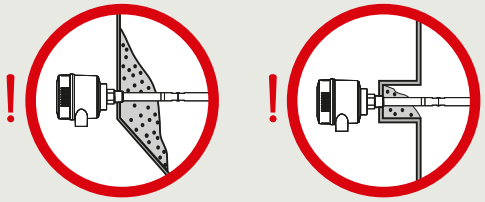
- Key Applications: liquids, slurries, bulk solids, relatively high pressure and temperature, hazardous areas, milling and mining applications

Configuration

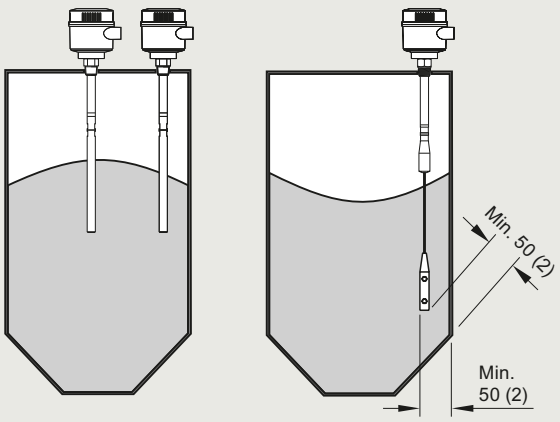
Installation



Keep unit out of path of falling material, or protect probe from falling material.



Build up of material in active shield area does not affect switch operation.



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

Pointek CLS300 installation, dimensions in mm (inch)

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Selection and ordering data

Pointek CLS300 RF Capacitance point level switch, rod design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, with active shield to tune out build-up on probe.	Article No. 7ML5650-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection											
Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		**0**	**A**								
1" NPT [(Taper), ASME B1.20.1]		**0**	**B**								
1¼" NPT [(Taper), ASME B1.20.1]		**0**	**C**								
1½" NPT [(Taper), ASME B1.20.1]		**0**	**D**								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**A**								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**B**								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**D**								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**A**								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**B**								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**D**								
Welded flange, 316L stainless steel, raised face											
1" ASME, 150 lb		**5**	**A**								
1" ASME, 300 lb		**5**	**B**								
1" ASME, 600 lb		**5**	**C**								
1½" ASME, 150 lb		**5**	**D**								
1½" ASME, 300 lb		**5**	**E**								
1½" ASME, 600 lb		**5**	**F**								
2" ASME, 150 lb		**5**	**G**								
2" ASME, 300 lb		**5**	**H**								
2" ASME, 600 lb		**5**	**J**								
3" ASME, 150 lb		**5**	**K**								
3" ASME, 300 lb		**5**	**L**								
3" ASME, 600 lb		**5**	**M**								
4" ASME, 150 lb		**5**	**N**								
4" ASME, 300 lb		**5**	**P**								
4" ASME, 600 lb		**5**	**Q**								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		**6**	**A**								
DN 25, PN 40		**6**	**B**								
DN 40, PN 16		**6**	**C**								
DN 40, PN 40		**6**	**D**								
DN 50, PN 16		**6**	**E**								
DN 50, PN 40		**6**	**F**								
DN 80, PN 16		**6**	**G**								
DN 80, PN 40		**6**	**H**								
DN 100, PN 16		**6**	**J**								
DN 100, PN 40 (Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		**6**	**K**								
Probe length											
(length from flange face) (threaded lengths include process thread)											
Note: No Y01 needed in Order code for standard lengths											
Standard version, rod 350 mm (13.78 inch)				**A**							
Extended rod, length 500 mm (19.69 inch)				**B**							
Extended rod, length 750 mm (29.53 inch)				**C**							
Extended rod, length 1 000 mm (39.37 inch)				**D**							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch)				**E**							
Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch)				**F**							
Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)				**G**							

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, rod design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, with active shield to tune out build-up on probe.	Article No. 7ML5650- ● ● ● ● ● - ● ● ● ●
Thermal isolator	
Without thermal isolator	**0**
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	**1**
Wetted seals	
FKM	**0**
FFKM [for process temperatures above -20 °C (-4 °F)]	**1**
Probe material	
316L stainless steel with PFA lining and PEEK isolators	**0**
Approvals	
Dust Ignition Proof with IS Probe: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db	**C**
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db	**D**
Flameproof Enclosure with IS Probe, with Overfill Protection: CE, UKCA, RCM, WHG, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db	**E**
Dust Ignition Proof with IS Probe: CSA/ FM Class II, III Div. 1 Gr .E, F, G T4	**F**
Explosion Proof Enclosure with IS Probe: CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4	**G**
General Purpose CSA, FM	**H**
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM	**J**
Ordinary Locations/General Purpose (Non-Ex) with Overfill Protection: CSA, FM, CE, UKCA, RCM, WHG	**K**
Enclosure and lid	
Aluminum epoxy coated	
2 x ½" NPT via adapter - cable inlet, IP65	**A**
2 x M20 x 1.5 cable inlet, IP65	**B**
2 x ½" NPT via adapter - cable inlet, IP68	**C**
2 x M20 x 1.5 cable inlet, IP68	**D**
Active shield length	
Standard length - (125 mm threaded, 105 mm flanged)	**0**
Extended shield - (250 mm threaded, 230 mm flanged)[1]	**1**
Extended shield - (400 mm threaded, 380 mm flanged)[2]	**2**

[1] Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)].
[2] Available with Probe version options C, D, and G only [≥ 750 mm (29.53 inch)].

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material Inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1]	**E24**

Selection and Ordering data	Order code
INMETRO[2]	**E34**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	**See accessories following CLS300 Digital selection and ordering data.**

[1] Available only with Approvals options C, D and E; specific EAC Ex-marking.
[2] Available only with Approvals options C, D, E.

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, cable design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Cable extension options to 25 m (82.02 ft), adaptable sensitivity, with active shield to tune out build-up on probe.	Article No. 7ML565-1-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection											
Threaded, 316L stainless steel											
1¼" NPT [(Taper), ASME B1.20.1]		0	C								
1½" NPT [(Taper), ASME B1.20.1]		0	D								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	D								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	D								
Welded flange, 316L stainless steel, raised face											
1½" ASME, 150 lb		5	D								
1½" ASME, 300 lb		5	E								
1½" ASME, 600 lb		5	F								
2" ASME, 150 lb		5	G								
2" ASME, 300 lb		5	H								
2" ASME, 600 lb		5	J								
3" ASME, 150 lb		5	K								
3" ASME, 300 lb		5	L								
3" ASME, 600 lb		5	M								
4" ASME, 150 lb		5	N								
4" ASME, 300 lb		5	P								
4" ASME, 600 lb		5	Q								
Welded flange, 316L stainless steel, Type A flat faced											
DN 40, PN 16		6	C								
DN 40, PN 40		6	D								
DN 50, PN 16		6	E								
DN 50, PN 40		6	F								
DN 80, PN 16		6	G								
DN 80, PN 40		6	H								
DN 100, PN 16		6	J								
DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		6	K								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Extended cable, 3 000 mm (118.11 inch), length can be shortened by customer				A							
Extended cable, 6 000 mm (236.22 inch), length can be shortened by customer				B							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended cable, 500 ... 1 000 mm (19.69 ... 39.37 inch)[2)]				E							
Extended cable, 1 001 ... 5 000 mm (39.41 ... 196.85 inch)				F							
Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch)				G							
Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)				H							
Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.40 inch)				J							
Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)				K							
Thermal isolator											
Without thermal isolator					0						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					1						
Wetted seals											
FKM						0					
FFKM [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
Bare 316L stainless steel cable, PEEK isolators and 316L stainless steel cable weight								0			
PFA coated cable, PEEK isolators and 316L stainless steel cable weight								1			

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, cable design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Cable extension options to 25 m (82.02 ft), adaptable sensitivity, with active shield to tune out build-up on probe.	Article No. 7ML565- 1-	●	●	●	●	●	-	●	●	●	●
Approvals											
Dust Ignition Proof with IS Probe: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									**C**		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									**D**		
Flameproof Enclosure with IS Probe, with Overfill Protection: CE, UKCA, RCM, WHG, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									**E**		
Dust Ignition Proof with IS Probe: CSA/ FM Class II, III Div. 1 Gr .E, F, G T4									**F**		
Explosion Proof Enclosure with IS Probe: CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4									**G**		
General Purpose CSA, FM									**H**		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM									**J**		
Ordinary Locations/General Purpose (Non-Ex) with Overfill Protection: CSA, FM, CE, UKCA, RCM, WHG									**K**		
Enclosure and lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										**A**	
2 x M20 x 1.5 cable inlet, IP65										**B**	
2 x ½" NPT via adapter - cable inlet, IP68										**C**	
2 x M20 x 1.5 cable inlet, IP68										**D**	
Active shield length											
Standard length - (125 mm threaded, 105 mm flanged)											**0**
Extended shield - (250 mm threaded, 230 mm flanged)[1]											**1**
Extended shield - (400 mm threaded, 380 mm flanged)[1]											**2**

[1] Available with Probe version options A, B, F ... K, only [≥ 1 000 mm (39.7 inch)].
[2] Not available with Active shield option 1.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material Inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1]	**E24**
INMETRO[2]	**E34**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	

Selection and Ordering data	Order code
Accessories	**See accessories following CLS300 Digital selection and ordering data.**

[1] Available only with Approvals options C, D and E; specific EAC Ex-marking.
[2] Available only with Approvals options C, D, E.

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, high temperature design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, with active shield to tune out build-up on probe.	Article No. 7ML565-2-	●	●	●	0	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		0	A								
1" NPT [(Taper), ASME B1.20.1]		0	B								
1¼" NPT [(Taper), ASME B1.20.1]		0	C								
1½" NPT [(Taper), ASME B1.20.1]		0	D								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	A								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	B								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	D								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	A								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	B								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	D								
Welded flange, 316L stainless steel, raised face											
1" ASME, 150 lb		5	A								
1" ASME, 300 lb		5	B								
1" ASME, 600 lb		5	C								
1½" ASME, 150 lb		5	D								
1½" ASME, 300 lb		5	E								
1½" ASME, 600 lb		5	F								
2" ASME, 150 lb		5	G								
2" ASME, 300 lb		5	H								
2" ASME, 600 lb		5	J								
3" ASME, 150 lb		5	K								
3" ASME, 300 lb		5	L								
3" ASME, 600 lb		5	M								
4" ASME, 150 lb		5	N								
4" ASME, 300 lb		5	P								
4" ASME, 600 lb		5	Q								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		6	A								
DN 25, PN 40		6	B								
DN 40, PN 16		6	C								
DN 40, PN 40		6	D								
DN 50, PN 16		6	E								
DN 50, PN 40		6	F								
DN 80, PN 16		6	G								
DN 80, PN 40		6	H								
DN 100, PN 16		6	J								
DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		6	K								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Standard version rod, 350 mm (13.78 inch)				A							
Extended rod, length 500 mm (19.69 inch)				B							
Extended rod, length 750 mm (29.53 inch)				C							
Extended rod, length 1 000 mm (39.37 inch)				D							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch)				E							
Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch)				F							

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, high temperature design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, with active shield to tune out build-up on probe.	Article No. 7ML565-2- ●	●	●	0	●	-	●	●	●	●
Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)			G							
Wetted seals										
Graphite					0					
Probe material										
316L stainless steel with ceramic (ZrO_2) isolators							0			
Approvals										
Dust Ignition Proof with IS Probe: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db								C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db								D		
Flameproof Enclosure with IS Probe, with Overfill Protection: CE, UKCA, RCM, WHG, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db								E		
Dust Ignition Proof with IS Probe: CSA/ FM Class II, III Div. 1 Gr .E, F, G T4								F		
Explosion Proof Enclosure with IS Probe: CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4								G		
General Purpose CSA, FM								H		
Ordinary Locations/General Purpose (Non-Ex): CE, UKCA, RCM								J		
Ordinary Locations/General Purpose (Non-Ex) with Overfill Protection: CSA, FM, CE, UKCA, RCM, WHG								K		
Enclosure and lid										
Aluminum epoxy coated										
2 x ½" NPT via adapter - cable inlet, IP65									A	
2 x M20 x 1.5 cable inlet, IP65									B	
2 x ½" NPT via adapter - cable inlet, IP68									C	
2 x M20 x 1.5 cable inlet, IP68									D	
Active shield length										
Standard length - (125 mm threaded, 105 mm flanged)										0
Extended shield - (250 mm threaded, 230 mm flanged)[1]										1
Extended shield - (400 mm threaded, 380 mm flanged)[2]										2

[1] Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)].

[2] Available with Probe version options C, D, and G only [≥ 750 mm (29.53 inch)].

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description[1]	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material Inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[2]	**E24**
INMETRO[3]	**E34**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	**See accessories following CLS300 Digital selection and ordering data.**

[1] Not available with Probe length option B.

[2] Available only with Approvals options C, D and E; specific EAC Ex-marking.

[3] Available only with Approvals options C, D, E.

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Technical specifications

Pointek CLS300 - Standard	
Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal	
• Relay output	1 SPDT Form C relay
- Max. contact voltage	• 30 V DC • 250 V AC
- Max. contact current	• 5 A (DC) • 8 A (AC)
- Max. switching capacity	• 150 W (DC) • 2 000 VA (AC)
- Time delay (ON and/or OFF)	1 ... 60 s
• Solid-state output	
- Output	Galvanically isolated
- Protection	Against reversed polarity (bipolar)
- Max. switching voltage	• 30 V (DC) • 30 V peak (AC)
- Max. load current	82 mA
- Voltage drop	< 1 V, typical at 50 mA
- Time delay (pre or post switching)	1 ... 60 s
Accuracy	
Resolution	
• Min. sensitivity (pF)	1 % change in actual capacitance
• Max. temperature error	0.2 % of actual capacitance value
Rated operating conditions[1]	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)[2]
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Medium conditions	Liquids, bulk solids, slurries and interfaces, and applications with viscous materials
• Relative dielectric constant ϵ_r	Min. 1.5
• Process temperature	
- Rod/Cable version	-40 ... +200 °C (-40 ... +392 °F)[2]
- High-temperature version	-40 ... +400 °C (-40 ... +752 °F)
• Process pressure[3]	-1 ... +35 bar g (-14.6 ... +511 psi g)
Design	
Material (enclosure)	Powder-coated aluminum with gasket
Degree of Protection	Standard: Type 4/NEMA 4/IP65 Optional: Type 4/NEMA 4/IP68
Cable inlet	2 x M20 x 1.5 thread (option: 2 x ½" NPT conduit entry including 1 plugged entry)
Controls and displays	
Displays	3 LEDs, for probe status, output status and power supply
Potentiometers	2 potentiometers for time delay and sensitivity
Switches	5 DIP switches for delay on/off, fail-safe high/low, time delay test/adjust, high/low sensitivity, test delay settings
Power supply	
Supply	12 ... 250 V AC/DC, 0 ... 60 Hz, galvanically isolated, 2 W

Pointek CLS300 - Standard	
Certificates and approvals	
General Purpose	CSA, FM, CE, UKCA, RCM
Flameproof Enclosure with IS Probe	ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db
Dust Ignition Proof with IS Probe	ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Explosion Proof Enclosure with IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, and ENV5
Overfill Protection	WHG (Germany) VLAREM II (Belgium)
Others	Pattern Approval (China)

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also CLS300 pressure/temperature curves.
2) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F).
3) Pressure rating of process seal is temperature dependent. See also CLS300 pressure/temperature curves.

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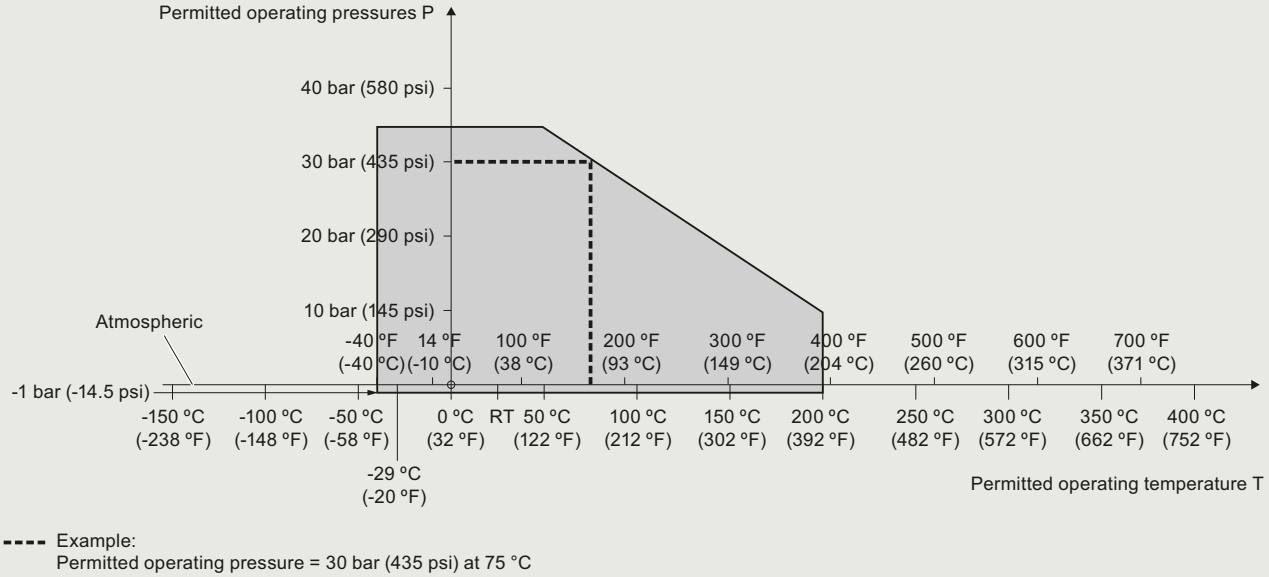
Technical specifications (continued)

Design: Probe	Rod version	High Temperature version	Cable version
Length	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA (no insulation on active probe), 316L stainless steel, PEEK isolators	Ceramic (ZrO_2[1]) isolators (no insulation on active probe), 316L stainless steel	316 stainless steel, optional PFA, PEEK isolators
O-ring seal material	FKM (optional FFKM)[2]	Graphite[2]	FKM (optional FFKM)[2]
Thermal isolator	Optional	Standard	Optional
Extension	User-selectable length	User-selectable length	User selectable cable length

1) Zirconium Oxide
2) For caustic materials, consult a local sales person for alternative O-rings. For more information, please visit http://www.automation.siemens.com/aspa_app.

Characteristic curves

Pressure/temperature curve
CLS300 extended rod and cable probes
Threaded process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)

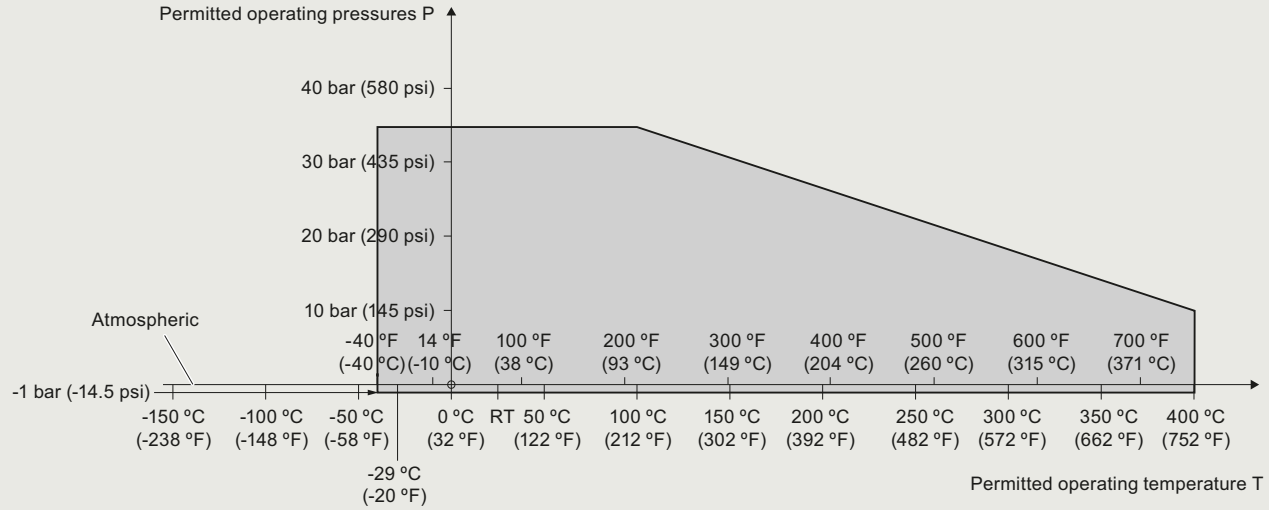


Pointek CLS300 process pressure/temperature derating curves (7ML5650, 7ML5651, 7ML5660, and 7ML5661)

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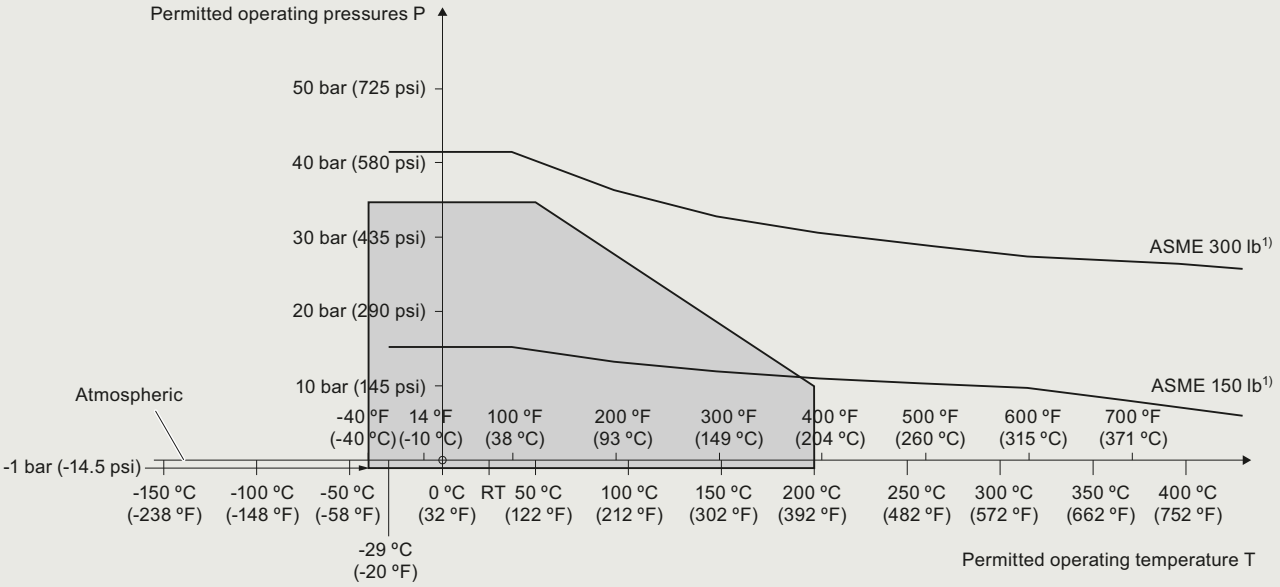
Characteristic curves (continued)

Pressure/temperature curve
CLS300 high temperature rod probes
Threaded process connections
(7ML5652 and 7ML5662)



Pointek CLS300 process pressure/temperature derating curves (7ML5652 and 7ML5662)

Pressure/temperature curve
CLS300 extended rod and cable probes
ASME flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)

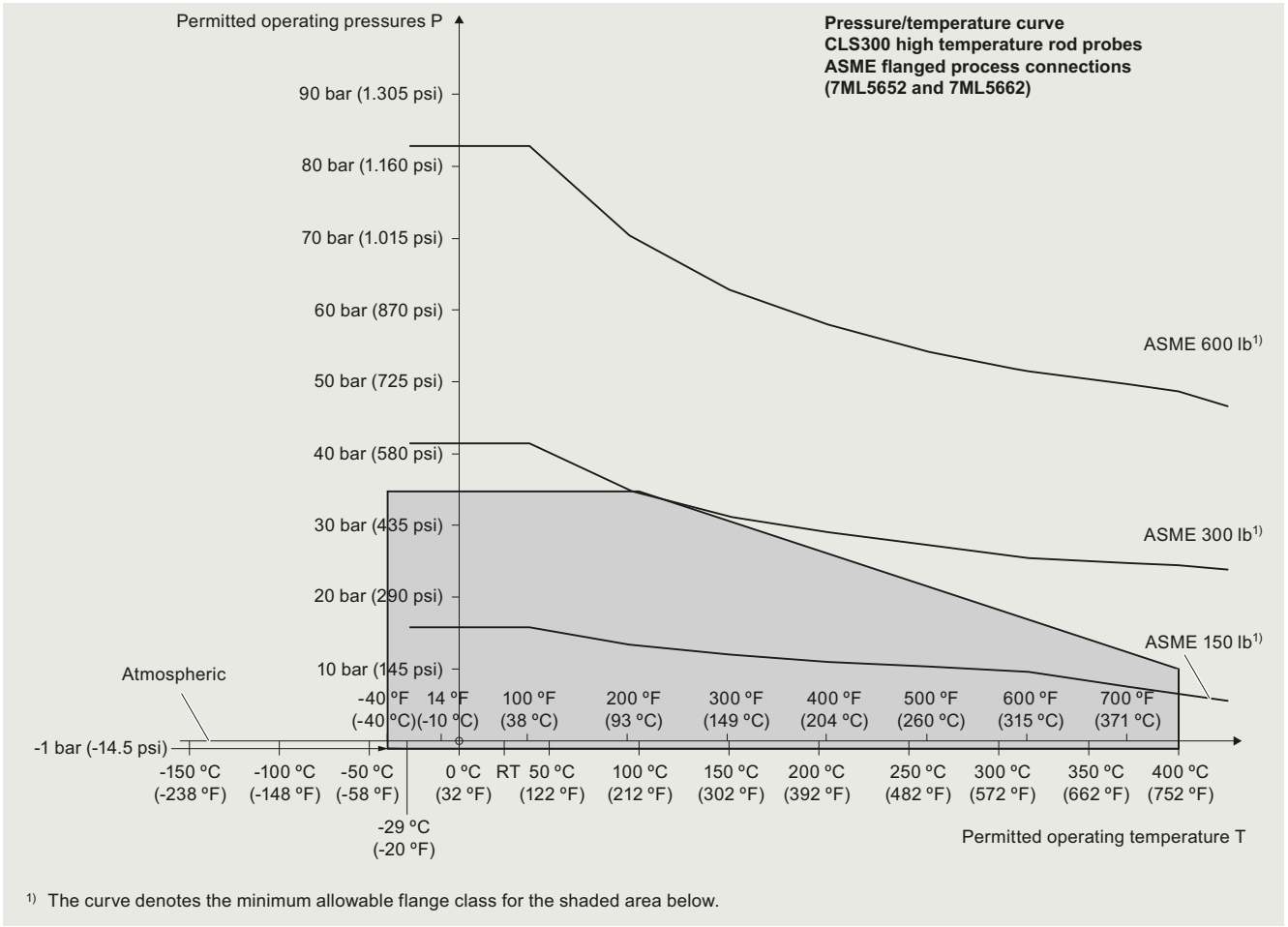


1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 process pressure/temperature derating curves (7ML5650, 7ML5651, 7ML5660, and 7ML5661)

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Characteristic curves (continued)



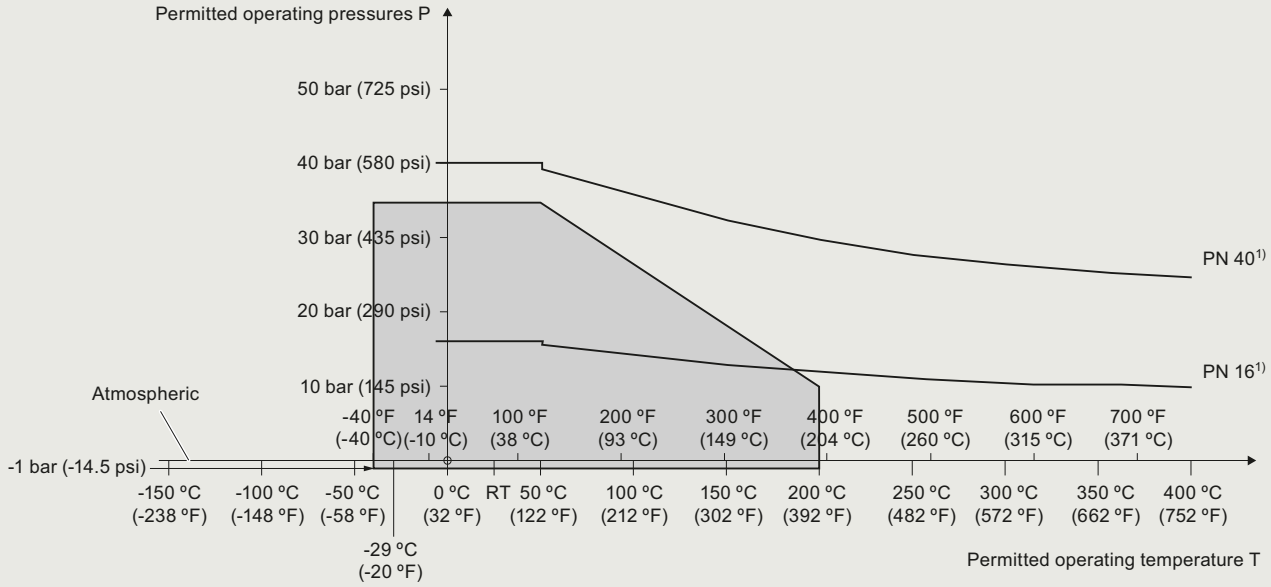
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 process pressure/temperature derating curves (7ML5652 and 7ML5662)

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Characteristic curves (continued)

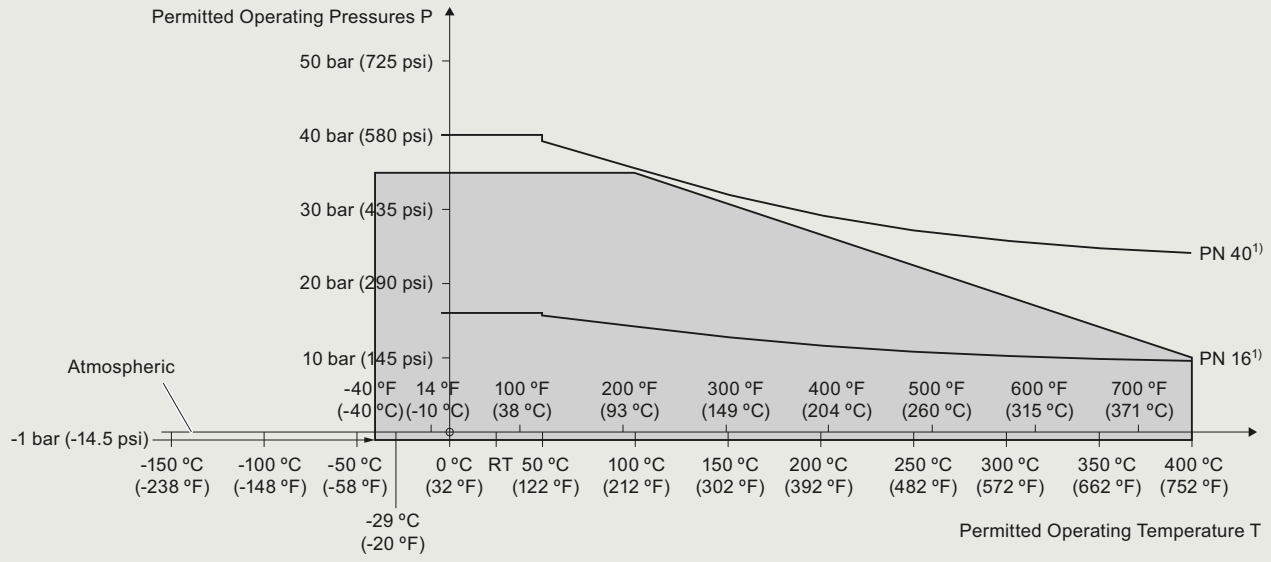
Pressure/temperature curve
CLS300 extended rod and cable probes
EN flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)



1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 process pressure/temperature derating curves (7ML5650, 7ML5651, 7ML5660, and 7ML5661)

Pressure/Temperature Curve
CLS300 High Temperature Rod Probes
EN Flanged Process Connections (7ML5652 and 7ML5662)



1) The curve denotes the minimum allowable flange class for the shaded area below.

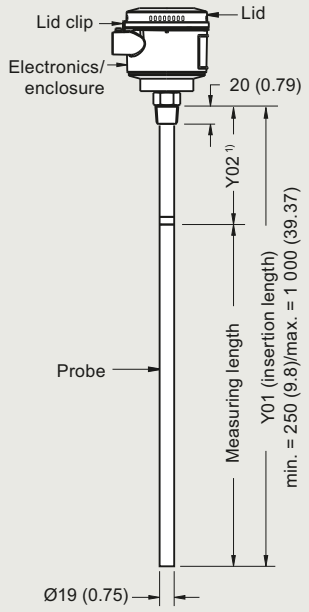
Pointek CLS300 process pressure/temperature derating curves (7ML5652 and 7ML5662)

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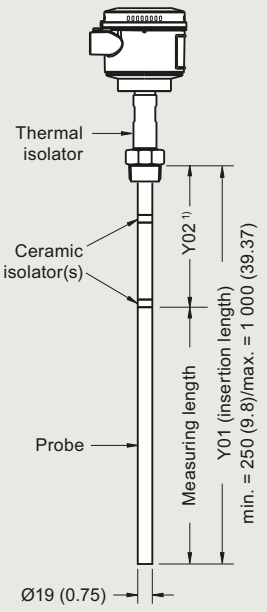
Characteristic curves (continued)

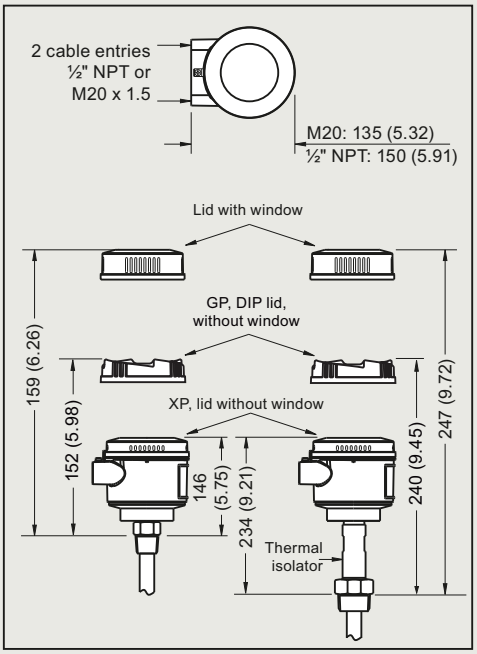
Dimensional drawings

Rod version
Threaded (7ML5650 and 7ML5660)

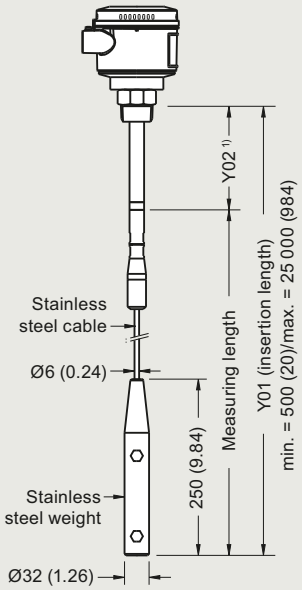


High temperature rod version
Threaded (7ML5652 and 7ML5662)

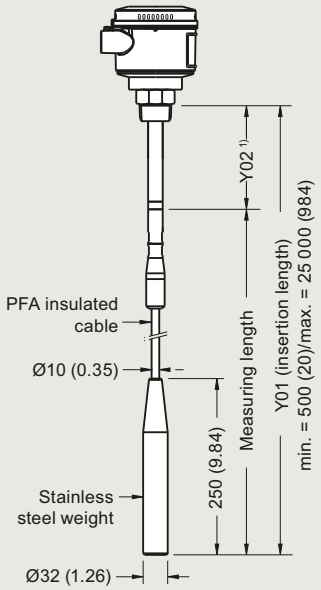




Cable version, non-insulated
Threaded (7ML5651 and 7ML5661)



Cable version, insulated
Threaded (7ML5651 and 7ML5661)



Note:

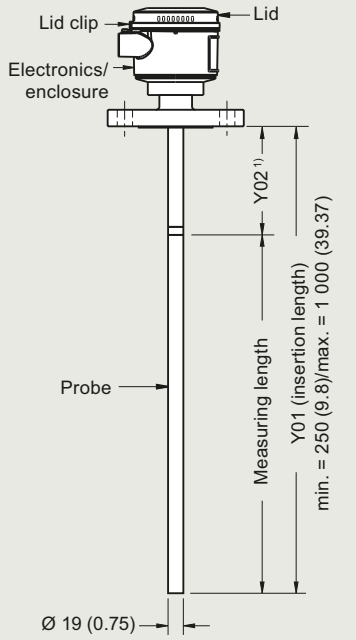
1) Extended Active Shield (Y02): standard length 125 (4.92). Optional active shield lengths: 250 (9.84) or 400 (15.75).

Pointek CLS300 threaded process connections, dimensions in mm (inch)

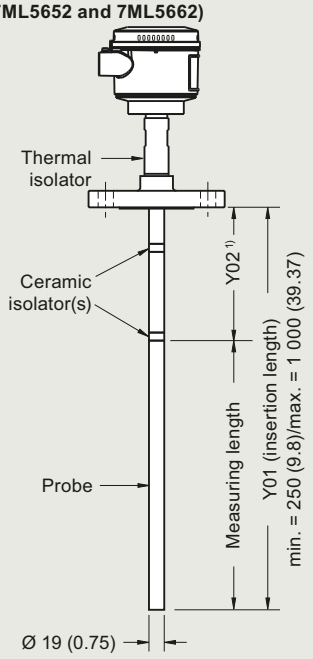
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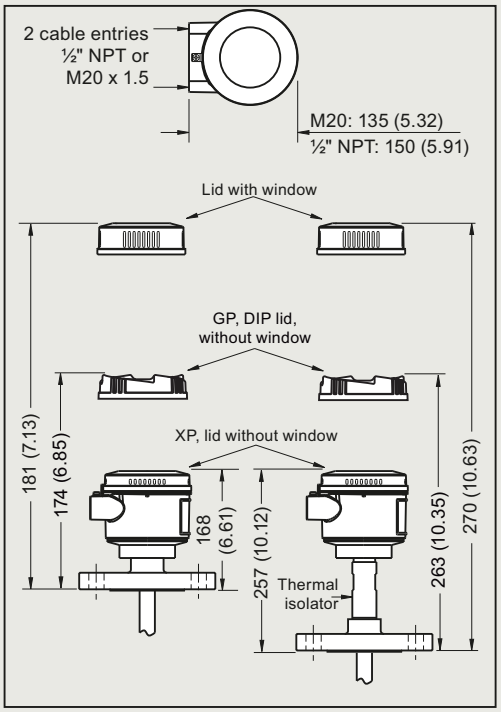
Dimensional drawings (continued)

Rod version
Welded flange (7ML5650 and 7ML5660)

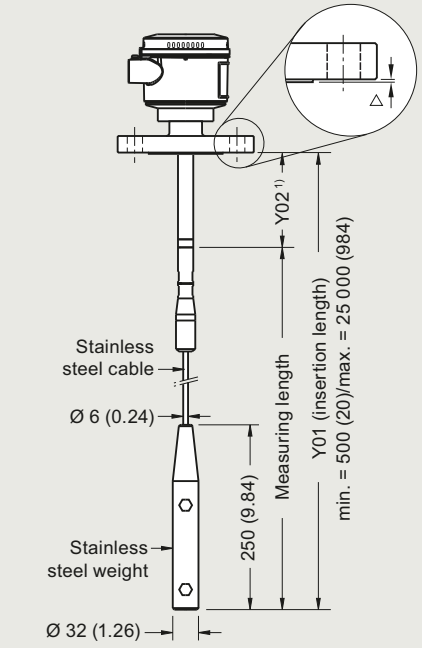


High temperature rod version
Welded flange
(7ML5652 and 7ML5662)

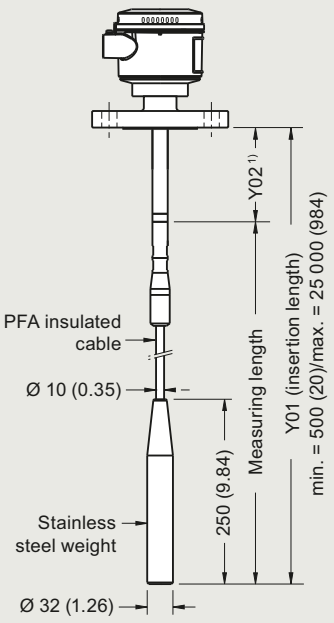




Cable version, non-insulated
Welded flange (7ML5651 and 7ML5661)



Cable version, insulated
Welded flange (7ML5651 and 7ML5661)



Flange Facing (raised face)	
Flange Class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

Note:

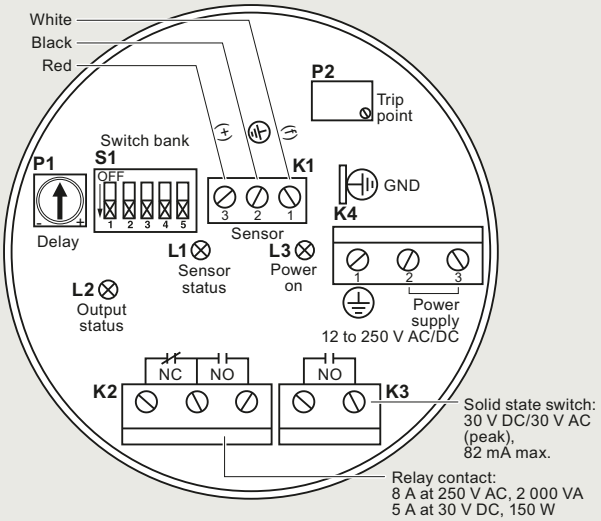
1) Extended Active Shield (Y02): standard length 105 (4.13). Optional active shield lengths: 230 (9.06) or 380 (14.96). Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

Pointek CLS300 flanged process connections, dimensions in mm (inch)

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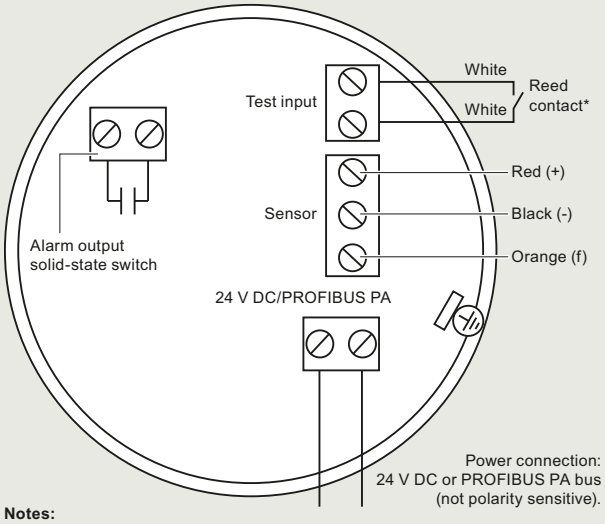
Circuit diagrams

Wiring: Pointek CLS300 standard



Notes:
- Identification label is on underside of lid. Switch and potentiometer settings are for illustration purposes only (refer to operation/setup in manual).
- All field wiring must have insulation suitable for at least 250 V.
- Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
- Maximum working voltage between adjacent relay contacts shall be 250 V.
- Refer to the Instruction manual or contact Siemens representative for detailed wiring information.

Wiring: Pointek CLS300 digital



Notes:
Refer to the instruction manual or contact a Siemens representative for detailed wiring information.

***Magnet activated sensor test**
A magnet can be used to test the sensor without opening the lid of the Pointek CLS300 digital version. Bring the magnet close to the test area indicated on the enclosure. The sensor test starts and finishes automatically after 10 seconds.



Pointek CLS300 connections

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Overview



Pointek CLS300 (digital version) is an inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out buildup on the probe. The digital version includes PROFIBUS PA, an LCD display, and advanced diagnostic features.

Benefits

- Active-Shield technology so measurement is unaffected by material buildup or nozzle interference in active shield section
- Performs in extremely abrasive conditions because of solid rod construction
- Push-button calibration, full-function diagnostics
- High sensitivity allows installation in a wide range of liquids, solids or slurry applications
- Integral LCD display allows for easy menu-driven setup
- PROFIBUS PA communication (SIMATIC PDM compatible)

Application

Pointek CLS300 digital version provides an integral LCD display for stand-alone use, with PROFIBUS PA communication (Profile version 3.0, Class B) when required. Solid-state switch alarm is standard.

The robust design of CLS300 makes it specifically applicable for heavy solids applications where abrasive materials occur as in the mining industry.

The fully potted electronics are unaffected by condensation, dust or vibration.

Wetted parts are made of stainless steel with a PFA shield for high chemical resistance, and of ceramic and stainless steel for high temperature version. Materials with low or high dielectric constants can be accurately detected. The unique Active Shield suppresses interference from material buildup or long installation nozzles.

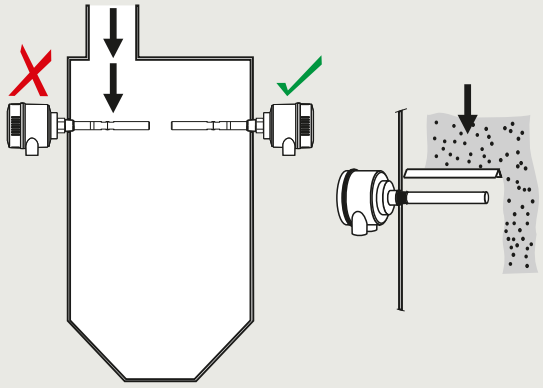
The unique modular design of the Pointek CLS300 provides a wide range of configurations, process connections, extensions and approvals to meet the temperature and pressure requirements of specific applications. The modular design makes ordering easier and reduces stocking requirements. A wide range of probe configurations are available, including rod and cable versions.

- Key Applications: liquids, slurries, bulk solids, relatively high pressure and temperature, hazardous areas, milling and mining applications

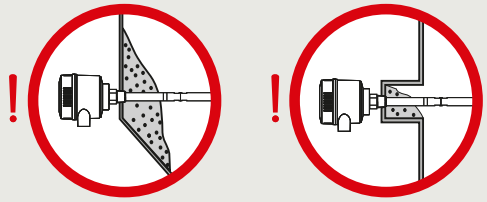
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Configuration

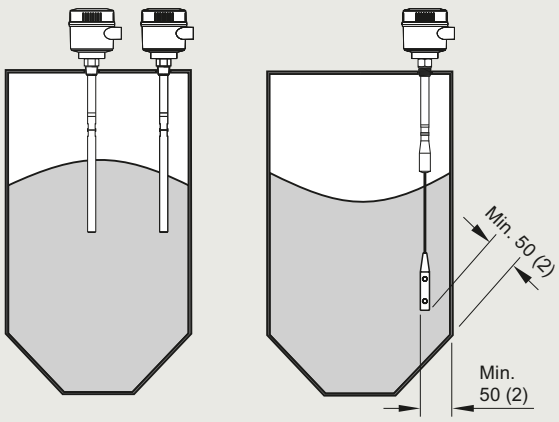
Installation



Keep unit out of path of falling material, or protect probe from falling material.



Build up of material in active shield area does not affect switch operation.



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

Pointek CLS300 installation, dimensions in mm (inch)

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Selection and ordering data

Pointek CLS300 RF Capacitance point level switch, digital, rod design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, and active shield to tune out build-up on probe. With display and digital communications.	Article No. 7ML566- 0-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection											
Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		0	A								
1" NPT [(Taper), ASME B1.20.1]		0	B								
1¼" NPT [(Taper), ASME B1.20.1]		0	C								
1½" NPT [(Taper), ASME B1.20.1]		0	D								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	A								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	B								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1	D								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	A								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	B								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3	D								
Welded flange, 316L stainless steel, raised face											
1" ASME, 150 lb		5	A								
1" ASME, 300 lb		5	B								
1" ASME, 600 lb		5	C								
1½" ASME, 150 lb		5	D								
1½" ASME, 300 lb		5	E								
1½" ASME, 600 lb		5	F								
2" ASME, 150 lb		5	G								
2" ASME, 300 lb		5	H								
2" ASME, 600 lb		5	J								
3" ASME, 150 lb		5	K								
3" ASME, 300 lb		5	L								
3" ASME, 600 lb		5	M								
4" ASME, 150 lb		5	N								
4" ASME, 300 lb		5	P								
4" ASME, 600 lb		5	Q								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		6	A								
DN 25, PN 40		6	B								
DN 40, PN 16		6	C								
DN 40, PN 40		6	D								
DN 50, PN 16		6	E								
DN 50, PN 40		6	F								
DN 80, PN 16		6	G								
DN 80, PN 40		6	H								
DN 100, PN 16		6	J								
DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		6	K								
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths											
Standard version, rod 350 mm (13.78 inch)				A							
Extended rod, length 500 mm (19.69 inch)				B							
Extended rod, length 750 mm (29.53 inch)				C							
Extended rod, length 1 000 mm (39.37 inch)				D							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch)				E							
Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch)				F							

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, digital, rod design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, and active shield to tune out build-up on probe. With display and digital communications.	Article No. 7ML566- 0-	●	●	●	●	●	-	●	●	●	●
Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)				G							
Thermal isolator											
Without thermal isolator					0						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					1						
Wetted seals											
FKM						0					
FFKM [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
316L stainless steel with PFA lining and PEEK isolators								0			
Approvals											
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									B		
Intrinsically Safe[1)] CE, RCM, CE, UKCA, RCM, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									D		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1 Gr. E, F, GT4									E		
Intrinsically Safe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4 or T6									F		
Explosion Proof with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4									G		
General Purpose CSA, FM									H		
Ordinary Locations/General Purpose (Non-Ex): CSA, FM, CE, UKCA, RCM									J		
Enclosure and Lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	
Active shield length											
Standard length - (125 mm threaded, 105 mm flanged)											0
Extended shield - (250 mm threaded, 230 mm flanged)[2)]											1
Extended shield - (400 mm threaded, 380 mm flanged)[3)]											2

[1)] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.

[2)] Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)].

[3)] Available with Probe version options C, D, and G only [≥ 750 mm (29.53 inch)].

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1)]	**E24**
INMETRO[2)]	**E34**

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	**See accessories following CLS300 Digital selection and ordering data.**

[1] Available only with Approvals options B, C, D; specific EAC Ex-marking.

[2] Available only with Approvals options B and D.

Pointek CLS300 RF Capacitance point level switch, digital, cable design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Cable extension options to 25 m (82.02 ft), adaptable sensitivity, with active shield to tune out build-up on probe. With display and digital communications.	**Article No. 7ML566-1-**	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection											
Threaded, 316L stainless steel											
1¼" NPT [(Taper), ASME B1.20.1]		**0**	**C**								
1½" NPT [(Taper), ASME B1.20.1]		**0**	**D**								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**D**								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**D**								
Welded flange, 316L stainless steel, raised face											
1½" ASME, 150 lb		**5**	**D**								
1½" ASME, 300 lb		**5**	**E**								
1½" ASME, 600 lb		**5**	**F**								
2" ASME, 150 lb		**5**	**G**								
2" ASME, 300 lb		**5**	**H**								
2" ASME, 600 lb		**5**	**J**								
3" ASME, 150 lb		**5**	**K**								
3" ASME, 300 lb		**5**	**L**								
3" ASME, 600 lb		**5**	**M**								
4" ASME, 150 lb		**5**	**N**								
4" ASME, 300 lb		**5**	**P**								
4" ASME, 600 lb		**5**	**Q**								
Welded flange, 316L stainless steel, Type A flat faced											
DN 40, PN 16		**6**	**C**								
DN 40, PN 40		**6**	**D**								
DN 50, PN 16		**6**	**E**								
DN 50, PN 40		**6**	**F**								
DN 80, PN 16		**6**	**G**								
DN 80, PN 40		**6**	**H**								
DN 100, PN 16		**6**	**J**								
DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		**6**	**K**								
Probe length											
(length from flange face) (threaded lengths include process thread)											
Note: No Y01 needed in Order code for standard lengths											
Extended cable, 3 000 mm (118.11 inch), length can be shortened by customer				**A**							
Extended cable, 6 000 mm (236.22 inch), length can be shortened by customer				**B**							
Add Order code Y01 and plain text: "Insertion length ... mm"											
Extended cable, 500 ... 1 000 mm (19.69 ... 39.37 inch)[3]				**E**							
Extended cable, 1 001 ... 5 000 mm (39.41 ... 196.85 inch)				**F**							
Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch)				**G**							
Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)				**H**							
Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.40 inch)				**J**							
Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)				**K**							

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, digital, cable design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Cable extension options to 25 m (82.02 ft), adaptable sensitivity, with active shield to tune out build-up on probe. With display and digital communications.	Article No. 7ML566- 1-	●	●	●	●	●	-	●	●	●	●
Thermal isolator											
Without thermal isolator					0						
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]					1						
Wetted seals											
FKM						0					
FFKM [for process temperatures above -20 °C (-4 °F)]						1					
Probe material											
Bare 316L stainless steel cable, PEEK isolators and 316L stainless steel cable weight								0			
PFA coated cable, PEEK isolators and 316L stainless steel cable weight								1			
Approvals											
Dust Ingnition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									B		
Intrinsically Safe[1] CE, UKCA, RCM, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									D		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1 Gr. E, F, GT4									E		
Intrinsically Safe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4 or T6									F		
Explosion Proof with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4									G		
General Purpose CSA, FM									H		
Ordinary Locations/General Purpose (Non-Ex): CSA, FM, CE, UKCA, RCM									J		
Enclosure and Lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	
Active shield length											
Standard length - (125 mm threaded, 105 mm flanged)											0
Extended shield - (250 mm threaded, 230 mm flanged)[2]											1
Extended shield - (400 mm threaded, 380 mm flanged)[2]											2

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.

[2] Available with Probe version options A, B, F ... K, only [≥ 1 000 mm (39.7 inch)].

[3] Not available with Active shield option 1.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**

Selection and Ordering data	Order code
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1]	**E24**
INMETRO[2]	**E34**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	**See accessories following CLS300 Digital selection and ordering data.**

[1] Available only with Approvals options B, C, D; specific EAC Ex-marking.

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Selection and ordering data (continued)

2) Available only with Approvals options B and D.

Pointek CLS300 RF Capacitance point level switch, digital, high temperature design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, with active shield to tune out build-up on probe. With display and digital communications.	Article No. 7ML566-2-	●	●	●	0	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Process connection											
Threaded, 316L stainless steel											
¾" NPT [(Taper), ASME B1.20.1]		**0**	**A**								
1" NPT [(Taper), ASME B1.20.1]		**0**	**B**								
1¼" NPT [(Taper), ASME B1.20.1]		**0**	**C**								
1½" NPT [(Taper), ASME B1.20.1]		**0**	**D**								
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**A**								
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**B**								
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**1**	**D**								
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**A**								
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**B**								
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		**3**	**D**								
Welded flange, 316L stainless steel, raised face											
1" ASME, 150 lb		**5**	**A**								
1" ASME, 300 lb		**5**	**B**								
1" ASME, 600 lb		**5**	**C**								
1½" ASME, 150 lb		**5**	**D**								
1½" ASME, 300 lb		**5**	**E**								
1½" ASME, 600 lb		**5**	**F**								
2" ASME, 150 lb		**5**	**G**								
2" ASME, 300 lb		**5**	**H**								
2" ASME, 600 lb		**5**	**J**								
3" ASME, 150 lb		**5**	**K**								
3" ASME, 300 lb		**5**	**L**								
3" ASME, 600 lb		**5**	**M**								
4" ASME, 150 lb		**5**	**N**								
4" ASME, 300 lb		**5**	**P**								
4" ASME, 600 lb		**5**	**Q**								
Welded flange, 316L stainless steel, Type A flat faced											
DN 25, PN 16		**6**	**A**								
DN 25, PN 40		**6**	**B**								
DN 40, PN 16		**6**	**C**								
DN 40, PN 40		**6**	**D**								
DN 50, PN 16		**6**	**E**								
DN 50, PN 40		**6**	**F**								
DN 80, PN 16		**6**	**G**								
DN 80, PN 40		**6**	**H**								
DN 100, PN 16		**6**	**J**								
DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		**6**	**K**								
Probe length											
(length from flange face) (threaded lengths include process thread)											
Note: No Y01 needed in Order code for standard lengths											
Standard version rod, 350 mm (13.78 inch)				**A**							
Extended rod, length 500 mm (19.69 inch)				**B**							
Extended rod, length 750 mm (29.53 inch)				**C**							
Extended rod, length 1 000 mm (39.37 inch)				**D**							
Add Order code Y01 and plain text: "Insertion length ... mm"											

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Selection and ordering data (continued)

Pointek CLS300 RF Capacitance point level switch, digital, high temperature design. Detects level and interface in aggressive liquids, solids, slurries, and foam. Adjustable, 1 m (3.28 ft), insertion, adaptable sensitivity, with active shield to tune out build-up on probe. With display and digital communications.	Article No. 7ML566- 2-	●	●	●	0	●	-	●	●	●	●
Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch)				E							
Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch)				F							
Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)				G							
Wetted seals											
Graphite						0					
Probe material											
316L stainless steel with ceramic (ZrO_2)isolators								0			
Approvals											
Dust Ignition Proof: CE, UKCA, RCM, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									B		
Intrinsically Safe[1] CE, UKCA, RCM, ATEX II 1 G Ex ia IIC TX Ga, ATEX II 1/2 D Ex ia IIIC TX Da/Db UKEX II 1 G Ex ia IIC TX Ga, UKEX II 1/2 D Ex ia IIIC TX Da/Db									C		
Flameproof Enclosure with IS Probe: CE, UKCA, RCM, ATEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, ATEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb, UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db									D		
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1 Gr. E, F, GT4									E		
Intrinsically Safe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4 or T6									F		
Explosion Proof with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4									G		
General Purpose CSA, FM									H		
Ordinary Locations/General Purpose (Non-Ex): CSA, FM, CE, UKCA, RCM									J		
Enclosure and Lid											
Aluminum epoxy coated											
2 x ½" NPT via adapter - cable inlet, IP65										A	
2 x M20 x 1.5 cable inlet, IP65										B	
2 x ½" NPT via adapter - cable inlet, IP68										C	
2 x M20 x 1.5 cable inlet, IP68										D	
Active shield length											
Standard length - (125 mm threaded, 105 mm flanged)											0
Extended shield - (250 mm threaded, 230 mm flanged)[2]											1
Extended shield - (400 mm threaded, 380 mm flanged)[3]											2

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection.

[2] Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)].

[3] Available with Probe version options C, D, and G only [≥ 750 mm (29.53 inch)].

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material Inspection Certificate Type 3.1 per EN 10204	**C12**

Selection and Ordering data	Order code
EAC Ex-Approval[1]	**E24**
INMETRO[2]	**E34**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Accessories	**See accessories following CLS300 Digital selection and ordering data.**

[1] Available only with Approvals options B, C, D; specific EAC Ex-marking.

[2] Available only with Approvals options B and D.

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Selection and ordering data (continued)

Selection and Ordering data	Article No.
Accessories	
One metallic cable gland M20 x 1.5, -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA)	**7ML1930-1AQ**
General Purpose	
½" NPT General Purpose Cable Entry IP68/IP69K NEMA 6, -40 ... +80 °C (-40 ... +176 °F), Dust Ignition Proof, cable size 6 ... 12 mm (0.236 ... 0.472 inch)	**7ML1830-1JA**
M20 x 1.5 General Purpose Cable Entry IP68/IP69K NEMA 6, -40 ... +80 °C (-40 ... +176 °F), Dust Ignition Proof, cable size 7 ... 12 mm (0.275 ... 0.472 inch)	**7ML1830-1JC**
Hazardous Locations	
½" NPT EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX and UKEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	**7ML1830-1JB**
M20 EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX and UKEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	**7ML1830-1JD**
Blind threaded flanges are available. Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.	
Pointek Specials	**See page 4/60**

Pointek Specials[1]	Article No.
CLS100 Polycarbonate Lid and Gasket, FKM	
Kit, lid and gasket, CLS100 enclosure version	**A5E01163671**
CLS100 Miscellaneous Parts	
Custom length of cable is available only for 7ML5501-xxx1x and 7ML5501-xxx5x[2]	
CLS200 Gasket (IP65), Synprene	
Spare gasket, enclosure version (IP65 versions only)	**A5E01163672**
CLS200 Gasket (IP68), Silicone	
Spare gasket, enclosure version (IP68 versions)	**A5E01163673**
CLS200/CLS300/LC300 Blind Lid	
Spare aluminum blind lid (for standard versions only)	**A5E01163674**
CLS200/CLS300 Lid with window	
Spare aluminum lid with window	**A5E01163676**
CLS200 Sensor Kit for cable units	
Kit, sensor for cable units, PPS, standard, FKM	**A5E01163677**
Kit, sensor for cable units, PPS, digital, FKM	**A5E01163678**
Kit, sensor for cable units, PPS, standard, FFKM	**A5E01163679**
Kit, sensor for cable units, PPS, digital, FFKM	**A5E01163680**
Kit, sensor for cable units, PVDF, standard, FKM	**A5E01163681**
Kit, sensor for cable units, PVDF, digital, FKM	**A5E01163682**
Kit, sensor for cable units, PVDF, standard, FFKM	**A5E01163683**
Kit, sensor for cable units, PVDF, digital, FFKM	**A5E01163684**
CLS200 Mounting Bracket, 316L stainless steel	
Spare mounting bracket, mounting hole 27 mm (1 inch)	**A5E01163685**
CLS200 PROFIBUS Connector (IP65)	
Spare, PROFIBUS connector (IP65 versions only)	**A5E01163686**
CLS200 Miscellaneous Parts	
CLS200 with FFKM O-rings (any version)[2]	
CLS200 Electronics	
Test magnet, digital version	**7ML1830-1JE**
Amplifier/power supply kit, standard version	**A5E03251681**
Amplifier/power supply, digital version	**7ML1830-1JF**
LCD display, digital version	**7ML1830-1JK**

Pointek Specials[1]	Article No.
CLS300 Cable Extensions, 316L stainless steel	
Kit, stainless steel cable extension, 1 m, adjustable by customer	**A5E01163688**
Kit, stainless steel cable extension, 3 m, adjustable by customer	**A5E01163689**
Kit, stainless steel cable extension, 5 m, adjustable by customer	**A5E01163690**
Kit, stainless steel cable extension, 10 m, adjustable by customer	**A5E01163691**
Kit, stainless steel cable extension, 15 m, adjustable by customer	**A5E01163693**
Kit, stainless steel cable extension, 20 m, adjustable by customer	**A5E01163695**
CLS300 Cable Extensions, 316 stainless steel with PFA coating	
Kit, PFA cable extension, 1 m, adjustable by customer	**A5E01163697**
Kit, PFA cable extension, 3 m, adjustable by customer	**A5E01163698**
Kit, PFA cable extension, 5 m, adjustable by customer	**A5E01163699**
Kit, PFA cable extension, 10 m, adjustable by customer	**A5E01163700**
Kit, PFA cable extension, 15 m, adjustable by customer	**A5E01163701**
Kit, PFA cable extension, 20 m, adjustable by customer	**A5E01163702**
CLS300 Rod Kits, 316L stainless steel	
Kit, stainless steel rod 180 mm (7.09 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 350 mm (13.78 inch).	**A5E01163719**
Kit, stainless steel rod 330 mm (12.99 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 500 mm (19.69 inch).	**A5E01163720**
Kit, stainless steel rod 580 mm (22.83 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 750 mm (29.53 inch).	**A5E01163721**
Kit, stainless steel rod 830 mm (32.68 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 1 000 mm (39.37 inch).	**A5E01163722**
Kit, stainless steel rod 1330 mm (52.36 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 1 500 mm (59.06 inch).[2]	
Kit, stainless steel rod 1830 mm (72.05 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 2 000 mm (78.74 inch).[2]	
Kit, stainless steel rod customized length up to 1 m[2]	
Kit, stainless steel rod customized length up to 2 m[2]	
CLS300 Electronics Kits with drivers (for rod or cable versions)	
Kit, electronics with driver, standard CLS300. To be used in cable versions with length greater than 5 m.[3][4]	**A5E01163723**
Kit, electronics with driver, digital CLS300. To be used in cable versions with length greater than 5 m.[3][4]	**A5E01163725**
CLS300 Electronics Kits with drivers (for cable versions)	
Kit, electronics with driver, standard CLS300. To be used in cable versions with length greater than 5 m.[3][4]	**A5E01163724**
Kit, electronics with driver, digital CLS300. To be used in cable versions with length greater than 5 m.[3][4]	**A5E01163726**
CLS300 Electronics	
Test magnet, digital version	**7ML1830-1JE**
Amplifier/power supply kit, standard version	**A5E03251683**
Amplifier/power supply, digital version	**7ML1830-1JF**
LCD display, digital version	**7ML1830-1JK**
CLS300 Weight Kit, 316L stainless steel	
Kit, spare stainless steel weight. To be used in any cable version of CLS300.	**A5E01163727**

[1] Special flange sizes and facings are available. Please consult a local sales person for details.

[2] Please consult a local sales person for part number and pricing

[3] For General Purpose approvals only

[4] To maintain approvals, qualified trained Siemens personnel required for part replacement

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

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Technical specifications

Pointek CLS300 Digital	
Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Solid-state output	
• Output	Galvanically isolated
• Protection	Against reversed polarity (bipolar)
• Max. switching voltage	• 30 V (DC) • 30 V peak (AC)
• Max. load current	82 mA
• Voltage drop	< 1 V, typical at 50 mA
• Time delay (pre or post switching)	Programmable by user (0 ... 100 s)
Fail-safe mode	Min. or max.
Connection	Removable terminal block
Accuracy	
Resolution	
• Min. sensitivity (pF)	1 % change in actual capacitance
• Max. temperature error	0.2 % of actual capacitance value
Rated operating conditions[1]	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)[2]
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Medium conditions	Liquids, bulk solids, slurries, interfaces, and applications with viscous materials
• Relative dielectric constant ϵ_r	Min. 1.5
• Process temperature	
- Rod/Cable version	-40 ... +200 °C (-40 ... +392 °F)[2]
- High Temperature version	-40 ... +400 °C (-40 ... +752 °F)
• Process pressure[3]	-1 ... +35 bar g (-14.6 ... +511 psi g)
Design	
Material (enclosure)	Powder-coated aluminum with gasket
Degree of protection	Standard: Type 4/NEMA 4/IP65 Optional: Type 4/NEMA 4/IP68
Cable inlet	2 x M20 x 1.5 thread (option: 2 x ½" NPT conduit entry including 1 plugged entry)
Controls and displays	
Local display	LCD
Configuration	• Locally, using 3 button keypad (for standalone operation) • Remotely, using SIMATIC PDM (for installation on a network)
Power supply	
Bus voltage (at process connection)	• Standard: 12 ... 30 V DC • Intrinsically Safe: 12 ... 24 V DC
Current consumption	12.5 mA
Certificates and approvals	
General Purpose	CSA, FM, CE, UKCA, RCM
Dust Ignition Proof	ATEX II 1/2 D, 2 D IP6X T100 °C UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db
Flameproof Enclosure With IS Probe	ATEX II 1/2 G EEx d[ia] IIC T6 ... T4 ATEX II 1/2 D T100 °C UKEX II 1/2 G Ex ia/db [ia Ga] IIC TX Ga/Gb UKEX II 1/2 D Ex ia/tb [ia Da] IIIC TX Da/Db
Dust Ignition Proof With IS Probe	CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4

Pointek CLS300 Digital	
Intrinsically Safe[4]	ATEX II 1 G EEx ia IIC T6 ... T4 ATEX II 1/2 D, 2 D IP6X T100 °C UKEX II 1 G Ex ia IIC TX Ga UKEX II 1/2 D Ex ia IIIC TX Da/Db CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Non-incendive	CSA/FM Class I, Div. 2, Groups A, B, C, D CSA/FM Class II, Div. 2, Groups F, G CSA/FM Class III T4 or T6
Explosion Proof with IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, and ENV5
Others	Pattern Approval (China)
Communication	PROFIBUS PA (IEC 61158 CPF3 CP3/2) Bus physical layer: IEC 61158-2 MBP-(IS) Device profile: PROFIBUS PA profile for Process Control Devices Version 3.0, Class B FISCO field device

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also CLS300 pressure/temperature curves.
2) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)
3) Pressure rating of process seal is temperature dependent. See also CLS300 pressure/temperature curves.
4) Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

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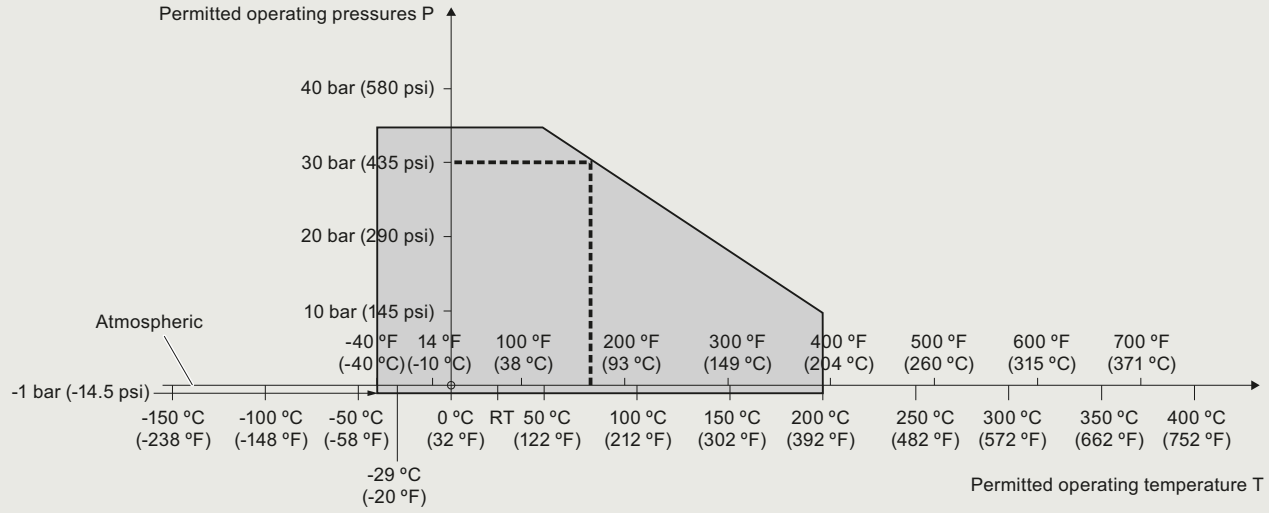
Technical specifications (continued)

Design: Probe			
	Rod version	**High Temperature version**	**Cable version**
Length	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA (no insulation on active probe), 316L stainless steel, PEEK isolators	Ceramic (ZrO_2[1]) isolators (no insulation on active probe), 316L stainless steel	316 stainless steel, optional PFA, PEEK isolators
O-ring seal material	FKM (optional FFKM)[2]	Graphite[2]	FKM (optional FFKM)[2]
Thermal isolator	Optional	Standard	Optional
Extension	User selectable length	User selectable length	User selectable cable length

[1] Zirconium Oxide
[2] For caustic materials, consult a local sales person for alternative O-rings. For more information, please visit http://www.automation.siemens.com/aspa_app.

Characteristic curves

Pressure/temperature curve
CLS300 extended rod and cable probes
Threaded process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)

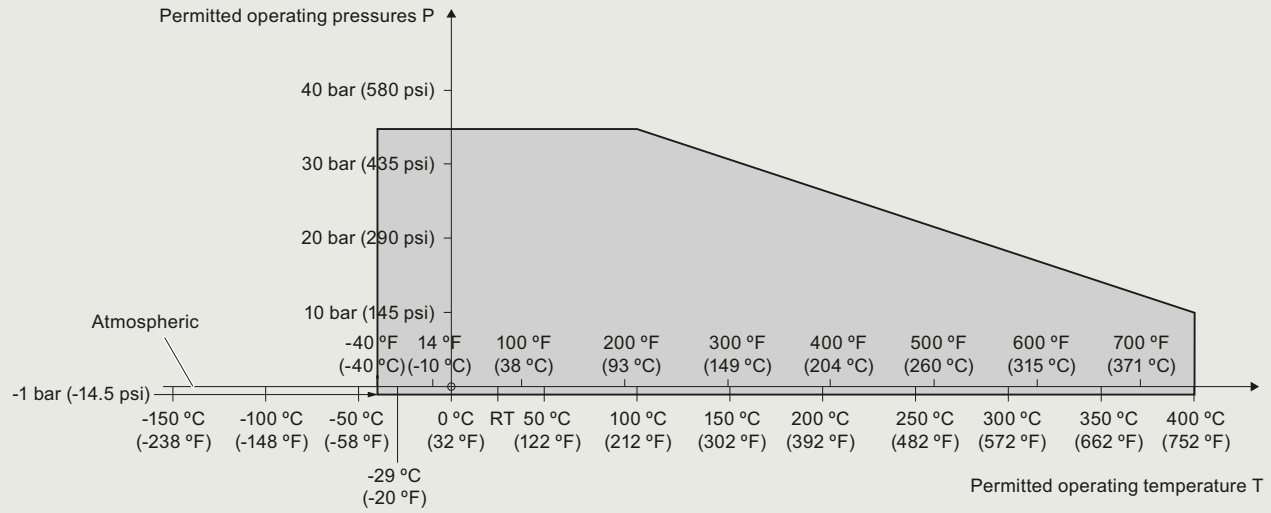


Pointek CLS300 process pressure/temperature derating curves (7ML5650, 7ML5651, 7ML5660 and 7ML5661)

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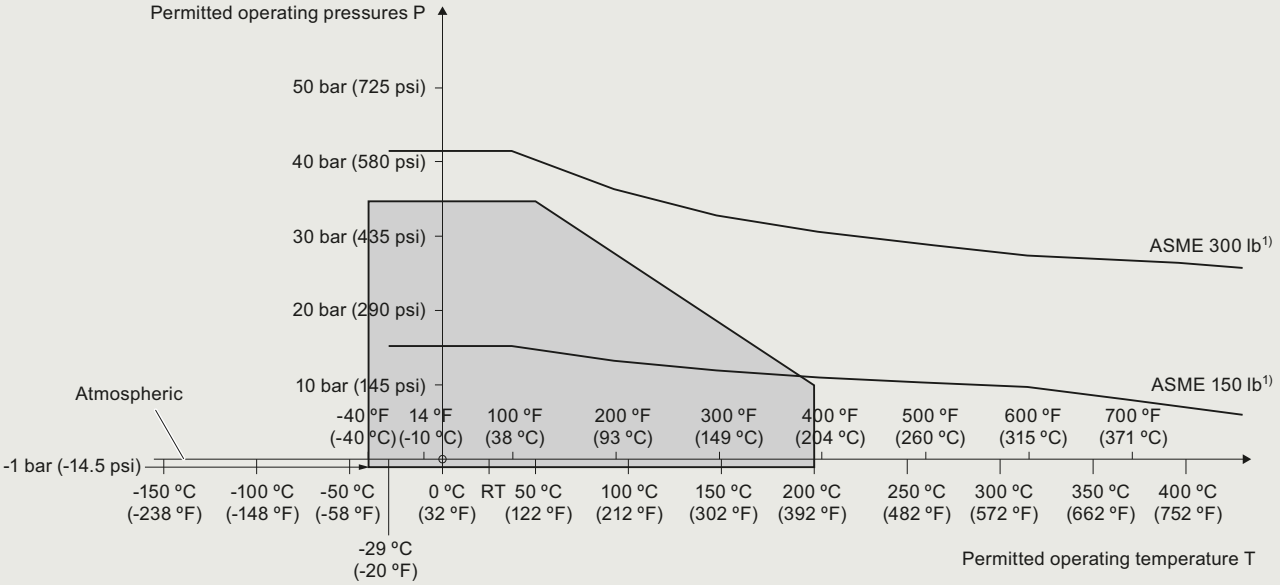
Characteristic curves (continued)

Pressure/temperature curve
CLS300 high temperature rod probes
Threaded process connections
(7ML5652 and 7ML5662)



Pointek CLS300 process pressure/temperature derating curves (7ML5652 and 7ML5662)

Pressure/temperature curve
CLS300 extended rod and cable probes
ASME flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)

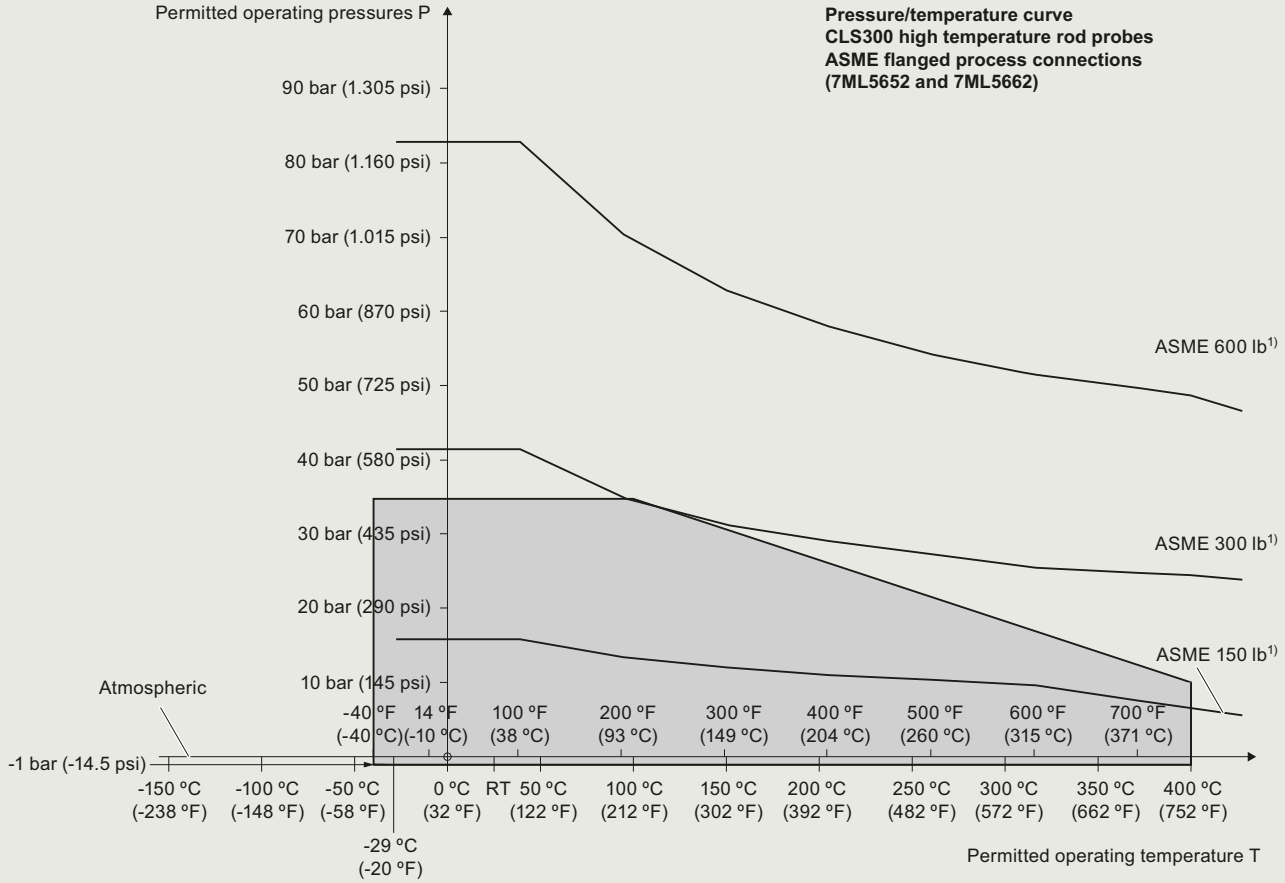


1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 process pressure/temperature derating curves (7ML5650, 7ML5651, 7ML5660, and 7ML5661)

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Characteristic curves (continued)



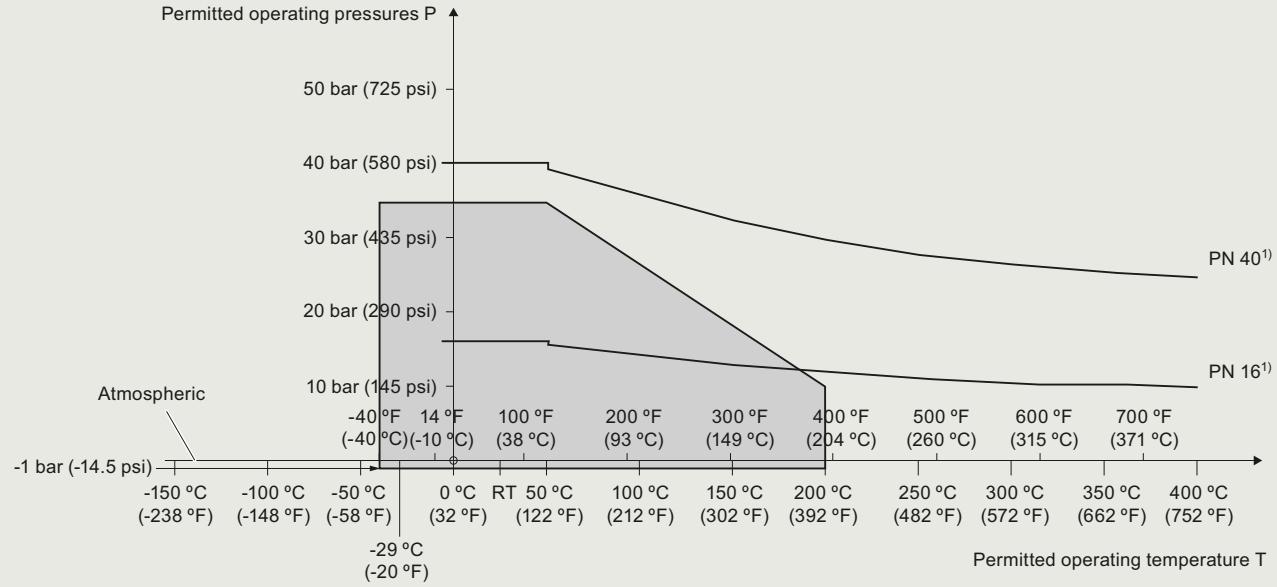
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 process pressure/temperature derating curves (7ML5652 and 7ML5662)

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Characteristic curves (continued)

Pressure/temperature curve
CLS300 extended rod and cable probes
EN flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)



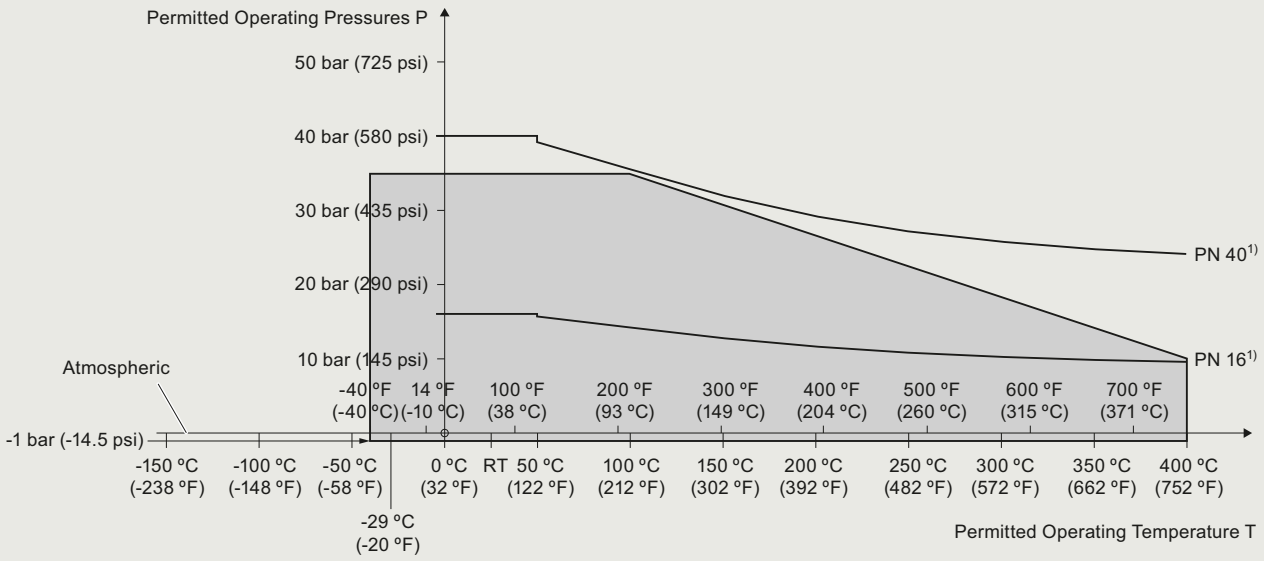
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 process pressure/temperature derating curves (7ML5650, 7ML5651, 7ML5660 and 7ML5661)

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Characteristic curves (continued)

Pressure/Temperature Curve
CLS300 High Temperature Rod Probes
EN Flanged Process Connections (7ML5652 and 7ML5662)



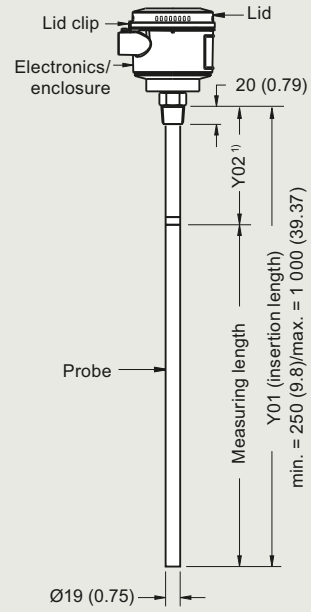
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 process pressure/temperature derating curves (7ML5652 and 7ML5662)

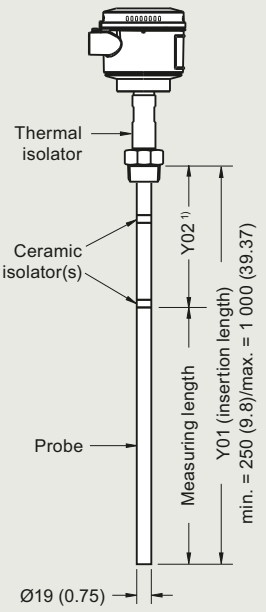
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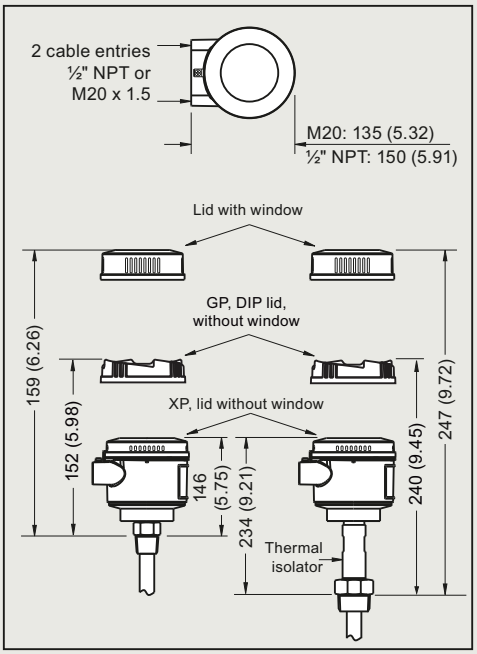
Dimensional drawings

Rod version
Threaded (7ML5650 and 7ML5660)

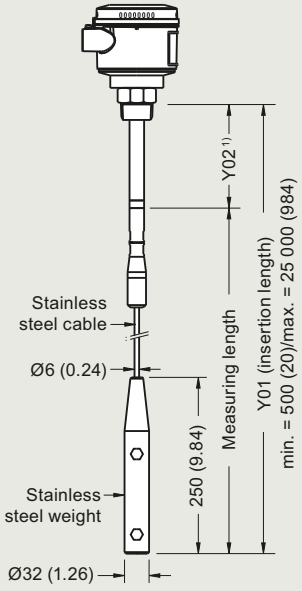


High temperature rod version
Threaded (7ML5652 and 7ML5662)

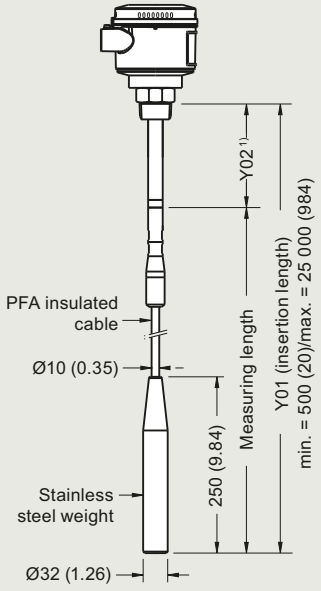




Cable version, non-insulated
Threaded (7ML5651 and 7ML5661)



Cable version, insulated
Threaded (7ML5651 and 7ML5661)



Note:

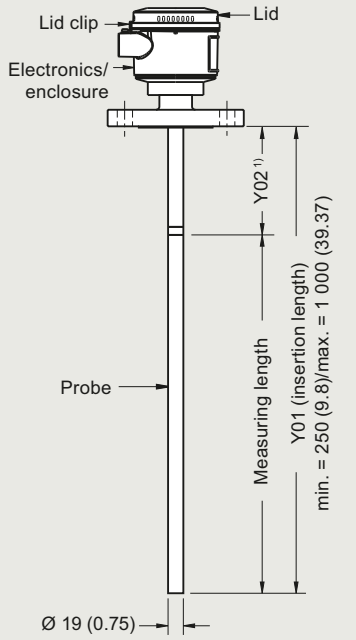
1) Extended Active Shield (Y02): standard length 125 (4.92). Optional active shield lengths: 250 (9.84) or 400 (15.75).

Pointek CLS300 threaded process connections, dimensions in mm (inch)

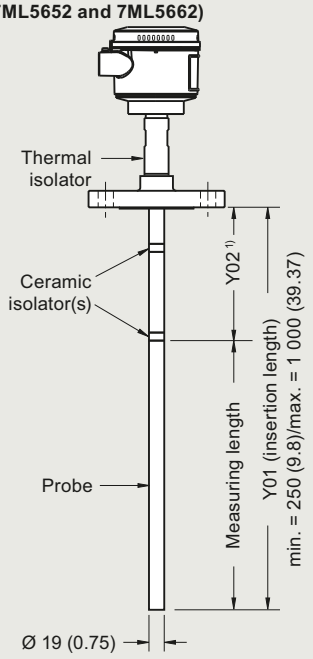
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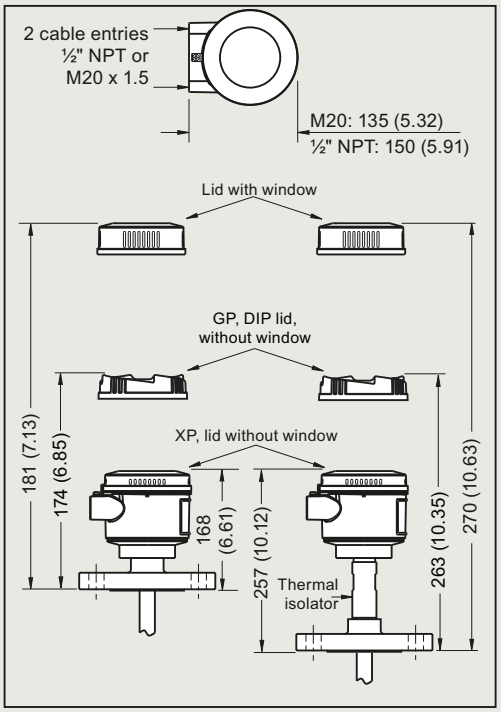
Dimensional drawings (continued)

Rod version
Welded flange (7ML5650 and 7ML5660)

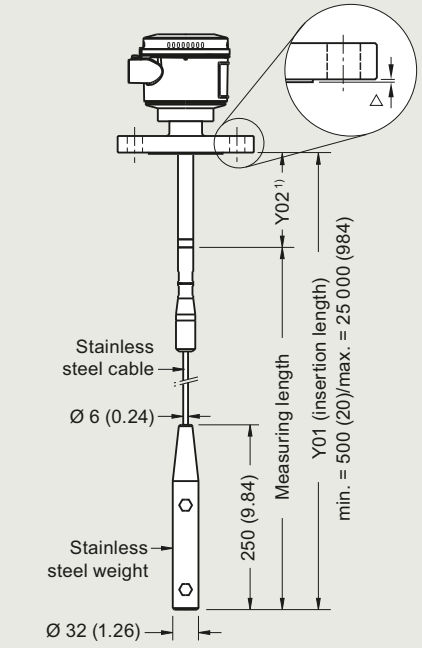


High temperature rod version
Welded flange
(7ML5652 and 7ML5662)

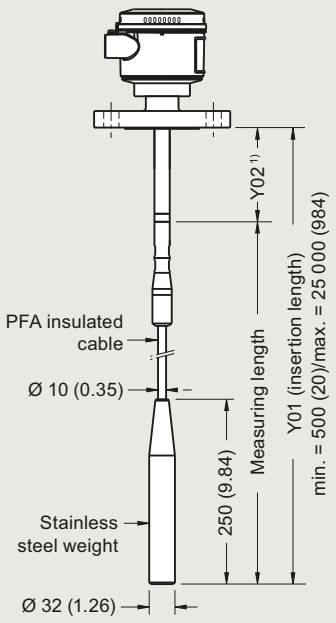




Cable version, non-insulated
Welded flange (7ML5651 and 7ML5661)



Cable version, insulated
Welded flange (7ML5651 and 7ML5661)



Flange Facing (raised face)	
Flange Class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

Note:

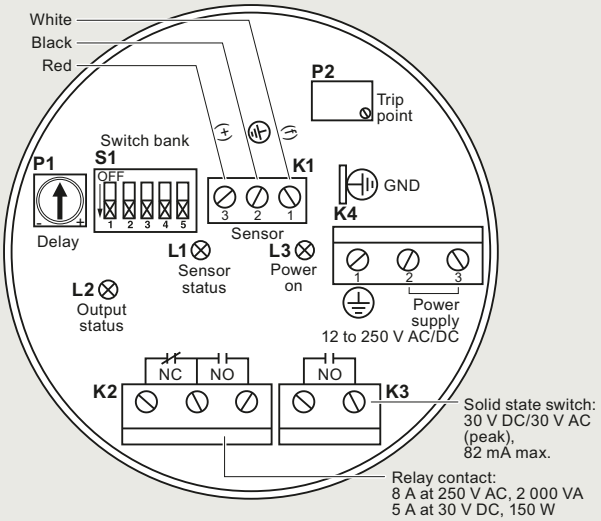
[1] Extended Active Shield (Y02): standard length 105 (4.13). Optional active shield lengths: 230 (9.06) or 380 (14.96).
Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

Pointek CLS300 flanged process connections, dimensions in mm (inch)

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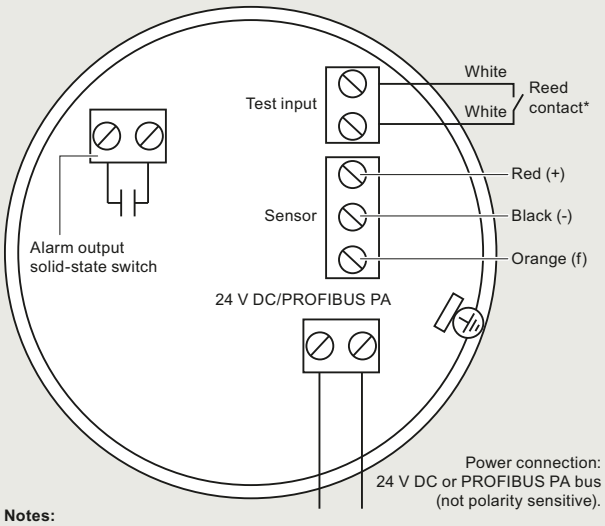
Circuit diagrams

Wiring: Pointek CLS300 standard



Notes:
- Identification label is on underside of lid. Switch and potentiometer settings are for illustration purposes only (refer to operation/setup in manual).
- All field wiring must have insulation suitable for at least 250 V.
- Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
- Maximum working voltage between adjacent relay contacts shall be 250 V.
- Refer to the Instruction manual or contact Siemens representative for detailed wiring information.

Wiring: Pointek CLS300 digital



Notes:
Refer to the instruction manual or contact a Siemens representative for detailed wiring information.

***Magnet activated sensor test**
A magnet can be used to test the sensor without opening the lid of the Pointek CLS300 digital version. Bring the magnet close to the test area indicated on the enclosure. The sensor test starts and finishes automatically after 10 seconds.



Pointek CLS300 connections

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Overview



SITRANS LVL100 is a compact vibrating point level switch for material detection in liquid and slurry applications such as overflow, high, low and demand applications, as well as pump protection. It is ideal for use in confined spaces.

Benefits

- Proven vibrating level switch technology for liquids
- Compact insertion length of 40 mm (1.57 inch) for confined space applications
- Available starting at 1/2" threaded process connections
- Fault monitoring for corrosion, loss of vibration, or line break to the piezo drive
- Integrated test function to confirm correct operation

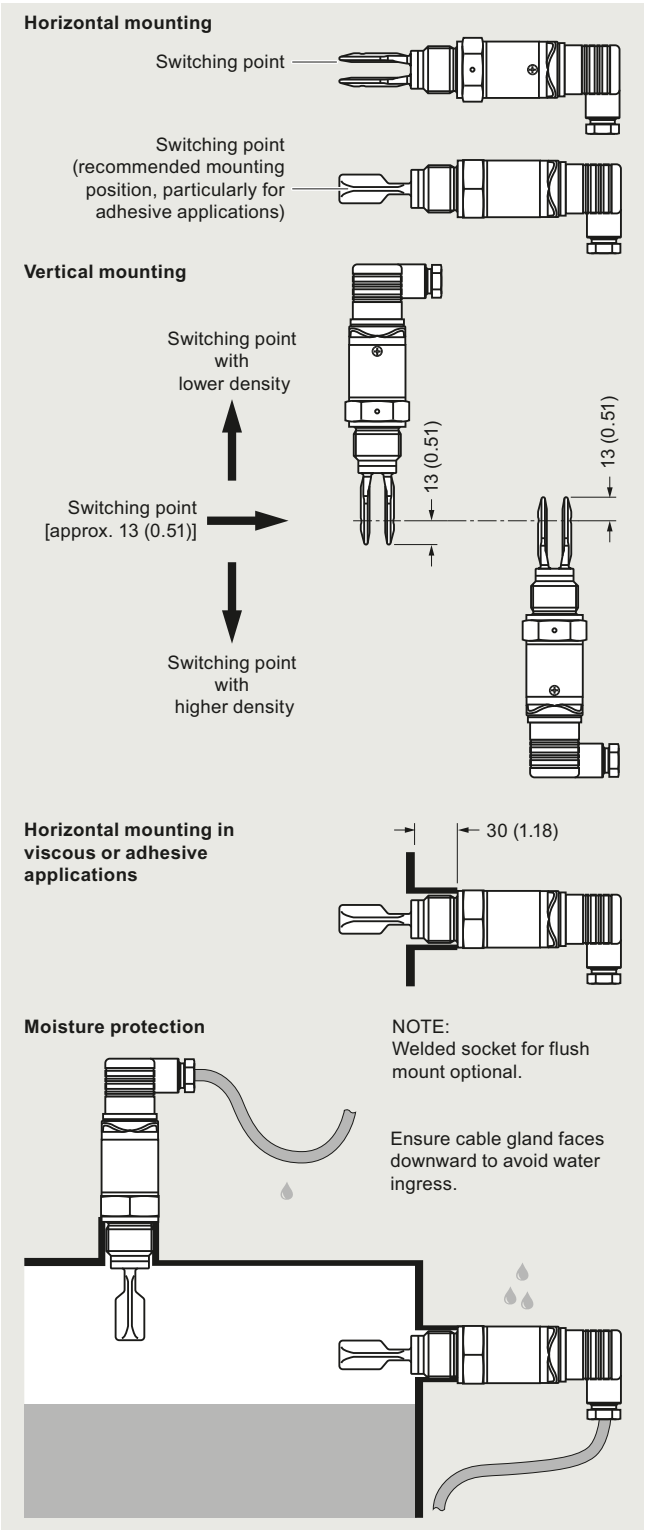
Application

SITRANS LVL100 is a compact level switch designed for industrial use in all areas of process technology and can be used for material detection with liquids and slurries. With an insertion length of only 40 mm (1.57 inch), SITRANS LVL100 can be mounted in small pipes and confined space applications. It is virtually unaffected by the chemical and physical properties of the liquid. The LVL100 can be used in difficult conditions including turbulence, air bubbles, foam generation, buildup, or external vibration.

The tuning fork is piezoelectrically energized and vibrates at a mechanical resonance frequency of approximately 1 200 Hz. The vibration frequency changes when the tuning fork is covered by the medium. This change is detected by the integrated oscillator and converted into a switching command. The integrated electronics evaluate the level signal and output a switching signal to connected devices.

- Key Applications: for use in liquids and slurries, for level measurement, overfill, and dry run protection

Configuration



SITRANS LVL100 installation, dimensions in mm (inch)

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Selection and ordering data

SITRANS LVL100 Vibrating point level switch Detects level and material in liquids and slurries. Compact, with 40 mm (1.6 inch) insertion.	Article No. 7ML574- ●	●	●	●	●	-	●	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Approvals										
CE	1									
CE, UKCA, Marine Approvals (ABS, CCS, DNV-GL, LR, RINA)[5]	2									
CE, UKCA, Overfill Protection (WHG)[1]	3									
Canada/US for Ordinary Locations/General Purpose (Non-Ex), CE, UKCA[7]	4									
Version/Process temperature										
Standard -40 ... +100 °C (-40 ... +212 °F)[2]		A								
Extended -40 ... +150 °C (-40 ... +302 °F)[2][6]		B								
Hygienic applications -40 ... +150 °C (-40 ... +302 °F)[3]		C								
Process connection										
Thread G¾" A PN 64/316L			A	0						
Thread G¾" A PN 64/316L Ra < 0.8 µm			A	1						
Thread ¾" NPT PN 64/316L			A	2						
Thread ¾" NPT PN 64/316L Ra < 0.8 µm			A	3						
Thread G1" A PN 64/316L			A	4						
Thread G1" A PN 64/316L Ra < 0.8 µm			A	5						
Thread 1" NPT PN 64/316L			A	6						
Thread 1" NPT PN 64/316L Ra < 0.8 µm			A	7						
Tri-Clamp 1" PN 16 DIN 32676/316L Ra < 0.8 µm			A	8						
Tri-Clamp 1½" PN 16 DIN 32676/316L Ra < 0.8 µm			B	0						
Tri-Clamp 2" PN 16 DIN 32676/316L Ra < 0.8 µm			B	1						
Bolting DN 25 PN 40 DIN 11851/316L Ra < 0.8 µm			B	2						
Bolting DN 40 PN 40 DIN 11851/316L Ra < 0.8 µm			B	3						
Bolting DN 50 PN 25 DIN 11851/316L Ra < 0.8 µm			B	4						
SMS DN 38 PN 6 316L Ra < 0.8 µm			B	5						
Hygienic fitting with compression nut F40 PN 25/316L Ra < 0.8 µm			B	6						
Thread G½" (DIN 3852-A) PN 64/316L			C	0						
Thread G½" (DIN 3852-A) PN 64/316L Ra < 0.8 µm			C	1						
Thread ½" NPT (ASME B1.20.1) PN 64/316L			C	2						
Thread ½" NPT (ASME B1.20.1) PN 64/316L Ra < 0.8 µm			C	3						
Thread R¾" PN 64, EN 10226-1/316L			D	0						
R1 Thread R1 PN 64, EN 10226-1/316L			D	1						
RF Thread R1 PN 64, EN 10226-1/316L (Ra < 0.8 µm)			D	2						
Electronics										
Contactless electronic switch 20 ... 250 V AC/DC[4]					1					
Transistor output PNP 10 ... 35 V DC					2					
I/O link 18 ... 30 V DC					3					
Housing										
316L							1			
Electrical connection/Protection										
M12 x 1/IP67								A		
According to ISO4400 including plug/IP65								B		
According to DIN 43650 incl. plug with QuickOn connection/IP65								C		
M12 x 1 incl. 5 m cable/IP68 (0.2 bar)								D		

[1] Available only with Electronics option 2.

[2] Available only with Process connection options A0, A2, A4, A6, C0, C2, D0, and D1.

[3] Available only with Process connection options A1, A3, A5, and A7 ... B6, C1, C3, and D2.

[4] Available only with Electrical connection/Protection options B and C.

[5] Available only with Process temperature options A and B.

[6] Available only with Marine approval options DNV and GL.

[7] Available only with Electrical connection/Protection options A and B.

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Selection and ordering data (continued)

Selection and ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Cleaning including certificate (oil, grease and silicone free)	**W01**
Identification Label, foil laser marking	**Y16**
Acceptance test Certificate 2.2 for material EN 10204	**C15**
3.1-Inspection Certificate for instrument with test data (EN 10204)	**C25**

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Selection and ordering data (continued)

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation.	
Spare Parts	
LVL100 Threaded Welded Socket	
G¾" A/316L with FKM Seal	**7ML1930-1EE**
G1" A/316L with FKM Seal	**7ML1930-1EF**
M27 x 1.5/316L with FKM Seal	**7ML1930-1EG**
G¾" A/316L with EPDM Seal	**7ML1930-1EH**
G1" A/316L with EPDM Seal	**7ML1930-1EJ**
M27 x 1.5/316L with EPDM Seal	**7ML1930-1EK**

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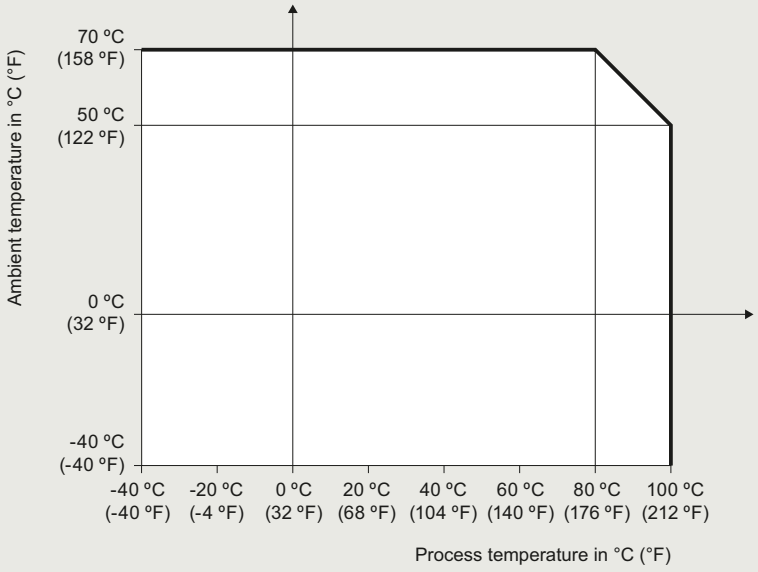
Technical specifications

SITRANS LVL100	
Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High and low and demand
Output	
Output options	• Contactless electronic switch • Transistor output PNP
Measuring accuracy	
Hysteresis	Approx. 2 mm (0.08 inch) with vertical installation
Switching delay	Approx. 500 ms (on/off)
Frequency	Approx. 1 100 Hz
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +70 °C (-40 ... +158 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Temperature	
- Standard	-40 ... +100 °C (-40 ... +212 °F)
- High temperature option	-40 ... +150 °C (-40 ... +302 °F)
• Pressure (vessel)	-1 ... 64 bar g (-14.5 ... 928 psi g)
• Density	0.7 ... 2.5 g/cm³ (0.025 ... 0.09 lb/in³)
Design	
Material	
• Enclosure	316L and Plastic PEI
• Tuning fork	316L (1.4404 or 1.4435)
• Process connection (threaded)	316L (1.4404 or 1.4435)
• Process seal	Klingersil C-4400
Process connection	
• Pipe thread, cylindrical (ISO 228 T1)	G ½" A, G ¾" A, or G 1" A
• Pipe thread, tapered	½" NPT, ¾" NPT, or 1" NPT
• Hygienic fittings	Bolting DN 40 PN 40 Tri-clamp 1", 1½", 2" PN 10
Degree of protection	IP65/Type 4/NEMA 4 (with DIN 43650 valve plug), IP66/67 or IP68 (with M12 connector)
Conduit entry	1 x M12 [IP66/IP67 or IP68 (0.2 bar)]
Weight (housing)	250 g (9 oz)
Power supply	
Supply voltage	20 ... 253 V AC, 50/60 Hz 20 ... 253 V DC
Power consumption	Max. 0.5 W
Certificates and approvals	• Overfill protection (WHG) • Marine approvals (ABS, CCS, DNV-GL, LR, RINA)

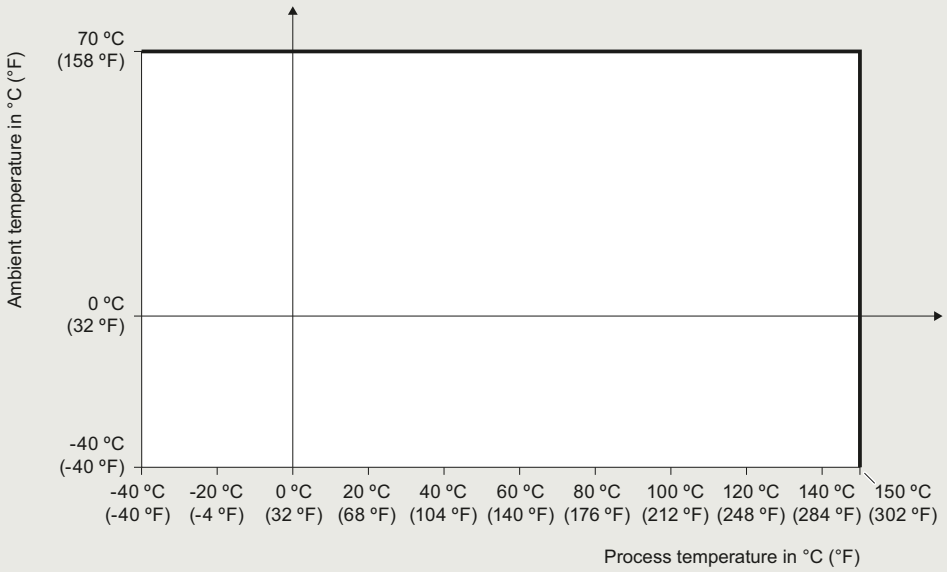
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Characteristic curves

Ambient temperature to process temperature dependency (standard version)



Ambient temperature to process temperature dependency (high temperature version)



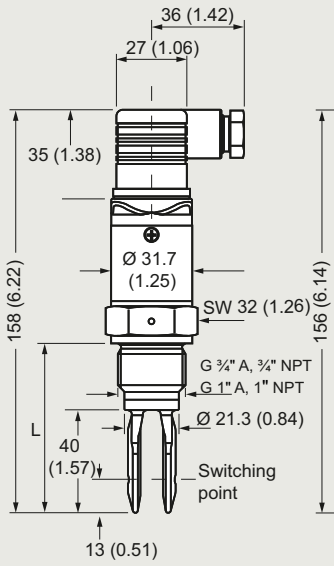
SITRANS LVL100 ambient temperature/process temperature derating curves

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Dimensional drawings

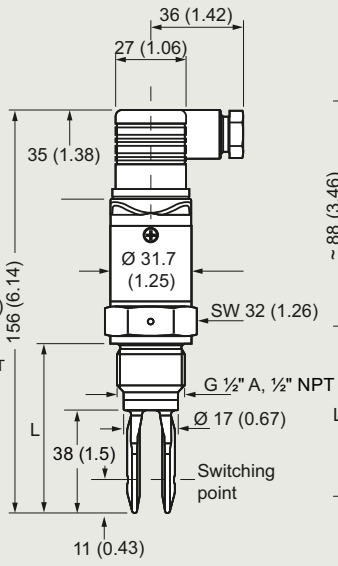
SITRANS LVL100 (standard)

Thread G ¾", G 1" A
(DIN ISO 228/1),
¾" NPT or 1" NPT
(valve plug ISO 4400)



L =
Length with G ¾" A, ¾" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)

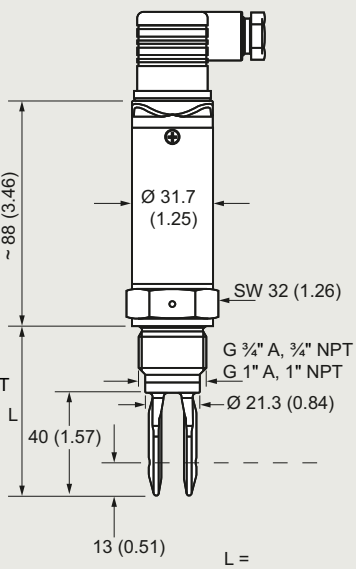
Thread G ½" A
(DIN ISO 228/1),
½" NPT
(valve plug ISO 4400)



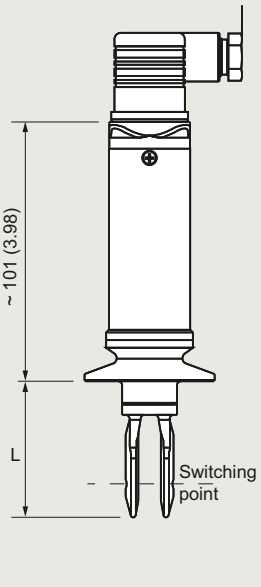
L =
Length with G ½" A, ½" NPT: 62 (2.4)

SITRANS LVL100 (extended high temperature)

Thread G ¾" A, G 1" A
(DIN ISO 228/1),
¾" NPT or 1" NPT
(valve plug DIN 43650)

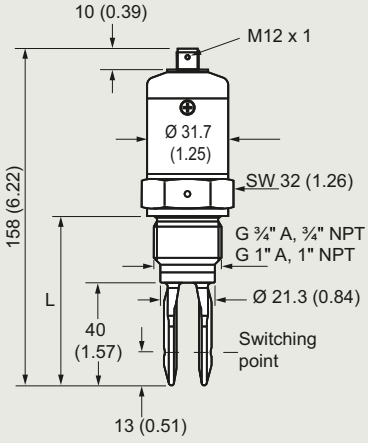


Tri-clamp (valve plug DIN 43650)

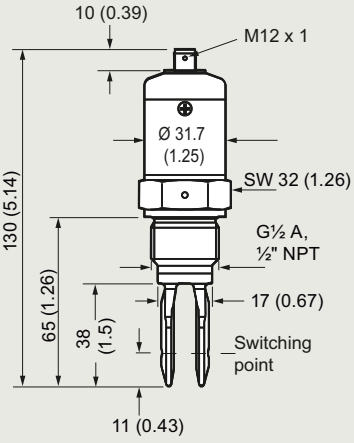


L =
Length with G ¾" A, ¾" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)
Length with Tri-clamp: 53 (2.1)

SITRANS LVL100 (standard with M12 connector)



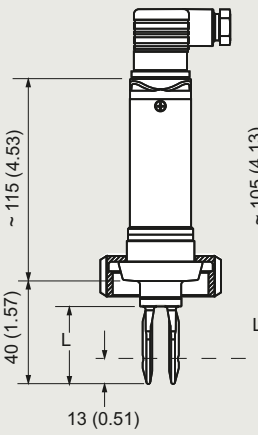
L =
Length with G ¾" A, ¾" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)



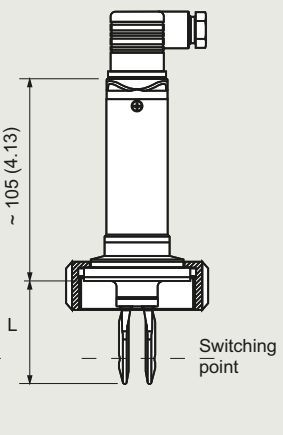
L =
Length with G ½" A, ½" NPT: 62 (2.4)

SITRANS LVL100 (extended, high temperature)

Bolting DIN 11851
(valve plug DIN 43650)



SMS 1145
(valve plug DIN 43650)

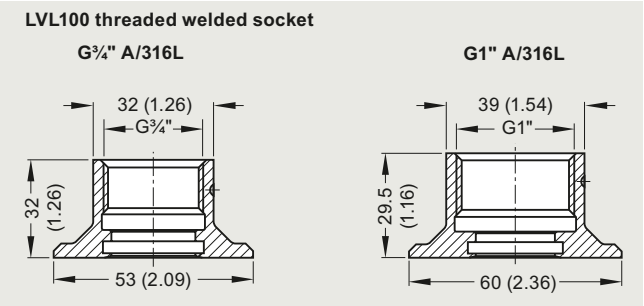


L =
Length with bolting: 53 (2.1)
Length with SMS 1145: 53 (2)

SITRANS LVL100, dimensions in mm (inch)

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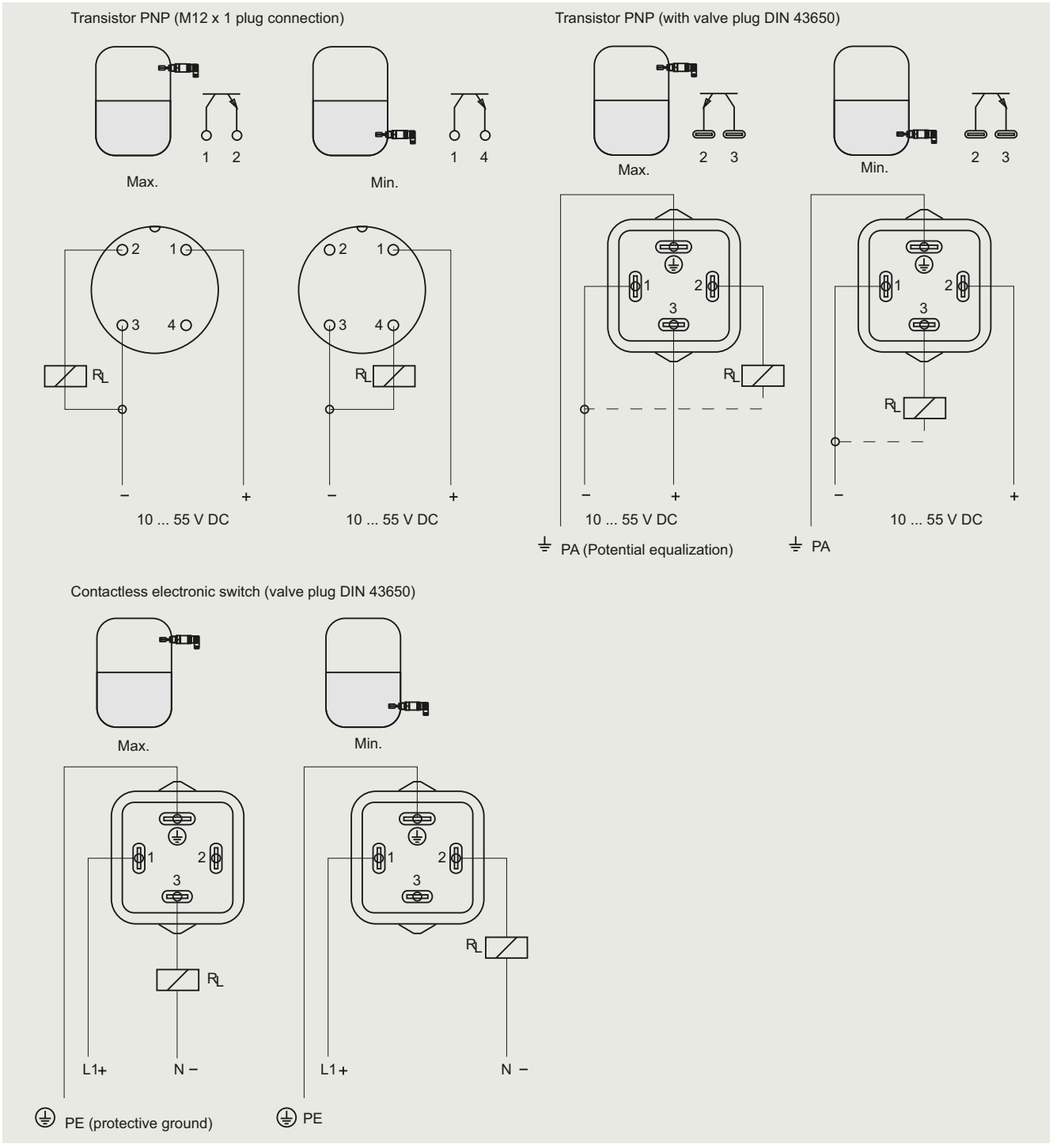
Dimensional drawings (continued)



SITRANS LVL100 welded socket, dimensions in mm (inch)

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Circuit diagrams



SITRANS LVL100 connections

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Overview



SITRANS LVL200 is a standard vibrating point level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 applications.

Benefits

- Proven vibrating level switch technology for liquids
- Compact insertion length of 40 mm (1.57 inch) for confined space applications
- Fault monitoring for corrosion, loss of vibration or line break to the piezo drive
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511
- Hygienic process connections
- Suitable for API 2350
- Optional remote test signal conditioner

Application

SITRANS LVL200 is a level switch designed for industrial use in all areas of process technology and can be used with liquids and slurries. With a tuning fork insertion length of only 40 mm (1.57 inch), SITRANS LVL200 can be mounted in small pipes and applications with confined space. The LVL200 can be used to measure products with a minimum density of > 0.5 g/cm³ (0.018 lb/in³). The LVL200 can be used in difficult conditions including turbulence, air bubbles, foam generation, buildup, or external vibration.

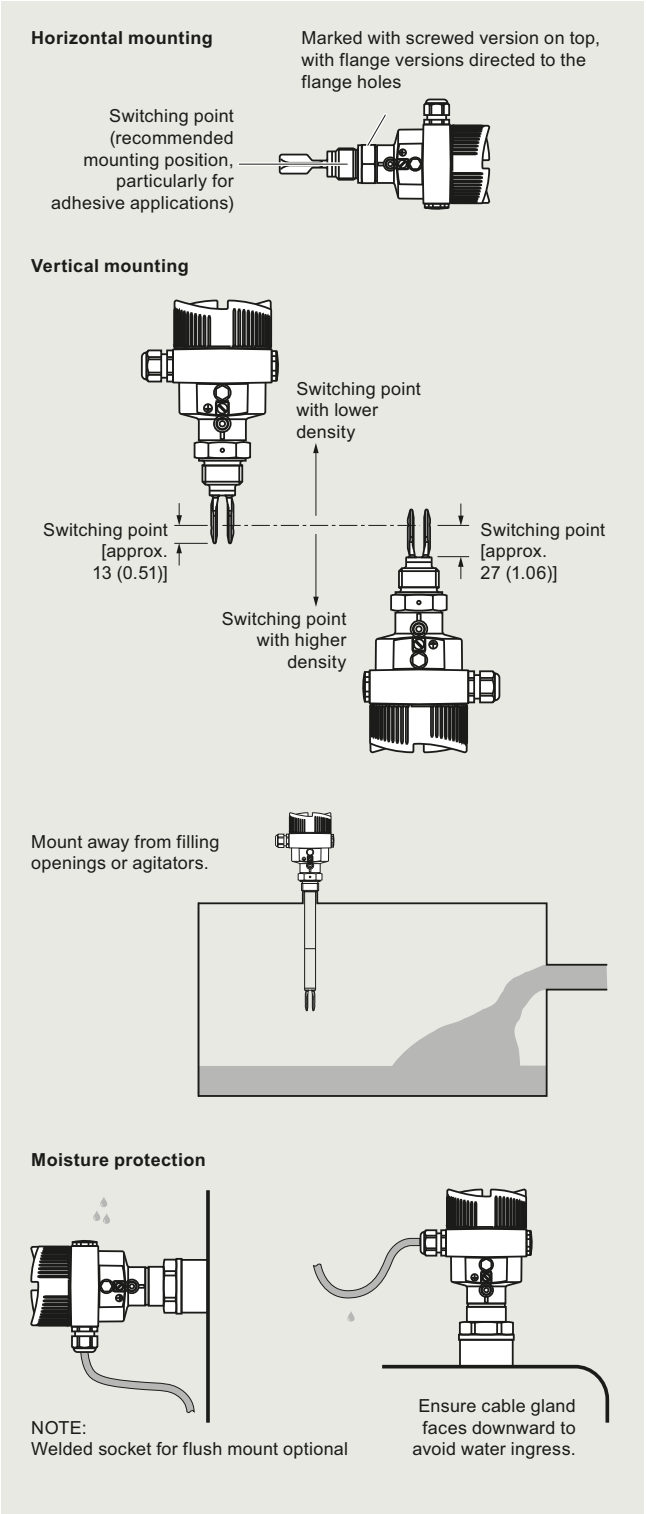
SITRANS LVL200 continuously monitors faults via frequency evaluation, providing early detection of strong corrosion or damage on the tuning fork, loss of vibration, or a line break to the piezo drive.

The tuning fork is piezoelectrically energized and vibrates at its mechanical resonance frequency of approximately 1 200 Hz. The vibration frequency changes when the tuning fork is covered by the medium. This change is detected by the integrated oscillator and converted into a switching command. The integrated electronics evaluate the level signal and output a switching signal, directly operating connected devices.

The optional signal conditioner provides a remote test feature to ensure continuous product reliability.

- Key Applications: for use in liquids and slurries, for level measurement, overfill, and dry run protection

Configuration



SITRANS LVL200 installation, dimensions in mm (inch)

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Selection and ordering data

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574-6-	●	●	●	●	●	-	●	●	A	0	Ord. Code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Electronics														
Contactless electronic switch 20 ... 250 V AC/DC[1)9)24)]		1												
Double relay (DPDT) 20 ... 72 V DC/20 ... 250 V AC[24)]		2												
NAMUR signal[9)]		4												
Transistor (NPN/PNP) 10 ... 55 V DC[1)25)]		5												
Two-wire (8/16 mA) 12 ... 36 V DC[27)]		6												
Approvals														
CE			A											
Overfill protection (WHG)[9)]			B											
ATEX II 1G, ½G, 2G Ex ia IIC T6[6)]			W											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + WHG[6)9)]			C											
ATEX II ½G, 2G Ex d IIC T6 + WHG[5)15)]			D											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + shipping approvals[6)16)]			E											
ATEX II ½G, 2G Ex d IIC T6 + shipping approvals[5)15)]			F											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + ATEX II ½D IP6X T[6)7)17)]			G											
IECEx Ex ia IIC T6[6)18)]			H											
Shipping approvals[16)]			K											
ATEX II 3G Ex nA II T5 ... T1 X[14)19)]			L											
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[6)20)]			N											
FM (XP) Class I, Div. 1, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G[2)5)10)]			P											
FM (NI) Class I, Div. 2, Groups A, B, C, D, CE[21)]			Q											
IECEx d IIC T6 ... T2 Ga/Gb[5)15)]			R											
CSA (XP) Class I, II, III Div. 1, Groups A, B, C, D, E, F, G[5)15)]			S											
CSA (NI) Class I, II, III, Div. 2, Groups A, B, C, D, E, F, G, CE[22)]			T											
BR-Ex d IIC T6 ... T2[5)23)]			U											
CSA (IS) Class I, II, III Div. 1, Groups A, B, C, D, E, F, G[6)9)]			V											
ATEX II ½D, 2D ExtD A20/21, A21 IP6 T...[6)19)]			X											
EAC + ATEX II 1G, ½G, 2G Ex ia IIC T6 + WHG[9)26)]			Z									J	1	A
EAC + ATEX II ½G, Ex d IIC T2 ... T6 + WHG[5)15)28)]			Z									J	1	B
EAC + ATEX II ½G, Ex d IIC T2 ... T6 + Ship approval[5)15)28)]			Z									J	1	C
EAC + ATEX II 1G, ½G, 2G Ex ia IIC T6 + II ½D, 2D ExtD[7)17)28)]			Z									J	1	D
EAC + ATEX II ½D, 2D ExtD A20/21, A21 IP6 T...[17)26)]			Z									J	1	E
Process connection														
Thread G¾" A, PN 64/316L				A	0	0								
Thread G¾" A, PN 64/316L Ra < 0.8 µm				A	0	1								
Thread ¾" NPT, PN 64/316L				A	0	2								
Thread ¾" NPT, PN 64/316L Ra < 0.8 µm				A	0	3								
Thread ¾" NPT, PN 64/Alloy 400 (2.4360)				A	0	4								
Thread G¾" A, PN 64/Alloy C22 (2.4602)				A	0	5								
Thread ¾" NPT, PN 64/Alloy C22 (2.4602)				A	0	6								
Thread G1" A, PN 64/316L				A	0	7								
Thread G1" A, PN 64/316L ECTFE coated MB1982[4)]				A	0	8								
Thread G1" A, PN 64/316L PFA coated[4)]				A	1	0								
Thread G1" A, PN 64/Alloy 400 (2.4360)				A	1	1								
Thread G1" A, PN 64/316L Ra < 0.8 µm				A	1	2								
Thread 1" NPT, PN 64/316L				A	1	3								
Thread 1" NPT, PN 64/316L ECTFE coated MB1982[4)]				A	1	4								
Thread 1" NPT, PN 64/316L PFA-coated[4)]				A	1	5								

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● A 0	Ord. Code ● ● ●
Thread 1" NPT, PN 64/Alloy 400 (2.4360)	A 1 6	
Thread 1" NPT, PN 64/316L Ra < 0.8 µm	A 1 7	
Thread G1" A, PN 64/Alloy C22 (2.4602)	A 1 8	
Thread G1" A, PN 64/Alloy C22 (2.4602) Ra < 0.3 µm	A 2 0	
Thread G1½" A, PN 64/316L	A 2 1	
Thread G1½" A, PN 64/316L Ra < 0.8 µm	A 2 2	
Thread G1½" A, PN 64/Alloy C22 (2.4602)	A 2 3	
Thread 1" NPT, PN 64/Alloy C22 (2.4602)	A 2 4	
Thread 1½" NPT, PN 64/316L	A 2 5	
Thread 1½" NPT, PN 64/316L Ra < 0.8 µm	A 2 6	
Thread 1½" NPT, PN 64/Alloy C22 (2.4602)	A 2 7	
Thread G2" A, PN 64/316L	A 2 8	
Thread M27 x 1.5, PN 64/316L	A 3 0	
Conus DN 25, PN 40/316L Ra < 0.3 µm	A 3 1	
Conus DN 25, PN 40/316L Ra < 0.8 µm	A 3 2	
Conus DN 25, PN 40/ECTFE (ZB3033)[4]	A 3 3	
Conus M52, PN 40/316L	A 3 4	
Conus M52, PN 40/316L Ra < 0.3 µm	A 3 5	
Conus M52, PN 40/316L Ra < 0.8 µm	A 3 6	
Tri-Clamp 1", PN 16/316L Ra < 0.3 µm	A 3 7	
Tri-Clamp 1", PN 16/Alloy C22 (2.4602)	A 3 8	
Tri-Clamp 1", PN 16/316L Ra < 0.8 µm	A 4 0	
Tri-Clamp 1½", PN 16/316L Ra < 0.3 µm	A 4 1	
Tri-Clamp 1½", PN 16/Alloy C22 (2.4602)	A 4 2	
Tri-Clamp 1½", PN 16/316L Ra < 0.8 µm	A 4 3	
Tri-Clamp 2", PN 16/316L Ra < 0.3 µm	A 4 4	
Tri-Clamp 2", PN 16/Alloy C22 (2.4602)	A 4 5	
Tri-Clamp 2", PN 16/316L Ra < 0.8 µm	A 4 6	
Tri-Clamp 2½", PN 10/316L Ra < 0.3 µm	A 4 7	
Tri-Clamp 2½", PN 10/316L Ra < 0.8 µm	A 4 8	
Tri-Clamp 3", PN 10/316L Ra < 0.3 µm	A 5 0	
Tri-Clamp 3", PN 10/316L Ra < 0.8 µm	A 5 1	
Bolting DN 32, PN 40 DIN11851/316L Ra < 0.3 µm	A 5 2	
Bolting DN 32, PN 40 DIN11851/316L Ra < 0.8 µm	A 5 3	
Bolting DN 25, PN 40 DIN11851/316L Ra < 0.3 µm	A 5 4	
Bolting DN 25, PN 40 DIN11851/316L Ra < 0.8 µm	A 5 5	
Bolting DN 40, PN 40 DIN11851/316L Ra < 0.3 µm	A 5 6	
Bolting DN 40, PN 40 DIN11851/316L Ra < 0.8 µm	A 5 7	
Bolting DN 40, PN 40 DIN11864-1 A/316L Ra < 0.8 µm ZB3052	A 5 8	
Bolting DN 50, PN 25 DIN11851/316L Ra < 0.3 µm	A 6 0	
Bolting DN 50, PN 25 DIN11851/316L Ra < 0.8 µm	A 6 1	
Bolting DN 50, PN 25 DIN11864-1 A/316L Ra < 0.8 µm ZB3052	A 6 2	
Hygienic w. compr. nut F40, PN 25/316L	A 6 3	
Hygienic w. compr. nut F40, PN 25/316L Ra < 0.3 µm	A 6 4	
Hygienic w. compr. nut F40, PN 25/316L Ra < 0.8 µm	A 6 5	
Varivent N50-40/316L Ra < 0.3 µm	A 6 6	
Varivent N50-40/316L Ra < 0.8 µm	A 6 7	
Varivent N125/100/316L Ra < 0.8 µm	A 6 8	
DRD flange, PN 40/316L ZB3007	A 7 0	
SMS DN 38/316L Ra < 0.8 µm[4]	A 7 1	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● A 0	Ord. Code ● ● ●
SMS DN 51, PN 6/316L Ra < 0.8 µm[4]	A 7 2	
Swagelok VCR screwing ZG2579, PN 64/316L	A 7 3	
Neumo biocontrol size 25, PN 16/316L Ra < 0.8 µm	A 7 4	
Neumo biocontrol size 50, PN 16/316L Ra < 0.8 µm[4]	A 7 5	
Neumo biocontrol size 65, PN 16/316L Ra < 0.8 µm	A 7 6	
Neumo biocontrol size 80, PN 16/316L Ra < 0.8 µm	A 7 7	
SÜDMO DN 50, PN 10/316L Ra < 0.8 µm	A 7 8	
Small flange DN 25, PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm	A 8 0	
Small flange DN 40, PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm	A 8 1	
Ingold connection, PN16/316L a < 0.8 µm (acc. to MB2523)	A 8 2	
Ingold connection, PN 16/Alloy C22 (2.4602) Ra < 0.8 µm (acc. to MB6017)	A 8 3	
Terminal DN 33.7 PN 40 DIN 11864-3-A-/316L BN2 Ra < 0.8 µm[4]	A 8 4	
Hygienic fl. DN 50 PN 16 DIN 11864-2-A-/316L Ra < 0.8 µm	A 8 5	
Flange DN 25, PN 6 Form C, DIN 2501/316L	A 8 6	
Flange DN 25, PN 6 Form C, DIN 2501/PFA[4]	A 8 7	
Flange DN 25, PN 40 Form C, DIN 2501/316L	A 8 8	
Flange DN 25, PN 40 Form C, DIN 2501/Alloy C22 (2.4602)	B 0 0	
Flange DN 25, PN 40 Form C, DIN 2501/ECTFE[4]	B 0 1	
Flange DN 25, PN 40 Form C, DIN 2501/PFA[4]	B 0 2	
Flange DN 25, PN 40 Form C, DIN 2501/Enamelled	B 0 3	
Flange DN 25, PN 40 Form D, DIN 2501/316L	B 0 4	
Flange DN 25, PN 40 Form F, DIN 2501/316L	B 0 5	
Flange DN 25, PN 40 Form N, DIN 2501/316L	B 0 6	
Flange DN 25, PN 40 Form N, DIN 2501/Alloy C22 (2.4602)	B 0 7	
Flange DN 25, PN 40 Form N, DIN 2501/Alloy 400 (2.4360) solid	B 0 8	
Flange DN 25, PN 40 V13, DIN 2501/316L	B 1 0	
Flange DN 32, PN 40 Form C, DIN 2501/316L	B 1 1	
Flange DN 32, PN 40 Form C, DIN 2501/ECTFE[4]	B 1 2	
Flange DN 40, PN 6 Form C, DIN 2501/316L	B 1 3	
Flange DN 40, PN 6 Form C, DIN 2501/ECTFE[4]	B 1 4	
Flange DN 40, PN 40 Form C, DIN 2501/316L	B 1 5	
Flange DN 40, PN 40 Form C, DIN 2501/Alloy C22 (2.4602)	B 1 6	
Flange DN 40, PN 40 Form C, DIN 2501/ECTFE[4]	B 1 7	
Flange DN 40, PN 40 Form C, DIN 2501/PFA[4]	B 1 8	
Flange DN 40, PN 40 Form C, DIN 2501/Enamelled[3]	B 2 0	
Flange DN 40, PN 40 Form F, DIN 2501/316L	B 2 1	
Flange DN 40, PN 40 Form N, DIN 2501/316L	B 2 2	
Flange DN 40, PN 40 Form E, DIN 2501/316L	B 2 3	
Flange DN 40, PN 40 V13, DIN 2501/316L	B 2 4	
Flange DN 50, PN 40 Form C, DIN 2501/316L	B 2 5	
Flange DN 50, PN 40 Form C, DIN 2501/Alloy C22 (2.4602)	B 2 6	
Flange DN 50, PN 40 Form C, DIN 2501/ECTFE[4]	B 2 7	
Flange DN 50, PN 40 Form C, DIN 2501/ECTFE (ZB3108)[4]	B 2 8	
Flange DN 50, PN 40 Form C, DIN 2501/PFA[4]	B 3 0	
Flange DN 50, PN 40 Form D, DIN 2501/316L	B 3 1	
Flange DN 50, PN 40 Form D, DIN 2501/Alloy C22 (2.4602)	B 3 2	
Flange DN 50, PN 40 Form F, DIN 2501/316L	B 3 3	
Flange DN 50, PN 40 Form N, DIN 2501/316L	B 3 4	
Flange DN 50, PN 40 Form N, DIN 2501/Alloy C22 (2.4602)	B 3 5	
Flange DN 50, PN 40 Form E, DIN 2501/316L	B 3 6	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● A 0	Ord. Code ● ● ●
Flange DN 50, PN 40 V13, DIN 2501/316L	B 3 7	
Flange DN 50, PN 40 R13, DIN 2501/316L	B 3 8	
Flange DN 50, PN 64 Form F, DIN 2501/316L	B 4 0	
Flange DN 50, PN 64 Form N, DIN 2501/Alloy C22 (2.4602)	B 4 1	
Flange DN 50, PN 64 Form C, DIN 2501/316L	B 4 2	
Flange DN 50, PN 64 Form L, DIN 2501/316L	B 4 3	
Flange DN 50, PN 100 Form E, DIN 2501/316L	B 4 4	
Flange DN 50, PN 100 Form L, DIN 2501/316L	B 4 5	
Flange DN 65, PN 40 Form C, DIN 2501/316L	B 4 6	
Flange DN 65, PN 40 Form C, DIN 2501/Alloy C22 (2.4602)	B 4 7	
Flange DN 65, PN 40 Form C, DIN 2501/ECTFE[4)]	B 4 8	
Flange DN 65, PN 40 Form C, DIN 2501/PFA[4)]	B 5 0	
Flange DN 65, PN 40 Form F, DIN 2501/316L	B 5 1	
Flange DN 65, PN 64 Form E, DIN 2501/316L	B 5 2	
Flange DN 80, PN 40 Form C, DIN 2501/316L	B 5 3	
Flange DN 80, PN 40 Form C, DIN 2501/Alloy C22 (2.4602)	B 5 4	
Flange DN 80, PN 40 Form C, DIN 2501/ECTFE[4)]	B 5 5	
Flange DN 80, PN 40 Form C, DIN 2501/PFA[4)]	B 5 6	
Flange DN 80, PN 40 Form C, DIN 2501/Enamelled[3)]	B 5 7	
Flange DN 80, PN 40 Form F, DIN 2501/316L	B 5 8	
Flange DN 80, PN 40 Form N, DIN 2501/316L	B 6 0	
Flange DN 100, PN 16 Form C, DIN 2501/316L	B 6 2	
Flange DN 100, PN 16 Form C, DIN 2501/Alloy C22 (2.4602)	B 6 3	
Flange DN 100, PN 16 Form C, DIN 2501/ECTFE[4)]	B 6 4	
Flange DN 100, PN 16 Form C, DIN 2501/PFA[4)]	B 6 5	
Flange DN 100, PN 16 Form C, DIN 2501/Enamelled[3)]	B 6 6	
Flange DN 100, PN 16 Form D, DIN 2501/316L	B 6 7	
Flange DN 100, PN 16 Form F, DIN 2501/316L	B 6 8	
Flange DN 100, PN 16 Form N, DIN 2501/316L	B 7 0	
Flange DN 100, PN 40 Form C, DIN 2501/316L	B 7 1	
Flange DN 100, PN 40 Form C, DIN 2501/ECTFE[4)]	B 7 2	
Flange DN 100, PN 40 Form C, DIN 2501/PFA[4)]	B 7 3	
Flange DN 100, PN 40 Form C, DIN 2501/Enamelled[3)]	B 7 4	
Flange DN 100, PN 40 Form F, DIN 2501/316L	B 7 5	
Flange DN 100, PN 40 Form N, DIN 2501/316L	B 7 6	
Flange DN 100, PN 40 V13, DIN 2501/316L	B 7 7	
Flange DN 100, PN 64 Form E, DIN 2501/316L	B 7 8	
Flange DN 100, PN 100 Form E, DIN 2501/316L	B 8 0	
Flange DN 100, PN 100 Form L, DIN 2501/316L	B 8 1	
Flange DN 125, PN 16 Form F, DIN 2501/316L	B 8 2	
Flange DN 125, PN 40 Form C, DIN 2501/316L	B 8 3	
Flange DN 125, PN 40 Form N, DIN 2512/ 316L	B 8 4	
Flange DN 150, PN 16 Form C, DIN 2501/316L	B 8 5	
Flange DN 150, PN 16 Form C, DIN 2501/Alloy C22 (2.4602)	B 8 6	
Flange DN 150, PN 16 Form C, DIN 2501/ECTFE[4)]	B 8 7	
Flange DN 150, PN 16 Form C, DIN 2501/PFA[4)]	B 8 8	
Flange DN 150, PN 16 Form D, DIN 2501/316L	C 0 0	
Flange DN 150, PN 40 Form C, DIN 2501/316L	C 0 1	
Flange DN 150, PN 40 Form C, DIN 2501/Alloy C22 (2.4602)	C 0 2	
Flange DN 150, PN 40 Form F, DIN 2501/316L	C 0 3	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● A 0	Ord. Code ● ● ●
Flange DN 150, PN 40 Form N, DIN 2512/316L	C 0 4	
Flange DN 200, PN 10 Form C, DIN 2501/ECTFE[4]	C 0 5	
Flange DN 200, PN 16 Form C, DIN 2501/316L	C 0 6	
Flange DN 25, PN 40 Form B1, EN 1092-1/316L	C 0 7	
Flange DN 25, PN 40 Form B1, EN 1092-1/Alloy C22 (2.4602)	C 0 8	
Flange DN 25, PN 40 Form B1, EN/316L/PFA[4]	C 1 0	
Flange DN 25, PN 40 Form B1, EN 1092-1/Enamelled[3]	C 1 1	
Flange DN 25, PN 40 Form B2, EN 1092-1/316L	C 1 2	
Flange DN 25, PN 40 Form F, EN 1092-1/316L	C 1 3	
Flange DN 25, PN 63 Form B1, EN 1092-1/316L	C 1 4	
Flange DN 25, PN 100 Form B2, EN 1092-1/316L	C 1 5	
Flange DN 40, PN 40 Form B1, EN/316L	C 1 6	
Flange DN 40, PN 40 Form B1, EN 1092-1/PFA[4]	C 1 7	
Flange DN 40, PN 40 Form B2, EN/316L	C 1 8	
Flange DN 50, PN 40 Form B1, EN/316L	C 2 0	
Flange DN 50, PN 40 Form B1, EN 1092-1/Alloy C22 (2.4602)	C 2 1	
Flange DN 50, PN 40 Form B1, EN 1092-1/Alloy 400 (2.4360) ZB2977	C 2 2	
Flange DN 50, PN 40 Form B1, EN 1092-1/ECTFE[4]	C 2 3	
Flange DN 50, PN 40 Form B1, EN/316L/PFA[4]	C 2 4	
Flange DN 50, PN 40 Form B1, EN 1092-1/Enamelled[3]	C 2 5	
Flange DN 50, PN 40 Form C, EN 1092-1/316L	C 2 6	
Flange DN 50, PN 40 Form D, EN/316L	C 2 7	
Flange DN 50, PN 40 Form D, EN 1092-1/Alloy C22 (2.4602)	C 2 8	
Flange DN 50, PN 40 Form B2, EN 1092-1/316L	C 3 0	
Flange DN 50, PN 40 Form E, EN 1092-1/316L	C 3 1	
Flange DN 80, PN 40 Form B1, EN 1092-1/316L	C 3 2	
Flange DN 80, PN 40 Form B1, EN 1092-1/Alloy C22 (2.4602)	C 3 3	
Flange DN 80, PN 40 Form B1, EN 1092-1/ECTFE[4]	C 3 4	
Flange DN 80, PN 40 Form B1, EN 1092-1/Enamelled[3]	C 3 5	
Flange DN 80, PN 40 Form B2, EN 1092-1/316L	C 3 6	
Flange DN 100, PN 16 Form B1, EN 1092-1/316L	C 3 7	
Flange DN 100, PN 16 Form B1, EN 1092-1/Alloy C22 (2.4602)	C 3 8	
Flange DN 100, PN 16 Form B1, EN 1092-1/Enamelled[3]	C 4 0	
Flange DN 100, PN 40 Form B1, EN 1092-1/316L	C 4 1	
Flange DN 100, PN 40 Form B1, EN 1092-1/Enamelled[3]	C 4 2	
Flange DN 100, PN 40 Form C, EN 1092-1/316L	C 4 3	
Flange DN 100, PN 63 Form B2, EN 1092-1/316L	C 4 4	
Flange DN 150, PN 16 Form B1, EN 1092-1/316L	C 4 5	
Flange DN 150, PN 16 Form B1, EN 1092-1/PFA[4]	C 4 6	
Flange DN 150, PN 40 Form B1, EN 1092-1/316L	C 4 7	
Flange DN 150, PN 40 Form B1, EN 1092-1/ECTFE[4]	C 4 8	
Flange DN 150, PN 40 Form B2, EN 1092-1/316L	C 5 0	
Flange 1" 150 lb RF, ASME B16.5/316L	C 5 1	
Flange 1" 150 lb RF, ASME B16.5/Alloy C22 (2.4602)	C 5 2	
Flange 1" 150 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	C 5 3	
Flange 1" 150 lb RF, ASME B16.5/ECTFE[4]	C 5 4	
Flange 1" 150 lb RF, ASME B16.5/PFA[4]	C 5 5	
Flange 1" 150 lb RF, ASME B16.5/Enamelled[3]	C 5 6	
Flange 1" 300 lb RF, ASME B16.5/316L	C 5 7	
Flange 1" 300 lb RF, ASME B16.5/ECTFE[4]	C 5 8	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● A 0	Ord. Code ● ● ●
Flange 1" 600 lb RF, ASME B16.5/316L	C 6 0	
Flange 1½" 150 lb RF, ASME B16.5/316L	C 6 1	
Flange 1½" 150 lb RF, ASME B16.5/Alloy C22 (2.4602)	C 6 2	
Flange 1½" 150 lb RF, ASME B16.5/ECTFE[4]	C 6 3	
Flange 1½" 150 lb RF, ASME B16.5/PFA[4]	C 6 4	
Flange 1½" 150 lb RF, ASME B16.5 Enamelled[3]	C 6 5	
Flange 1½" 150 lb FF, ASME B16.5/ECTFE[4]	C 6 6	
Flange 1½" 300 lb RF, ASME B16.5/316L	C 6 7	
Flange 1½" 300 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	C 6 8	
Flange 1½" 300 lb RF, ASME B16.5/ECTFE[3]	C 7 0	
Flange 1½" 600 lb RF, ASME B16.5/316L	C 7 1	
Flange 2" 150 lb RF, ASME B16.5/316L	C 7 2	
Flange 2" 150 lb RF, ASME B16.5/Alloy C22 (2.4602)	C 7 3	
Flange 2" 150 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	C 7 4	
Flange 2" 150 lb RF, ASME B16.5/ECTFE[4]	C 7 5	
Flange 2" 150 lb RF, ASME B16.5/PFA[4]	C 7 6	
Flange 2" 150 lb RF, ASME B16.5/Enamelled[3]	C 7 7	
Flange 2" 150 lb FF, ASME B16.5/316L	C 7 8	
Flange 2" 150 lb FF, ASME B16.5/ECTF[4]	C 8 0	
Flange 2" 150 lb SG (small groove), ASME B16.5/316L	C 8 1	
Flange 2" 300 lb RF, ASME B16.5/316L	C 8 2	
Flange 2" 300 lb RF, ASME B16.5/Alloy C22 (2.4602)	C 8 3	
Flange 2" 300 lb RF, ASME B16.5/ECTFE[4]	C 8 5	
Flange 2" 300 lb RF, ASME B16.5/PFA[4]	C 8 6	
Flange 2" 300 lb RF, ASME B16.5 Enamelled[3]	C 8 7	
Flange 2" 300 lb RJF, ASME B16.5/316L	C 8 8	
Flange 2" 300 lb ST, ASME B16.5/316L	D 0 0	
Flange 2" 300 lb LG (large groove), ASME B16.5/316L	D 0 1	
Flange 2" 300 lb LT, ASME B16.5/316L	D 0 2	
Flange 2" 600 lb RF, ASME B16.5/316L	D 0 3	
Flange 2" 600 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	D 0 4	
Flange 2" 600 lb RF, ASME B16.5/ECTFE[4]	D 0 5	
Flange 2" 600 lb RJF, ASME B16.5/316L	D 0 6	
Flange 2" 600 lb LG, ASME B16.5/316L	D 0 7	
Flange 2" 900 lb RJF, ASME B16.5/316L	D 0 8	
Flange 2½" 150 lb RF, ASME B16.5/316L	D 1 0	
Flange 2½" 300 lb RF, ASME B16.5/316L	D 1 1	
Flange 3" 150 lb RF, ASME B16.5/316L	D 1 2	
Flange 3" 150 lb RF, ASME B16.5/Alloy C22 (2.4602)	D 1 3	
Flange 3" 150 lb RF, ASME B16.5/ECTFE[4]	D 1 4	
Flange 3" 150 lb RF, ASME B16.5/PFA[4]	D 1 5	
Flange 3" 150 lb RF, ASME B16.5/Enamelled[3]	D 1 6	
Flange 3" 150 lb FF, ASME B16.5/316L	D 1 7	
Flange 3" 150 lb FF, ASME B16.5/ECTFE[4]	D 1 8	
Flange 3" 150 lb FF, ASME B16.5/PFA[4]	D 2 0	
Flange 3" 300 lb RF, ASME B16.5/316L	D 2 1	
Flange 3" 300 lb RF, ASME B16.5/Alloy C22 (2.4602)	D 2 2	
Flange 3" 300 lb RF, ASME B16.5/ECTFE[4]	D 2 3	
Flange 3" 300 lb RF, ASME B16.5/PFA[4]	D 2 4	
Flange 3" 300 lb RF, ASME B16.5/Enamelled[3]	D 2 5	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● A 0	Ord. Code ● ● ●
Flange 3" 600 lb RF, ASME B16.5/316L	D 2 6	
Flange 3½" 150 lb RF, ASME B16.5/316L	D 2 7	
Flange 3½" 150 lb RF, ASME B16.5/ECTFE[4]	D 2 8	
Flange 4" 150 lb RF, ASME B16.5/316L	D 3 0	
Flange 4" 150 lb RF, ASME B16.5/Alloy C22 (2.4602)	D 3 1	
Flange 4" 150 lb RF, ASME B16.5/ECTFE[4]	D 3 2	
Flange 4" 150 lb RF, ASME B16.5/PFA[4]	D 3 3	
Flange 4" 150 lb RF, ASME B16.5/Enamelled[3]	D 3 4	
Flange 4" 150 lb LT, ASME B16.5/316L	D 3 5	
Flange 4" 300 lb RF, ASME B16.5/316L	D 3 6	
Flange 4" 300 lb RF, ASME B16.5/Alloy C22 (2.4602)	D 3 7	
Flange 4" 300 lb RF, ASME B16.5/ECTFE[4]	D 3 8	
Flange 4" 300 lb RJF, ASME B16.5/316L	D 4 0	
Flange 4" 300 lb LG, ASME B16.5/316L	D 4 1	
Flange 4" 300 lb LT, ASME B16.5/316L	D 4 2	
Flange 4" 600 lb RF, ASME B16.5/316L	D 4 3	
Flange 4" 600 lb RJF, ASME B16.5/316L	D 4 4	
Flange 6" 150 lb RF, ASME B16.5/316L	D 4 5	
Flange 6" 150 lb RF, ASME B16.5/Alloy C22 (2.4602)	D 4 6	
Flange 6" 150 lb RF, ASME B16.5/ECTFE[4]	D 4 7	
Flange 6" 150 lb RF, ASME B16.5/PFA[4]	D 4 8	
Flange 6" 150 lb RJF, ASME B16.5/316L	D 5 0	
Flange 6" 300 lb RF, ASME B16.5/316L	D 5 1	
Flange 8" 150 lb RF, ASME B16.5/316L	D 5 2	
Flange 8" 150 lb RF, ASME B16.5/ECTFE[4]	D 5 3	
Flange 1" BS.10 Table E/316L	D 5 4	
Flange 1" BS.10 Table E/PFA[4]	D 5 5	
Flange 1½" BS.10 Table E/316L	D 5 6	
Flange 3½" BS.10 Table E/316L	D 5 7	
Flange 4" BS.10 Table E/ECTFE[4]	D 5 8	
Flange DN 40 10K, JIS/316L	D 6 0	
Flange DN 50 10K, JIS/316L	D 6 1	
Flange DN 80 10K, JIS/316L	D 6 2	
Flange DN 100 10K, JIS/316L	D 6 3	
Thread R1 PN 64, EN 10226-1/316L	D 6 5	
Flange 2" 900 lb RF, ASME B16.5/316L	D 7 0	
Adapter/Process temperature		
Without adapter/-50 ... +150 °C (-58 ... +302 °F)	1	
With adapter/-50 ... +200 °C (-58 ... +392 °F)[13]	2	
With adapter/-50 .... +250 °C (-58 ... +482 °F)	3	
With gas-tight leadthrough/-50 ... +150 °C (-58 ... +302 °F)	4	
With gas-tight leadthrough/-50 ... +250 °C (-58 ... +482 °F)	5	
Housing/Cable entry		
Aluminum IP66/IP67/M20 x 1.5	A	
Aluminum IP66/IP67/½" NPT	B	
316L stainless steel (electropolished) IP66/IP67/M20 x 1.5	C	
316L stainless steel (electropolished) IP66/IP67/½" NPT	D	
Plastic single chamber IP66/IP67/M20 x 1.5	E	
Plastic single chamber IP66/IP67/½" NPT	F	
Stainless steel chamber (precision casting) IP66/IP67/M20 x 1.5	G	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, standard design Detects level and material in liquids and slurries. Short insertion. For hazardous applications.	Article No. 7ML574-6-						-					Ord. Code		
	●	●	●	●	●		●	●	A	0		●	●	●
Stainless steel chamber (precision casting) IP66/IP67/½" NPT								H						
Aluminum IP66/IP67/M20 x 1.5 Special HARTING plug HAN 7D (bent) according to Tier One (ZB7555)[11]								V						

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Switching status indication with colors red-green[12]	**A21**
Cleaning including Certificate (oil, grease, and silicone free)	**W01**
Identification label (measurement loop) stainless steel: max. 40 characters, add in plain text. To add more than one line, use a coma ","" for line break.	**Y17**
Identification Label (measurement loop) foil: max. 40 characters add in plain text. To add more than one line, use a coma "," for line break.	**Y18**
NACE0175 to 3.1 Material Certificate for material (EN10204 NACE MR 0175)[8] Note: not available with Process Connection and Rigid extension coatings PFA, ECTFE, and Enamel. NACE not available with Hygienic process connections.	**D07**
Material Inspection certificate 3.1 of EN 10204[8]	**C05**
2.2-Factory certificate for material (EN 10204)[8]	**C15**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[8]	**C20**
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN 10204)[8]	**C13**
Positive material identification test + 3.1 certificate/instrument[8]	**C16**
Roughness test + 3.1 certificate/instrument[8]	**C18**
3.1-Inspection Certificate for instrument with test data (EN 10204)[8]	**C25**
Quality and test plan	**C26**
Inspection certificate 3.1 (EN 10204) - device and pressure test[8]	**C31**
Helium leak test + 3.1 certificate/instrument[8]	**C32**
Ferrite measuring accuracy to DIN 32514-1 + 3.1 certificate/instrument[8]	**C60**
Pressure test according to Norsok + 3.1 certificate/instrument[8]	**C61**
Factory declaration 2.1 (EN 10204) - certificate suitable for tropical regions with all attachment parts of metal	**C65**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

Spare Parts and Accessories	Article No.
Electronics module SITRANS LVL200 Relay	**7ML1830-1NC**
Electronics module SITRANS LVL200 Contactless	**7ML1930-6AA**
NAMUR spare electronics module	**A5E35817107**
SITRANS SCSC single channel signal conditioner and remote test	**7ML5760**
SITRANS TCSC two channel signal conditioner and remote test	**7ML5761**
LVL200 Threaded Welded Socket	
• G¾" A/316L with FKM Seal	**7ML1930-1EE**
• G1" A/316L with FKM Seal	**7ML1930-1EF**
• M27 x 1.5/316L with FKM Seal	**7ML1930-1EG**
• G¾" A/316L with EPDM Seal	**7ML1930-1EH**
• G1" A/316L with EPDM Seal	**7ML1930-1EJ**
• M27 x 1.5/316L with EPDM Seal	**7ML1930-1EK**

[1] Available only with Adapter/Process temperature options 1, 3, 4, and 5.
[2] Available only with Housing/Protection/Cable option B.
[3] Available only with Adapter/Process Temperature options 1, 2, and 4.
[4] Not available with Adapter/Process Temperature options 2, 3, and 5.
[5] Not available with Adapter/Process Temperature options 2, 4, and 5.
[6] Available only with Electronics options 4 and 6.
[7] Not available with ECTFE coated probe options.
[8] Listed Certificates are not available with all configurations please contact factory for more information.
[9] Not available with Housing/Protection/Cable Option V.
[10] Not available with PFA and ECTFE coating options.
[11] Available only with Approval option A.
[12] Available only with Relay Electronic options and Non-hazardous Approval options.
[13] Available only with Enamelled Process connection options.
[14] Available only with Electronic options 4, 5, and 6.
[15] Available only with Aluminum Housing/Protection/Cable options.
[16] Not available with Stainless Steel (electropolished) Housing/Protection/Cable options and certain glands.
[17] Not available with Plastic and Stainless Steel (electropolished) Housing/Protection/Cable options and certain glands.
[18] Not available with Housing/Protection/Cable options D, and V.
[19] Not available with Plastic Housing/Protection/Cable options and certain glands.
[20] Not available with Housing/Protection/Cable options A, E, G, and V.
[21] Available only with Housing/Protection/Cable options B, D, F, and H.
[22] Not available with Housing/Protection/Cable options C and V.
[23] Available only with Housing/Protection/Cable options A, B, and H.
[24] Not available with Approval options C, E, G, H, L, N, V, W, J1A, J1D, and J1E.
[25] Not available with Approval options C, E, G, H, N, V, W, J1A, J1D, and J1E.
[26] Available only with Electronic option 4.
[27] Not available with EAC approval options.
[28] Not available with Electronic option 6.

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ●	●	●	●	●	-	●	●	●	●	Ord. Code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Electronics													
Contactless electronic switch 20 ... 250 V AC/DC[1)9)14)]	1												
Double relay (DPDT) 20 ... 72 V DC/20 ... 250 V AC[14)]	2												
NAMUR signal[9)]	4												
Transistor (NPN/PNP) 10 ... 55 V DC[1)15)]	5												
Two-wire (8/16 mA) 12 ... 36 V DC[25)]	6												
Approvals													
CE		A											
Overfill protection (WHG)[9)]		B											
ATEX II 1G, ½G, 2G Ex ia IIC T6[6)]		W											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + WHG[6)9)]		C											
ATEX II ½G, 2G Ex d IIC T6 + WHG[5)7)16)]		D											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + shipping approvals[6)17)]		E											
ATEX II ½G, 2G Ex d IIC T6 + shipping approvals[5)7)16)]		F											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + ATEX II ½D IP6X T[6)8)10)18)]		G											
IECEx Ex ia IIC T6[6)19)]		H											
Shipping approvals[17)]		K											
ATEX II 3G Ex nA II T5 ... T1 X		L											
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[6)20)]		N											
FM (XP) Class I, Div. 1, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G[2)5)]		P											
FM (NI) Class I, Div. 2, Groups A, B, C, D[21)]		Q											
IECEx d IIC T6 ... T2 Ga/Gb[5)7)16)]		R											
CSA (XP) Class I, II, III Div. 1, Groups A, B, C, D, E, F, G[2)5)7)]		S											
CSA (NI) Class I, II, III, Div. 2, Groups A, B, C, D, E, F, G[22)]		T											
BR-Ex d IIC T6 ... T2[5)18)]		U											
CSA (IS) Class I, II, III Div. 1, Groups A, B, C, D, E, F, G[6)9)]		V											
ATEX II ½D, 2D ExtD A20/21, A21 IP6 T...[6)10)23)]		X											
EAC + ATEX II 1G, ½G, 2G Ex ia IIC T6 + WHG[9)24)]		Z									J	1	A
EAC + ATEX II ½G, Ex d IIC T2 ... T6 + WHG[5)7)16)26)]		Z									J	1	B
EAC + ATEX II ½G, Ex d IIC T2 ... T6 + Ship approval[5)7)16)26)]		Z									J	1	C
EAC + ATEX II 1G, ½G, 2G Ex ia IIC T6 + II ½D, 2D ExtD[10)18)24)]		Z									J	1	D
EAC + ATEX II ½D, 2D ExtD A20/21, A21 IP6 T...[10)18)24)]		Z									J	1	E
Note: When selecting a Process connection option, process connection coating must match the extension coating and the material and surface roughness type.													
Process connection													
Thread G¾" A, PN 64/316L			A	0	0								
Thread G¾" A, PN 64/316L Ra < 0.8 µm			A	0	1								
Thread ¾" NPT, PN 64/316L			A	0	2								
Thread ¾" NPT, PN 64/316L Ra < 0.8 µm			A	0	3								
Thread ¾" NPT, PN 64/Alloy 400 (2.4360)			A	0	4								
Thread G¾" A, PN 64/Alloy C22 (2.4602)			A	0	5								
Thread ¾" NPT, PN 64/Alloy C22 (2.4602)			A	0	6								
Thread G1" A, PN 64/316L			A	0	7								
Thread G1" A, PN 64/316L ECTFE coated MB1982[4)]			A	0	8								
Thread G1" A, PN 64/316L PFA coated[4)]			A	1	0								
Thread G1" A, PN 64/Alloy 400 (2.4360)			A	1	1								
Thread G1" A, PN 64/316L Ra < 0.8 µm			A	1	3								
Thread 1" NPT, PN 64/316L			A	1	4								
Thread 1" NPT, PN 64/316L ECTFE coated MB1982[4)]			A	1	5								

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ● ●	Ord. Code ● ● ●
Thread 1" NPT, PN 64/316L PFA coated[4)]	A 1 6	
Thread 1" NPT, PN 64/Alloy 400 (2.4360)	A 1 7	
Thread 1" NPT, PN 64/316L Ra < 0.8 µm	A 1 8	
Thread G1" A, PN 64/Alloy C22 (2.4602)	A 2 0	
Thread G1½" A, PN 64/316L	A 2 1	
Thread G1½" A, PN 64/316L Ra <0.8 µm	A 2 2	
Thread G1½" A, PN 64/Alloy C22 (2.4602)	A 2 3	
Thread 1" NPT, PN 64/Alloy C22 (2.4602)	A 2 4	
Thread 1½" NPT, PN 64/316L	A 2 5	
Thread 1½" NPT, PN 64/316L Ra < 0.8 µm	A 2 6	
Thread 1½" NPT, PN 64/Alloy C22 (2.4602)	A 2 7	
Thread G2" A, PN 64/316L	A 2 8	
Thread M27 x 1.5 PN 64/316L	A 3 0	
Cyl. socket/316Ti/1.4581 ECTFE coated ZB2984[4)]	A 3 1	
Conus DN 25 PN 40/316L Ra < 0.3 µm	A 3 2	
Conus DN 25 PN 40/316L Ra < 0.8 µm	A 3 3	
Conus DN 25 PN 40/ECTFE (ZB3033)[4)]	A 3 4	
Conus M52 PN 40/316L	A 3 5	
Conus M52 PN 40/316L Ra < 0.3 µm	A 3 6	
Conus M52 PN 40/316L Ra < 0.8 µm	A 3 7	
Tri-Clamp 1" PN 16/316L Ra < 0.3 µm	A 3 8	
Tri-Clamp 1" PN 16/Alloy C22 (2.4602)	A 4 0	
Tri-Clamp 1" PN 16/316L Ra < 0.8 µm	A 4 1	
Tri-Clamp 1½" PN 16/316L Ra < 0.3 µm	A 4 2	
Tri-Clamp 1½" PN 16/Alloy C22 (2.4602)	A 4 3	
Tri-Clamp 1½" PN 16/316L Ra < 0.8 µm	A 4 4	
Tri-Clamp 2" PN 16/316L Ra < 0.3 µm	A 4 5	
Tri-Clamp 2" PN 16/Alloy C22 (2.4602)	A 4 6	
Tri-Clamp 2" PN 16/316L Ra < 0.8 µm	A 4 7	
Tri-Clamp 2½" PN 10/316L Ra < 0.3 µm	A 4 8	
Tri-Clamp 2½" PN 10/316L Ra < 0.8 µm	A 5 0	
Tri-Clamp 3" PN 10/316L Ra < 0.3 µm	A 5 1	
Clamp 3" PN16 (ø91 mm) DIN32676, ISO2852/ 316L (Ra < 0.8 µm)	A 5 2	
Bolting DN 32 PN 40 DIN 11851/316L Ra < 0.3 µm	A 5 3	
Bolting DN 32 PN 40 DIN 11851/316L Ra < 0.8 µm	A 5 4	
Bolting DN 25 PN 40 DIN 11851/316L Ra < 0.3 µm	A 5 5	
Bolting DN 25 PN 40 DIN 11851/316L Ra < 0.8 µm	A 5 6	
Bolting DN 40 PN 40 DIN 11851/316L Ra < 0.3 µm	A 5 7	
Bolting DN 40 PN 40 DIN 11851/316L Ra < 0.8 µm	A 5 8	
Bolting DN 40 PN 40 DIN 11864-1 A/316L Ra < 0.8 µm ZB3052	A 6 0	
Bolting DN 50 PN 25 DIN 11851/316L Ra < 0.3 µm	A 6 1	
Bolting DN 50 PN 25 DIN 11851/316L Ra < 0.8 µm	A 6 2	
Bolting DN 50 PN 25 DIN 11864-1 A/316L Ra < 0.8 µm ZB3052	A 6 3	
Hygienic w.compr.nut F40 PN 25/316L	A 6 4	
Hygienic w.compr.nut F40 PN 25/316L Ra < 0.3 µm	A 6 5	
Hygienic w.compr.nut F40 PN 25/316L Ra < 0.8 µm	A 6 6	
Varivent N50-40/316L Ra < 0.3 µm	A 6 7	
Varivent N50-40/316L Ra < 0.8 µm	A 6 8	
Varivent N125/100/316L Ra < 0.8 µm	A 7 0	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ● ● ● ● ● 7-	Ord. Code
DRD flange PN 40/316L ZB3007	A 7 1	
SMS DN 38/316L Ra < 0.8 µm[4]	A 7 2	
SMS DN 51 PN 6/316L Ra < 0.8 µm[4]	A 7 3	
Swagelok VCR screwing ZG2579 PN 64/316L	A 7 4	
Neumo biocontrol size 25 PN 16/316L Ra < 0.8 µm	A 7 5	
Neumo biocontrol size 50 PN 16/316L Ra < 0.8 µm	A 7 6	
SÜDMO DN 50 PN 10/316L Ra < 0.8 µm	A 8 0	
Small flange DN 25 PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm	A 8 1	
Small flange DN 40 PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm	A 8 2	
Ingold connection PN 16/316L Ra < 0.8 µm	A 8 3	
Collar clamp connection DN 33,7 PN 40 Form A, DIN 11864-3/1.4435 (BN2, Ra < 0.8 µm)	A 8 4	
Collar flange DN 50 PN 16 Form A, DIN 11864-2/316L (Ra < 0.8 µm)	A 8 5	
Flange DN 25 PN 6 Form C, DIN 2501/316L	A 8 6	
Flange DN 25 PN 6 Form C, DIN 2501/PFA[4]	A 8 7	
Flange DN 25 PN 40 Form C, DIN 2501/316L	A 8 8	
Flange DN 25 PN 40 Form C, DIN 2501/Alloy C22 (2.4602) plated	B 0 0	
Flange DN 25 PN 40 Form C, DIN 2501/ECTFE[4]	B 0 1	
Flange DN 25 PN 40 Form C, DIN 2501/PFA[4]	B 0 2	
Flange DN 25 PN 40 Form D, DIN 2501/316L	B 0 3	
Flange DN 25 PN 40 Form F, DIN 2501/316L	B 0 4	
Flange DN 25 PN 40 Form N, DIN 2501/316L	B 0 5	
Flange DN 25 PN 40 Form N, DIN 2501/Alloy 400 (2.4360) solid	B 0 7	
Flange DN 25 PN 40 V13, DIN 2501/316L	B 0 8	
Flange DN 32 PN 40 Form C, DIN 2501/316L	B 1 0	
Flange DN 32 PN 40 Form C, DIN 2501/ECTFE[4]	B 1 1	
Flange DN 40 PN 6 Form C, DIN 2501/316L	B 1 2	
Flange DN 40 PN 6 Form C, DIN 2501/ECTFE[4]	B 1 3	
Flange DN 40 PN 40 Form C, DIN 2501/316L	B 1 4	
Flange DN 40 PN 40 Form C, DIN 2501/Alloy C22 (2.4602) plated	B 1 5	
Flange DN 40 PN 40 Form C, DIN 2501/ECTFE[4]	B 1 6	
Flange DN 40 PN 40 Form C, DIN 2501/PFA[4]	B 1 7	
Flange DN 40 PN 40 Form C, DIN 2501/Enamelled[3]	B 1 8	
Flange DN 40 PN 40 Form F, DIN 2501/316L	B 2 0	
Flange DN 40 PN 40 Form N, DIN 2501/316L	B 2 1	
Flange DN 40 PN 40 Form E, DIN 2501/316L	B 2 2	
Flange DN 40 PN 40 V13, DIN 2501/316L	B 2 3	
Flange DN 50 PN 40 Form C, DIN 2501/316L	B 2 4	
Flange DN 50 PN 40 Form C, DIN 2501/Alloy C22 (2.4602) plated	B 2 5	
Flange DN 50 PN 40 Form C, DIN 2501/ECTFE[4]	B 2 6	
Flange DN 50 PN 40 Form C, DIN 2501/ECTFE (ZB3108)[4]	B 2 7	
Flange DN 50 PN 40 Form C, DIN 2501/PFA[4]	B 2 8	
Flange DN 50 PN 40 Form D, DIN 2501/316L	B 3 0	
Flange DN 50 PN 40 Form D, DIN 2501/Alloy C22 (2.4602)	B 3 1	
Flange DN 50 PN 40 Form F, DIN 2501/316L	B 3 2	
Flange DN 50 PN 40 Form N, DIN 2501/316L	B 3 3	
Flange DN 50 PN 40 Form N, DIN 2501/Alloy C22 (2.4602) solid	B 3 4	
Flange DN 50 PN 40 Form E, DIN 2501/316L	B 3 5	
Flange DN 50 PN 40 V13, DIN 2501/316L	B 3 6	
Flange DN 50 PN 40 R13, DIN 2501/316L	B 3 7	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ● ●	Ord. Code ● ● ●
Flange DN 50 PN 64 Form F, DIN 2501/316L	B 3 8	
Flange DN 50 PN 64 Form C, DIN 2501/316L	B 4 1	
Flange DN 50 PN 64 Form L, DIN 2501/316L	B 4 2	
Flange DN 50 PN 100 Form E, DIN 2501/316L	B 4 3	
Flange DN 50 PN 100 Form L, DIN 2501/316L	B 4 4	
Flange DN 65 PN 40 Form C, DIN 2501/316L	B 4 5	
Flange DN 65 PN 40 Form C, DIN 2501/ECTFE[4]	B 4 7	
Flange DN 65 PN 40 Form C, DIN 2501/PFA[4]	B 4 8	
Flange DN 65 PN 40 Form F, DIN 2501/316L	B 5 0	
Flange DN 65 PN 64 Form E, DIN 2501/316L	B 5 1	
Flange DN 80 PN 40 Form C, DIN 2501/316L	B 5 2	
Flange DN 80 PN 40 Form C, DIN 2501/Alloy C22 (2.4602) plated	B 5 3	
Flange DN 80 PN 40 Form C, DIN 2501/ECTFE[4]	B 5 4	
Flange DN 80 PN 40 Form C, DIN 2501/PFA[4]	B 5 5	
Flange DN 80 PN 40 Form F, DIN 2501/316L	B 5 6	
Flange DN 80 PN 40 Form N, DIN 2501/316L	B 5 7	
Flange DN 100 PN 16 Form C, DIN 2501/316L	B 6 0	
Flange DN 100 PN 16 Form C, DIN 2501/Alloy C22 (2.4602) plated	B 6 1	
Flange DN 100 PN 16 Form C, DIN 2501/ECTFE[4]	B 6 2	
Flange DN 100 PN 16 Form C, DIN 2501/PFA[4]	B 6 3	
Flange DN 100 PN 16 Form D, DIN 2501/316L	B 6 4	
Flange DN 100 PN 16 Form F, DIN 2501/316L	B 6 5	
Flange DN 100 PN 16 Form N, DIN 2501/316L	B 6 6	
Flange DN 100 PN 40 Form C, DIN 2501/316L	B 6 7	
Flange DN 100 PN 40 Form C, DIN 2501/ECTFE[4]	B 6 8	
Flange DN 100 PN 40 Form C, DIN 2501/PFA[4]	B 7 0	
Flange DN 100 PN 40 Form C, DIN 2501/Enamelled[3]	B 7 1	
Flange DN 100 PN 40 Form F, DIN 2501/316L	B 7 2	
Flange DN 100 PN 40 Form N, DIN 2501/316L	B 7 3	
Flange DN 100 PN 40 V13, DIN 2501/316L	B 7 4	
Flange DN 100 PN 64 Form E, DIN 2501/316L	B 7 5	
Flange DN 100 PN 100 Form E, DIN 2501/316L	B 7 6	
Flange DN 100 PN 100 Form L, DIN 2501/316L	B 7 7	
Flange DN 125 PN 16 Form F, DIN 2501/316L	B 7 8	
Flange DN 125 PN 40 Form C, DIN 2501/316L	B 8 0	
Flange DN 125 PN 40 Form N, DIN 2512/316L	B 8 1	
Flange DN 150 PN 16 Form C, DIN 2501/316L	B 8 2	
Flange DN 150 PN 16 Form C, DIN 2501/Alloy C22 (2.4602) plated	B 8 3	
Flange DN 150 PN 16 Form C, DIN 2501/ECTFE[4]	B 8 4	
Flange DN 150 PN 16 Form C, DIN 2501/PFA[4]	B 8 5	
Flange DN 150 PN 16 Form D, DIN 2501/316L	B 8 6	
Flange DN 150 PN 40 Form C, DIN 2501/316L	B 8 7	
Flange DN 150 PN 40 Form C, DIN 2501/Alloy C22 (2.4602) plated	B 8 8	
Flange DN 150 PN 40 Form F, DIN 2501/316L	C 0 0	
Flange DN 150 PN 40 Form N, DIN 2512/316L	C 0 1	
Flange DN 200 PN 10 Form C, DIN 2501/ECTFE[4]	C 0 2	
Flange DN 200 PN 16 Form C, DIN 2501/316L	C 0 3	
Flange DN 25 PN 40 Form B1, EN 1092-1/316L	C 0 4	
Flange DN 25 PN 40 Form B1, EN 1092-1/Alloy C22 (2.4602) plated	C 0 5	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ● ● ● ● ●	Ord. Code ● ● ●
Flange DN 25 PN 40 Form B1, EN/316L/PFA[4]		C 0 6
Flange DN 25 PN 40 Form B1, EN 1092-1/Enamelled[3]		C 0 7
Flange DN 25 PN 40 Form B2, EN 1092-1/316L		C 0 8
Flange DN 25 PN 40 Form F, EN 1092-1/316L		C 1 0
Flange DN 25 PN 63 Form B1, EN 1092-1/316L		C 1 1
Flange DN 25 PN 100 Form B2, EN 1092-1/316L		C 1 2
Flange DN 40 PN 40 Form B1, EN/316L		C 1 3
Flange DN 40 PN 40 Form B1, EN 1092-1/PFA[4]		C 1 4
Flange DN 40 PN 40 Form B2, EN/316L		C 1 5
Flange DN 50 PN 40 Form B1, EN/316L		C 1 6
Flange DN 50 PN 40 Form B1, EN 1092-1/Alloy C22 (2.4602) plated		C 1 7
Flange DN 50 PN 40 Form B1,EN 1092-1/Alloy 400 (2.4360) ZB2977		C 1 8
Flange DN 50 PN 40 Form B1, EN 1092-1/ECTFE[4]		C 2 0
Flange DN 50 PN 40 Form B1, EN/316L/PFA[4]		C 2 1
Flange DN 50 PN 40 Form B1, EN 1092-1/Enamelled[3]		C 2 2
Flange DN 50 PN 40 Form C, EN 1092-1/316L		C 2 3
Flange DN 50 PN 40 Form D, EN/316L		C 2 4
Flange DN 50 PN 40 Form B2, EN 1092-1/316L		C 2 6
Flange DN 50 PN 40 Form E, EN 1092-1/316L		C 2 7
Flange DN 80 PN 40 Form B1, EN 1092-1/316L		C 2 8
Flange DN 80 PN 40 Form B1, EN 1092-1/Alloy C22 (2.4602) plated		C 3 0
Flange DN 80 PN 40 Form B1, EN 1092-1/ECTFE[4]		C 3 1
Flange DN 80 PN 40 Form B1, EN 1092-1/Enamelled[3]		C 3 2
Flange DN 80 PN 40 Form B2, EN 1092-1/316L		C 3 3
Flange DN 100 PN 16 Form B1, EN 1092-1/316L		C 3 4
Flange DN 100 PN 16 Form B1, EN 1092-1/Alloy C22 (2.4602) plated		C 3 5
Flange DN 100 PN 16 Form B1, EN 1092-1/Enamelled[3]		C 3 6
Flange DN 100 PN 40 Form B1, EN 1092-1/316L		C 3 7
Flange DN 100 PN 40 Form B1, EN 1092-1/Enamelled[3]		C 3 8
Flange DN 100 PN 40 Form C, EN 1092-1/316L		C 4 0
Flange DN 100 PN 63 Form B2, EN 1092-1/316L		C 4 1
Flange DN 150 PN 16 Form B1, EN 1092-1/316L		C 4 2
Flange DN 150 PN 16 Form B1, EN 1092-1/PFA[4]		C 4 3
Flange DN 150 PN 40 Form B1, EN 1092-1/316L		C 4 4
Flange DN 150 PN 40 Form B1, EN 1092-1/ECTFE[4]		C 4 5
Flange DN 150 PN 40 Form B2, EN 1092-1/316L		C 4 6
Flange 1" 150 lb ASME B16.5/316L		C 4 7
Flange 1" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) plated		C 4 8
Flange 1" 150 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977		C 5 0
Flange 1" 150 lb RF, ASME B16.5/ECTFE[4]		C 5 1
Flange 1" 150 lb RF, ASME B16.5/PFA[4]		C 5 2
Flange 1" 150 lb RF, ASME B16.5/Enamelled[3]		C 5 3
Flange 1" 300 lb RF, ASME B16.5/316L		C 5 4
Flange 1" 300 lb RF, ASME B16.5/ECTFE[4]		C 5 5
Flange 1" 600 lb RF, ASME B16.5/316L		C 5 6
Flange 1½" 150 lb RF, ASME B16.5/316L		C 5 7
Flange 1½" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) plated		C 5 8
Flange 1½" 150 lb RF, ASME B16.5/ECTFE[4]		C 6 0
Flange 1½" 150 lb RF, ASME B16.5/PFA[4]		C 6 1

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ● ●	Ord. Code ● ● ●
Flange 1½" 150 lb RF, ASME B16.5 Enamelled[3]	C 6 2	
Flange 1½" 150 lb FF, ASME B16.5/ECTFE[4]	C 6 3	
Flange 1½" 300 lb RF, ASME B16.5/316L	C 6 4	
Flange 1½" 300 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	C 6 5	
Flange 1½" 300 lb RF, ASME B16.5/ECTFE[4]	C 6 6	
Flange 1½" 600 lb RF, ASME B16.5/316L	C 6 7	
Flange 2" 150 lb RF, ASME B16.5/316L	C 6 8	
Flange 2" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) plated	C 7 0	
Flange 2" 150 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	C 7 1	
Flange 2" 150 lb RF, ASME B16.5/ECTFE[4]	C 7 2	
Flange 2" 150 lb RF, ASME B16.5/PFA[4]	C 7 3	
Flange 2" 150 lb RF, ASME B16.5/Enamelled[3]	C 7 4	
Flange 2" 150 lb FF, ASME B16.5/316L	C 7 5	
Flange 2" 150 lb FF, ASME B16.5/ECTFE[4]	C 7 6	
Flange 2" 150 lb SG (small groove), ASME B16.5/316L	C 7 7	
Flange 2" 300 lb RF, ASME B16.5/316L	C 7 8	
Flange 2" 300 lb RF, ASME B16.5/Alloy C22 (2.4602) plated	C 8 0	
Flange 2" 300 lb RF, ASME B16.5/ECTFE[4]	C 8 2	
Flange 2" 300 lb RF, ASME B16.5/PFA[4]	C 8 3	
Flange 2" 300 lb RJF, ASME B16.5/316L	C 8 5	
Flange 2" 300 lb ST, ASME B16.5/316L	C 8 6	
Flange 2" 300 lb LG (large groove), ASME B16.5/316L	C 8 7	
Flange 2" 300 lb LT, ASME B16.5/316L	C 8 8	
Flange 2" 600 lb RF, ASME B16.5/316L	D 0 0	
Flange 2" 600 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	D 0 1	
Flange 2" 600 lb RF, ASME B16.5/ECTFE[4]	D 0 2	
Flange 2" 600 lb RJF, ASME B16.5/316L	D 0 3	
Flange 2" 600 lb LG, ASME B16.5/316L	D 0 4	
Flange 2" 900 lb RJF, ASME B16.5/316L	D 0 5	
Flange 2½" 150 lb RF, ASME B16.5/316L	D 0 6	
Flange 2½" 300 lb RF, ASME B16.5/316L	D 0 7	
Flange 3" 150 lb RF, ASME B16.5/316L	D 0 8	
Flange 3" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) plated	D 1 0	
Flange 3" 150 lb RF, ASME B16.5/Alloy 400 (2.4360) ZB2977	D 1 1	
Flange 3" 150 lb RF, ASME B16.5/ECTFE[4]	D 1 2	
Flange 3" 150 lb RF, ASME B16.5/PFA[4]	D 1 3	
Flange 3" 150 lb RF, ASME B16.5/Enamelled[3]	D 1 4	
Flange 3" 150 lb FF, ASME B16.5/316L	D 1 5	
Flange 3" 150 lb FF, ASME B16.5/ECTFE[4]	D 1 6	
Flange 3" 150 lb FF, ASME B16.5/PFA[4]	D 1 7	
Flange 3" 300 lb RF, ASME B16.5/316L	D 1 8	
Flange 3" 300 lb RF, ASME B16.5/Alloy C22 (2.4602) plated	D 2 0	
Flange 3" 300 lb RF, ASME B16.5/ECTFE[4]	D 2 1	
Flange 3" 300 lb RF, ASME B16.5/PFA[4]	D 2 2	
Flange 3" 300 lb RF, ASME B16.5/Enamelled[3]	D 2 3	
Flange 3" 600 lb RF, ASME B16.5/316L	D 2 4	
Flange 3½" 150 lb RF, ASME B16.5/316L	D 2 5	
Flange 3½" 150 lb RF, ASME B16.5/ECTFE[4]	D 2 6	
Flange 4" 150 lb RF, ASME B16.5/316L	D 2 7	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ● ● 7-	Ord. Code ● ● ●
Flange 4" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) plated	D 2 8	
Flange 4" 150 lb RF, ASME B16.5/ECTFE[4)]	D 3 0	
Flange 4" 150 lb RF, ASME B16.5/PFA[4)]	D 3 1	
Flange 4" 150 lb RF, ASME B16.5/Enamelled[3)]	D 3 2	
Flange 4" 150 lb LT, ASME B16.5/316L	D 3 3	
Flange 4" 300 lb RF, ASME B16.5/316L	D 3 4	
Flange 4" 300 lb RF, ASME B16.5/Alloy C22 (2.4602) plated	D 3 5	
Flange 4" 300 lb RF, ASME B16.5/ECTFE[4)]	D 3 6	
Flange 4" 300 lb RJF, ASME B16.5/316L	D 3 7	
Flange 4" 300 lb LG, ASME B16.5/316L	D 3 8	
Flange 4" 300 lb LT, ASME B16.5/316L	D 4 0	
Flange 4" 600 lb RF, ASME B16.5/316L	D 4 1	
Flange 4" 600 lb RJF, ASME B16.5/316L	D 4 2	
Flange 5" 150 lb RF, ASME B16.5/316L	D 4 3	
Flange 6" 150 lb RF, ASME B16.5/316L	D 4 4	
Flange 6" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) plated	D 4 5	
Flange 6" 150 lb RF, ASME B16.5/ECTFE[4)]	D 4 6	
Flange 6" 150 lb RF, ASME B16.5/PFA[4)]	D 4 7	
Flange 6" 150 lb RJF, ASME B16.5/316L	D 4 8	
Flange 6" 300 lb RF, ASME B16.5/316L	D 5 0	
Flange 8" 150 lb RF, ASME B16.5/316L	D 5 1	
Flange 8" 150 lb RF, ASME B16.5/ECTFE[4)]	D 5 2	
Flange 1" BS.10 Table E/316L	D 5 3	
Flange 1" BS.10 Table E/PFA[4)]	D 5 4	
Flange 1½" BS.10 Table E/316L	D 5 5	
Flange 3½" BS.10 Table E/316L	D 5 6	
Flange 4" BS.10 Table E/ECTFE[4)]	D 5 7	
Flange DN 40 10K, JIS/316L	D 5 8	
Flange DN 50 10K, JIS/316L	D 6 0	
Flange DN 80 10K, JIS/316L	D 6 1	
Flange DN 100 10K, JIS/316L	D 6 2	
Thread R1 PN 64, EN10226-1/316L[11)]	D 6 5	
Flange 2" 900 lb RF, ASME B16.5/316L	D 7 0	
Flange 4" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) solid	D 7 1	
Flange NPS 2" Class 1500 RJF, ASME B16.5 / 316/316L[26)]	D 7 2	
Adapter/Process temperature		
Without adapter/-50 ... +150 °C	1	
With adapter/-50 ... +200 °C[13)]	2	
With adapter/-50 ... +250 °C	3	
With gas-tight leadthrough/-50 ... +150 °C	4	
With gas-tight leadthrough/-50 ... +250 °C	5	
Housing/Cable entry		
Aluminum IP66/IP67/M20 x 1.5	A	
Aluminum IP66/IP67/½" NPT	B	
316L stainless steel (electropolished) IP66/IP67/M20 x 1.5	C	
316L stainless steel (electropolished) IP66/IP67/½" NPT	D	
Plastic single chamber IP66/IP67/M20 x 1.5	E	
Plastic single chamber IP66/IP67/½" NPT	F	
Stainless steel chamber (precision casting) IP66/IP67/M20 x 1.5	G	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ●	Ord. Code ● ● ●
Stainless steel chamber (precision casting) IP66/IP67/½" NPT	H	
Aluminum IP66/IP67/M20 x 1.5 Special HARTING plug HAN 7D (bent) according to Tier One (ZB7555)	V	
NOTE: When selecting a Rigid Extension option, extension coating must match the process connection coating and the material and surface roughness type.		
Rigid Extension 316L		
80 ... 500 mm	A 0	
501 ... 1 000 mm	A 1	
1 001 ... 1 500 mm	A 2	
1 501 ... 2 000 mm	A 3	
2 001 ... 2 500 mm	A 4	
2 501 ... 3 000 mm	A 5	
3 001 ... 3 500 mm	A 6	
3 501 ... 4 000 mm	A 7	
Rigid Extension ECTFE coated		
80 ... 500 mm	B 0	
501 ... 1 000 mm	B 1	
1 001 ... 1 500 mm	B 2	
1 501 ... 2 000 mm	B 3	
2 001 ... 2 500 mm	B 4	
2 501 ... 3 000 mm	B 5	
Rigid Extension PFA coated		
80 ... 500 mm	C 0	
501 ... 1 000 mm	C 1	
1 001 ... 1 500 mm	C 2	
1 501 ... 2 000 mm	C 3	
2 001 ... 2 500 mm	C 4	
2 501 ... 3 000 mm	C 5	
3 001 ... 3 500 mm	C 6	
3 501 ... 4 000 mm	C 7	
Rigid Extension 316L Ra ≤ 0.8 µm		
80 ... 500 mm	D 0	
501 ... 1 000 mm	D 1	
1 001 ... 1 500 mm	D 2	
1 501 ... 2 000 mm	D 3	
2 001 ... 2 500 mm	D 4	
2 501 ... 3 000 mm	D 5	
3 001 ... 3 500 mm	D 6	
3 501 ... 4 000 mm	D 7	
Rigid Extension 316L Ra ≤ 0.3 µm		
80 ... 500 mm	E 0	
501 ... 1 000 mm	E 1	
1 001 ... 1 500 mm	E 2	
1 501 ... 2 000 mm	E 3	
2 001 ... 2 500 mm	E 4	
2 501 ... 3 000 mm	E 5	
3 001 ... 3 500 mm	E 6	
3 501 ... 4 000 mm	E 7	
Rigid Extension Enamelled version		
80 ... 250 mm	F 0	
251 ... 500 mm	F 1	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, rigid extension design Detects level and material in liquids and slurries. Top mount, with extension options to 6 m (19.69 ft). Ideal for hazardous applications.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ●	Ord. Code ● ● ●
501 ... 750 mm	F 2	
751 ... 1 000 mm	F 3	
1 001 ... 1 250 mm	F 4	
1 251 ... 1 500 mm	F 5	
Rigid Extension Alloy C22 (2.4602)		
80 ... 500 mm	G 0	
501 ... 1 000 mm	G 1	
1 001 ... 1 500 mm	G 2	
1 501 ... 2 000 mm	G 3	
2 001 ... 2 500 mm	G 4	
2 501 ... 3 000 mm	G 5	
3 001 ... 3 500 mm	G 6	
3 501 ... 4 000 mm	G 7	
Rigid Extension Alloy 400 (2.4360)		
80 ... 500 mm	H 0	
501 ... 1 000 mm	H 1	
1 001 ... 1 500 mm	H 2	
1 501 ... 2 000 mm	H 3	
2 001 ... 2 500 mm	H 4	
2 501 ... 3 000 mm	H 5	

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Switching status indication with colors red-green[1,2)]	**A21**
Cleaning including Certificate (oil, grease, and silicone free)	**W01**
Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)	**Y01**
Identification label (measurement loop) stainless steel: max. 40 characters, add in plain text. To add more than one line, use a coma "," for line break.	**Y17**
Identification label (measurement loop) foil: max. 40 characters add in plain text. To add more than one line, use a coma "," for line break.	**Y18**
NACE0175 to 3.1 Material Certificate for material (EN 10204 NACE MR 0175)[8)] Note: not available with Process connection and Rigid extension coatings PFA, ECTFE, and Enamel. NACE not available with Hygienic process connections.	**D07**
Material Inspection certificate 3.1 of EN 10204	**C05**
2.2-Factory certificate for material (EN 10204)[8)]	**C15**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[8)]	**C20**
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN 10204)[8)]	**C13**
Positive material identification test + 3.1 certificate/instrument[8)]	**C16**
Roughness test + 3.1 certificate/instrument[8)]	**C18**
3.1-Inspection Certificate for instrument with test data (EN 10204)	**C25**
Quality and test plan	**C26**
Inspection certificate 3.1 (EN 10204) - device and pressure test[8)]	**C31**
Helium leak test + 3.1 certificate/instrument[8)]	**C32**
Ferrite measuring accuracy to DIN 32514-1 + 3.1 certificate/instrument[8)]	**C60**
Pressure test according to Norsok + 3.1 certificate/instrument[8)]	**C61**
Factory declaration 2.1 (EN 10204) - certificate suitable for tropical regions with all attachment parts of metal	**C65**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

Spare Parts and Accessories	Article No.
Electronics module SITRANS LVL200 Relay	**7ML1830-1NC**
Electronics module SITRANS LVL200 Contactless	**7ML1930-6AA**
NAMUR spare electronics module	**A5E35817107**
SITRANS SCSC single channel signal conditioner and remote test	**7ML5760**
SITRANS TCSC two channel signal conditioner and remote test	**7ML5761**
Lock fitting, unpressurized, G1" A/316L	**7ML1930-1DQ**
Lock fitting, unpressurized, 1" NPT/316L	**7ML1930-1DR**
Lock fitting, unpressurized, G1 ... 1/2" A/316L	**7ML1930-1DS**
Lock fitting, unpressurized, 1 ... 1/2" NPT/316L	**7ML1930-1DT**
Lock fitting, -1 ... 16 bar, G1" A/316L	**7ML1930-1DU**
Lock fitting, -1 ... 16 bar, 1" NPT/316L	**7ML1930-1DV**
Lock fitting, -1 ... 16 bar, G1 1/2" A/316L	**7ML1930-1DW**
Lock fitting, -1 ... 16 bar, 1 1/2" NPT/316L	**7ML1930-1DX**
Lock fitting, -1 ... 64 bar, G1" A/316L	**7ML1930-1EA**
Lock fitting, -1 ... 64 bar, 1" NPT/316L	**7ML1930-1EB**
Lock fitting, -1 ... 64 bar, G1 1/2" A/316L	**7ML1930-1EC**
Lock fitting, -1 ... 64 bar, 1 1/2" NPT/316L	**7ML1930-1ED**

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Selection and ordering data (continued)

1) Available only with Adapter/Process temperature options 1, 3, 4, and 5.
2) Available only with Housing/Cable entry option B.
3) Available only with Adapter/Process temperature options 1, 2, and 4.
4) Not available with Adapter/Process temperature options 2, 3, and 5.
5) Not available with Adapter/Process temperature options 2, 4, and 5.
6) Available only with Electronics options 4 and 6.
7) Available only with rigid extension options less than 3 001 mm.
8) Listed Certificates are not available with all configurations please contact factory for more information.
9) Not available with Housing/Protection/Cable option V.
10) Not available with PFA, ECTFE, and enamelled coating options.
11) Available only with some 316L extensions.
12) Available only with relay electronic options and non-hazardous Approval options.
13) Available only with Enamelled Process connection/Material options.
14) Not available with Approval options C, E, G, H, L, N, V, and W.
15) Not available with Approval options C, E, G, H, N, and V.
16) Only available with Aluminum Housing/Protection/Cable options and certain glands.
17) Not available with Stainless Steel Electropolish Housing/Protection/Cable options and certain glands.
18) Not available with Plastic or Stainless Steel Electropolish Housing/Protection/Cable options and certain glands.
19) Not available with Housing/Protection/Cable options D and V.
20) Not available with Housing/Protection/Cable options A, E, G, and V.
21) Not available with some Housing/Protection/Cable gland options.
22) Not available with Housing/Protection/Cable options A, C, and V.
23) Not available with Plastic Housing/Protection/Cable options.
24) Available only with Electronic option 4.
25) Not available with FM approval options.
26) Available only with Rigid extension options A0 ... A7.

SITRANS LVL200 Vibrating point level switch, high temperature and pressure design Detects level and material in liquids and slurries in extreme environments. Extension options to 3 m (9.84 ft).	Article No. 7ML57-48-	●	●	●	●	●	-	●	●	●	●	Ord. Code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Version/Material														
Compact version/Inconel 718 (2.4668)[1)2)]		1												
With tube extension/316L and Inconel 718 (2.4668)[1)3)]		2												
With tube extension/Alloy C22 (2.4602) and Inconel 718 (2.4668)[4)]		3												
Approvals														
Europe CE			A											
Ship approval			B											
Overfill protection WHG[7)]			C											
ATEX II ½G, 2G Ex d IIC T6[6)9)]			D											
ATEX II 1G, ½G, 2G Ex ia IIC T6[5)9)]			F											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + ship approval[5)9)10)]			G											
ATEX II 1G, ½G, 2G Ex ia IIC T6 + Overfill protection (WHG)[6)7)9)]			H											
ATEX II ½G, 2G Ex d IIC T6 + Overfill protection (WHG)[6)7)9)]			J											
FM (NI) Class I, Div. 2, Groups A, B, C, D T6 ... T1[9)11)]			N											
FM (NI) Class I, Div. 2, Groups A, B, C, D T6 ... T1 + Ship approval[6)9)]			P											
FM (IS) Class I, Div. 1, Groups A, B, C, D Zone 0, 0/1, 1, AEx ia IIC T6 ... T1 Ga, Ga/Gb, Gb[5)9)12)]			Q											
FM (XP) Class I, Div. 1, Groups A, B, C, D T6 ... T1, Zone 0/1, 1, AEx d IIC T6 ... T1 Ga/Gb, Gb[6)9)]			R											
FM (XP) Class I, Div. 1, Groups A, B, C, D T6 ... T1, Zone 0/1, 1, AEx d IIC T6 ... T1 Ga/Gb, Gb + Ship approval[6)9)]			S											
IEC Ex d IIC T6[6)9)]			E											
IEC Ex ia IIC T6 + Ship approval[5)9)10)]			U											
IEC Ex ia IIC T6[5)9)]			T											
$_{C}CSA_{US}$(NI) Class I, Div. 2, Groups A, B , C, D, (DIP) Class II, III, Div. 1, Groups E, F, G[6)9)]			V											
$_{C}CSA_{US}$(NI) Class I, Div. 2, Groups A, B, C, D, (DIP) Class II, III, Div. 1, Groups E, F, G + Ship approval[6)9)]			W											
$_{C}CSA_{US}$(IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[5)9)12)]			X											
$_{C}CSA_{US}$(IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[5)9)13)]			Y											
$_{C}CSA_{US}$(XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[6)9)]			K											

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, high temperature and pressure design Detects level and material in liquids and slurries in extreme environments. Extension options to 3 m (9.84 ft).	Article No. 7ML57-48- ● ● ● ● ● - ● ● ● ●	Ord. Code ● ● ●
$_{c}CSA_{US}$(XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[6)9)]	L	
EAC Ga/Gb Ex ia IIC T6 ... T1 X, 0Ex ia IIC T6 ... T1 Ga, 1Ex ia IIC T6 ... T1 Gb X[5)9)]	Z	J 1 A
EAC 1Ex db IIC T6 ... T1 Gb, Ga/Gb Ex db IIC T6 ... T1[6)9)]	Z	J 1 B
INMETRO Ex d IIC T6 ... T1 Ga/Gb, Gb	Z	J 2 A
Process connection		
Thread G1 PN 100, DIN 3852-A/316L	A 0	
Thread G1 PN 160, DIN 3852-A/Inconel 718 (2.4668)	A 1	
Thread 1" NPT PN 100, ASME B1.20.1/316L	A 2	
Thread 1" NPT PN 160, ASME B1.20.1/ Inconel 718 (2.4668)	A 3	
Flange DN 50 PN 40 Form C, DIN 2501/316/316	A 4	
Flange DN 50 PN 40 Form C, DIN 2501/316/316L, with Alloy C22 (2.4602) coating	A 5	
Flange DN 50 PN 40 Form N, DIN 2501/316/316L	A 6	
Flange DN 50 PN 40 Form V13, DIN 2501/316/316L	A 7	
Flange DN 50 PN 40 Form V13, DIN 2501/Alloy C22 (2.4602) solid	A 8	
Flange DN 50 PN 40 Form V13, DIN 2501/316/316L, with Alloy C22 (2.4602) coating	B 0	
Flange DN 50 PN 64 Form E, DIN 2501/316/316L	B 1	
Flange DN 50 PN 100 Form C, DIN 2501/316/316L	B 2	
Flange DN 50 PN 100 Form F, DIN 2501/316/316L	B 3	
Flange DN 50 PN 100 Form V13, DIN 2501/316/316L	B 4	
Flange DN 50 PN 160 Form C, DIN 2501/316/316L	B 5	
Flange DN 50 PN 160 Form F, DIN 2501/316/316L	B 6	
Flange DN 65 PN 16 Form C, DIN 2501/316/316L	B 7	
Flange DN 65 PN 40 Form C, DIN 2501/316/316L	B 8	
Flange DN 65 PN 100 Form C, DIN 2501/316/316L	C 0	
Flange DN 80 PN 40 Form C, DIN 2501/316/316L	C 1	
Flange DN 80 PN 100 Form C, DIN 2501/316/316L	C 2	
Flange DN 80 PN 160 Form F, DIN 2501/316/316L	C 3	
Flange DN 80 PN 160 Form L, DIN 2501/316/316L	C 4	
Flange DN 80 PN 250 Form L, DIN 2501/316/316L	C 5	
Flange DN 80 PN 250 Form L, DIN 2501/Alloy C22 (2.4602) solid	C 6	
Flange DN 100 PN 16 Form C, DIN 2501/316/316L	C 7	
Flange DN 100 PN 40 Form C, DIN 2501/316/316L	C 8	
Flange DN 100 PN 100 Form E, DIN 2501/316/316L	D 0	
Flange DN 100 PN 160 Form L, DIN 2501/316/316L	D 1	
Flange DN 125 PN 16 Form C, DIN 2501/316/316L	D 2	
Flange DN 125 PN 40 Form C, DIN 2501/316/316L	D 3	
Flange DN 150 PN 16 Form C, DIN 2501/316/316L	D 4	
Flange DN 150 PN 16 Form C, DIN 2501/316/316L, with Alloy C22 (2.4602) coating	D 5	
Flange DN 150 PN 40 Form C, DIN 2501/316/316L	D 6	
Flange DN 150 PN 160 Form L, DIN 2501/316/316L	D 7	
Flange DN 200 PN 16 Form C, DIN 2501/316/316L	D 8	
Flange DN 200 PN 64 Form C, DIN 2501/316/316L	E 0	
Flange DN 250 PN 16 Form C, DIN 2501/316/316L	E 1	
Flange DN 250 PN 64 Form C, DIN 2501/316/316L	E 2	
Flange DN 50 PN 40 Form B1, EN 1092-1/1.4435	E 3	
Flange DN 50 PN 40 Form B1, EN 1092-1/316/316L	E 4	
Flange DN 50 PN 40 Form B1, EN 1092-1/316/316L, with Alloy C22 (2.4602) coating	E 5	
Flange DN 50 PN 40 Form B2, EN 1092-1/316/316L	E 6	
Flange DN 50 PN 40 Form C, EN 1092-1/316/316L	E 7	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, high temperature and pressure design Detects level and material in liquids and slurries in extreme environments. Extension options to 3 m (9.84 ft).	Article No. 7ML57- 48-												Ord. Code		
	●	●	●	●	●	-	●	●	●	●			●	●	●
Flange DN 50 PN 40 Form D, EN 1092-1/316/316L				E	8										
Flange DN 50 PN 40 Form E, EN 1092-1/316/316L				F	0										
Flange DN 50 PN 63 Form B2, EN 1092-1/316/316L				F	1										
Flange DN 50 PN 63 Form B2, EN 1092-1/316/316L, with Alloy C22 (2.4602) coating				F	2										
Flange DN 50 PN 63 Form C, EN 1092-1/316/316L				F	3										
Flange DN 50 PN 63 Form D, EN 1092-1/316/316L				F	4										
Flange DN 50 PN 100 Form B1, EN 1092-01/316/316L				F	5										
Flange DN 50 PN 100 Form C, EN 1092-1/316/316L				F	6										
Flange DN 50 PN 160 Form B1, EN 1092-1/316/316L				F	7										
Flange DN 50 PN 160 Form B2, EN 1092-1/316/316L				F	8										
Flange DN 50 PN 250 Form B1, EN 1092-1/316/316L				G	0										
Flange DN 50 PN 250 Form B2, EN 1092-1/316/316L				G	1										
Flange DN 65 PN 40 Form B1, EN 1092-1/316/316L				G	2										
Flange DN 65 PN 63 Form C, EN 1092-1/316/316L				G	3										
Flange DN 80 PN 40 Form B1, EN 1092-1/316/316L				G	4										
Flange DN 80 PN 40 Form B2, EN 1092-1/316/316L				G	5										
Flange DN 80 PN 40 Form C, EN 1092-1/316/316L				G	6										
Flange DN 80 PN 40 Form D, EN 1092-1/316/316L				G	7										
Flange DN 80 PN 63 Form B2, EN 1092-1/316/316L				G	8										
Flange DN 80 PN 160 Form B2, EN 1092-1/316/316L				H	0										
Flange DN 80 PN 250 Form B1, EN 1092-1/316/316L				H	1										
Flange DN 100 PN 16 Form D, EN 1092-1/316/316L				H	2										
Flange DN 100 PN 40 Form B1, EN 1092-1/316/316L				H	3										
Flange DN 100 PN 40 Form B2, EN 1092-1/316/316L				H	4										
Flange DN 100 PN 40 Form C, EN 1092-1/316/316L				H	5										
Flange DN 100 PN 40 Form D, EN 1092-1/316/316L				H	6										
Flange DN 100 PN 160 Form B2, EN 1092-1/316/316L				H	7										
Flange DN 125 PN 63 Form C, EN 1092-1/316/316L				H	8										
Flange DN 125 PN 160 Form B2, EN 1092-1/316/316L				K	0										
Flange DN 150 PN 40 Form B1, EN 1092-1/316/316L				K	1										
Flange DN 150 PN 40 Form C, EN 1092-1/316/316L				K	2										
Flange DN 150 PN 40 Form D, EN 1092-1/316/316L				K	3										
Flange DN 40 PN 100, GOST 12815-80.7/316/316L				K	4										
Flange DN 50 PN 100, GOST 12815-80.7/316/316L				K	5										
Flange DN 80 PN 100, GOST 12815-80.7/316/316L				K	6										
Flange DN 100 PN 100, GOST 12815-80.7/316/316L				K	7										
Flange 1½" 150 lb RJF, ASME B16.5/316/316L				K	8										
Flange 1½" 300 lb RJF, ASME B16.5/316/316L				L	1										
Flange 1½" 1 500 lb RJF, ASME B16.5/316/316L				L	2										
Flange 2" 150 lb RF, ASME B16.5/316/316L				L	3										
Flange 2" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) solid				L	4										
Flange 2" 300 lb RF, ASME B16.5/316/316L				L	5										
Flange 2" 300 lb RF, ASME B16.5/Alloy C22 (2.4602) solid				L	6										
Flange 2" 300 lb RF, ASME B16.5/316/316L, with Alloy C22 (2.4602) coating				L	7										
Flange 2" 300 lb ST (small tongue), ASME B16.5/316/316L				L	8										
Flange 2" 300 lb RJF, ASME B16.5/316/316L				M	1										
Flange 2" 300 lb LM (large male), ASME B16.5/316/316L				M	2										
Flange 2" 300 lb SG, ASME B16.5/316/316L				M	3										
Flange 2" 300 lb LG, ASME B16.5/316/316L				M	4										

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, high temperature and pressure design Detects level and material in liquids and slurries in extreme environments. Extension options to 3 m (9.84 ft).	Article No. 7ML57-48- ● ● ● ● ● - ● ● ● ● ●	Ord. Code ● ● ●
Flange 2" 600 lb RF, ASME B16.5/316/316L	M 5	
Flange 2" 600 lb RF, ASME B16.5/316/316L, with Alloy C22 (2.4602) coating	M 6	
Flange 2" 600 lb RJF, ASME B16.5/316/316L	M 7	
Flange 2" 900 lb RF, ASME B16.5/316/316L	M 8	
Flange 2" 900 lb RJF, ASME B16.5/316/316L	N 1	
Flange 2" 1 500 lb RF, ASME B16.5/316/16L	N 2	
Flange 2" 1 500 lb RJF, ASME B16.5/316/316L	N 3	
Flange 2" 1 500 lb LT, ASME B16.5/Alloy C22 (2.4602) solid	N 4	
Flange 2" 1 500 lb LM, ASME B16.5/316/316L	N 5	
Flange 2" 2 500 lb RJF, ASME B16.5/316/316L	N 6	
Flange 2½" 150 lb RF, ASME B16.5/316/316L	N 7	
Flange 2½" 300 lb RF, ASME B16.5/316/316L	N 8	
Flange 2½" 600 lb RF, ASME B16.5/316/316L	P 1	
Flange 2½" 900 lb RF, ASME B16.5/316/316L	P 2	
Flange 2½" 2 500 lb RJF, ASME B16.5/316/316L	P 3	
Flange 3" 150 lb RF, ASME B16.5/316/316L	P 4	
Flange 3" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) solid	P 5	
Flange 3" 300 lb RF, ASME B16.5/316/316L	P 6	
Flange 3" 300 lb RJF, ASME B16.5/316/316L	P 7	
Flange 3" 300 lb LT, ASME B16.5/316/316L	P 8	
Flange 3" 600 lb RF, ASME B16.5/316/316L	R 1	
Flange 3" 600 lb RF, ASME B16.5/Alloy C22 (2.4602) solid	R 2	
Flange 3" 600 lb RF, ASME B16.5/316/316L, with Alloy C22 (2.4602) coating	R 3	
Flange 3" 600 lb RJF, ASME B16.5/316/316L	R 4	
Flange 3" 900 lb RF, ASME B16.5/316/316L	R 5	
Flange 3" 900 lb RJF, ASME B16.5/316/316L	R 6	
Flange 3" 1 500 lb RF, ASME B16.5/316/316L	R 7	
Flange 3" 1 500 lb RJF, ASME B16.5/316/316L	R 8	
Flange 3" 2 500 lb RF, ASME B16.5/316/316L	S 1	
Flange 3" 2 500 lb RJF, ASME B16.5/316/316L	S 2	
Flange 4" 150 lb RF, ASME B16.5/316/316L	S 3	
Flange 4" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) solid	S 4	
Flange 4" 150 lb RJF, ASME B16.5/316/316L	S 5	
Flange 4" 300 lb RF, ASME B16.5/316/316L	S 6	
Flange 4" 300 lb RF, ASME B16.5/Alloy C22 (2.4602) solid	S 7	
Flange 4" 300 lb LT, ASME B16.5/316/316L	S 8	
Flange 4" 600 lb RF, ASME B16.5/316/316L	T 1	
Flange 4" 600 lb RF, ASME B16.5/Alloy C22 (2.4602) solid	T 2	
Flange 4" 600 lb RJF, ASME B16.5/316/316L	T 3	
Flange 4" 900 lb RF, ASME B16.5/316/316L	T 4	
Flange 4" 900 lb RJF, ASME B16.5/316/316L	T 5	
Flange 4" 900 lb LT, ASME B16.5/316/316L	T 6	
Flange 4" 1 500 lb RF, ASME B16.5/316/316L	T 7	
Flange 4" 1 500 lb RJF, ASME B16.5/316/316L	T 8	
Flange 4" 1 500 lb LT, ASME B16.5/316/316L	U 1	
Flange 5" 150 lb RF, ASME B16.5/316/316L	U 2	
Flange 5" 300 lb RF, ASME B16.5/316/316L	U 3	
Flange 5" 600 lb RJF, ASME B16.5/316/316L	U 4	
Flange 6" 150 lb RF, ASME B16.5/316/316L	U 5	
Flange 6" 300 lb RF, ASME B16.5/316/316L	U 6	

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Selection and ordering data (continued)

SITRANS LVL200 Vibrating point level switch, high temperature and pressure design Detects level and material in liquids and slurries in extreme environments. Extension options to 3 m (9.84 ft).	Article No. 7ML57-● ● ● ● ● - ● ● ● ●	Ord. Code ● ● ●
Flange 6" 300 lb LT, ASME B16.5/316/316L	U 7	
Flange DN 50 30K RF, JIS/316/316L	U 8	
Flange DN 50 40K RF, JIS/316/316L	V 1	
Flange DN 65 40 K RF, JIS/316/316L	V 2	
Mobrey flange PN 16 Form A/316/316L	V 3	
Mobrey flange PN 16 Form E/316/316L	V 4	
Thread R1 PN 160, EN 10226-1/Inconel 718 (2.4668)[14]	W 1	
Thread R1 PN 100, EN 10226-1/316L[15]	W 2	
Gas-tight seal/Process temperature		
With gas-tight seal/-196 ... +450 °C (-321 ... +842 °F)	1	
Without/-196 ... +450 °C (-321 ... +842 °F)	2	
Electronics		
Relay (2 x SPDT) 20 .. 72 V DC/20 ... 253 V AC (5A)	1	
Transistor (NPN/PNP) 9.6 ... 55 V DC	2	
Two-wire (8/16 mA) 9.6 ... 35 V DC	3	
Relay (2 x SPDT) 20 ... 72 V DC/20 ... 253 V AC (5A), with SIL qualification	4	
Transistor (NPN/PNP) 9.6 ... 55 V DC, with SIL qualification	5	
Two-wire (8/16 mA) 9.6 ... 35 V DC, with SIL qualification	6	
Housing/Cable entry		
Plastic single chamber/IP66/IP67/M20 x 1.5 gland PA black (ø5 ... 9 mm)	A	
Plastic single chamber/IP66/IP67/½" NPT gland PA black (ø5 ... 9 mm)	B	
Aluminum IP66/IP67/M20 x 1.5 gland PA black (ø5 ... 9 mm)	C	
Aluminum IP66/IP67/½" NPT gland PA black (ø5 ... 9 mm)	D	
Stainless steel single chamber (precision casting)/ IP66/IP67/M20 x 1.5	E	
Stainless steel single chamber (precision casting)/ IP66/IP67/½" NPT gland PA black (ø5 ... 9 mm)	F	
Stainless steel single chamber (electropolished)/ IP66/IP67/M20 x 1.5 gland PA black (ø5 ... 9 mm)	G	
Stainless steel single chamber (electropolished)/ IP66/IP67/½" NPT gland PA black (ø5 ... 9 mm)	H	
Aluminium IP66/IP67/M20 x 1.5 blind plug	J	
Aluminium IP66/IP67/½" NPT blind plug	K	
Stainless steel single chamber (precision casting)/IP66/IP67/M20 x 1.5 blind plug	L	
Stainless steel single chamber (precision casting)/ IP66/IP67/½" NPT blind plug	M	
Stainless steel single chamber (electropolished)/ IP66/IP67/M20 x 1.5 blind plug	N	
Stainless steel single chamber (electropolished)/ IP66/IP67/½" NPT blind plug	P	
Rigid Extension Compact		
Compact version, 77 mm	C 1	
Rigid Extension 316L		
200 ... 500 mm	A 0	
501 ... 1 000 mm	A 1	
1 001 ... 1 500 mm	A 2	
1 501 ... 2 000 mm	A 3	
2 001 ... 2 500 mm	A 4	
2 501 ... 3 000 mm	A 5	
Rigid Extension Alloy C22		
200 ... 500 mm	B 0	
501 ... 1 000 mm	B 1	
1 001 ... 1 500 mm	B 2	
1 501 ... 2 000 mm	B 3	
2 001 ... 2 500 mm	B 4	
2 501 ... 3 000 mm	B 5	

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Cleaning including Certificate(oil, grease, and silicone free).	**W01**
Enter the total insertion length in plain text description.	**Y01**
Identification label (measurement loop) stainless steel.	**Y17**
Identification Label (measurement loop) foil.	**Y18**
Output switching delay (1 ... 60 s)/default is 1 s	**Y36**
NACE0175 to 3.1 Material Certificate for material (EN 10204 NACE MR 0175) Note: not available with some Process connection options.	**D07**
Material Inspection 3.1-Inspection certificate for material (EN 10204)	**C05**
Acceptance test Certificate 2.2 for material (EN 10204)	**C15**
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN 10204)	**C13**
3.1-Inspection certificate for instrument with test data (EN 10204)	**C25**
Quality and test plan	**C26**
Inspection certificate 3.1 (EN 10204) - device and pressure test	**C31**
Helium leak test + 3.1 certificate/instrument	**C32**

Spare Parts and Accessories	Article No.
SITRANS SCSC single channel signal conditioner and remote test	**7ML5760**
SITRANS TCSC two channel signal conditioner and remote test	**7ML5761**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

[1] Not available with Process Connection options A0 and A2.
[2] Available only with Rigid extension option C1.
[3] Available only with 316L Process Connection and Rigid extension options.
[4] Available only with Alloy C22 Rigid extension options.
[5] Available only with Electronic options 3 and 6.
[6] Available only with Housing/Cable entry options J, K, L, M.
[7] Available only with Electronic option 6.
[8] Available only with Electronic options 1, 2, and 4.
[9] Available only with Gas tight seal/Process temperature option 1.
[10] Not available with Housing/Cable entry options G, H, N, P.
[11] Available only with Housing/Cable entry options J, K, L, M, N, P.
[12] Not available with Housing/Cable entry options A and B.
[13] Not available with Housing/Cable entry options A, B, G, H, N, P.
[14] Available only with Version/material option 1.
[15] Available only with Version/material option 2.

SITRANS SCSC, single channel, signal conditioner Provides power and relay output for one LVL200 vibrating switch, 8/16 mA electronics design. Provides remote test of any LVL200 device.	**Article No. 7ML576-0-**	●	●	A	●	1	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Approvals											
For Ex-free area		**1**	**A**								
ATEX II (1) G/D [Ex ia Ga/Da] IIC/IIIC, I (M1) [Ex ia Ma] I		**1**	**D**								
ATEX II (1) G/D (Ex ia Ga/Da) IIC/IIIC, I (M1) (Ex ia Ma) I + WHG		**1**	**E**								
IEC [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I		**1**	**H**								
IEC (Ex ia Ga) IIC, (Ex ia Da) IIIC, (Ex ia Ma) I + WHG		**1**	**J**								
Ex-free area (incl. EAC approval)		**2**	**A**								
SIL qualification											
Without					**1**						
With					**2**						
Version											
Single-channel (8/16 mA) for level detection								**1**			
Single channel (8/16 mA), level detection with fail safe relay								**2**			
Housing/cable entry											
Plastic/IP20									**A**		
Terminal block connection											
Detachable 2.5 mm²/ Ex sensor: 2 x blue; output and operating voltage: 2 x black										**A**	
Detachable 2.5 mm²/ sensor: 2 x black; output and operating voltage: 2 x black										**B**	
Language											
English											**0**
German											**1**

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Selection and ordering data (continued)

Selection and Ordering data	
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

SITRANS TCSC, dual channel, signal conditioner Provides power and relay output for two LVL200 vibrating switches, 8/16 mA electronics design. Provides remote test of any LVL200 device.	Article No. 7ML576- 1-	●	●	A	●	1	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Approvals											
For Ex-free area[1]		1	A								
ATEX II (1) G/D [Ex ia Ga/Da] IIC/IIIC, I (M1) [Ex ia Ma] I[2]		1	D								
ATEX II (1) G/D (Ex ia Ga/Da) IIC/IIIC, I (M1) (Ex ia Ma) I + WHG		1	E								
IEC [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I[2]		1	H								
IEC (Ex ia Ga) IIC, (Ex ia Da) IIIC, (Ex ia Ma) I + WHG		1	J								
Ex-free area (incl. EAC approval)		2	A								
SIL qualification											
Without					1						
With					2						
Version											
Double-channel (8/16 mA) for level detection								1			
Housing/cable entry											
Plastic/IP20									A		
Terminal block connection											
Detachable 2.5 mm²/ Ex sensor: 2 x blue; output and operating voltage: 2 x black										A	
Detachable 2.5 mm²/ sensor: 2 x black; output and operating voltage: 2 x black										B	
Language											
English											0
German											1

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

[1] Available only with terminal block connection option B.
[2] Available only with terminal block connection option A.

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Technical specifications

SITRANS LVL200	
Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High and low and demand (via mode switch)
Output	
Output options	• Relay output (DPDT), 2 floating SPDTs • Contactless electronic switch • 2-wire Namur signal output • Transistor (NPN/PNP) 10 ... 55 V DC • 8/16 mA
Measuring accuracy	
Repeatability	0.1 mm (0.004 inch)
Hysteresis	Approx. 2 mm (0.08 inch) with vertical installation
Switching delay	• Standard, Extended: approx. 500 ms (on/off) • High temperature: approx. 1 s (optionally adjustable at factory)
Frequency	• Standard, Extended: Approx. 1 200 Hz • High temperature: 1400 Hz
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +70 °C (-40 ... +158 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Temperature	
- LVL200S Standard	-50 ... +150 °C (-58 ... +302 °F)
- LVL200S High temperature option	-50 ... +250 °C (-58 ... +482 °F)
- LVL200E Standard: with 316L/ Alloy C22	-50 ... +150 °C (-58 ... +302 °F)
- LVL200E High temperature option with 316L/Alloy C22	-50 ... +250 °C (-58 ... +482 °F)
- LVL200H High temperature	-196 ... +450 °C (-321 ... +842 °F)
Pressure (vessel)	• Standard, Extended: -1 ... 64 bar g (-14.5 ... 928 psi g) • High temperature: instrument version up to 160 bar (2 320 psi g): -1 ... 160 bar/-100 ... 16 000 kPa (-14.5 ... 2 320 psi g) Note: The process pressure is dependent on configuration, including process fitting, e.g. flange
Density	0.7 ... 2.5 g/cm³ (0.025 ... 0.09 lb/in³); 0.5 ... 2.5 g/cm³ (0.018 ... 0.09 lb/in³) by switching over Density optionally starts at 0.47 cm³(0.017 lb/in³)
Design	
Material	
• Enclosure	• Aluminum die-cast AlSi10Mg, powder-coated, basis: Polyester • Stainless steel housing, electropolished 316L • Stainless steel housing, precision casting 316L • Plastic housing, plastic PBT (Polyester)
• Tuning fork	316L (1.4404 or 1.4435), Alloy C22
• Extension tube [ø 21.3 mm (0.839 inch)]	316L (1.4404 or 1.4435), Alloy C22
• Process connection: threaded	• Standard, Extended: 316L (1.4404 or 1.4435), Alloy C22 • High temperature: Inconel 718
• Process connection: flange	316L (1.4404 or 1.4435), 316L with Alloy C22, ECTFE, or PFA coating

Technical specifications (continued)

SITRANS LVL200	
• Process seal	Klingersil C-4400
Process connection	
• Pipe thread, cylindrical (ISO 228 T1)	G ¾" A, G 1" A
• Pipe thread, tapered	¾" NPT, 1" NPT, 1½" NPT
• Flanges	DIN from DN 25, ASME from 1"
• Hygienic fittings	Bolting DN 40 PN 40, 1, 1½, 2, 2½" Tri-Clamp PN 10, conus DN 25 PN 40, Tuchenhagen Varivent DN 50 PN 10, SMS
Degree of protection	Type 4X/NEMA 4X/IP66/IP67
Conduit entry	• 1 x M20 x 1.5 (cable: ø 5 ... 9 mm), 1 x blind stopper M20 x 1.5; attached 1 x M20 x 1.5 cable entry • 1 x ½" NPT cable entry, 1 x blind stopper ½" NPT, 1 x ½" NPT cable entry • 1x M12 x 1; 1 x blind stopper M20 x 1.5
Weight	
• Device weight (dependent on process fitting)	Approx. 0.8 ... 4 kg (0.18 ... 8.82 lb)
• Tube extension (extended version)	Approx. 920 g/m (10 oz/ft)
Power supply	
Supply voltage	
• Relay DPDT	20 ... 253 V AC, 50/60 Hz, 20 ... 72 V DC
• Contactless	20 ... 253 V AC, 50/60 Hz, 20 ... 253 V DC
• 2-wire NAMUR	
Operating voltage (characteristics according to standard) for connection to an amplifier according to NAMUR	IEC 60947-5-6, approx. 8.2 V Off-load voltage U_o approx. 8.2 V Short-circuit current I_U approx. 8.2 mA
Operating voltage 8/16 mA (via the signal conditioning instrument)	
• Non-Ex instrument	12 ... 36 V DC
• Ex-d instrument (ATEX, FM, CSA)	12 ... 36 V DC
• Ex-ia instrument (ATEX)	12 ... 29 V DC
• Ex-ia instrument (FM, CSA)	12 ... 31 V DC
Power consumption	• Standard, Extended: 1 ... 8 VA (AC), approx. 1.3 W (DC) • High temperature: 3 VA (AC), 1 W (DC)
• Relay DPDT	1 ... 8 VA (AC), approx. 1.3 W (DC)
• Contactless	Domestic current requirement approx. 3 mA (via load circuit) Load current • Min. 10 mA • Max. 400 mA [with I > 300 mA the ambient temperature can be max. 60 °C (140 °F)] • Max. 4 A up to 40 ms (not WHG specified)
• 8/16 mA, two-wire output	Output signal • Empty (uncovered) - 8 mA • Full (covered) - 16 mA • Fault message - < 1.8 mA Possible signal conditioning instruments: SITRANS SCSC, SITRANS TCSC
• 2-wire Namur	Current consumption • Falling characteristics ≥ 2.6 mA uncovered/≤ 0.6 mA covered • ≤ 0.6 mA uncovered/≥ 2.6 mA covered • Failure message ≤ 0.6 mA

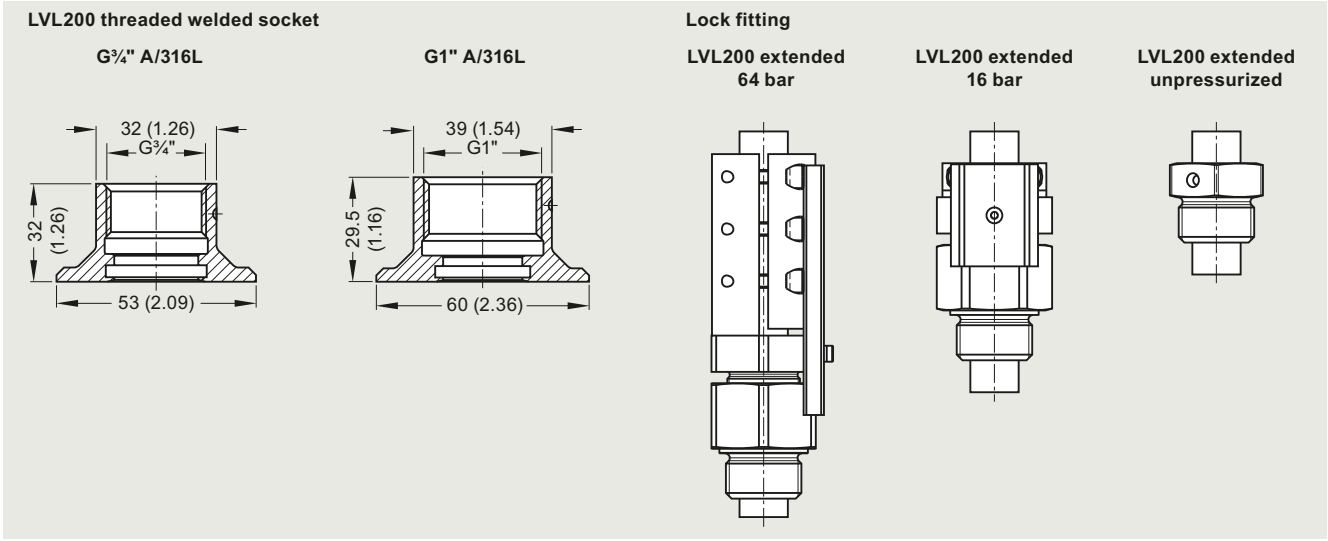
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Technical specifications (continued)

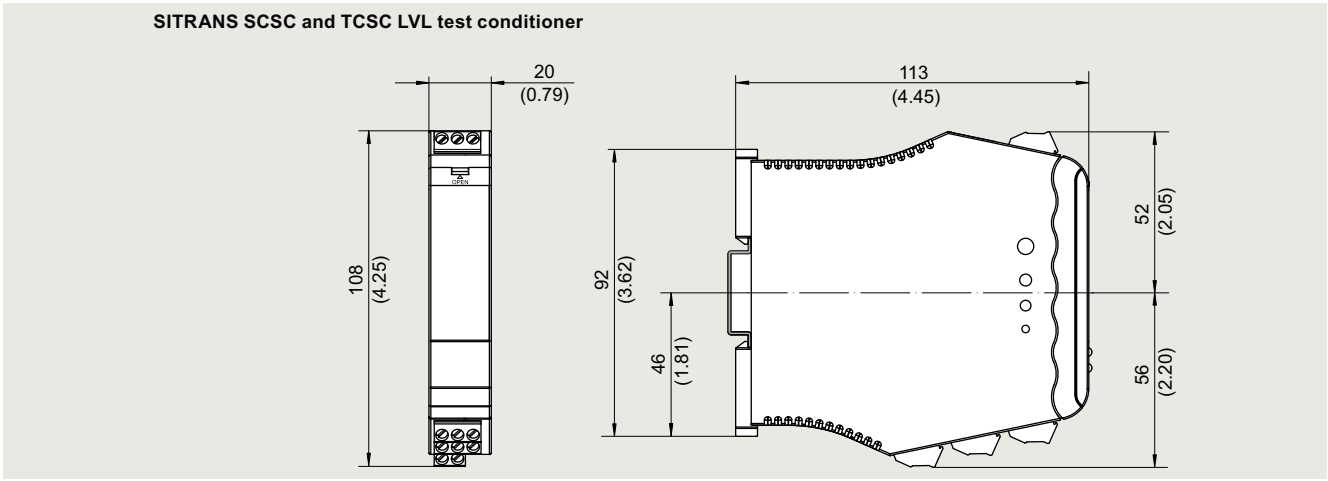
SITRANS LVL200	
• Transistor (NPN/PNP) 10 ... 55 V DC	Output • Floating transistor output, permanently shortcircuit-proof Load current • < 400 mA Voltage loss • < 1 V Switching voltage • < 55 V DC Blocking current • < 10 µA
Certificates and approvals	• CE, CSA • Overfill Protection WHG and VLAREM II • FM (Non-Incendive) Class I, Div. 2, Groups A, B, C, D • FM (Explosion-Proof) Class I, Div. 1, Groups A, B, C, D; (Dust Ignition-Proof) Class II, III, Div. 1, Groups E, F, G1 • IECEx d IIC T6 ... T2 Ga/Gb EHEDG • ATEX II 1/2G, 2G EEx d IIC T6 • ATEX II 1G, 1/2G, 2G EEx ia IIC T6 • Shipping approvals • BR-Ex d IIC T6 ... T2 • FDA, 3A, EHEDG • SIL/IEC61508 Declaration of Conformity [SIL-2 (min/max detection)] Please see configuration section below for full list of approvals.

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Options



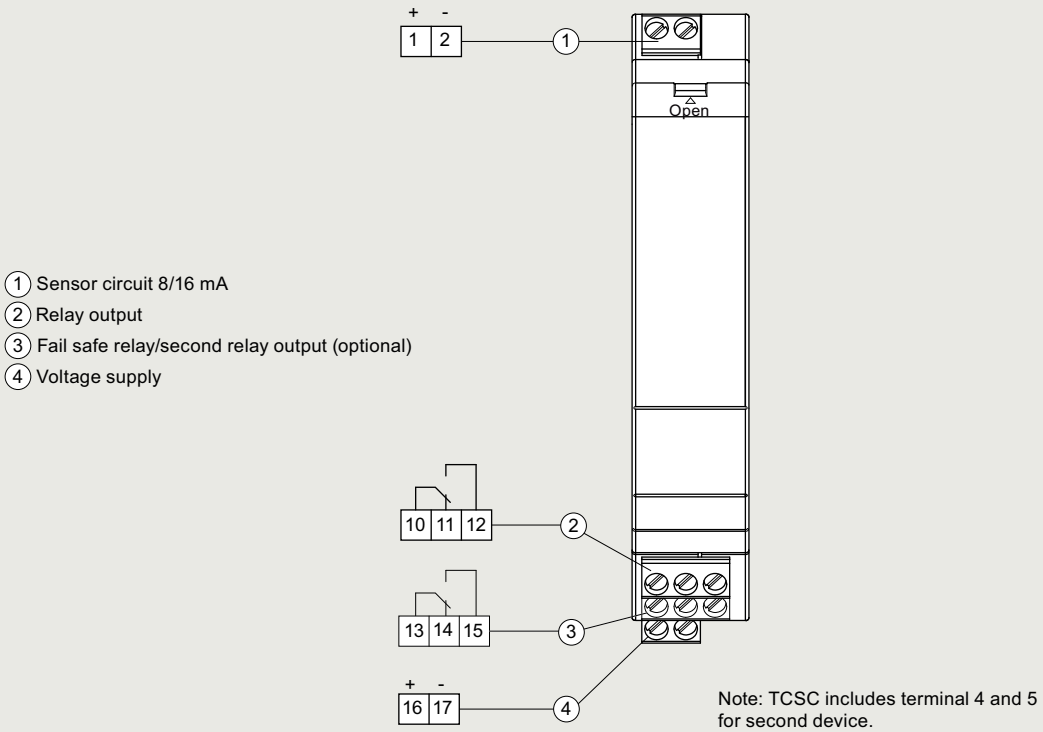
SITRANS LVL200 welded socket and lock fitting, dimensions in mm (inch)



SITRANS SCSC and SITRANS TCSC LVL Test Conditioners, dimensions in mm (inch)

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Options (continued)



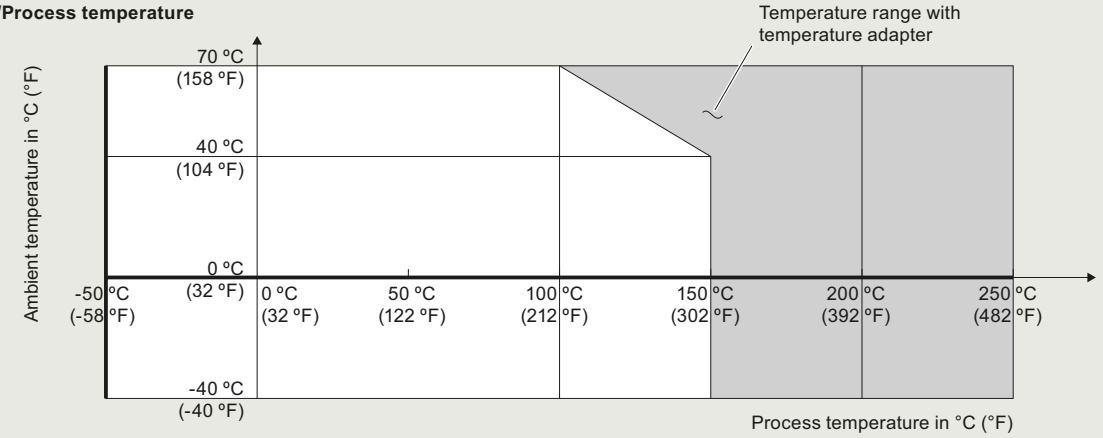
1 Sensor circuit 8/16 mA
2 Relay output
3 Fail safe relay/second relay output (optional)
4 Voltage supply

SITRANS SCSC and SITRANS TCSC LVL Test Conditioner connections

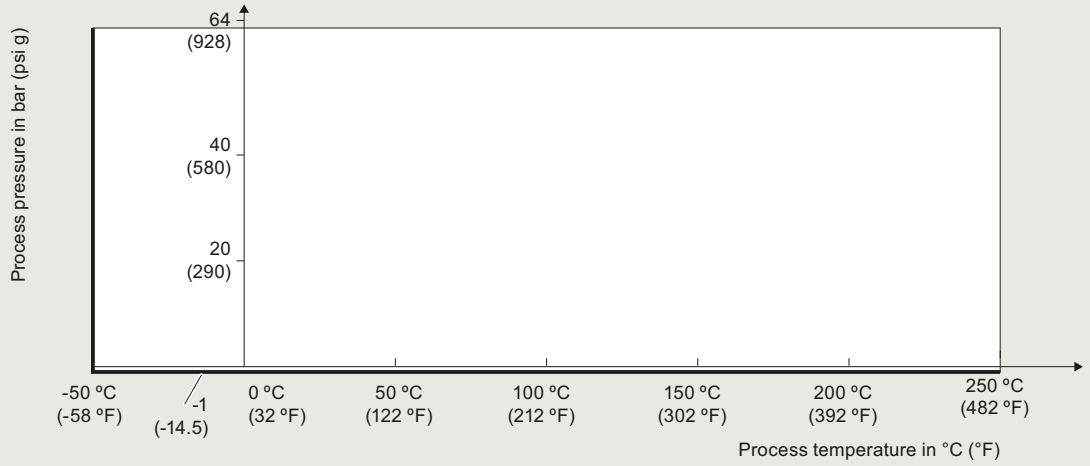
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Characteristic curves

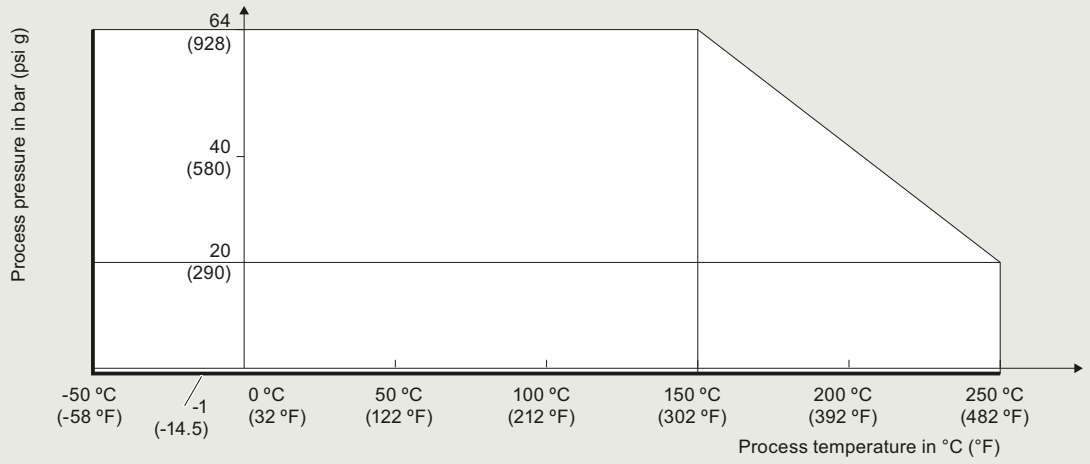
Ambient/Process temperature



Process pressure with switch position 0.7 g/cm³ (mode switch)



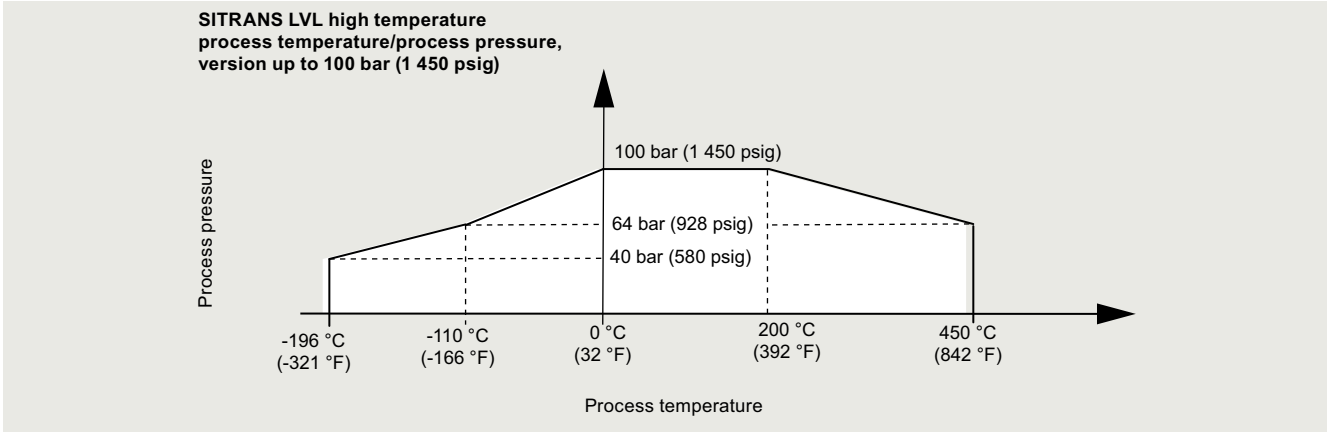
Process pressure with switch position 0.5 g/cm³ (mode switch)



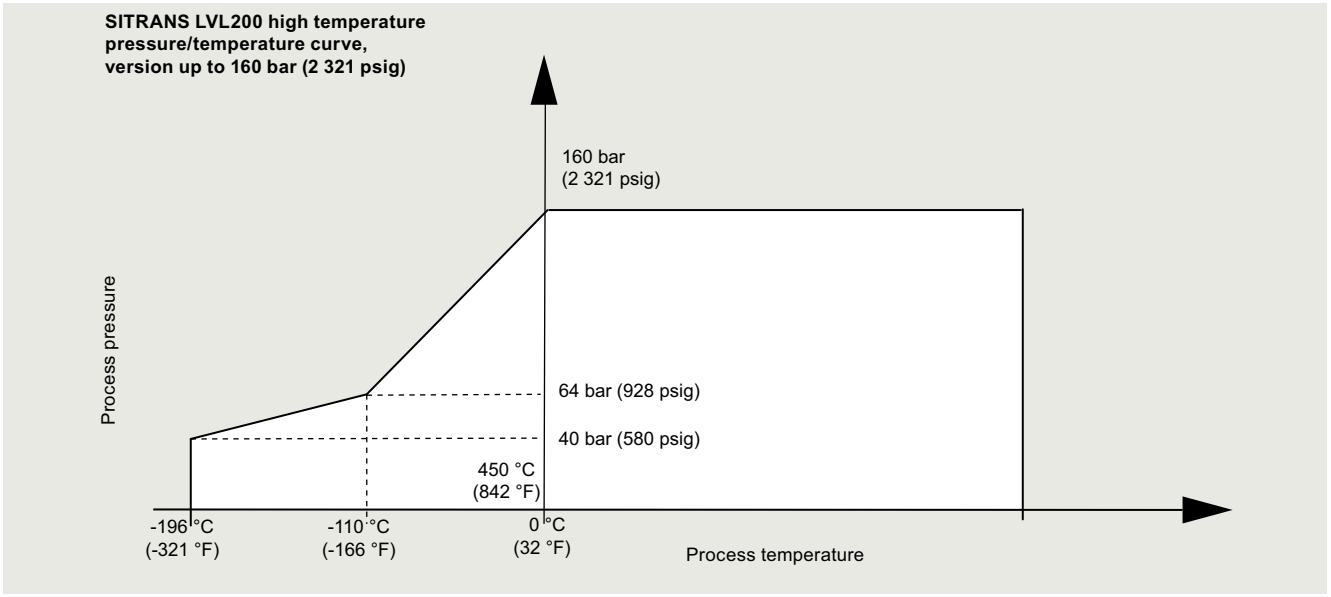
SITRANS LVL200 process pressure/process temperature/ambient temperature derating curves

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Characteristic curves (continued)



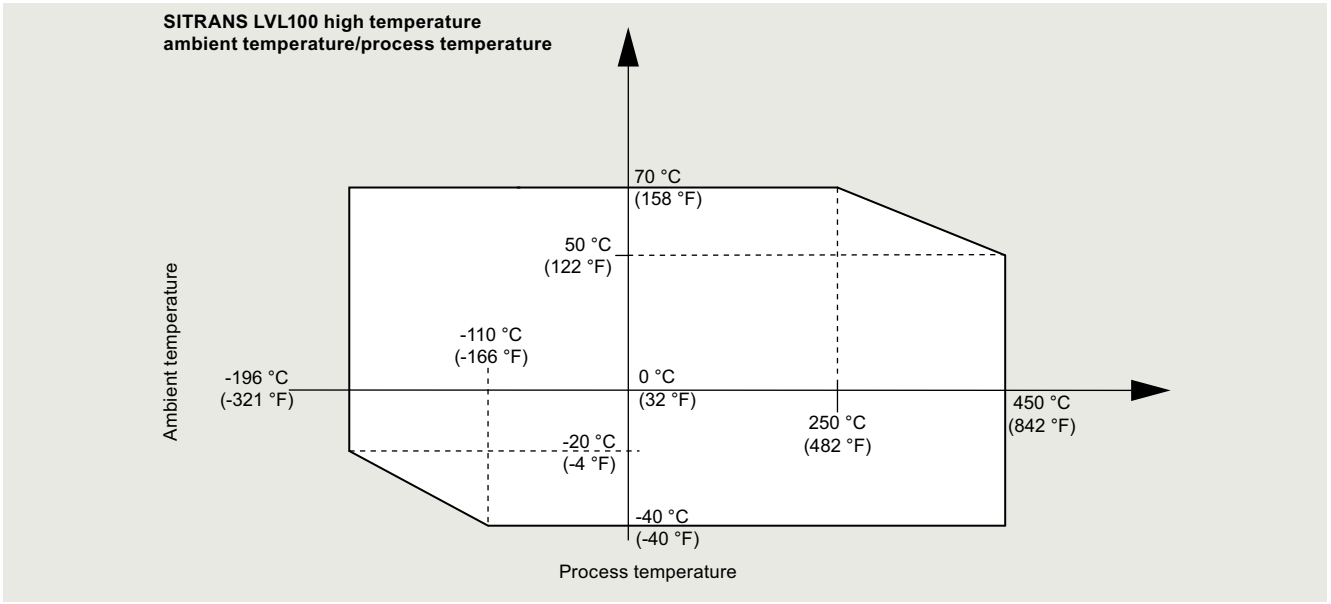
SITRANS LVL200 high temperature process temperature/process pressure curve, version up to 100 bar (1 450 psig)



SITRANS LVL200 high temperature pressure/temperature curve, version up to 160 bar (2 321 psig)

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Characteristic curves (continued)

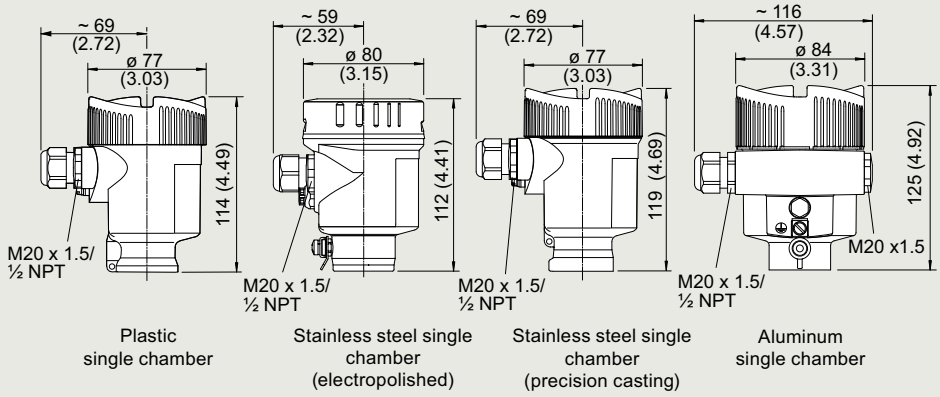


SITRANS LVL200 high temperature ambient temperature/process temperature

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Dimensional drawings

SITRANS LVL200, housing

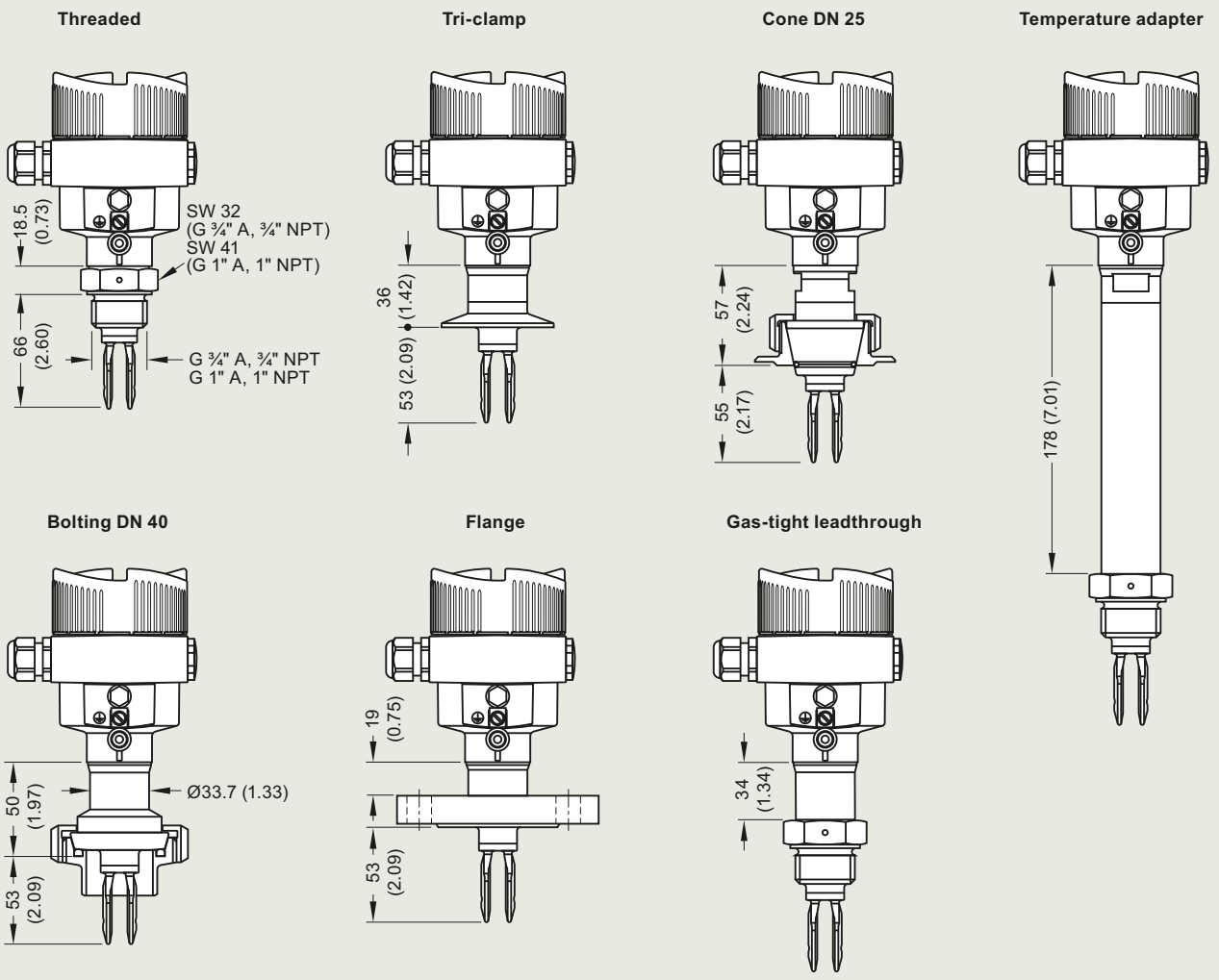


SITRANS LVL200 housing, dimensions in mm (inch)

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Dimensional drawings (continued)

SITRANS LVL200 standard

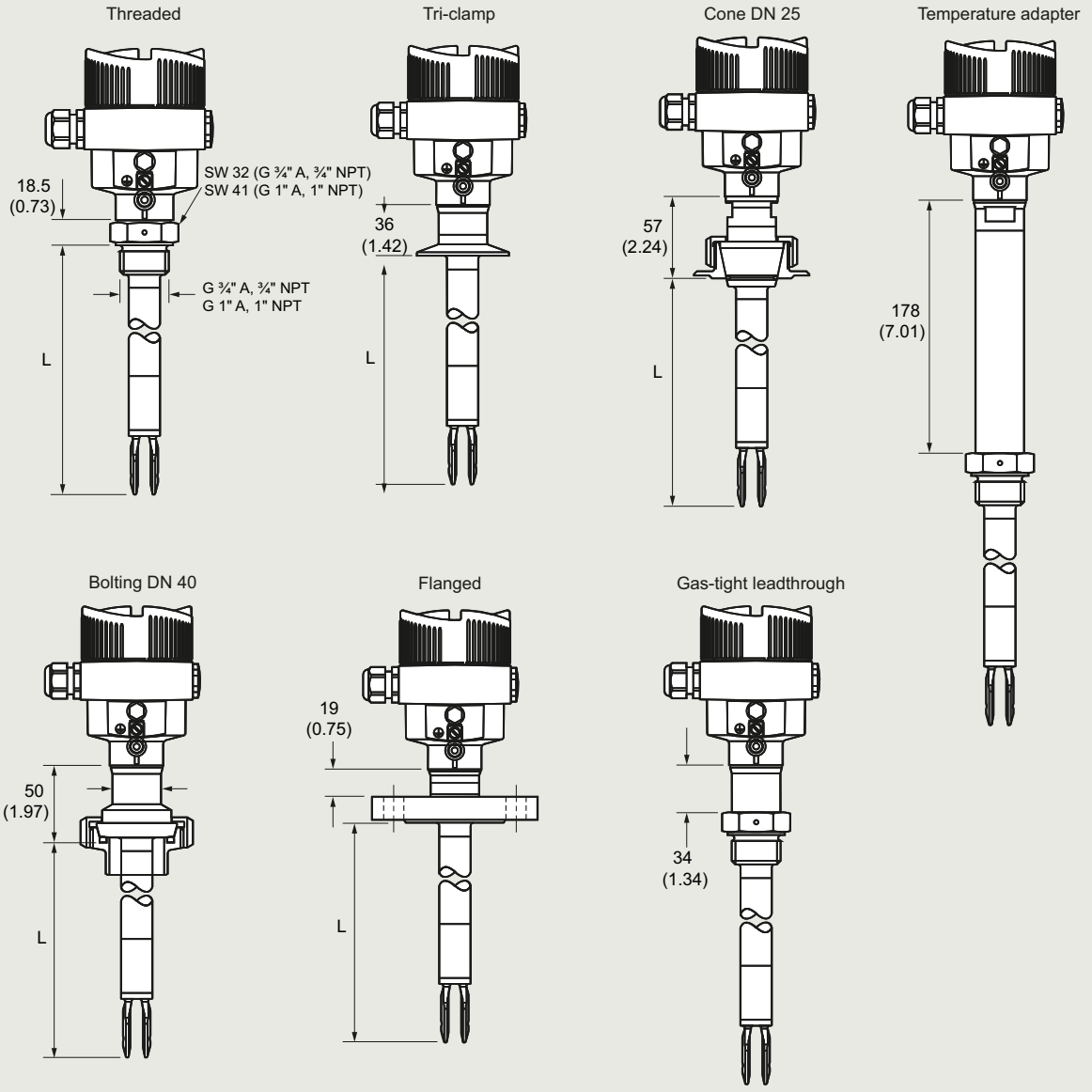


SITRANS LVL200 (standard), dimensions in mm (inch)

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Dimensional drawings (continued)

SITRANS LVL200 extended



Sensor length (L)

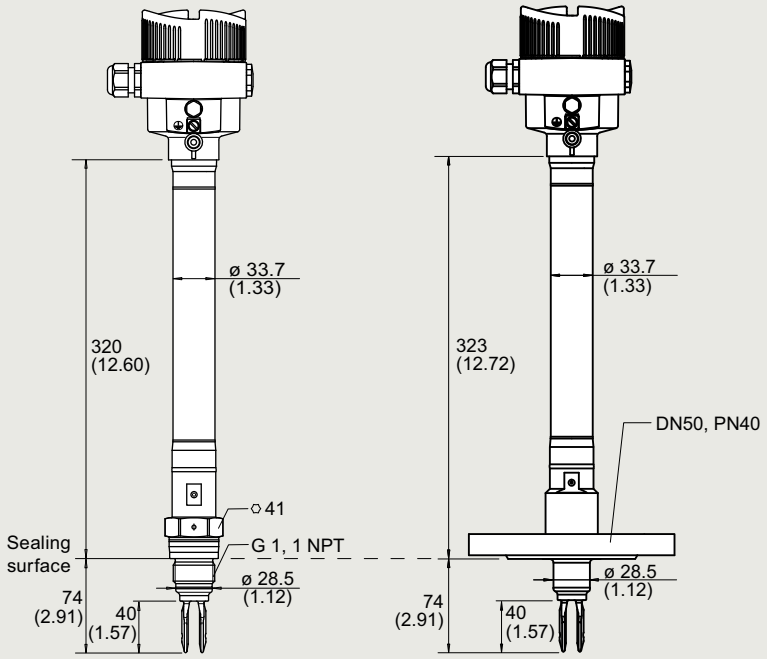
316L, Alloy C22 (2.4602)	80 ... 6 000 mm (3.15 ... 236.2 inch)
Enamelled	80 ... 1 500 mm (3.15 ... 59.06 inch)
316L, ECTFE coated	80 ... 3 000 mm (3.15 ... 118.1 inch)
316L, PFA coated	80 ... 4 000 mm (3.15 ... 157.5 inch)

SITRANS LVL200 (extended), dimensions in mm (inch)

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Dimensional drawings (continued)

SITRANS LVL200 high temperature, compact version

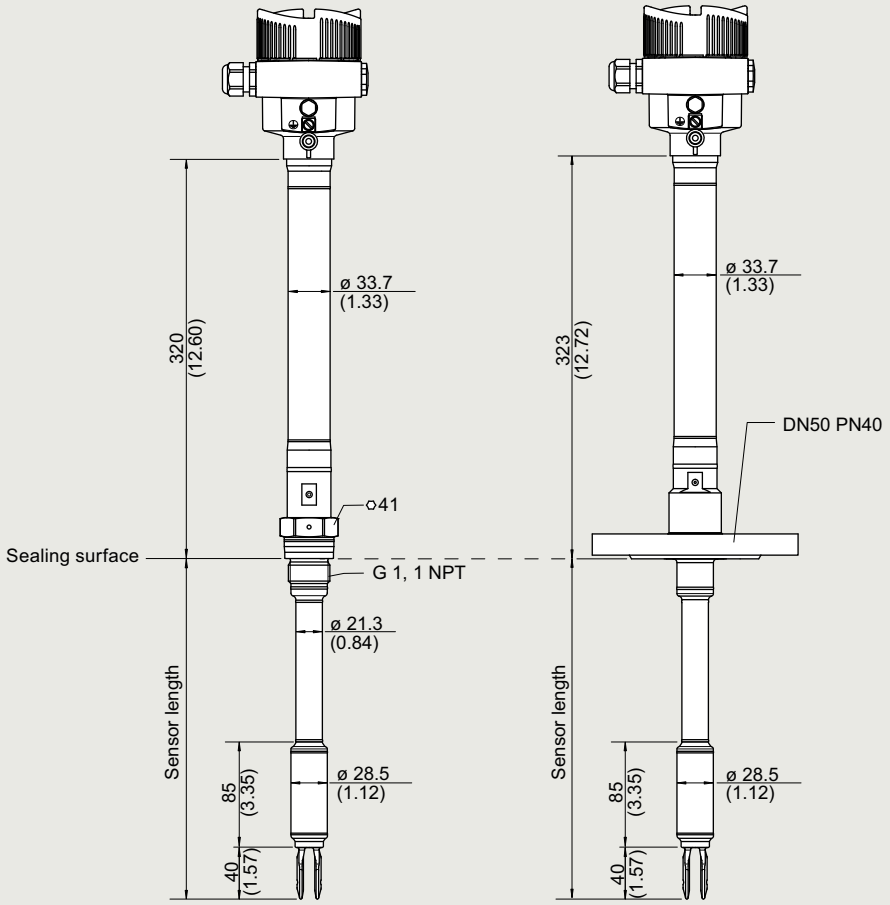


SITRANS LVL200 high temperature, compact version, dimensions in mm (inch)

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Dimensional drawings (continued)

SITRANS LVL200 high temperature, tube version

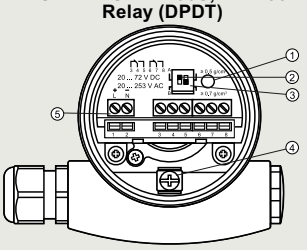


SITRANS LVL200 high temperature, tube version, dimensions in mm (inch)

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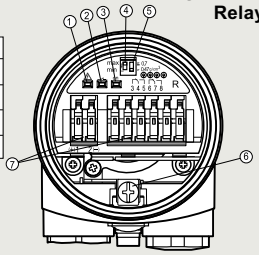
Circuit diagrams

SITRANS LVL200S, LVL200E Relay (DPDT)

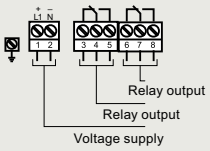


①	Control lamp
②	DIL switch for characteristics reversal
③	DIL switch for sensitivity adjustment
④	Ground terminal
⑤	Connection terminals

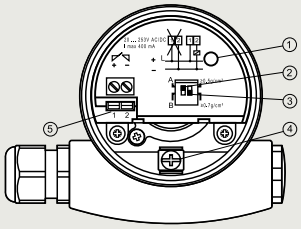
SITRANS LVL200H Relay (DPDT)



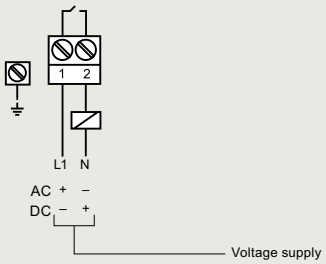
①	Control lamp - fault indication (red)
②	Control lamp - Switching status (yellow)
③	Control lamp - Operating status (green)
④	Mode switch for selecting the switching behaviour (min./max.)
⑤	DIL switch for sensitivity adjustment
⑥	Ground terminal
⑦	Connection terminals



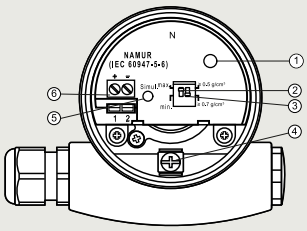
Contactless



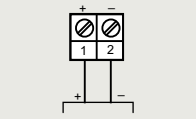
①	Control lamp
②	DIL switch for mode adjustment
③	DIL switch for switching point adaptation
④	Ground terminal
⑤	Connection terminals



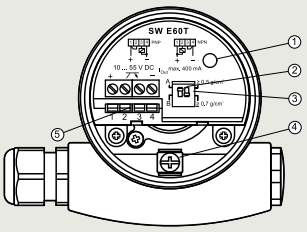
NAMUR



①	Control lamp
②	DIL switch for characteristics reversal
③	DIL switch for sensitivity adjustment
④	Ground terminal
⑤	Simulation key
⑥	Connection terminals

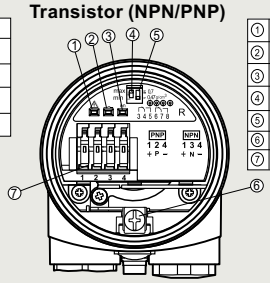


SITRANS LVL200S, LVL200E Transistor (NPN/PNP)

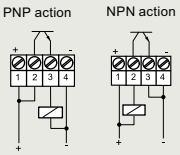


①	Control lamp
②	DIL switch for mode adjustment
③	DIL switch for switching point
④	Ground terminal
⑤	Connection terminals

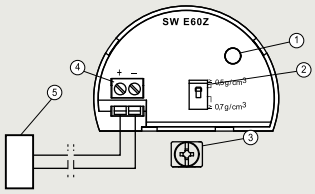
SITRANS LVL200H, Transistor (NPN/PNP)



①	Control lamp - fault indication (red)
②	Control lamp - Switching status (yellow)
③	Control lamp - Operating status (green)
④	Mode switch for selecting the switching behaviour (min./max.)
⑤	DIL switch for sensitivity adjustment
⑥	Ground terminal
⑦	Connection terminals

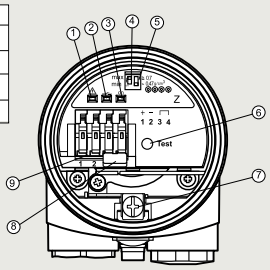


SITRANS LVL200S, LVL200E 8/16 mA

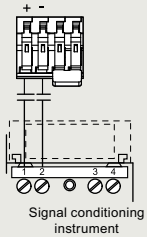


①	Control lamp
②	DIL switch for sensitivity adjustment
③	Ground terminal
④	Connection terminals
⑤	Processing system or PLC

SITRANS LVL200H 8/16 mA



①	Control lamp - fault indication (red)
②	Control lamp - switching status (yellow)
③	Control lamp - operating status (green)
④	Mode switch for selecting the switching behavior (min./max.)
⑤	DIL switch for sensitivity behavior (min./max.)
⑥	Test key
⑦	Ground terminal
⑧	Connector block
⑨	Connection terminals



SITRANS LVL200 connections

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Overview



SITRANS LVS100 is a vibrating point level switch for material detection in bulk solids.

Benefits

- High resistance to mechanical forces
- Sliding sleeve options for adjustable insertion length and ease of cleaning
- Rotatable enclosure for ease of installation and wiring
- Suitable for point level detection of materials starting at a bulk density of 30 g/l (1.9 lb/ft³)
- Customer desired extensions up to 4 000 mm (157.48 inch)

Application

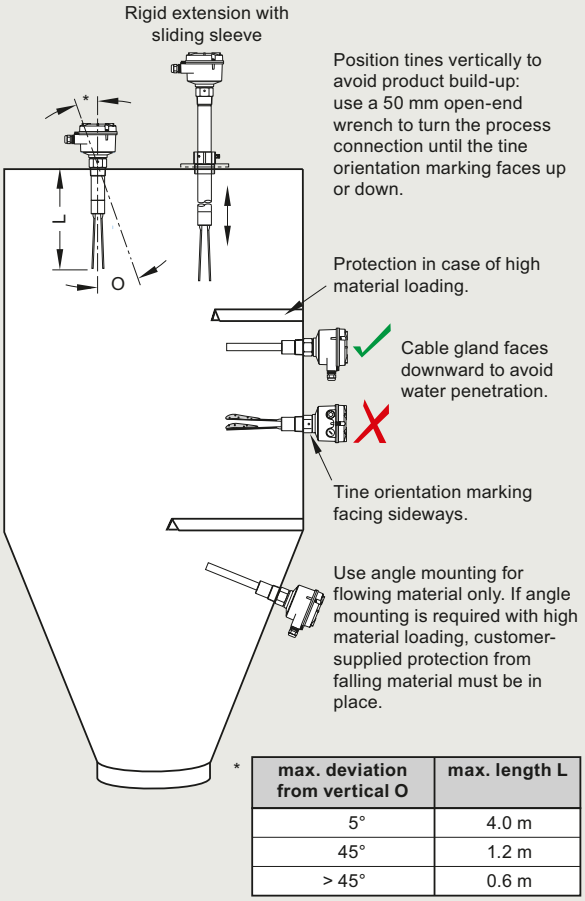
SITRANS LVS100 detects high, low or demand levels of dry bulk solids in bins, silos or hoppers.

SITRANS LVS100 has a compact design and can be top, side, or angle mounted. The vibrating fork design ensures the tines are kept clean. The unique design of the fork and crystal assembly eliminates false high level readings even if tines become damaged.

A signal from the electronic circuit excites a crystal in the probe causing the fork to vibrate. If the fork is covered by material, the change in vibration is detected by the electronic circuitry which causes the relay to change state after a one second delay. When the fork is free from material pressure, full vibration resumes and the relay reverts to its normal condition.

- Key Applications: dry bulk solids in bins, silos, hoppers

Configuration



* max. deviation from vertical O	max. length L
5°	4.0 m
45°	1.2 m
> 45°	0.6 m

SITRANS LVS100 installation, dimensions in mm (inch)

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Selection and ordering data

SITRANS LVS100 Vibrating point level switch Level and material detection for dry bulk solids. Extension options to 4 m (13.12 ft).	Article No. 7ML573- 5-	●	●	●	●	●	-	0	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Input Voltage											
DPDT Relay: 19 ... 230 V AC, 19 ... 40 V DC		1									
DPDT Relay: 19 ... 230 V AC, 19 ... 40 V DC (stocked version)[1)3)]		2									
Process temperature											
Up to 150 °C (302 °F)			A								
Process connection											
Threaded											
R 1½" [(BSPT), EN 10226]				A							
1¼" NPT [(Taper), ANSI/ASME B1.20.1]				B							
R 1½" [(BSPT), EN 10226] DIN 2999 thread, sliding sleeve [min. length 500 mm (19.69 inch)][2)]				C							
1½" NPT [(Taper), ANSI/ASME B1.20.1] , sliding sleeve [min. length 500 mm (19.69 inch)][2)]				D							
Extension length											
Stainless steel 316L (1.4404)											
Standard length, 170 mm (6.69 inch)					1	1					
Add Order code Y01 and plain text: "Insertion length ... mm"											
Stainless steel 304 (1.4301)											
230 ... 500 mm (9.05 ... 19.69 inch)					1	2					
501 ... 1 000 mm (19.72 ... 39.37 inch)					1	3					
1 001 ... 1 500 mm (39.41 ... 59.06 inch)					1	4					
1 501 ... 2 000 mm (59.09 ... 78.74 inch)					1	5					
2 001 ... 2 500 mm (78.78 ... 98.43 inch)					1	6					
2 501 ... 3 000 mm (98.46 ... 118.11 inch)					1	7					
3 001 ... 3 500 mm (118.15 ... 137.80 inch)					1	8					
3 501 ... 4 000 mm (137.83 ... 157.48 inch)					2	0					
Approvals											
CSA/FM General Purpose, CE, RCM									A		
CSA/FM Class II, Div. 1, Groups E, F, G, Class III, ATEX II ½ D, RCM									B		
IEC-Ex Ex t IIIC T-- Da/Db IP6X									C		
EAC Ex ta/tb IIIC Da/Db									D		

[1)] Only available with the following configurations 7ML5735-2AA11-0AA0 or 7ML5735-2AB11-0AA0.

[2)] Not available with extension length options 11 and 12.

[3)] Input voltage 2 not allowed with extension length 16, 17, 18 or 20.

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Art. No. and specify Order code(s).	
Total insertion length: Enter the total insertion length in plain text description, max. (50 mm increments)	**Y01**
Signal bulb inserted in M20 cable gland[1)]	**A20**
Factory test certificate - M to DIN 55350, Part 18	**C11**
CCC Ex-Approval Ex ta/tb IIIC Da/Db[2)]	**E27**

[1)] Available only with Approval option A.

[2)] Available only with Approval option B.

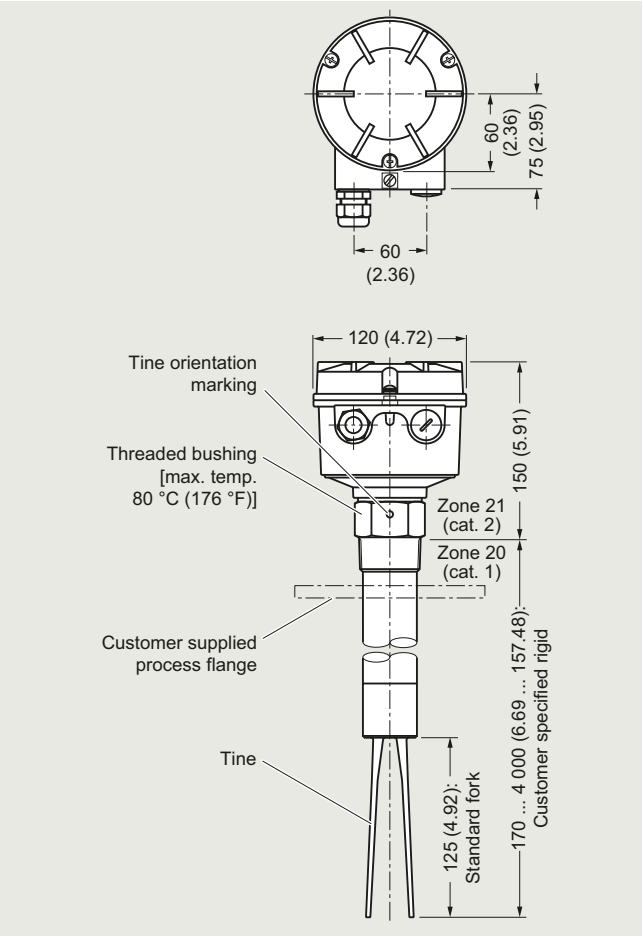
Spare Parts	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Replacement Electronics Module LVS100 DPDT Relay (19 ... 253 V AC, 19 ... 55 V DC)	**7ML1830-1NS**
R 1½" [(BSPT), EN 10226] DIN 2999 thread, sliding sleeve	**7ML1830-1NT**
1½" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)]	**7ML1830-1NU**

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Technical specifications

SITRANS LVS100	
Mode of Operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High, low and demand
Measuring frequency	200 Hz
Output	
Relays	DPDT relay
Relay delay	From loss of vibration: approximately 1 second From resumption of vibration: approximately 1 ... 2 s
Signal delay	Probe uncovered to covered: approximately 1 s Probe covered to uncovered: approximately 1 ... 2 s
Relay fail-safe	High or low, switch selectable
Alarm output	Relay 8 A at 250 V AC, non-inductive Relay 5 A at 30 V DC, non-inductive
Sensitivity	High or low, switch selectable
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Process temperature	-40 ... +150 °C (-40 ... +302 °F)
• Max. threaded bushing temperature	80 °C (176 °F)
• Max. enclosure surface temperature (Category 2D)	90 °C (194 °F)
• Max. extension surface temperature (Category 1D)	150 °C (302 °F)
• Pressure (vessel)	Max. 10 bar g (145 psi g) European Pressure Directive 2014/68/EU: Category 1
Minimum material density	Approx. 30 g/l (1.9 lb/ft³)
Design	
Material	
• Enclosure	Epoxy coated aluminum
Process connection	• Thread 1¼" NPT [(Taper), ANSI/ASME B1.20.1], R 1½" [(BSPT), EN 10226] • Thread R 1½" [(BSPT), EN 10226], ½" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)] • Thread material: stainless steel 304 (1.4301) or 316L (1.4404) depending on configuration
Tine material	Stainless steel 316L (1.4404)
Degree of protection	IP66/Type 4/NEMA 4
Conduit entry	2 x M20 x 1.5 or 2 x ½" NPT (For FM and CSA approved versions only.)
Weight	Standard version, no extensions: approx. 1.7 kg (3.7 lb)
Power supply	• 19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA • 19 ... 40 V DC, +10 %, 1.5 W
Certificates and approvals	• CSA/FM General Purpose • CE • CSA/FM Dust Ignition Proof • RCM • ATEX II 1/2 D • IECex

Dimensional drawings

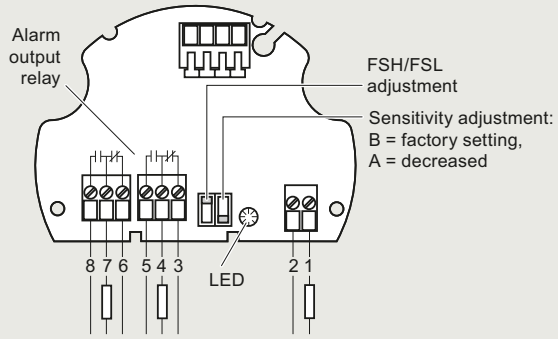


SITRANS LVS100, dimensions in mm (inch)

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Circuit diagrams

Universal voltage (DPDT relay)



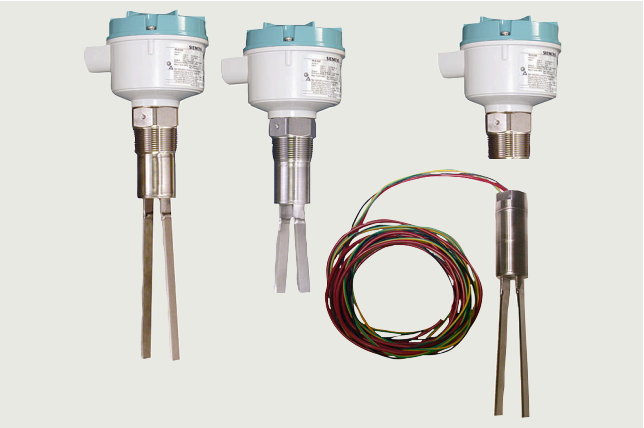
AC: Terminal 1: L
Terminal 2: N
19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA

DC: Terminal 1: +
Terminal 2: -
19 ... 50 V DC, +10 %, 2 W

SITRANS LVS100 connections

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Overview



SITRANS LVS200 is a vibrating point level switch for high, low, or demand level detection of bulk solids.

Benefits

- High resistance to mechanical forces
- Strong vibration resistance to high bulk material loads
- Rotatable enclosure for convenient wiring
- Suitable for low density material: standard version, 20 g/l (1.3 lb/ft^3); liquid/solid interface version, 50 g/l (3 lb/ft^3) and low density option min. 5 g/l (0.3 lb/ft^3)
- Customer desired extensions up to 20 000 mm (787 inch)
- Optional detection of solids within liquid
- Durable short fork option with 165 mm (6.5 inch) insertion length

Application

The standard LVS200 detects high, low, or demand levels of dry bulk solids in bins, silos, or hoppers. The liquid/solid interface version can also detect settled solids within liquids or solids within confined spaces such as feed pipes. It is designed to ignore liquids in order to detect the interface between a solid and a liquid.

A pipe extension version is available with either the standard or liquid/solid interface electronics and fork, separated by a customer supplied 1 inch pipe.

SITRANS LVS200 has an optional 4 to 20 mA output for monitoring buildup on the fork to determine when preventative maintenance should be performed in sticky applications.

The LVS200 has a compact design and can be top, side or angle mounted. The vibrating fork design ensures the tines are kept clean. The unique design of the fork and crystal assembly eliminates false high level readings even if tines become damaged.

A signal from the electronic circuit excites a crystal in the probe causing the fork to vibrate. If the fork is covered by material, the change in vibration is detected by the electronic circuitry which causes the relay to change state after a one second delay. When the fork is free from material pressure, full vibration resumes and the relay reverts to its normal condition.

- Key Applications: dry bulk solids in bins, silos, hoppers or settled solids within liquids (interface version)

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Selection and ordering data

SITRANS LVS200 Vibrating point level switch, standard design Level and material detection in dry bulk solids. Extension options to 4 m (13.12 ft). With advanced testing, output, and durability options, including low bulk densities.	Article No. 7ML5731-	●	●	●	●	●	-	●	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Power supply											
19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)[1]		1									
19 ... 230 V AC, 19 ... 55 V DC, two relay outputs (DPDT)[1]		2									
18 ... 50 V DC PNP[1]		3									
19 ... 230 V AC/DC without contact, 2-wire loop powered[1]		4									
7 ... 9 V DC (requires NAMUR switch amplifier) NAMUR IEC 60947-5-6, 2-wire[2]		5									
8/16 mA or 4 ... 20 mA; 12.5 ... 35 V DC, 2-wire[3]		6									
19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT) basic version[4][5]		7									
Process temperature											
Without temperature isolator			A								
With temperature isolator			B								
Separated enclosure - cable length 1.5 m (4.92 ft) [max. temperature process 150 °C (302 °F)/max. temperature electronics 60 °C (140 °F)]			C								
Separated enclosure - cable length 4.0 m (13.12 ft) [max. temperature process150 °C (302 °F)/max. temperature electronics 60 °C (140 °F)]			D								
Process connection											
Threaded											
R 1½" [(BSPT), EN 10226]				A							
1½" NPT [(Taper), ANSI/ASME B1.20.1]				B							
G 2" [(BSPP), EN ISO 228-1], sliding sleeve [min. length 500 mm (19.69 inch)][6]				C							
2" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)][6]				D							
Flanged											
DN 100 PN 6, EN 1092-1, flat face[7]				E							
DN 100 PN 16, EN 1092-1, flat face				F							
2" ASME 150 lb B16.5, raised face				G							
3" ASME 150 lb B16.5, raised face				H							
4" ASME 150 lb B16.5, raised face				J							
2" Tri-clamp (DN 50) ISO 2852				K							
Extension length											
Stainless steel 304 (1.4301)											
Standard length, 235 mm (9.25 inch)					1	1					
Add Order code Y01 and plain text: "Insertion length ... mm"											
300 ... 500 mm (11.81 ... 19.69 inch)					1	2					
501 ... 750 mm (19.72 ... 29.53 inch)					1	3					
751 ... 1 000 mm (29.57 ... 39.37 inch)					1	4					
1 001 ... 1 250 mm (39.41 ... 49.21 inch)					1	5					
1 251 ... 1 500 mm (49.25 ... 59.06 inch)					1	6					
1 501 ... 1 750 mm (59.09 ... 68.90 inch)					1	7					
1 751 ... 2 000 mm (68.94 ... 78.74 inch)					1	8					
2 001 ... 2 250 mm (78.78 ... 88.58 inch)					2	1					
2 251 ... 2 500 mm (88.62 ... 98.43 inch)					2	2					
2 501 ... 2 750 mm (98.46 ... 108.27 inch)					2	3					
2 751 ... 3 000 mm (108.31 ... 118.11 inch)					2	4					
3 001 ... 3 250 mm (118.15 ... 127.95 inch)					2	5					
3 251 ... 3 500 mm (127.99 ... 137.80 inch)					2	6					
3 501 ... 3 750 mm (137.83 ... 147.64 inch)					2	7					
3 751 ... 4 000 mm (147.68 ... 157.48 inch)					2	8					
Stainless steel 316L (1.4404)											
Standard length, 235 mm (9.25 inch)					3	1					
Add Order code Y01 and plain text: "Insertion length ... mm"											
300 ... 500 mm (11.81 ... 19.69 inch)					3	2					
501 ... 750 mm (19.72 ... 29.53 inch)					3	3					

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Selection and ordering data (continued)

SITRANS LVS200 Vibrating point level switch, standard design Level and material detection in dry bulk solids. Extension options to 4 m (13.12 ft). With advanced testing, output, and durability options, including low bulk densities.	Article No. 7ML5731-	● ● ● ● ● - ● ● A 0
751 ... 1 000 mm (29.57 ... 39.37 inch)		3 4
1 001 ... 1 250 mm (39.41 ... 49.21 inch)		3 5
1 251 ... 1 500 mm (49.25 ... 59.06 inch)		3 6
1 501 ... 1 750 mm (59.09 ... 68.90 inch)		3 7
1 751 ... 2 000 mm (68.94 ... 78.74 inch)		3 8
2 001 ... 2 250 mm (78.78 ... 88.58 inch)		4 1
2 251 ... 2 500 mm (88.62 ... 98.43 inch)		4 2
2 501 ... 2 750 mm (98.46 ... 108.27 inch)		4 3
2 751 ... 3 000 mm (108.31 ... 118.11 inch)		4 4
3 001 ... 3 250 mm (118.15 ... 127.95 inch)		4 5
3 251 ... 3 500 mm (127.99 ... 137.80 inch)		4 6
3 501 ... 3 750 mm (137.83 ... 147.64 inch)		4 7
3 751 ... 4 000 mm (147.68 ... 157.48 inch)		4 8
Material process connection/extension		
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301)[8]		1
Stainless steel 316L (1.4404)[9]		2
Approvals		
CSA/FM Dust Ignition Proof, RCM		A
ATEX II ½ D, RCM		B
CSA/FM General Purpose, RCM, CE		C
CE, RCM		D
CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class I, Aex ia IIC, CSA Class I, Ex ia IIC, RCM		E
ATEX II 1G and ½G Eex ia IIC; ATEX II 1D and ½D, RCM		F
IEC-Ex t IIIC Da/Db		G
EAC Ex ta/tb IIIC Da/Db, Ex ta IIIC Da		H
EAC Ex Ga/Gb Ex ia IIC, 0Ex ia IIC Ga; Ex ta/tb IIIC Da/Db, Ex ta IIIC Da		J

[1] Available with Approval options A, B, C, D, G, and H only.
[2] Available with Approval options D, E, F, and J only.
[3] Available with Approval options B, D, F, G, H, and J only.
[4] Available with configurations 7ML5731-7AA11-1BA0 or 7ML5731-7AB11-1AA0 only.
[5] Basic version is cost effective and offers fast delivery.
[6] Not available with extension length options 11, 12, 31, 32.
[7] Max. 6 bar (87 psi).
[8] Available with option extension length 11 ... 28.
[9] Available with option extension length 31 ... 48.

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Factory test certificate - M to DIN 55350, Part 18	**C11**
Total insertion length: Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)	**Y01**
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	**Y14**
Enhanced sensitivity > 5 g/l via electronics and increased insertion length of 25 mm (0.98 inch)[3]	**K05**
Enhanced sensitivity < 5 g/l via electronics, increased insertion length of 25 mm (0.98 inch), and increased aluminum fork width[1][3]	**G01**
Signal bulb inserted in M20 cable gland[2]	**A20**

Selection and Ordering data	Order code
CCC Ex-Approval Ex tb ta/tb IIIC Db Da/Db or Ex tb ta/tb IIIC Db Da/Db and Ex ia IIC Ga Ga/Gb[4]	**E27**
NAMUR 8/16 mA switch amplifiers available, contact factory for pricing	

Spare Parts	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Replacement Electronics Module (125 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)]	**7ML1830-1KL**
Replacement Electronics Module (125 Hz) [19 ... 230 V AC, 19 ... 55 V DC, two relay output (DPDT)]	**A5E35525363**
Sliding sleeve, 2" BSP (ISO 228)	**7ML1830-1JM**
Sliding sleeve, 2" NPT (ASME B1.20.1)	**7ML1830-1JN**
Namur Isolator switch amplifier relay output KFD2-SR2-Ex1.W	**A5E35667901**
SITRANS LVS200, standard, power supply 7, process temperature A, process connection A, extension length 11, material process connection/extension 1, and approval B	**7ML5731-7AA11-1B-A0**

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Selection and ordering data (continued)

Technical specifications

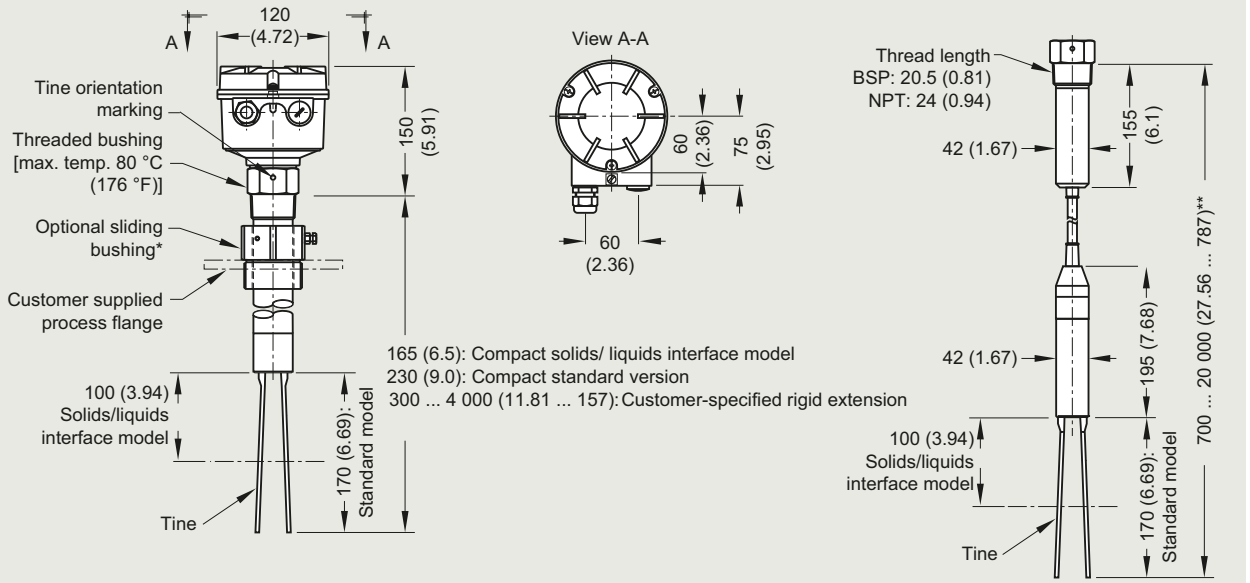
SITRANS LVS200	
Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High, low, and demand
Measuring frequency	
• Standard	125 Hz
• Liquid/solid interface and short fork version	350 Hz
Output	
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected Turn-on voltage: max. 50 V (reverse protection)
2-wire without contact	Load current: • Min. 10 mA • Max. 500 mA permanent • Max. 2A < 200 ms • Max. 5A < 50 ms Voltage drop on the electronic module: max. 7 V with closed electric circuit Cut-off current with open electric circuit: max. 5 mA
Relays	
• Version with 1 relay	SPDT relay
• Version with 2 relays	DPDT relay
Relay delay	• From loss of vibration: approximately 1 second • From resumption of vibration: approximately 1 ... 2 seconds
Signal delay	• Probe uncovered to covered: approximately 1 second • Probe covered to uncovered: approximately 1 ... 2 seconds
Relay fail-safe	High or low, switch selectable
Alarm output	• Relay 8 A at 250 V AC, non-inductive • Relay 5 A at 30 V DC, non-inductive
mA output	8/16 mA or 4 ... 20 mA
• Resolution	4 ... 20 mA ± 0.1 mA
Sensitivity	High or low, switch selectable
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Process temperature	• All except CSA Class II, Group G: -40 ... +150 °C (-40 ... +302 °F) • CSA Class II, Group G: -40 ... +140 °C (-40 ... +284 °F), CSA temperature code T3B
• Max. threaded bushing temperature	80 °C (176 °F)
• Max. enclosure surface temperature (Category 2D)	90 °C (194 °F)
• Max. extension surface temperature (Category 1D)	150 °C (302 °F)
• Pressure (vessel)	Max. 30 bar g (435 psi g) European Pressure Directive 2014/68/EU: Category 1

Technical specifications (continued)

SITRANS LVS200	
• Minimum material density	• Standard version: approx. 20 g/l (1.2 lb/ft³) • Liquid/solid interface version: approx. 50 g/l (3 lb/ft³) • Optional low density version: approx. 5 g/l (0.3 lb/ft³)
Design	
Material	
• Enclosure	Epoxy coated aluminum
Process connection	• Thread 1½" NPT [(Taper), ANSI/ASME B1.20.1], R ½" [(BSPT), EN 10226], and flange options • Optional sliding bushing with 2" NPT [(Taper), ANSI/ASME B1.20.1] or BSP thread • Thread material: stainless steel 303 (1.4301)
Tine material	Stainless steel 316L (1.4404), PTFE-coated tines are available upon special request
Degree of protection	IP65/Type 4/NEMA 4
Conduit entry	2 x M20 x 1.5 or 2 x ½" NPT (For FM and CSA approved versions only.)
Weight	• Standard version, no extensions: approx. 2.0 kg (4.4 lb) • Solids/liquids version, no extensions: approx. 1.9 kg (4.2 lb)
Power supply	• 19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA • 19 ... 55 V DC, +10 %, 1.5 W
Certificates and approvals	
	• CSA/FM General Purpose • CE • CSA/FM Dust Ignition Proof • RCM • ATEX II 1/2 D • CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class I, Aex ia IIC, CSA Class I, Ex ia IIC, available only with power supply options 5 and 6 • ATEX II 1G and 1/2 G Eex ia IIC; ATEX II 1D and 1/2 D, available only with power supply option 5

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Dimensional drawings



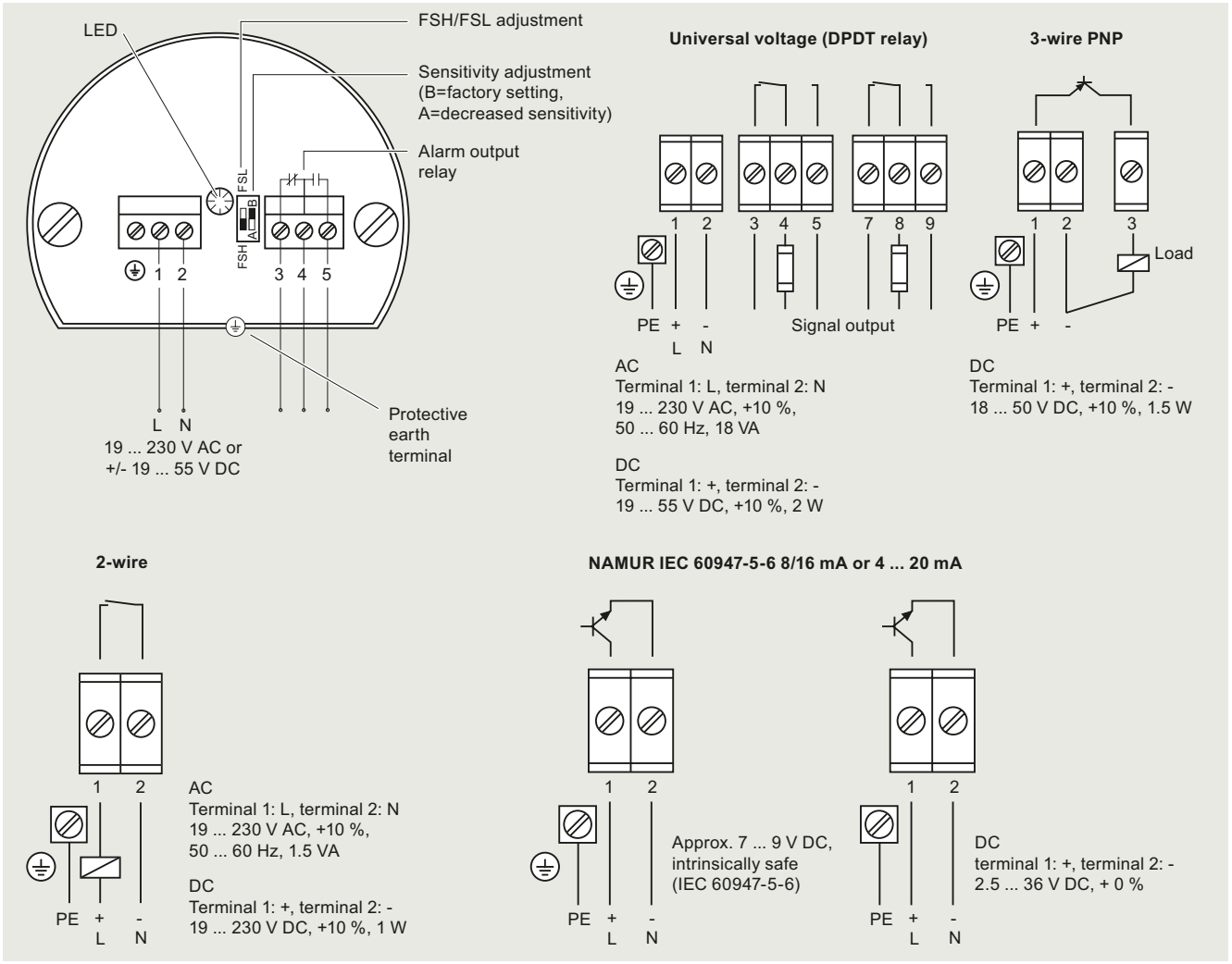
Notes:

* The clamping screws of the sliding bushing must be tightened to 10 Nm.
** Cable version with liquids/solids interface model option length to 7 000 mm (275.59 inch)
Cable version with NAMUR electronics length to 10 000 mm (393.7 inch) tightened to 10 Nm.
See manual for pipe extended version details. (Pipe is customer supplied.)

SITRANS LVS200, dimensions in mm (inch)

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Circuit diagrams



SITRANS LVS200 connections

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Overview



SITRANS LVS300 is a vibrating rod point level switch for high, low, or demand level detection of bulk solids.

Benefits

- High resistance to mechanical forces.
- Adjustable sensitivity for varied applications including build-up.
- Rotatable enclosure for convenient wiring.
- Suitable for low density material: standard version, 20 g/l (1.3 lb/ft^3).
- Customer desired extensions up to 4 000 mm (157 inch).
- 160 mm (6.3 inch) insertion length.
- Flexible, customer supplied, rods to 4 meters.
- Process connections starting at 1 inch.

Application

The standard LVS300 detects high, low, or demand levels of dry bulk solids in bins, silos, or hoppers.

A pipe extension version is available, separated by a customer supplied 1 inch pipe.

The LVS300 has a compact design and can be top, side or angle mounted. The vibrating rod design ensures the product will not be impacted by bridging of traditional forks in applications with buildup potential. A durable probe design ensures the product will withstand heavier materials without damage or bending.

A signal from the electronic circuit excites a crystal in the probe causing the rod to vibrate. If the rod is covered by material, the change in vibration is detected by the electronic circuitry which causes the output to change state after a one second delay. When the probe is free from material, full vibration resumes and the relay reverts to its normal condition.

- Key Applications: dry or bulk solids with buildup potential, in bins, silos, or hoppers, such as lime, molding sand, milk powder, flour, salt, and plastic granules.

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Selection and ordering data

SITRANS LVS300 Vibrating rod point level switch, compact design Level and material detection in solids. Compact, with 160 mm (6.30 inch) insertion.	Article No. 7ML573- 6-	●	●	●	●	●	-	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Power supply									
Relays DPDT 21 ... 230 V AC 22 ... 45 V DC		1							
PNP 20 ... 40 V DC		2							
Process temperature									
Without temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]			A						
With temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]			B						
Process connection									
Threaded									
Thread G 1½" (BSPP) EN ISO 228-1				A					
Thread G 1¼" (BSPP) EN ISO 228-1				B					
Thread G 1" (BSPP) EN ISO 228-1				C					
Thread NPT 1½" (Taper) ANSI B1.20.1				D					
Thread NPT 1¼" (Taper) ANSI B1.20.1				E					
Thread NPT 1" (Taper) ANSI B1.20.1				F					
Tri-clamp 2" (DN50) ISO 2852				G					
Flanged									
Flange DN 100 PN6, EN1092-1[1]				H					
Flange DN 100 PN16, EN1092-1				J					
2" ASME 150 lb B16.5				K					
3" ASME 150 lb B16.5				L					
4" ASME 150 lb B16.5				M					
Extension length									
Standard length, 160 mm (6.3 inch)					1	1			
Material process connection/extension									
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301)								1	
Stainless steel 316 L (1.4404)								2	
Approvals									
CE									A
ATEX II 1/2D Ex ta/tb IIIC TI Da/Db IP6X									B
FM_{US} and FM_C General Purpose									C
FM_{US} and FM_C DIP Class II, III Div. 1 Groups E, F, G									D

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [70 mm x 13 mm (2.76 x 0.51 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y14**
Signal bulb inserted in M20 cable gland[2]	**A20**
Factory test certificate - M to DIN 55350, Part 18	**C11**
EAC Ex-Approval[3]	**E24**
CCC Ex-Approval Ex ta/tb IIIC Da/Db[4]	**E27**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

[1] Max. 6 bar (87 psi).
[2] Available only with Approval option A.
[3] Available only with Approval option B; specific EAC Ex-marking.
[4] Available only with Approval option B.

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Selection and ordering data (continued)

SITRANS LVS300 Vibrating rod point level switch, pipe extended design Level and material detection in solids. Extension options up to 4 m (13.12 ft).	Article No. 7ML573-7-	●	●	●	●	●	-	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Power supply									
Relays DPDT 21 ... 230 V AC 22 ... 45 V DC		1							
PNP 20 ... 40 V DC		2							
Process temperature									
Without temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]			A						
With temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]			B						
Process connection									
Threaded									
Thread G 1½" (BSPP) EN ISO 228-1				A					
Thread G 1¼" (BSPP) EN ISO 228-1				B					
Thread G 1" (BSPP) EN ISO 228-1				C					
Thread NPT 1½" (Taper) ANSI B1.20.1				D					
Thread NPT 1¼ " (Taper) ANSI B1.20.1				E					
Thread NPT 1" (Taper) ANSI B1.20.1				F					
Tri-clamp 2" (DN50) ISO 2852				G					
Flanged									
Flange DN 100 PN6, EN1092-1[1)]				H					
Flange DN 100 PN16, EN1092-1				J					
2" ASME 150 lb B16.5				K					
3" ASME 150 lb B16.5				L					
4" ASME 150 lb B16.5				M					
Extension length									
Extension length Stainless steel threads 304 (1.4301), flanges 321 (1.4541)									
200 ... 500 mm (7.87 ... 19.69 inch)					1	2			
501 ... 750 mm (19.72 ... 29.53 inch)					1	3			
751 ... 1 000 mm (29.57 ... 39.37 inch)					1	4			
1 001 ... 1 250 mm (39.41 ... 49.21 inch)					1	5			
1 251 ... 1 500 mm (49.25 ... 59.06 inch)					1	6			
1 501 ... 1 750 mm (59.09 ... 68.90 inch)					1	7			
1 751 ... 2 000 mm (68.94 ... 78.74 inch)					1	8			
2 001 ... 2 250 mm (78.78 ... 88.58 inch)					2	1			
2 251 ... 2 500 mm (88.62 ... 98.43 inch)					2	2			
2 501 ... 2 750 mm (98.46 ... 108.27 inch)					2	3			
2 751 ... 3 000 mm (108.31 ... 118.11 inch)					2	4			
3 001 ... 3 250 mm (118.15 ... 127.95 inch)					2	5			
3 251 ... 3 500 mm (127.99 ... 137.80 inch)					2	6			
3 501 ... 3 750 mm (137.83 ... 147.64 inch)					2	7			
3 751 ... 4 000 mm (147.68 ... 157.48 inch)					2	8			
Extension length Stainless steel 316 L (1.4404)									
200 ... 500 mm (7.87 ... 19.69 inch)					4	2			
501 ... 750 mm (19.72 ... 29.53 inch)					4	3			
751 ... 1 000 mm (29.57 ... 39.37 inch)					4	4			
1 001 ... 1 250 mm (39.41 ... 49.21 inch)					4	5			
1 251 ... 1 500 mm (49.25 ... 59.06 inch)					4	6			
1 501 ... 1 750 mm (59.09 ... 68.90 inch)					4	7			
1 751 ... 2 000 mm (68.94 ... 78.74 inch)					4	8			
2 001 ... 2 250 mm (78.78 ... 88.58 inch)					5	1			
2 251 ... 2 500 mm (88.62 ... 98.43 inch)					5	2			
2 501 ... 2 750 mm (98.46 ... 108.27 inch)					5	3			
2 751 ... 3 000 mm (108.31 ... 118.11 inch)					5	4			
3 001 ... 3 250 mm (118.15 ... 127.95 inch)					5	5			

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Selection and ordering data (continued)

SITRANS LVS300 Vibrating rod point level switch, pipe extended design Level and material detection in solids. Extension options up to 4 m (13.12 ft).	Article No. 7ML573-	●	●	●	●	●	-	●	●
	7-								
3 251 ... 3 500 mm (127.99 ... 137.80 inch)					5	6			
3 501 ... 3 750 mm (137.83 ... 147.64 inch)					5	7			
3 751 ... 4 000 mm (147.68 ... 157.48 inch)					5	8			
Material process connection/extension									
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301)[2]								1	
Stainless steel 316 L (1.4404)[3]								2	
Approvals									
CE									A
ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X									B
FM_{US} and FM_C General Purpose									C
FM_{US} and FM_C DIP Class II, III Div. 1, Groups E, F, G									D

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)	**Y01**
Stainless steel tag [70 mm x 13 mm (2.76 x 0.51 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y14**
Signal bulb inserted in M20 cable gland[4]	**A20**
Sliding sleeve, for application without overpressure max. 150 °C (302 °F), min. length 501 mm (19.72 inch)[5][6][7]	**P12**
Sliding sleeve, for application with overpressure, max. 16 bar (232 psi), max. 150 °C (302 °F), min. length 501 mm (19.72 inch)[6]	**P13**
Factory test certificate - M to DIN 55350, Part 18	**C11**
EAC Ex- Approval[9]	**E24**
CCC Ex-Approval Ex ta/tb IIIC Da/Db[8]	**E27**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

Selection and Ordering data	Order code
Spare parts	
Replacement Electronics Modules are available. Contact factory for pricing.	

[1] Max. 6 bar (87 psi).
[2] Available with extension length 12.
[3] Available with extension length 42.
[4] Available only with Approval option A.
[5] Available only with Approval options A and C.
[6] Available only with Process connection options A, D, H, J, K, L, M, not available with extension length 12 and 42.
[7] Available only with Material Process connection/extension option 1.
[8] Available only with Approval option B.
[9] Available only with Approval option B; specific EAC Ex-marking.

SITRANS LVS300 Vibrating rod point level switch, customer supplied tube Level and material detection in solids. Requires flexible, customer supplied, pipe extensions with insertion to 4 m (13.12 ft).	Article No. 7ML573-	●	●	●	●	●	-	●	●
	8-								
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Power supply									
Relays DPDT 21 ... 230 V AC 22 ... 45 V DC		1							
PNP 20 ... 40 V DC		2							
Process temperature									
Without temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]			A						
Process connection									
Threaded									
Thread G 1½" (BSPP) EN ISO 228-1				A					
Thread NPT 1½" (Taper) ANSI B1.20.1				D					
Tri-clamp 2" (DN50) ISO 2852				G					
Flanged									
Flange DN 100 PN6, EN1092-1[1]				H					
Flange DN 100 PN16, EN1092-1				J					
2" ASME 150 lb B16.5				K					
3" ASME 150 lb B16.5				L					
4" ASME 150 lb B16.5				M					

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Selection and ordering data (continued)

SITRANS LVS300 Vibrating rod point level switch, customer supplied tube Level and material detection in solids. Requires flexible, customer supplied, pipe extensions with insertion to 4 m (13.12 ft).	Article No. 7ML573-8-	●	●	●	●	●	-	●	●
Extension length									
1 500 mm (59 inch), adjustable cable length					1	1			
4 000 mm (157 inch), adjustable cable length					1	2			
Material process connection/extension									
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301)								1	
Stainless steel 316 L (1.4404)								2	
Approvals									
CE									A
ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X									B
FM_{US} and FM_C General Purpose									C
FM_{US} and FM_C DIP Class II, III Div.1, Groups E, F, G									D

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [70 mm x 13 mm (2.76 x 0.51 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y14**
Signal bulb inserted in M20 cable gland[2)]	**A20**
Factory test certificate - M to DIN 55350, Part 18	**C11**
EAC Ex- Approval[4)]	**E24**
CCC Ex-Approval Ex ta/tb IIIC Da/Db[3)]	**E27**

Selection and Ordering data	Order code
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare parts	
Replacement Electronics Modules are available. Contact factory for pricing.	

[1)] Max. 6 bar (87 psi).
[2)] Available only with Approval option A.
[3)] Available only with Approval option B.
[4)] Available only with Approval option B; specific EAC Ex-marking.

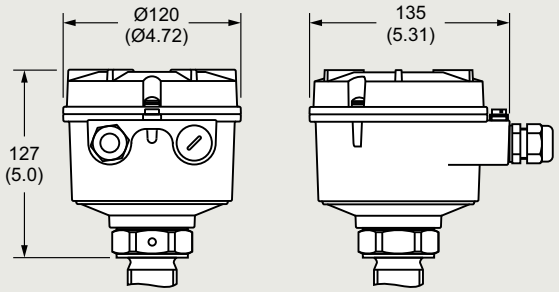
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Technical specifications

SITRANS LVS300	
Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High, low, and demand
Measuring frequency	
• Standard	330 Hz
Output	
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected (reverse protection)
Relay	DPDT relay
Signal delay	• Probe uncovered to covered: approximately 1 second • Probe covered to uncovered: approximately 1 ... 2 seconds
Relay fail-safe	High or low, switch selectable
Alarm output	• Relay 8 A at 250 V AC, non-inductive • Relay 5 A at 30 V DC, non-inductive
Sensitivity	Four sensitivity settings, switch selectable
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	II
• Pollution degree	2
Medium conditions	
• Process temperature	-40 ... +150 °C (-40 ... +302 °F)
• Pressure (vessel)	Max. 16 bar g (232 psi g) European Pressure Directive 2014/68/EU: Category 1
• Minimum material density	Approx. 20 g/l (1.2 lb/ft³)
Design	
Material	
• Enclosure	Aluminum powder coat
Process connection	• G 1", G 1 1/4", G 1 1/2" DIN 228; NPT 1", NPT 1 1/4", NPT 1 1/2" ANSI B 1.20.1 • Flange: according to selection 1.4541 (321) or 1.4404 (316L) • Tri-clamp: stainless steel 1.4301 (304) or 1.4404 (316L) • 2" (DN 50) ISO 2852
Probe material	• Oscillator material: stainless steel 1.4404 (316L) • Stainless steel 1.4301 (304)/1.4541 (321) or 1.4404 (316L) (process connection and tube extension)
Degree of protection	IP67 (EN 60529), NEMA Type 4X
Conduit entry	2 x M20 x 1.5 or 2 x ½" NPT
Weight	• Standard version: 1.3 kg (2.9 lb) +1.3 kg/m (+2.9 lb per 39.3 inch) extension • Customer supplied pipe: 1.8 kg (4.0 lb) +1.3 kg/m (+2.9 lb per 39.3 inch) extension
Power supply	• Relay DPDT 21 ... 230 V, 50 ... 60 Hz, ± 10 %* 22 VA, 22 ... 45 V DC, ± 10 %* 2W *incl. ± 10 % of EN 61010 • 3-wire PNP 20 ... 40 V DC, ± 10 %* *incl. ± 10 % of EN 61010
Certificates and approvals	CE, ATEX, FM

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Dimensional drawings

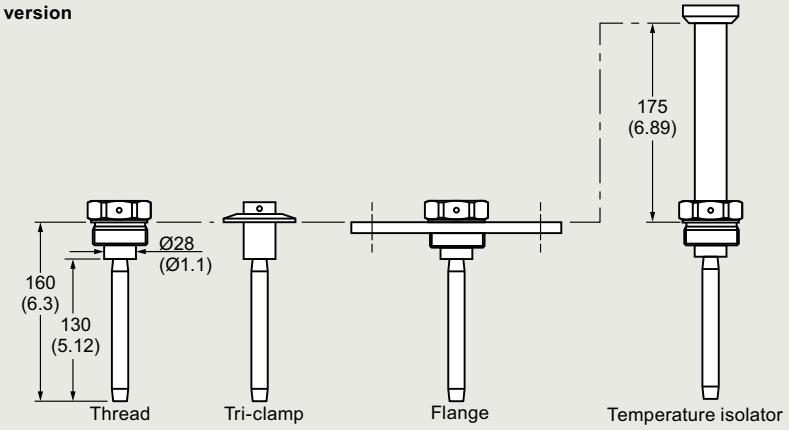


SITRANS LVS300 enclosure, dimensions in mm (inch)

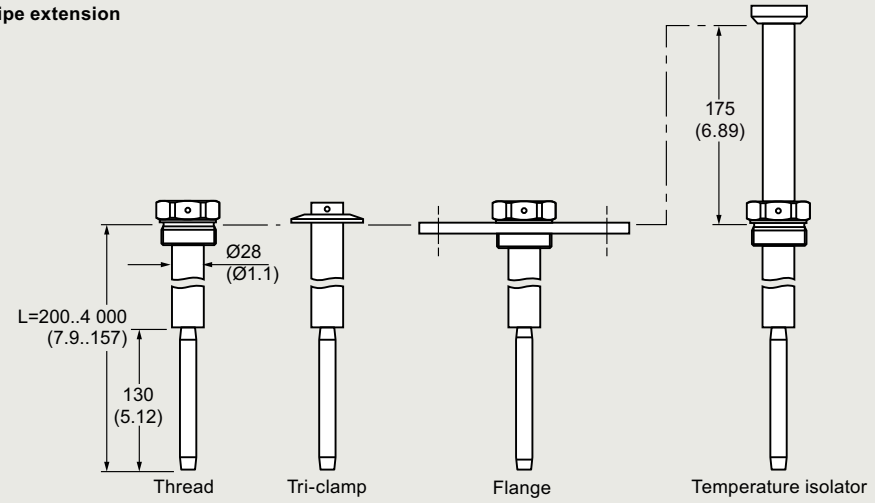
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Dimensional drawings (continued)

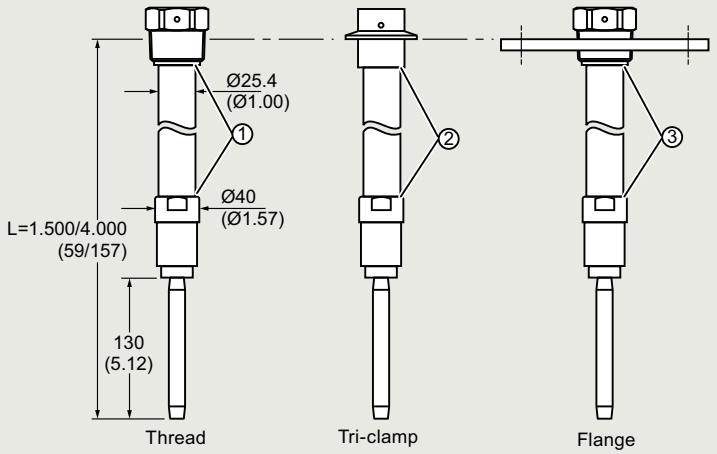
Compact version



Pipe extension



Pipe extension - customer mounted

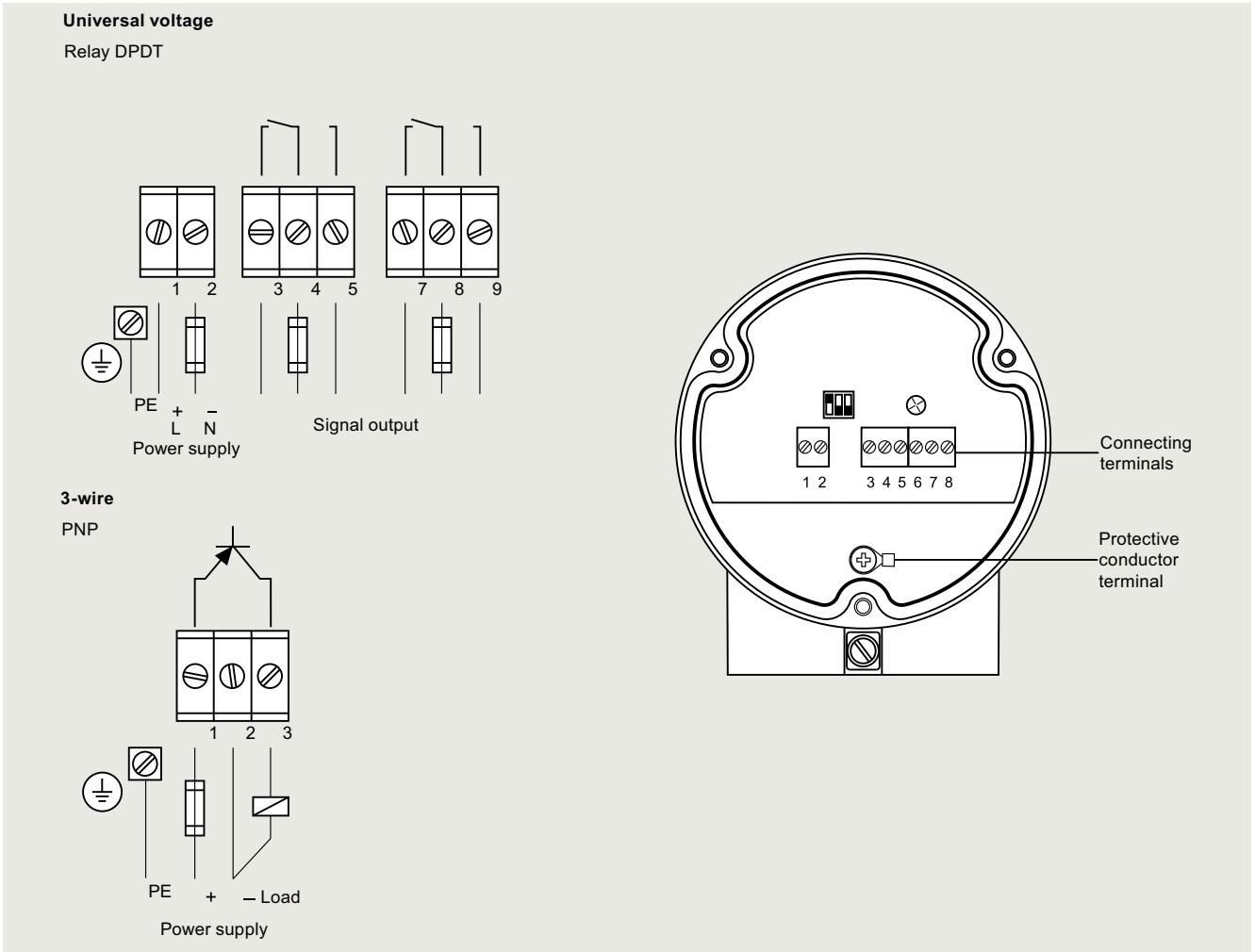


	Approval	Process connection	Thread on extension pipe
①	CE, ATEX	G 1½"	R 1"
	FM	NPT 1½"	NPT 1"
	Approval	**Thread on extension pipe**	
②	CE, ATEX	R 1"	
	FM	NPT 1"	
	Approval	**Process connection**	**Thread on extension pipe**
③	CE, ATEX	Flange DN	R 1"
		Flange ANSI	NPT 1"
	FM	Flange DN Flange ANSI	NPT 1"

SITRANS LVS300, dimensions in mm (inch)

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Circuit diagrams



SITRANS LVS300 connections

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Overview



SITRANS LPS100 is a rotary paddle switch for point level detection in bulk solids.

Benefits

- Proven paddle switch technology for bulk solids
- Unique friction clutch mechanism
- Rotatable enclosure
- Simple installation through existing process connection

Application

The paddle switch technology detects full, empty, or demand conditions on materials such as grain, feed, cement, plastic granulates, and wood chips. The paddle switch can handle bulk densities as low as 100 g/l (6 lb/ft³) with the standard measuring vane.

A low revolution geared motor with slip clutch drives a rotating measuring vane which senses the presence of material at the mounted level of the LPS100. As material comes into contact with the rotating paddle, rotation stops, which changes the microswitch state. When the paddle is no longer covered by material, rotation resumes and the relay reverts to its normal condition. The LPS100 has a rugged design for use in harsh conditions in the solids industry. The sensitivity of the paddle can be adjusted for varying material properties like build-up on the vane.

- Key Applications: bulk solids such as grain, feed, cement, plastic granulates, wood chips

Selection and ordering data

SITRANS LPS100 Rotary paddle point level switch, compact design. Level detection in bulk solid.	Article No. 7ML5723-	●	A	●	0	0	-	0	A	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Input voltage											
230 V AC, 1 rev/min.		0									
115 V AC, 1 rev/min.		1									
24 V DC, 1 rev/min.		2									
48 V AC, 1 rev/min.		3									
24 V AC, 1 rev/min.		4									
Process temperature											
Up to 80 °C (176 °F)											
Process connection / Enclosure											
1-½" BSPT thread, EN 10226, material aluminum / Enclosure open thread 2 × M20×1.5				A							
1-¼" NPT (taper) thread, material aluminum / Enclosure open thread 2 × NPT ¾"				B							
Extension length											
Standard length, 150 mm, material stainless steel 303 (1.4305)					0	0					
Approvals											
FM Class II, Div. 1, Group E,F, G, Class III, ATEX II 1/2 D, CE, FM Gen. Purpose									A		

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Technical specifications

SITRANS LPS100	
Mode of operation	
Measuring principle	Rotating point level switch
Input	
Measured variable	High, low, and demand
Output	
Output signal	
• Alarm output	• Microswitch 5 A at 250 V AC, non-inductive • Microswitch SPDT contact 4 A at 30 V DC, non-inductive
Sensitivity	Adjustable via reset force of spring or geometry of measuring vane
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-20 ... +60 °C (-4 ... +140 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	Bulk solids
• Temperature	
- Standard	-25 ... +80 °C (-13 ... +176 °F)
• Pressure (vessel)	
- Standard	Max. 0.8 bar g (11.6 psi g)
• Minimum material density	
- Standard measuring vane	Can detect down to 100 g/l (6.25 lb/ft³)
Design	
Material	
• Enclosure	Epoxy coated aluminum
• Process connection, measuring shaft and vane	Stainless steel 304 and 303 (1.4301 and 1.4305)
Process connection	Thread R 1½" (BSPT) or 1¼" NPT (ANSI B 1.20.1)
Degree of protection	IP66 (EN 60529), NEMA 4
Conduit entry	2 × M20×1.5, or 2 × ¾" NPT
Power supply	
Jumper selectable	• 115 or 230 V AC, 50 ... 60 Hz, 4 VA • 24 V DC, 2.5 W
Certificates and approvals	• FM General Purpose • FM Class II, III Div. 1 Groups E, F, G • ATEX II 1/2 D Ex tD A20/21 • C-TICK

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Overview



SITRANS LPS200 is a rotary paddle switch for point level and material detection in bulk solids.

Benefits

- Proven paddle switch technology for bulk solids
- High integrity mechanical seal
- Universal power supply options available
- Unique friction clutch mechanism prevents damage from falling material
- Rotatable enclosure for convenient wiring
- Optional paddles for use with low density materials
- Small paddle makes for simple installation through existing process connection
- High temperature model and optional extension kit available
- Optional fail-safe configuration detects loss of rotation
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511

Application

The paddle switch technology detects full, empty, or demand conditions on materials such as grain, feed, cement, plastic granulate, and wood chips. The paddle switch can handle bulk densities as low as 15.06 g/l (0.94 lb/ft^3) with the optional rectangular vane or 100 g/l (6.25 lb/ft^3) with the standard measuring vane.

A low revolution geared motor with slip clutch drives a rotating measuring vane which senses the presence of material at the mounted level of the LPS200. As material comes into contact with the rotating paddle, rotation stops, which changes the microswitch state. When the paddle is no longer covered by material, rotation resumes and the relay reverts to its normal condition.

The LPS200 has a rugged design for use in harsh conditions in the solids industry. The sensitivity of the paddle can be adjusted for varying material properties like buildup on the vane.

The LPS200 comes in a variety of configurations including compact, extended and cable extension. It is equipped with a standard vane which is effective in most applications, but can be configured with a hinged or rectangular vane for increased sensitivity for light materials.

- Key Applications: bulk solids such as grain, feed, cement, plastic granulate, wood chips

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Selection and ordering data

SITRANS LPS200 Rotary paddle point level switch, compact design Level detection in solids. Compact, side or top mount with extension options to 300 mm (11.81 inch).	Article No. 7ML572-5-	●	●	●	●	●	-	●	●	●	0	Ord. code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Process temperature														
Up to 80 °C (176 °F)		1												
Up to 150 °C (302 °F)		2												
Up to 250 °C (482 °F)		3												
Up to 600 °C (1 112 °F)[1)2)]		4												
Up to 80 °C (176 °F) basic version aluminum[1)3)]		5												
Up to 80 °C (176 °F) basic version stainless steel[1)4)]		6												
Power supply														
230 V AC, 1 rev/min.			A											
230 V AC, 5 rev/min.			C											
115 V AC, 1 rev/min.			E											
115 V AC, 5 rev/min.			G											
48 V AC, 1 rev/min.			J											
24 V AC, 1 rev/min.			K											
24 V DC, 1 rev/min.			L											
24 V DC, 5 rev/min.			N											
48 V AC, 5 rev/min.			Z									J	1	B
24 V AC, 5 rev/min.			Z									J	1	E
Universal Voltage, 1 rev/min.			Z									J	2	A
Universal Voltage, 1 rev/min., fail-safe			Z									J	2	B
Universal Voltage, 5 rev/min.			Z									J	2	C
Universal Voltage, 5 rev/min. fail-safe			Z									J	2	D
Process connection														
Threaded														
G 1¼" [(BSPP), EN ISO 228-1]				A										
G 1" [(BSPP), EN ISO 228-1]				B										
G 1½" [(BSPP), EN ISO 228-1]				C										
1" NPT [(Taper), ANSI/ASME B1.20.1]				D										
1¼" NPT [(Taper), ANSI/ASME B1.20.1]				E										
1½" NPT [(Taper), ANSI/ASME B1.20.1]				F										
Flanged														
DN 32 PN 6, EN 1092-1, flat face[5)]				G										
DN 100 PN 6, EN 1092-1, flat face[5)]				H										
DN 100 PN 16, EN 1092-1, flat face				J										
2" ASME 150 lb B16.5, raised face				K										
3" ASME 150 lb B16.5, raised face				L										
4" ASME 150 lb B16.5, raised face				M										
2" Tri-clamp (DN 50) ISO 2852[6)]				N										
Process pressure														
Up to 0.5 bar (7.25 psi)					1									
Up to 5 bar (72.5 psi)					2									
Up to 10 bar (145 psi)					3									
Process connection material														
Aluminum[7)]						1								
Stainless steel, threads 303 (1.4305), flanges 321 (1.4541), Tri-clamp 304 (1.4301)						2								
Stainless steel 316L (1.4404)[8)]						3								
Extension length														
100 mm (3.94 inch)[9)]								1						
150 mm (5.91 inch)								2						
200 mm (7.87 inch)								3						

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, compact design Level detection in solids. Compact, side or top mount with extension options to 300 mm (11.81 inch).	Article No. 7ML572-5- ● ● ● ● ● - ● ● ● 0	Ord. code ● ● ●
250 mm (9.84 inch)	4	
300 mm (11.81 inch)	5	
Measuring vane		
Boot shaped, 35 x 106 mm (1.38 x 4.17 inch)[10]	A	
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)[10][11]	B	
Boot shaped, 28 x 98 mm (1.10 x 3.86 inch)	C	
Rectangular, 50 x 150 mm (1.97 x 5.91 inch)[12]	D	
Rectangular, 50 x 250 mm (1.97 x 9.84 inch)[12]	E	
Rectangular, 98 x 150 mm (3.86 x 5.91 inch)[11][12]	F	
Rectangular, 98 x 250 mm (3.86 x 9.84 inch)[11][12]	G	
Rectangular, 50 x 98 mm (1.97 x 3.86 inch)[12]	H	
Approvals		
CSA/FM Dust Ignition Proof, RCM	A	
ATEX II ½ D, RCM	B	
CSA/FM General Purpose, RCM, CE	C	
CE, RCM	D	
IEC Ex ta/tb IIIC	E	
EAC Ex ta/tb IIIC Da/Db	F	

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Heating of enclosure[13][14]	**A35**
Signal bulb inserted in M20 cable gland[13]	**A20**
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing[15]	**K01**
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	**Y14**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[17][18]	**C20**
Factory test certificate - M to DIN 55350, Part 18	**C11**

Spare Parts and Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)	**7ML1830-1KH**
Hinged vane, 98 x 200 mm (3.86 x 7.87 inch)	**7ML1830-1KJ**
Rigid extension kit	
(Includes spring coupling, rigid tube extension, and required pins)	
Extension: 500, 400, 300 mm (19.7, 15.8, 11.8 inch)[16]	**7ML5711-0AA**
Extension: 1 000, 900, 800, 700, 600 mm (39.4, 35.4, 31.5, 27.6, 23.6 inch)[1-6]	**7ML5711-1AA**
Extension: 1 500, 1 400, 1 300, 1 200, 1 100 mm (59.1, 55.1, 51.2, 47.2, 43.3 inch)[16]	**7ML5711-2AA**
Rope extension kit, 2 m (6.56 ft)	**7ML1830-1KK**
SITRANS LPS200, compact for up to 80 °C (176 °F), aluminum, with power supply E, process connection E, process pressure 1, process connection material 1, extension length 2, measuring vane A, and approval C	**7ML5725-5EE11--2AC0**

Spare Parts and Accessories	Article No.
SITRANS LPS200, compact for up to 80 °C (176 °F), stainless steel, with power supply Z (J2A), process connection C, process pressure 1, process connection material 2, extension length 2, measuring vane A, and approval B	**7ML5725-6ZC12--2AB0 J2A**
SITRANS LPS200, compact for up to 80 °C (176 °F), stainless steel, with power supply Z (J2A), process connection E, process pressure 1, process connection material 2, extension length 2, measuring vane A, and approval A	**7ML5725-6ZE12--2AA0 J2A**

1) Available with Approval options C and D only, up to 0.5 bar.
2) Not available with Process connections A, B, D, E, and G.
3) Only available with the following configurations 7ML5725-5AC11-2AD0 or 7ML5725-5EE11-2AC0.
4) Only available with the following configurations 7ML5725-6ZC12-2AB0 J2A or 7ML5725-6ZE12-2AA0 J2A.
5) Available with Process pressure options 1 and 2 only.
6) Available with Process temperature option 1 only.
7) Available with Process connection options A ... F only, Process pressure option 1 and Process temperature options 1 and 5 only.
8) Available with Process connection options C, F, H ... N and Measuring vane options A and B.
9) Available with Measuring vane options A, C, D, E, H only.
10) Add 10 mm (0.39 inch) to extension length.
11) Available with Extension lengths 2, 3, 4, 5.
12) Available with Process connection options H ... M only.
13) Available with Approval option D only.
14) Available only with Power supply options J2A, J2B, J2C, and J2D.
15) Available up to 250 °C (482 °F).
16) Pendulum shaft 500 mm/1 000 mm/1 500 mm should be selected with 150 mm standard length 2 and vane A (35 x 106) to get to the desired lengths.
17) Available with Power supply options J2A and J2C only.
18) Available with Approval options A, B, C, D, and E only. Approvals A and C with FM only.

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, shaft protected design Level detection in aggressive solids. Compact, side or top mount, with enhanced shaft protection. Extension options to 300 mm (11.81 inch).	Article No. 7ML572-6-						-					Ord. code		
	●	●	●	●	●		●	●	●	●		●	●	●
Process temperature														
Up to 80 °C (176 °F)	1													
Up to 150 °C (302 °F)	2													
Up to 250 °C (482 °F)	3													
Up to 600 °C (1 112 °F)[1)2)]	4													
Up to 80 °C (176 °F) basic version[3)]	5													
Power supply														
230 V AC, 1 rev/min.		A												
230 V AC, 5 rev/min.		C												
115 V AC, 1 rev/min.		E												
115 V AC, 5 rev/min.		G												
48 V AC, 1 rev/min.		J												
24 V AC, 1 rev/min.		K												
24 V DC, 1 rev/min.		L												
24 V DC, 5 rev/min.		N												
48 V AC, 5 rev/min.		Z										J	1	B
24 V AC, 5 rev/min.		Z										J	1	E
Universal voltage, 1 rev/min.		Z										J	2	A
Universal voltage, 1 rev/min., fail-safe		Z										J	2	B
Universal voltage, 5 rev/min.		Z										J	2	C
Universal voltage, 5 rev/min., fail-safe		Z										J	2	D
Process connection														
Threaded														
G 1¼" [(BSPP), EN ISO 228-1]			A											
G 1½" [(BSPP), EN ISO 228-1]			B											
1¼" NPT [(Taper), ANSI/ASME B1.20.1]			C											
1½" NPT [(Taper), ANSI/ASME B1.20.1]			D											
Flanged														
DN 32 PN 6, EN 1092-1, flat face[4)]			E											
DN 100 PN 6, EN 1092-1, flat face[4)]			F											
DN 100 PN 16, EN 1092-1, flat face			G											
2" ASME 150 lb B16.5, raised face			H											
3" ASME 150 lb B16.5, raised face			J											
4" ASME 150 lb B16.5, raised face			K											
2" Tri-clamp (DN 50) ISO 2852[5)]			L											
Process pressure														
Up to 0.5 bar (7.25 psi)				1										
Up to 5 bar (72.5 psi)				2										
Up to 10 bar (145 psi)				3										
Process connection material														
Aluminum[6)]					1									
Stainless steel, threads 303 (1.4305), flanges 321 (1.4541), Tri-clamp 304 (1.4301)[18)]					2									
Stainless steel 316L (1.4404)[7)]					3									
Extension length														
150 mm (5.91 inch)[8)]							1							
200 mm (7.87 inch)							2							
250 mm (9.84 inch)							3							
300 mm (11.81 inch)							4							
Extension material (protection tube)														
Aluminum[9)]								A						
Stainless steel 303 (1.4305)								B						

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, shaft protected design Level detection in aggressive solids. Compact, side or top mount, with enhanced shaft protection. Extension options to 300 mm (11.81 inch).	Article No. 7ML572-6- ● ● ● ● ● - ● ● ● ●	Ord. code ● ● ●
Stainless steel 316L (1.4404)[10]	C	
Measuring vane		
Boot shaped, 35 x 106 mm (1.38 x 4.17 inch)[11]	A	
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)[11][12]	B	
Rectangular, 50 x 150 mm (1.97 x 5.91 inch)[13]	D	
Rectangular, 50 x 250 mm (1.97 x 9.84 inch)[13]	E	
Rectangular, 98 x 150 mm (3.86 x 5.91 inch)[12][13]	F	
Rectangular, 98 x 250 mm (3.86 x 9.84 inch)[12][13]	G	
Rectangular, 50 x 98 mm (1.97 x 3.86 inch)[13]	H	
Approvals		
CSA/FM Dust Ignition Proof, RCM	1	
ATEX II ½ D, RCM	2	
CSA/FM General Purpose, RCM, CE	3	
CE, RCM	4	
IEC Ex ta/tb IIIC	5	
EAC Ex ta/tb IIIC Da/Db	6	

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Heating of enclosure[14][15]	**A35**
Signal bulb inserted in M20 cable gland[14]	**A20**
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing[16]	**K01**
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	**Y14**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511.[17][19]	**C20**
Factory test certificate - M to DIN 55350, Part 18	**C11**

Spare Parts	Article No.
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)	**7ML1830-1KH**
Hinged vane, 98 x 200 mm (3.86 x 7.87 inch)	**7ML1830-1KJ**
SITRANS LPS200, extended for up to 80 °C (176 °F), power supply Z (J2A), process connection B, process pressure 1, process connection material 2, extension length 2, extension material B, measuring vane A, and approval 2	**7ML5726-5ZB12--2BA2 J2A**
SITRANS LPS200, extended for up to 80 °C (176 °F), power supply Z (J2A), process connection C, process pressure 1, process connection material 2, extension length 2, extension material B, measuring vane A, and approval 1	**7ML5726-5ZC12--2BA1 J2A**

[1] Available with Approval options 3 and 4 only and up to max 0.5 bar.
[2] Not available with Process connection options A, C, E.
[3] Only available with the following configurations 7ML5726-5ZB12-2BA2 J2A or 7ML5726-5ZC12-2BA1 J2A.
[4] Available with Process pressure options 1 and 2 only.
[5] Available with Process temperature option 1 only.
[6] Available with Process connection options A ... E only, available with process pressure option 1 only, and process temperature option 1 only.
[7] Extension and vane will also change to 316L, only for Process connection options B, D, F ... L and vane A.
[8] Available with Measuring vane options A, D, E, H only.
[9] Available with Process pressure option 1 and process temperature option 1 only.
[10] Available with Process connection options B, D, F ... L and vane A.
[11] Add 10 mm (0.39 inch) to extension length.
[12] Available with Extension length options 2 ... 4 only.
[13] Available with Process connection options F, G, H, J, K only.
[14] Available with Approval option 4 only.
[15] Available only with Power supply options J2A, J2B, J2C, and J2D.
[16] Available up to 250 °C (482 °F).
[17] Available with Power supply options J2A and J2C only.
[18] Available with Extension material Stainless steel, threads 303 option B only.
[19] Available with Approval options 1, 2, 3, 4, and 5 only. Approvals 1 and 3 with FM only.

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, cable extension design Level detection in solids. Top mount, with extension options to 10 m (32.80 ft).	Article No. 7ML572-7-	●	●	●	●	●	-	●	●	●	0	Ord. code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Process temperature														
Up to 80 °C (176 °F)		1												
Up to 150 °C (302 °F)		2												
Up to 250 °C (482 °F)		3												
Up to 600 °C (1 112 °F)[1)2)]		4												
Up to 80 °C (176 °F) basic version[3)]		5												
Power supply														
230 V AC, 1 rev/min.			A											
230 V AC, 5 rev/min.			C											
115 V AC, 1 rev/min.			E											
115 V AC, 5 rev/min.			G											
48 V AC, 1 rev/min.			J											
24 V AC, 1 rev/min.			K											
24 V DC, 1 rev/min.			L											
24 V DC, 5 rev/min.			N											
48 V AC, 5 rev/min.			Z									J	1	B
24 V AC, 5 rev/min.			Z									J	1	E
Universal voltage, 1 rev/min.			Z									J	2	A
Universal voltage, 1 rev/min., fail-safe			Z									J	2	B
Universal voltage, 5 rev/min.			Z									J	2	C
Universal voltage, 5 rev/min., fail-safe			Z									J	2	D
Process connection														
Threaded														
G 1¼" [(BSPP), EN ISO 228-1]				A										
G 1½" [(BSPP), EN ISO 228-1]				B										
1¼" NPT [(Taper), ANSI/ASME B1.20.1]				C										
1½" NPT [(Taper), ANSI/ASME B1.20.1]				D										
Flanged														
DN 32 PN 6, EN 1092-1, flat face[4)]				E										
DN 100 PN 6, EN 1092-1, flat face[4)]				F										
DN 100 PN 16, EN 1092-1, flat face				G										
2" ASME 150 lb B16.5, raised face				H										
3" ASME 150 lb B16.5, raised face				J										
4" ASME 150 lb B16.5, raised face				K										
Process pressure														
Up to 0.5 bar (7.25 psi)					1									
Up to 5 bar (72.5 psi)					2									
Up to 10 bar (145 psi)					3									
Process connection material														
Aluminum[5)]						1								
Stainless steel, threads 303 (1.4305), flanges 321 (1.4541)						2								
Cable extension length														
Standard cable length, 2 000 mm (78.74 inch)								0						
Add Order code Y01 and plain text: "Insertion length ... mm"														
500 ... 1 000 mm (19.69 ... 39.37 inch)								1						
Cable length 1 001 ... 2 000 mm (39.41 ... 78.74 inch)								2						
Cable length 2 001 ... 3 000 mm (78.78 ... 118.11 inch)								3						
Cable length 3 001 ... 4 000 mm (118.15 ... 157.48 inch)								4						
Cable length 4 001 ... 5 000 mm (157.52 ... 196.85 inch)								5						
Cable length 5 001 ... 6 000 mm (196.89 ... 236.22 inch)								6						

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, cable extension design Level detection in solids. Top mount, with extension options to 10 m (32.80 ft).	Article No. 7ML572- ● ● ● ● ● - ● ● ● 0	Ord. code ● ● ●
Cable length 6 001 ... 7 000 mm (236.26 ... 275.59 inch)	7	
Cable length 7 001 ... 10 000 mm (275.63 ... 393.70 inch)	8	
Without extension[12)]	9	N 1 A
Measuring vane		
Boot shaped, 35 x 106 mm (1.38 x 4.17 inch)[6)]	A	
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)[6)]	B	
Boot shaped, 28 x 98 mm (1.10 x 3.86 inch)[7)]	C	
Rectangular, 50 x 150 mm (1.97 x 5.91 inch)[7)]	D	
Rectangular, 50 x 250 mm (1.97 x 9.84 inch)[7)]	E	
Rectangular, 98 x 150 mm (3.86 x 5.91 inch)[7)]	F	
Rectangular, 50 x 98 mm (1.97 x 3.86 inch)[7)]	G	
Approvals		
CSA/FM Dust Ignition Proof, RCM	A	
ATEX II ½ D, RCM	B	
CSA/FM General Purpose, RCM, CE	C	
CE, RCM	D	
IEC Ex ta/tb IIIC	E	
EAC Ex ta/tb IIIC Da/Db	F	

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length:	**Y01**
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	**Y14**
Reinforced cable (max. 28 kN pulling force)[8)]	**P01**
Heating of enclosure[9)10)]	**A35**
Signal bulb inserted in M20 cable gland[9)]	**A20**
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing[11)]	**K01**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511.[13)14)]	**C20**
Factory test certificate - M to DIN 55350, Part 18	**C11**

Spare Parts	Article No.
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)	**7ML1830-1KH**
Hinged vane, 98 x 200 mm (3.86 x 7.87 inch)	**7ML1830-1KJ**
SITRANS LPS200, cable extension for up to 80 °C (176 °F), power supply Z (J2A), process connection B, process pressure 1, process connection material 2, extension length 0, measuring vane A, and approval B	**7ML5727-5ZB12--0AB0 J2A**

Spare Parts	Article No.
SITRANS LPS200, cable extension for up to 80 °C (176 °F), power supply Z (J2A), process connection C, process pressure 1, process connection material 2, extension length 0, measuring vane A, and approval A	**7ML5727-5ZC12--0AA0 J2A**

[1)] Available with Approval options C and D up to max. 0.5 bar.
[2)] Not available with Process connections A, C, E.
[3)] Only available with the following configurations 7ML5727-5ZC12-0AA0 J2A or 7ML5727-5ZB12-0AB0 J2A.
[4)] Available with Process pressure options 1 and 2 only.
[5)] Available with Process connections A ... E only, Process pressure option 1 only and process temperature options 1 and 5 only.
[6)] Add 10 mm (0.39 inch) to extension length.
[7)] Available with Process connections F ... K only.
[8)] Available only for Process temperature up to 80 °C (176 °F) and Process connection material 2.
[9)] Available with Approval option D.
[10)] Available only with Power supply options J2A, J2B, J2C, and J2D.
[11)] Available up to 250 °C (482 °F).
[12)] Not available with P01 and available with Approval D, mounting kit for rope extension included.
[13)] Available with Power supply options J2A and J2C only.
[14)] Available with Approval options A, B, C, D, and E only. Approvals A and C with FM only.

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, angled extension design Level detection in aggressive applications. Bottom or side mount with enhanced shaft protection. Extension options to 300 mm (11.81 inch).	Article No. 7ML572-8-	●	●	●	●	●	-	●	●	●	0	Ord. code ●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Process temperature														
Up to 80 °C (176 °F)		1												
Up to 150 °C (302 °F)		2												
Up to 250 °C (482 °F)		3												
Power supply														
230 V AC, 1 rev/min.			A											
230 V AC, 5 rev/min.			C											
115 V AC, 1 rev/min.			E											
115 V AC, 5 rev/min.			G											
48 V AC, 1 rev/min.			J											
24 V AC, 1 rev/min.			K											
24 V DC, 1 rev/min.			L											
24 V DC, 5 rev/min.			N											
48 V AC, 5 rev/min.			Z									J	1	B
24 V AC, 5 rev/min.			Z									J	1	E
Universal voltage, 1 rev/min.			Z									J	2	A
Universal voltage, 1 rev/min., fail-safe			Z									J	2	B
Universal voltage, 5 rev/min.			Z									J	2	C
Universal voltage, 5 rev/min., fail-safe			Z									J	2	D
Process connection														
Flanged														
DN 100 PN 6, EN 1092-1, flat face[1)]				A										
DN 100 PN 16, EN 1092-1, flat face				B										
4" ASME 150 lb B16.5, raised face				C										
Process pressure														
Up to 0.5 bar (7.25 psi)					1									
Up to 5 bar (72.5 psi)					2									
Up to 10 bar (145 psi)					3									
Process connection material														
Stainless steel 303/321 (1.4305/1.4541)						1								
Extension length														
125 mm (4.92 inch)								1						
150 mm (5.91 inch)								2						
200 mm (7.87 inch)								3						
250 mm (9.84 inch)								4						
300 mm (11.81 inch)								5						
Measuring vane														
Rectangular vane, 50 x 98 mm (1.97 x 3.86 inch)									A					
Rectangular vane, 50 x 150 mm (1.97 x 5.91 inch)									B					
Rectangular vane, 50 x 250 mm (1.97 x 9.84 inch)									C					
Rectangular vane, 98 x 150 mm (3.86 x 5.91 inch)									D					
Rectangular vane, 98 x 250 mm (3.86 x 9.84 inch)									E					
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)									F					
Approvals														
CSA/FM Dust Ignition Proof, RCM										A				
ATEX II ½ D, RCM										B				
CSA/FM General Purpose, RCM, CE										C				
CE, RCM										D				
IEC Ex ta/tb IIIC										E				
EAC Ex ta/tb IIIC Da/Db										F				

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Heating of enclosure[2)3)]	**A35**
Signal bulb inserted in M20 cable gland[2)]	**A20**
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing[4)]	**K01**
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	**Y14**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511.[4)5)]	**C20**
Factory test certificate - M to DIN 55350, Part 18	**C11**

Spare Parts	Article No.
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)	**7ML1830-1KH**
Hinged vane, 98 x 200 mm (3.86 x 7.87 inch)	**7ML1830-1KJ**

[1)] Available with Process pressure options 1 and 2 only.
[2)] Available with Approval option D only.
[3)] Available only with Power supply options J2A, J2B, J2C, and J2D.
[4)] Available with Power supply options J2A and J2C only.
[5)] Available with Approval options A, B, C, D, and E only. Approvals A and C with FM only.

SITRANS LPS200 Rotary paddle point level switch, rigid extension design Level detection in solids. Top mount, with extension options to 4 m (13.12 ft).	**Article No. 7ML573-0-** ● ● ● ● ● - ● ● ● ● ●	**Ord. code** ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process temperature		
Up to 80 °C (176 °F)	**1**	
Up to 150 °C (302 °F)	**2**	
Up to 250 °C (482 °F)	**3**	
Up to 600 °C (1 112 °F)[1)2)]	**4**	
Power supply		
230 V AC, 1 rev/min.	**A**	
230 V AC, 5 rev/min.	**C**	
115 V AC, 1 rev/min.	**E**	
115 V AC, 5 rev/min.	**G**	
48 V AC, 1 rev/min.	**J**	
24 V AC, 1 rev/min.	**K**	
24 V DC, 1 rev/min.	**L**	
24 V DC, 5 rev/min.	**N**	
48 V AC, 5 rev/min.	**Z**	**J 1 B**
24 V AC, 5 rev/min.	**Z**	**J 1 E**
Universal voltage, 1 rev/min.	**Z**	**J 2 A**
Universal voltage, 1 rev/min., fail-safe	**Z**	**J 2 B**
Universal voltage, 5 rev/min.	**Z**	**J 2 C**
Universal voltage, 5 rev/min., fail-safe	**Z**	**J 2 D**
Process connection		
Threaded		
G 1¼" [(BSPP), EN ISO 228-1]	**A**	
G 1½" [(BSPP), EN ISO 228-1]	**B**	
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	**C**	
1½" NPT [(Taper), ANSI/ASME B1.20.1]	**D**	
Flanged		
DN 32 PN 6, EN 1092-1, flat face[3)]	**E**	
DN 100 PN 6, EN 1092-1, flat face[3)]	**F**	
DN 100 PN 16, EN 1092-1, flat face	**G**	
2" ASME 150 lb B16.5, raised face	**H**	
3" ASME 150 lb B16.5, raised face	**J**	
4" ASME 150 lb B16.5, raised face	**K**	

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, rigid extension design Level detection in solids. Top mount, with extension options to 4 m (13.12 ft).	Article No. 7ML573-0-	●	●	●	●	●	-	●	●	●	●	Ord. code	●	●	●
2" Tri-clamp (DN 50) ISO 2852[4]				L											
Process pressure															
Up to 0.5 bar (7.25 psi)					1										
Up to 5 bar (72.5 psi)					2										
Up to 10 bar (145 psi)					3										
Process connection material															
Aluminum[5]						1									
Stainless steel, threads 303 (1.4305), flanges 321 (1.4541), Tri-clamp 304 (1.4301)						2									
Stainless steel 316L (1.4404)[6]						3									
Extension material (protection tube)															
Aluminum[7][8]								0							
Stainless steel 303 (1.4305)[9]								1							
Stainless steel 316L (1.4404)[10][11][22]								2							
Extension length															
Aluminum															
250 ... 500 mm (9.84 ... 19.69 inch)									A						
501 ... 750 mm (19.72 ... 29.53 inch)									B						
751 ... 1 000 mm (29.57 ... 39.37 inch)									C						
1 001 ... 1 250 mm (39.41 ... 42.21 inch)									D						
1 251 ... 1 500 mm (49.25 ... 59.06 inch)									E						
1 501 ... 1 750 mm (59.09 ... 68.90 inch)									F						
1 751 ... 2 000 mm (68.94 ... 78.74 inch)									G						
2 001 ... 2 250 mm (78.78 ... 88.58 inch)									H						
2 251 ... 2 500 mm (88.62 ... 98.43 inch)									J						
2 501 ... 2 750 mm (98.46 ... 108.27 inch)									K						
2 751 ... 3 000 mm (108.31 ... 118.11 inch)									L						
3 001 ... 3 250 mm (118.15 ... 127.95 inch)									M						
3 251 ... 3 500 mm (127.99 ... 137.80 inch)									N						
3 501 ... 3 750 mm (137.83 ... 147.64 inch)									P						
3 751 ... 4 000 mm (147.67 ... 157.48 inch)									Q						
Stainless steel 303 (1.4305)															
250 ... 500 mm (9.84 ... 19.69 inch)									R						
501 ... 750 mm (19.72 ... 29.53 inch)									S						
751 ... 1 000 mm (29.57 ... 39.37 inch)									T						
1 001 ... 1 500 mm (39.41 ... 59.05 inch)									U						
1 501 ... 2 000 mm (59.09 ... 78.74 inch)									V						
2 001 ... 2 500 mm (78.78 ... 98.42 inch)									W						
2 501 ... 3 000 mm (98.46 ... 118.11 inch)									X						
3 001 ... 4 000 mm (118.15 ... 157.48 inch)									Y						
Stainless steel 316L (1.4404)															
250 ... 500 mm (9.84 ... 19.69 inch)									Z				P	1	A
501 ... 750 mm (19.72 ... 29.53 inch)									Z				P	1	B
751 ... 1 000 mm (29.57 ... 39.37 inch)									Z				P	1	C
1 001 ... 1 500 mm (39.41 ... 59.05 inch)									Z				P	1	D
1 501 ... 2 000 mm (59.09 ... 78.74 inch)									Z				P	1	E
2 001 ... 2 500 mm (78.78 ... 98.42 inch)									Z				P	1	F
2 501 ... 3 000 mm (98.46 ... 118.11 inch)									Z				P	1	G
3 001 ... 4 000 mm (118.5 ... 157.48 inch)									Z				P	1	H
Measuring vane															
Boot shaped, 35 x 106 mm (1.34 x 4.17 inch)[12]										A					
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)[12]										B					
Rectangular, 50 x 150 mm (1.97 x 5.91 inch)[13]										C					

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Selection and ordering data (continued)

SITRANS LPS200 Rotary paddle point level switch, rigid extension design Level detection in solids. Top mount, with extension options to 4 m (13.12 ft).	Article No. 7ML573-0- ● ● ● ● ● - ● ● ● ●	Ord. code ● ● ●
Rectangular, 50 x 250 mm (1.97 x 9.84 inch)[13]	D	
Rectangular, 98 x 150 mm (3.86 x 5.91 inch)[13]	E	
Rectangular, 98 x 250 mm (3.86 x 9.84 inch)[13]	F	
Rectangular, 50 x 98 mm (1.97 x 3.86 inch)[13]	G	
Approvals		
CSA/FM Dust Ignition Proof, RCM	1	
ATEX II ½ D, RCM	2	
CSA/FM General Purpose, RCM, CE	3	
CE, RCM	4	
IEC Ex ta/tb IIIC	5	
EAC Ex ta/tb IIIC Da/Db	6	

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total insertion length: Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)	**Y01**
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	**Y14**
Heating of enclosure[14][15]	**A35**
Signal bulb inserted in M20 cable gland[14]	**A20**
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing[16][17]	**K01**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511.[20][21]	**C20**
Factory test certificate - M to DIN 55350, Part 18	**C11**
Optional end of shaft seal for stability and ingress protection	
Max. temperature 80 °C (176 °F)	**P06**
Max. temperature 150 °C (302 °F)	**P07**
Max. temperature 250 °C (482 °F)	**P08**
Max. temperature 600 °C (1 112 °F)	**P09**
Sliding sleeve: standard, max. pressure 0.5 bar[14][18]	**P12**
Sliding sleeve: pressure tight, for over-pressure application, dependent on pressure option ordered)[19]	**P13**

Spare Parts	Article No.
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)	**7ML1830-1KH**
Hinged vane, 98 x 200 mm (3.86 x 7.87 inch)	**7ML1830-1KJ**

[1] Available with Approval options 3 and 4, up to max 0.5 bar.
[2] Not available with Process connections A, C, E.
[3] Available with Process pressure options 1 and 2 only.
[4] Available with Process temperature 1 only.
[5] Available with Process connections A ... E only, with process pressure option 1 and process temperature option 1 only.
[6] Available with Process connection options B, D, F ... L and measuring vane option A.
[7] Available with Process pressure 1 and process temperature 1 only.
[8] Available with Extension length options A ... Q only.
[9] Available with Extension length options R ... Y only.
[10] Available with Process connection options B, D, F ... L and Measuring vane A, Process connection material 3. Available only with Extension length options P1A ... P1H only.
[11] Only available with Seal at tube end options P06 ... P09.
[12] Add 10 mm (0.39 inch) to extension length.
[13] Available with Process connections F, G, H, J, K only.
[14] Available with Approval option 4 only.
[15] Available only with Power supply options J2A, J2B, J2C, and J2D.
[16] Available when ordered with Ingress protection seal options P06 ... P09 only.
[17] Available up to 250 °C (482 °F).
[18] Available with Process pressure option 1 only.
[19] Available up to 250 °C (482 °F).
[20] Available with Power supply options J2A and J2C only.
[21] Available with Approval options 1, 2, 3, 4, and 5 only. Approvals 1 and 3 with FM only.
[22] Internal probe construction is 1.4305, add seal option P09 to prevent ingress.

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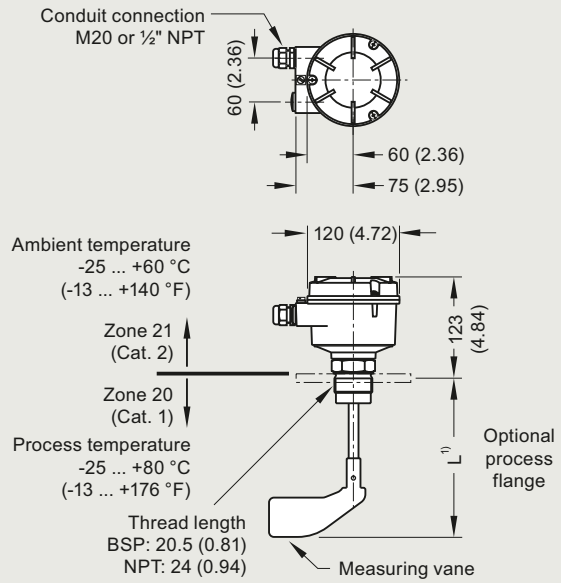
Technical specifications

SITRANS LPS200	
Mode of operation	
Measuring principle	Rotating point level switch
Input	
Measured variable	High and low and demand
Output	
Output signal	
• Alarm output	Microswitch 5 A at 250 V AC, non-inductive Microswitch SPDT contact 4 A at 30 V DC, non-inductive
• Pickup delay	Standard (1 rpm model): approx. 1.3 seconds Optional process applications (5 rpm model): approx. 0.26 seconds
Sensitivity	Adjustable via reset force of spring or geometry of measuring vane
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-25 ... +60 °C (-13 ... +140 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	Bulk solids
• Temperature	
- Standard	-25 ... +80 °C (-13 ... +176 °F)
- Optional	-25 ... +600 °C (-13 ... +1 112 °F) Higher temperature version is available. Consult a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.
• Pressure (vessel)	
- Standard	Max. 0.5 bar g (7.25 psi g)
- Optional	Max. 10 bar g (145 psi g)
• Minimum material density	
- Standard measuring vane	Can detect down to 100 g/l (6.25 lb/ft³)
- Optional measuring vane	Can detect down to 15.06 g/l (0.94 lb/ft³)
Design	
Material	
• Enclosure	Epoxy coated aluminum
• Process connection, measuring shaft and vane	Stainless steel or aluminum
Process connection	Thread NPT, BSP, and flange options
Degree of protection	IP65/Type 4/NEMA 4
Conduit entry	2 x M20 x 1.5 or 2 x ½" NPT (For FM and CSA approved versions only)
Power supply	
AC or DC versions	115 V AC, ± 15 %, 50 ... 60 Hz, 4 VA or 230 V AC, ± 15 %, 50 Hz, 6 VA, or 48 V AC, or 24 V AC, or 24 V DC, ± 15 %, 2.5 W
Universal voltage (DPDT replay)	24 V DC ± 15 % 50 ... 60 Hz, 22 ... 230 V AC, ± 10 %, max. 10 VA
Certificates and approvals	• CSA/FM General Purpose • CE • CSA/FM Dust Ignition Proof • ATEX II 1/2 D • RCM • IECex

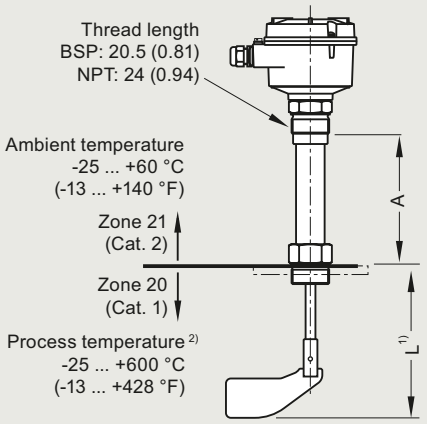
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Dimensional drawings

Standard model: compact version



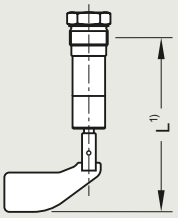
High temperature model: compact version



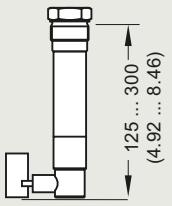
Process temperature	A
150/250 °C (302/482 °F)	200 (7.87)
350 °C (662 °F)	300 (11.81)
600 °C (1 112 °F)	400 (15.74)

L= Length
100 (3.94)
150 (5.91)
200 (7.87)
250 (9.84)
300 (11.81)

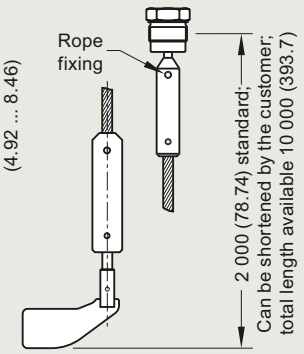
Shaft protected option



Angle option

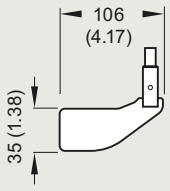


Rope option

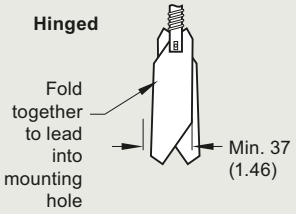


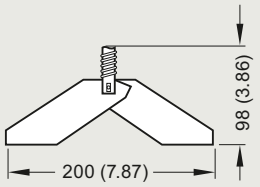
Measuring vanes

Standard

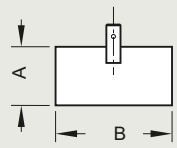


Hinged





Rectangular



Rectangular vane options

A	B
50 (1.97)	98 (3.86)
50 (1.97)	150 (5.90)
50 (1.97)	250 (9.84)
98 (3.86)	150 (5.90)
98 (3.86)	250 (9.84)

Vane	Completely covered with material		Covered up to 10 cm (3.93 inch) with material	
	Spring adjustment		Spring adjustment	
	Light	Central (factory setting)	Light	Central (factory setting)
Boot shaped 35 x 106 mm	200 g/l (12.5 lb/ft³)	300 g/l (18.7 lb/ft³)	100 g/l (6.2 lb/ft³)	150 g/l (9.4 lb/ft³)
Boot shaped 28 x 98 mm	300 g/l (18.7 lb/ft³)	500 g/l (31.2 lb/ft³)	150 g/l (9.4 lb/ft³)	150 g/l (9.4 lb/ft³)
Rectangular 50 x 98 mm	300 g/l (18.7 lb/ft³)	500 g/l (31.2 lb/ft³)	150 g/l (9.4 lb/ft³)	250 g/l (15.6 lb/ft³)
Rectangular 50 x 150 mm	80 g/l (5.0 lb/ft³)	120 g/l (7.5 lb/ft³)	40 g/l (2.5 lb/ft³)	60 g/l (3.7 lb/ft³)
Rectangular 50 x 250 mm	30 g/l (1.9 lb/ft³)	50 g/l (3.1 lb/ft³)	15 g/l (0.9 lb/ft³)	25 g/l (1.6 lb/ft³)
Rectangular 98 x 150 mm	30 g/l (1.9 lb/ft³)	50 g/l (3.1 lb/ft³)	15 g/l (0.9 lb/ft³)	25 g/l (1.6 lb/ft³)
Rectangular 98 x 250 mm	20 g/l (1.2 lb/ft³)	30 g/l (1.9 lb/ft³)	15 g/l (0.9 lb/ft³)	15 g/l (0.9 lb/ft³)
Hinged 98 x 200 mm	70 g/l (4.4 lb/ft³)	100 g/l (6.2 lb/ft³)	35 g/l (2.2 lb/ft³)	50 g/l (3.1 lb/ft³)

1. For 35 x 106 mm boot shaped and 98 x 200 mm hinged measuring vanes, add 16 mm to extension length.
2. For use with all approval options except CSA class II. See manual for more details.

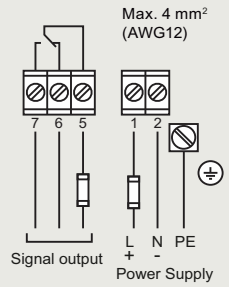
Notes
For heavy material, only top mounting of paddle switch is recommended.
Compact LPS200 is recommended for side mounting on bins for low or intermediate material levels.

SITRANS LPS200, dimensions in mm (inch)

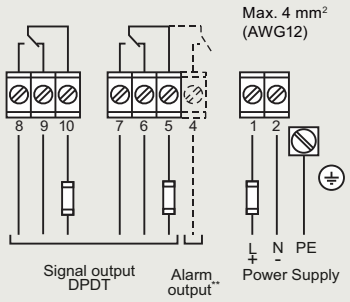
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Circuit diagrams

AC or DC version



Universal voltage (DPDT relay)*



* See manual for universal voltage with SIL.

** With option Fail safe alarm (rotation control).
Contact open when de-energised.
Fail safe alarm switching and timing behaviour:
If the vane is not covered, the rotating vane shaft will send pulses at 20 second intervals.
In case of fault, the pulses are missed.
After 30 seconds, the alarm relay will open.

Power supply:

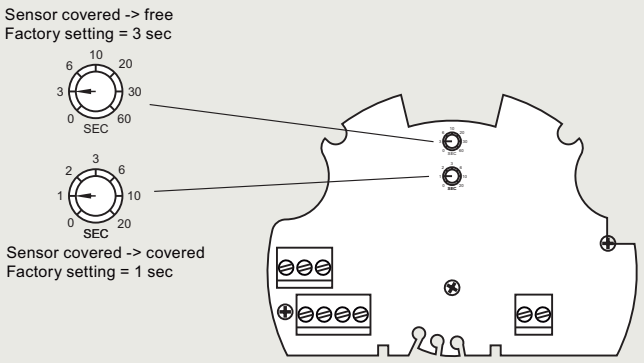
AC version:
24 V or 48 V or 115 V or 230 V 50/60 Hz max. 4 VA
All voltages ± 10 %[1)]
Supply voltage as selected.
External fuse: max 10 A, fast or slow, HBC, 250 V

DC version:
24 V DC ± 15 %[1)] max. 2.5 W
External fuse: not required

[1)] Including ±10% of EN 61010

Signal output:
Micro switch, SPDT contact
max. 250 V AC, 5 A, non inductive
max. 30 V DC, 4 A, non inductive
External fuse: max 10 A, fast or slow, HBC, 250 V

Signal output: delay



SITRANS LPS200 connections

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Overview

After driving the market in ultrasonic level controllers for the past 40 years, Siemens has evolved its industry leading solutions to include control for 80 GHz radar sensors.

Siemens level controller portfolio provides high-accuracy open channel monitoring, flexible control for multiple-relay ultrasonics, and reliable controllers for long-range, high frequency radar.

Technical specifications

SITRANS LT500

SITRANS LT500 is a monitor/controller that seamlessly connects and configures SITRANS LR110 and LR120 radar level transmitters, SITRANS Probe LU240 ultrasonic level transmitter, all Echomax transducers, and any 4 to 20 mA device for precise level measurement.



SITRANS LR110 Compact radar level transmitter



SITRANS LR120 Compact radar level transmitter



SITRANS Probe LU240 Ultrasonic level transmitter



EchoMax Ultrasonic transducers



SITRANS LH300 Pressure transmitter



SITRANS P420 Pressure transmitter

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Overview



SITRANS LT500 is a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.

Benefits

- Easy to use, configurable HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications.
- English, German, French, Spanish, Chinese, Italian, Portuguese, Japanese, Danish, Dutch, Swedish, Finnish, Polish, Russian, and Korean, Lithuanian, Czech, Hungarian, Turkish, Greek, Azerbajan languages on the HMI.
- Removable terminal blocks for ease of wiring.
- Digital inputs for back-up level override from point level device, totalizer control, or pump interlock.
- Communication options for HART, Modbus RTU, Modbus TCP, PROFIBUS PA, PROFIBUS DP, PROFINET, EtherNet/IP.
- Configuration and monitoring via WebIQ (browser based) over PROFINET, EtherNet/IP, or Modbus TCP
- Remote configuration and diagnostic management of supported sensors (SITRANS LR110, SITRANS LR120, SITRANS Probe LU240).
- Single or dual point level monitoring.
- Advanced process intelligence echo processing for reliable accurate measurement in difficult applications.
- Parameter back-up and copy functions.
- Auto False-Echo Suppression for fixed obstruction avoidance.
- IQ Guard for health monitoring, NE107 diagnostics, up to 200 saved echo profiles, event logging, data logging, parameter change logging, hundreds of diagnostics, limit monitoring, self check validation, parameter back-up and copy functions, and programming configuration backup/report.
- Real-time clock supporting energy saving algorithms for minimizing pump operation during high cost energy periods.
- Smart device connection for file storage and sharing via USB.
- Up to 6 independent programmable relays for pump control, alarms, or remote totalization.
- Time to spill/empty monitoring and alarming.
- Level, volume, and flow measurements in open channels, differential control, extended pump control, and alarm functions.
- Wall, panel, and remote panel mounting options.
- Remote configuration via EDD with SIMATIC PDM and SITRANS DTM via USB.
- MCERTS certified for open channel flow.
- Patented digital receiver for improved performance in electrically noisy applications (close proximity to VSDs).
- Remote configuration via MobileIQ with Android, IOS or WIndows based bluetooth connection.
- Seamless integration into TIA Portal and PCS 7 with faceplates and function blocks.

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Application

SITRANS LT500 mA HART version can be used with SITRANS LR110, LR120, Probe LU240 or any level device generating a mA signal. The ultrasonic version can connect any EchoMax or legacy transducer. SITRANS LT500 offers true dual point monitoring and digital communications. SITRANS LT500 is low maintenance and economical. With its advanced control functions, it can operate pumps during lower cost time periods and manage pump rosters for efficiency.

SITRANS LT500 will monitor open channel flow and features advanced relay alarming and pump control functions as well as volume conversion.

- Key Applications: wet wells, flumes/weirs, bar screen control, hoppers, chemical storage, liquid storage, crusher bins, dry solids storage

SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up, and monitor SITRANS LT500 series (available for Android, Apple, and Windows devices).

For more information: http://www.siemens.com/mobileIQ.

Design

SITRANS LT500 is available in wall, panel, or remote panel mounting options.

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Selection and ordering data

SITRANS LT500 mA Hart version Continuous, non-contact, for liquids, slurries, and solids. Monitors level, volume, and volume flow, for virtually any application in a wide range of process industries.	Article No. 7ML60	● ● - ● ● ● ● ● - ● A A ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Product brand[3]		
SITRANS LT500		2
SITRANS LT500 HydroRanger		0
SITRANS LT500 MultiRanger		1
Feature set		
Level, Volume, and Flow[4]		3
Level, Volume, and Flow, high accuracy[5]		4
Sensor input type		
4 ... 20 mA input(s) for radar sensors		0
Number of measurement points		
Single point version		A
Dual point version		B
Relay output		
1 relay (1 Form A), 250 V AC		A
3 relays (2 Form A, 1 Form C), 250 V AC		B
6 relays (4 Form A, 2 Form C), 250 V AC		C
Mounting, enclosure design		
Wall mount, standard enclosure		0
Wall mount, 4 entries, M20 cable glands included		1
Panel mount		2
Remote panel mount		3
Type of protection		
Ordinary Locations/General Purpose (Non-Ex), $_{c}CSA_{US}$, $_{c}UL_{US}$FM, CE, RCM, EAC[8]		0
Ex rated[1]		1
Removable data storage		
Included, (32 GB micro SD)		1
Input voltage		
12 ... 30 V DC		2
100 ... 230 V AC		3

Selection and ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**
Approvals	
CSA (USA & Canada)	
CSA Class I, Div. 2, Group A, B, C and D; Class II, Div 2, Group F & G; Class III/Class I, Zone 2 GP IIC T3 Zone 22 GP IIIB T160 °C	**E21**
VLAREM II[11]	**E61**
Certificates	
Quality inspection certificate - calibration IEC 62828-4	**C11**
Declaration of compliance DIN 55350-18, Type M / ISO 9001	**C19**
Factory certificate 2.2 (EN 10204)	**C14**
RFID tag	
RFID/NFC tag according IEC 61406-1	**D91**
Communication	
HART with 4 ... 20 mA active output[6]	**F01**
Modbus RTU	**F04**
Modbus TCP	**F13**

Selection and ordering data	Order code
PROFIBUS PA	**F05**
PROFIBUS DP	**F06**
PROFINET	**F07**
EtherNet/IP	**F09**
Wireless communication	
Bluetooth (consult catalog sheet for radio approval coverage)[11]	**F50**
Product version	
Suitable for high temperatures +60 °C (140 °F)[7]	**J20**
Specials	
Special design	**Y99**
For customs, contact a local sales person. For more information please visit http://www.automation.siemens.com/aspa_app	
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

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Selection and ordering data (continued)

Selection and ordering data	Article No.
Optional equipment	
Tag, stainless steel, 12 x 45 mm, one text line, (max. 16 characters)	**7ML1930-1AC**
Barriers in a NEMA 4X/IP65 enclosure	**A5E50255823**
Barrier suitable for LR1xx & LU240 (STAHL: 9001/01-280-110-101)	**A5E50113513**
Sunshield/pipe mount plate, 304 Stainless steel	**7ML1930-1GA**
Panel mount installation kit for ERS500, SITRANS LUC500, MiniRanger Plus, and HydroRanger Plus	**A5E53663857**
M12 IP65/IP67/IP69/IP69K external mount receptacle port to individual cable leads M20 mounting	**A5E53796231**
Ethernet cable 4 inch/100 mm long	**A5E53796237**
RJ45 external mount receptacle to receptacle adaptor	**A5E53796234**
M20 plastic cable gland with split seal for use with RJ45 cables, includes M20 nut	**A5E54001790**
USB cable, 2 m (6.56 ft), standard USB-B to USB-mini B	**7ML1930-1GD**
M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers)	**7ML1930-1FV**
Wall mount installation hardware	**A5E42140728**
AC power supply surge protector	**5SD7432-7**
DC power supply surge protector	**5SD7432-5**
SITRANS RD100, loop powered display	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion	**7ML5744-.....-..**
Industrial Ethernet cables	**6XV1870-.....-..**
Spare parts	
Replacement motherboard, single point, includes DC power module	**A5E50113558**
Replacement motherboard, dual point, includes DC power module	**A5E50113557**
Replacement motherboard, single point, includes AC power module	**A5E50113542**
Replacement motherboard, dual point, includes AC power module	**A5E50113543**
Replacement lid with 4 button HMI	**A5E50113559**
Replacement lid with 4 button HMI remote panel mount version	**A5E52897553**
Replacement lid with blind remote panel mount version	**A5E53276261**
Retrofit kit for wall mount to panel mount version	**A5E50114010**
Retrofit kit for wall mount to remote panel mount version	**A5E53276259**
Replacement wall mount door with HMI overlay only (no display LUI)	**A5E54153189**
Panel mount cable extension, 2.5 m (8.2 ft)	**7ML1930-1GF**
Remote panel mount gasket and fastener kit	**7ML1830-1PK**
Replacement terminal blocks for 4 ... 20 mA input(s) sensor type version	**A5E38824197**
Card AC power supply, spare	**7ML1830-1MD**
Card DC power supply, spare	**7ML1830-1ME**
Ethernet RJ45 to termination pin adaptor (for use with Ethernet based communication cards)	**A5E53671319**
Replacement SD card, 32 GB	**A5E50113554**
Replacement SD card, 20 GB	**A5E53821516**
Bluetooth adaptor replacement kit	**A5E50113563**
HART communications module	**A5E50113564**
PROFIBUS PA communications module	**A5E50113568**
Modbus RTU communications module	**A5E50113565**

Selection and ordering data	Article No.
PROFIBUS DP communications module	**A5E50113567**
PROFINET communications module	**A5E50113570**
EtherNet/IP communications module	**A5E50113562**
Modbus TCP communications module	**A5E50113566**

1) Available only with order code E21, and Mounting, enclosure design options 0 or 1.
2) Available only with Sensor input type option 1.
3) Branding only affects the name marked on the label, no other difference in form or function.
4) MCERTS class 2 certified.
5) MCERTS class 1 certified.
6) HART communication card not required for standard mA output.
7) Available only with Relay output option A or B, Type of protection option 0, and Voltage input option 2. Note, relays are de-rated to 1A. Does not include Mcerts approvals.
8) Not available with Ex approval options E21.
9) To be ordered at the same time as the device.
10) Order after receipt of the device, if required.
11) Available with "Type of protection" option 0 only.

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Selection and ordering data (continued)

SITRANS LT500 Ultrasonic version Continuous, non-contact, for liquids, slurries, and solids. Monitors level, volume, and volume flow, for virtually any application in a wide range of process industries.	Article No. 7ML60	● ● - ● ● ● ● ● - ● A A ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Product brand[3]		
SITRANS LT500		2
SITRANS LT500 HydroRanger		0
SITRANS LT500 MultiRanger		1
Feature set		
Level, Volume, and Flow[4]		3
Level, Volume, and Flow, high accuracy[5]		4
Sensor input type		
Ultrasonic transducer input(s)		1
Number of measurement points		
Single point version		A
Dual point version		B
Relay output		
1 relay (1 Form A), 250 V AC		A
3 relays (2 Form A, 1 Form C), 250 V AC		B
6 relays (4 Form A, 2 Form C), 250 V AC		C
Mounting, enclosure design		
Wall mount, standard enclosure		0
Wall mount, 4 entries, M20 cable glands included		1
Panel mount		2
Remote panel mount		3
Type of protection		
Ordinary Locations/General Purpose (Non-Ex), CSA, $_{c}$UL$_{US,}$ FM, CE, RCM, EAC		0
Ex rated[1]		1
Removable data storage		
Included, (32 GB micro SD)		1
Input voltage		
12 ... 30 V DC		2
100 ... 230 V AC		3

Selection and ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**
Approvals	
CSA (USA & Canada)	
CSA Class I, Div. 2, Group A, B, C and D; Class II, Div 2, Group F & G; Class III//Class I, Zone 2 GP IIC T3 Zone 22 GP IIIB T160 °C	**E21**
VLAREM II[11]	**E61**
Certificates	
Quality inspection certificate - calibration IEC 62828-4	**C11**
Declaration of compliance DIN 55350-18, Type M / ISO 9001	**C19**
Factory certificate 2.2 (EN 10204)	**C14**
RFID tag	
RFID/NFC tag according IEC 61406-1	**D91**
Communication	
HART with 4 ... 20 mA active output[6]	**F01**
Modbus RTU	**F04**
Modbus TCP	**F13**

Selection and ordering data	Order code
PROFIBUS PA	**F05**
PROFIBUS DP	**F06**
PROFINET	**F07**
EtherNet/IP	**F09**
Wireless communication	
Bluetooth (consult catalog sheet for radio approval coverage)[11]	**F50**
Product version	
Suitable for high temperatures +60 °C (140 °F)[7]	**J20**
Specials	
Special design	**Y99**
For customs, contact a local sales person. For more information please visit http://www.automation.siemens.com/aspa_app	
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

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Selection and ordering data (continued)

Selection and ordering data	Article No.
Optional equipment	
Tag, stainless steel, 12 x 45 mm, one text line, (max. 16 characters)	**7ML1930-1AC**
Sunshield/pipe mount plate, 304 Stainless steel	**7ML1930-1GA**
Panel mount installation kit for ERS500, SITRANS LUC500, MiniRanger Plus, and HydroRanger Plus	**A5E53663857**
Coaxial cable converter in a NEMA 4X/IP65 enclosure	**A5E53332217**
M12 IP65/IP67/IP69/IP69K external mount receptacle port to individual cable leads M20 mounting	**A5E53796231**
M20 plastic cable gland with split seal for use with RJ45 cables, includes M20 nut	**A5E54001790**
Ethernet cable 4 inch/100 mm long	**A5E53796237**
RJ45 external mount receptacle to receptacle adaptor	**A5E53796234**
M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers)	**7ML1930-1FV**
Wall mount installation hardware	**A5E42140728**
AC power supply surge protector	**5SD7432-7**
DC power supply surge protector	**5SD7432-5**
USB cable, 2 m (6.56 ft), standard USB-B to USB-mini B	**7ML1930-1GD**
SITRANS RD100, loop powered display	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion	**7ML5744-.....-..**
Industrial Ethernet cables	**6XV1870-.....-..**
Spare parts	
Replacement motherboard, single point, US comes with DC power module	**A5E52897550**
Replacement motherboard, dual point, US comes with DC power module	**A5E52897552**
Replacement motherboard, single point, US comes with AC power module	**A5E52897548**
Replacement motherboard, dual point, US comes with AC power module	**A5E52897549**
Replacement lid with 4 button HMI	**A5E50113559**
Replacement lid with 4 button HMI remote panel mount version	**A5E52897553**
Replacement lid with blind remote panel mount version	**A5E53276261**
Retrofit kit for wall mount to panel mount version	**A5E50114010**
Retrofit kit for wall mount to remote panel mount version	**A5E53276259**

Selection and ordering data	Article No.
Replacement wall mount door with HMI overlay only (no display LUI)	**A5E54153189**
Replacement terminal blocks for Ultrasonic transducer input(s) sensor type version	**A5E52897545**
Panel mount cable extension, 2.5 m (8.2 ft)	**7ML1930-1GF**
Card AC power supply, spare	**7ML1830-1MD**
Card DC power supply, spare	**7ML1830-1ME**
Ethernet RJ45 to termination pin adapter (for use with Ethernet based communication cards)	**A5E53671319**
Remote panel Mount Gasket and Fastener Kit	**7ML1830-1PK**
Replacement SD card, 32 GB	**A5E50113554**
Replacement SD card, 20 GB	**A5E53821516**
Bluetooth adaptor replacement kit	**A5E50113563**
HART communications module	**A5E50113564**
PROFIBUS PA communications module	**A5E50113568**
Modbus RTU communications module	**A5E50113565**
PROFIBUS DP communications module	**A5E50113567**
PROFINET communications module	**A5E50113570**
EtherNet/IP communications module	**A5E50113562**
Modbus TCP communications module	**A5E50113566**

1) Available only with order code E21, and Mounting, enclosure design option 0 or 1.
2) Available only with Sensor input type option 1.
3) Branding only affects the name marked on the label, no other difference in form or function.
4) MCERTS class 2 certified.
5) MCERTS class 1 certified.
6) HART communication card not required for standard mA output.
7) Available only with Relay output option A or B, Type of protection option 0, and Voltage input option 2. Note, relays are de-rated to 1A. Does not include Mcerts approvals.
8) Not available with Ex approval options E21.
9) To be ordered at the same time as the device.
10) Order after receipt of the device, if required.
11) Available with "Type of protection" option 0 only.

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Technical specifications

SITRANS LT500 mA HART version	
Mode of operation	Level, space, distance, volume, flow, head, level difference, level average, totalization
Sensor input, mA HART version	
Number of inputs	1 or 2
PV measurement	Advanced process intelligence
Terminal voltage	Max. 26 V, Min. 18 V (0 ... 22.6 mA)
Wiring	2 conductor, twisted, shielded, 0.5 ... 0.75 mm² (22 ... 18 AWG)
Max. cable length	500 m (1 640.42 ft) with or without an IS barrier based on 160 nF/km cable
Sensor input communication	• 4 ... 20 mA • HART protocol, for supported sensors: SITRANS LR110, LR120, SITRANS Probe LU240
4 ... 20 mA sensor input	
• Range	Dependent on connected sensor up to 10^{10}
• Resolution	0.025 % of full scale
• Accuracy	0.1 % of full scale
Note: resolution, range, repeatability and accuracy are dependent on connected sensor	
• Sensor power source	Limited Energy Source according to IEC 61010-1
Digital input	
Quantity	2
Switching threshold, low	0 ... 0.5 V DC
Switching threshold, high	10 ... 50 V DC
Input current	Max. 3 mA
Bias voltage supply	24 V
Isolation	Galvanically Isolated to the SELV (Safety Extra Low Voltage) 50 V level
Analog output	
Quantity	1 or 2
Range	0 ... 20 mA or 4 ... 20 mA isolated
Max. load	750 Ω
Resolution	0.1 % of range
Update time	Up to 1 measurement per second
Accuracy	±20 µA
Startup current	3.6 mA
Fail-safe	Programmable as high, low, last reliable, set value, or hold per NAMUR NE43
Wiring	2 conductor, twisted, shielded, 0.5 ... 0.75 mm² (22 ... 18 AWG)
Isolation	Galvanically Isolated to 500 V
Relay output	
Quantity	Up to 6, 4 form A and 2 form C
Rating	• 5 A at 250 V AC, 5 A at 30 V DC, non-inductive • High temperature option - 1 A at 250 V AC, 1 A at 30 V DC, non-inductive
Durability	50 000 operations min. per relay (5 A at 30 V DC, resistive load)
Minimum applicable load	10 mA at 12 V
Fail-safe	Programmable as energized, de-energized, or hold
Wiring	Copper conductors per local requirements to meet 250 V 5 A contact rating
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature	-20 ... +50 °C (-4 ... +122 °F)
• High temperature version	-20 ... +60 °C (-4 ... +140 °F)
• Storage temperature	-20 ... +60 °C (-4 ... +140 °F)

Technical specifications (continued)

SITRANS LT500 mA HART version	
• Humidity	Maximum relative humidity 80 % for temperatures up to 31 °C (88 °F) decreasing linearly to 50 % relative humidity at 40 °C (104 °F)
• Altitude	2 000 m (6 565 ft) maximum
• Vibration resistence	
- Vibration broad-band random, according to IEC 60068-2-64	• 10 ... 200 Hz, 0.0104 g²/Hz • 200 ... 500 Hz, 0.005 g²/Hz
- Vibration non-stationary including shock, according to IEC 60068-2-27	• Peak acceleration: 25 g • Duration: 6 ms • Number of impacts per direction: 1 000 • Impact directions: 6
• Impact according to CSA C22.2 No. 14 / IEC 61010-1	6.8 Joules
• Bump/shock resistence	25 g
• Long-term stability at +/-30 °C (+/-54 °F)	0.15% of upper range limit over 15 years
• Suitable for API 2350	
EMC performance	IEC/EN 61326-1, EN 55011 (Class A)
Design	
Weight	
• Wall mount	1.22 kg (2.68 lb)
• Panel mount	1.35 kg (2.97 lb)
• Remote panel mount	1.73 kg (3.80 lb)
Enclosure	
• Material	High impact polycarbonate lexan per UL 94V-0
- Gasket	Silicone
- Door fasteners	300 series stainless steel
- HMI overlay	Polyester with clear polycarbonate window
• Degree of protection	
- Wall mount	IP65 (per IEC 60529) / Type 4X (per UL50E / CSA C22.2)
- Panel mount	IP54 (per IEC 60529) / Type 3 (per UL50E / CSA C22.2)
- Remote panel mount (front panel)	IP65 (per IEC 60529) / Type 3 (per UL50E / CSA C22.2)
- Remote panel mount (enclosure)	IP20 (per IEC 60529)
- UV exposure	F1 rating per UL746C
Corrosion protection according to EN ISO 9227:2022 and EN ISO 12944:2017	C5-M medium durability
Climatic class in accordance with IEC 60721-3-4	4K4H
Display and control	
• LCD display	60 × 40 mm (2.36 × 1.57 inch) LCD, 240 × 160 pixels resolution graphical HMI with NE107 diagnostic data, echo profile display and backlight
• Menu navigation	4 push button keys, rated for 1 million button cycles over 10 years
Update time	1 second or less
Memory	Program and parameters stored in non-volatile Flash memory
Real time clock memory retention without power	48 hours
CPU speed	96 MHz
Memory card	32 GB Industrial micro SD, supporting up to 32 GB
Connections, electrical	
• Screw terminals	2.5 mm² AWG12
Diagnostic LED's	Green: powered Red: active alarm Yellow: fieldbus request
Power supply	
AC version	100 ... 230 V AC, ±15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)

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Technical specifications (continued)

SITRANS LT500 mA HART version	
Certificates and approvals	• CE, RCM, EAC, FM, $_{C}$CSA$_{US}$, $_{C}$UL$_{US}$, KC • RoHS, China RoHS, WEEE, REACH • $_{C}$CSA$_{US}$ Class I, Div. 2, Group A, B, C and D; Class II, Div 2, Group F & G; Class III & Class I, Zone 2 GP IIC T3 Zone 22, GP IIIB T160°C • MCERTS • Kazakhstan Metrology • FCC, IC, RED, CMIIT, ETA-WPC • Environmental Product Declaration (EPD) • Siemens EcoTech Profile (SEP)
Radio (Bluetooth) AW050	Australia, Brazil, Canada, Chile, China, Colombia, Ecuador, Egypt, EU, Hong Kong, India, Israel, Japan, Kazakhstan, Malaysia, Mexico, New Zealand, Pakistan, Peru, South Africa, South Korea, Taiwan, UAE, UK, USA, Vietnam
Production and development certification	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC ISO/IEC 80079-34 • IEC 62443-4-1, maturity level 3
Communication	
Service interface	USB 2.0 mini A cable
Optional Fieldbus	• HART 7, with Active/Passive 4 ... 20 mA • Modbus RTU • Modbus TCP • PROFIBUS PA per profile 4.01 • PROFIBUS DP per profile 4.01 • PROFINET • EtherNet/IP
Remote configuration via service interface	• EDD via SIMATIC PDM • SITRANS DTM via PACTware
Remote configuration via fieldbus	• EDS-AOP (EtherNet/IP) • EDD via SIMATIC PDM with Profibus DP, ProfiNet, Modbus RTU
Remote configuration via ethernet network interface	WebIQ Web-based interface for local programming via web browser (only with PROFINET, EtherNet/IP, Modbus TCP)
Remote configuration via Ethernet directly on PC	WebIQ Web-based interface for local programming via web browser (only with Modbus TCP)
Remote configuration via bluetooth	MobileIQ via Android, IOS, Windows

SITRANS LT500 Ultrasonic version	
Mode of operation	Level, space, distance, volume, flow, head, difference, average, totalization
Sensor input, ultrasonic version	
Number of inputs	1 or 2
PV measurements	Advanced process intelligence
Measuring range	0.3 ... 60 m (1 ... 196 ft), transducer dependent
Transducer frequency	10 ... 52 kHz
Ultrasonic transducer	Compatible transducers: all transducers ever produced by Siemens/Milltronics: XPS-10/15/30/40, ST-H, XRS-5, XCT-8/12, XLT-30/60, XLS-30/60, LR13/21, ST-25/50/100, XKS-6
Output voltage	440 V_{pp}
Accuracy	
• Error in measurement	• Standard operation: ±1 mm (0.04 inch) plus 0.17 % of measured distance • High accuracy OCM: ±1 mm (0.04 inch), within 3 m (9.84 ft) range (with XRS-5 and TS-3)
• Resolution / repeatability	• Standard operation: 0.1 % of range or 2 mm (0.08 inch), whichever is greater • High accuracy OCM: 0.6 mm (0.02 inch), within 3 m (9.84 ft) range • Accuracy per IEC 60770-1

Technical specifications (continued)

SITRANS LT500 Ultrasonic version	
• Temperature compensation	• -40 ... +150 °C (-40 ... +300 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values
Wiring	Transducer: 2 copper conductors, twisted, with foil shield/drain wire, 500 V 0.5 ... 0.75 mm² (22 ... 18 AWG)
• Max. cable length	365 m (1 200 ft)
Analog input	
Range	Dependent on connected sensor up to 10^{10}
Resolution	0.025 % of full scale
Accuracy	0.1 % of full scale
Polling rate	>1 Hz
Maximum cable length	500 m (1640.42 ft)
Supply voltage	24 V
Digital input	
Quantity	2
Switching threshold, low	0 ... 0.5 V DC
Switching threshold, high	10 ... 50 V DC
Input current	Max. 3 mA
Bias voltage supply	24 V
Isolation	Galvanically Isolated to the SELV (Safety Extra Low Voltage) 50 V level
Sensor power source	Limited Energy Source according to IEC 61010-1
Analog output	
Quantity	1 or 2
Range	0 ... 20 mA or 4 ... 20 mA isolated
Max. load	750 Ω
Resolution	0.1 % of range
Update time	Up to 1 measurement per second
Accuracy	±20 µA
Startup current	3.6 mA
Fail-safe	Programmable as high, low, last reliable, set value, or hold per NAMUR NE43
Wiring	2 conductor, twisted, shielded, 0.5 ... 0.75 mm² (22 ... 18 AWG)
Isolation	Galvanically Isolated to 500 V
Relay output	
Quantity	Up to 6, 4 form A and 2 form C
Rating	• 5 A at 250 V AC, 5 A at 30 V DC, non-inductive • High temperature option - 1 A at 250 V AC, 1 A at 30 V DC, non-inductive
Durability	50 000 operations min. per relay (5 A at 30 V DC, resistive load)
Minimum applicable load	10 mA at 12 V
Fail-safe	Programmable as energized, de-energized, or hold
Wiring	Copper conductors per local requirements to meet 250 V 5 A contact rating
System synchronization	Up to 25 units on the bus (only SITRANS LT500s). Up to 16 units on the bus (if 1 legacy controller is included).
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature	-20 ... +50 °C (-4 ... +122 °F)
• High temperature version	-20 ... +60 °C (-4 ... +140 °F)
• Storage temperature	-20 ... +60 °C (-4 ... +140 °F)

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Technical specifications (continued)

SITRANS LT500 Ultrasonic version	
• Humidity	Maximum relative humidity 80 % for temperature up to 31 °C (88 °F) decreasing linearly to 50 % relative at 40 °C (104 °F)
• Altitude	2 000 m (6 565 ft) maximum
• Vibration resistence	
- Vibration broad-band random, according to IEC 60068-2-64	• 10 ... 200 Hz, 0.0104 g^2/Hz • 200 ... 500 Hz, 0.005 g^2/Hz
- Vibration non-stationary including shock, according to IEC 60068-2-27	• Peak acceleration: 25 g • Duration: 6 ms • Number of impacts per direction: 1 000 • Impact directions: 6
• Impact according to CSA C22.2 No. 14 / IEC 61010-1	6.8 Joules
• Bump/shock resistence	25 g
• Long-term stability at +/-30 °C (+/-54 °F)	0.15% of upper range limit over 15 years
• Suitable for API 2350	
EMC performance	IEC/EN 61326-1, EN 55011 (Class A)
Design	
Weight	
• Wall mount	1.22 kg (2.68 lb)
• Panel mount	1.35 kg (2.97 lb)
• Remote panel mount	1.73 kg (3.80 lb)
Enclosure	
• Material	High impact polycarbonate lexan per UL 94V-0
- Gasket	Silicone
- Door fasteners	300 series stainless steel
- HMI overlay	Polyester with clear polycarbonate window
• Degree of protection	
• Wall mount	IP65 (per IEC 60529) / Type 4X (per UL50E / CSA C22.2)
• Panel mount	IP54 (per IEC 60529) / Type 3 (per UL50E / CSA C22.2)
• Remote panel mount (front panel)	IP65 (per IEC 60529) / Type 3 (per UL50E / CSA C22.2)
• Remote panel mount (enclosure)	IP20 (per IEC 60529)
UV exposure	F1 rating per UL746C
Corrosion protection according to EN ISO 9227:2022 and EN ISO 12944:2017	C5-M medium durability
Climatic class in accordance with IEC 60721-3-4	4K4H
Display and control	
• LCD display	60 × 40 mm (2.36 × 1.57 inch) LCD, 240 × 160 pixels resolution graphical HMI with NE107 diagnostic data, echo profile display and backlight
• Menu navigation	4 push button keys, rated for 1 million button cycles over 10 years
Update time	1 second or less
Memory	Program and parameters stored in non-volatile Flash memory
Real time clock memory retention without power	48 hours
CPU speed	96 MHz
Memory card	32 GB Industrial micro SD, supporting up to 32 GB
Connections, electrical	
• Screw terminals	2.5 mm^2 AWG12
Diagnostic LED's	Green: powered Red: active alarm Yellow: fieldbus request
Power supply	
AC version	100 ... 230 V AC, ±15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)

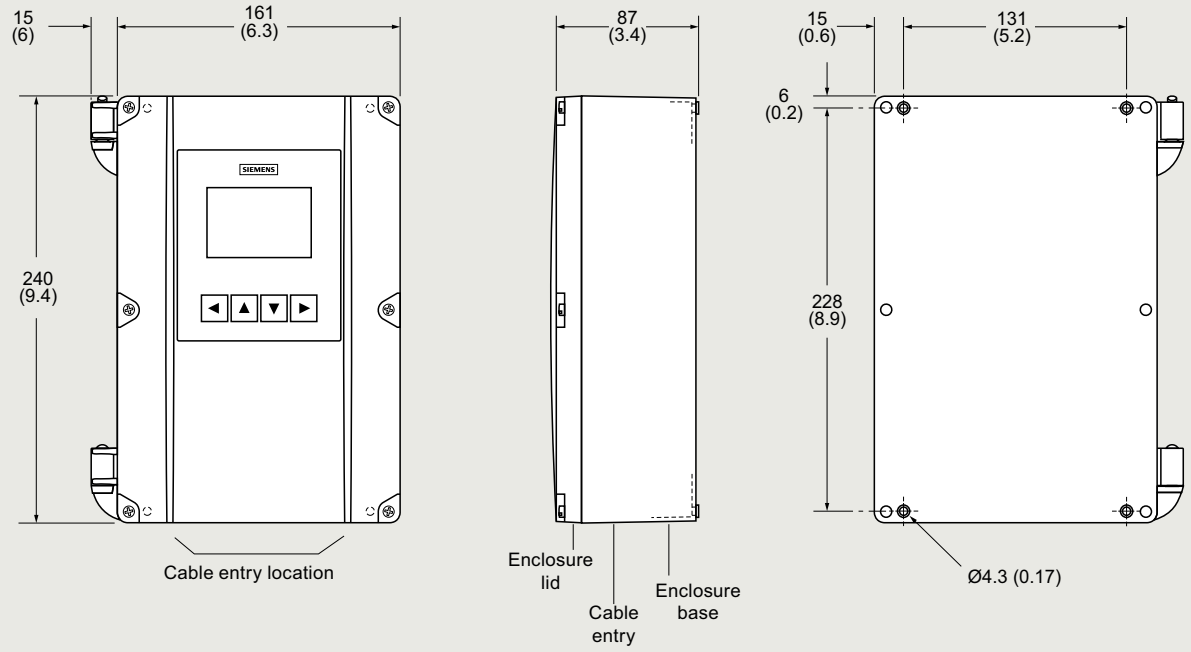
Technical specifications (continued)

SITRANS LT500 Ultrasonic version	
Certificates and approvals	• $_{c}CSA_{US}$, CE, RCM, EAC, FM, $_{c}UL_{US}$, KC • RoHS, China RoHS, WEEE, REACH • $_{c}CSA_{US}$ Class I, Div. 2, Group A, B, C and D; Class II, Div 2, Group F & G; Class III & Class I, Zone 2 GP IIC T3 Zone 22 GP IIIB T160 °C • MCERTS • Kazakhstan Metrology • FCC, IC, RED, CMIIT, ETA-WPC • Environmental Product Declaration (EPD) • Siemens EcoTech Profile (SEP)
Radio (Bluetooth) AW050	Australia, Brazil, Canada, Chile, China, Colombia, Ecuador, Egypt, EU, Hong Kong, India, Israel, Japan, Kazakhstan, Malaysia, Mexico, New Zealand, Pakistan, Peru, South Africa, South Korea, Taiwan, UAE, UK, USA, Vietnam
Production and development certification	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC ISO/IEC 80079-34 • IEC 62443-4-1, maturity level 3
Communication	
Service interface	USB 2.0 mini A cable
Optional Fieldbus	• HART 7, with Active/Passive 4 ... 20 mA • Modbus RTU • Modbus TCP • PROFIBUS PA per profile 4.01 • PROFIBUS DP per profile 4.01 • PROFINET • EtherNet/IP
Remote configuration via service interface	• EDD via SIMATIC PDM • SITRANS DTM via PACTware
Remote configuration via fieldbus	• EDS-AOP (EtherNet/IP) • EDD via SIMATIC PDM with Profibus DP, ProfiNet, Modbus RTU
Remote configuration via ethernet network interface	WebIQ Web-based interface for local programming via web browser (only with PROFINET, EtherNet/IP, Modbus TCP) Max. MTU packe size: 1500 bytes
Remote configuration via ethernet directly on PC	WebIQ Web-based interface for local programming via web browser (only with Modbus TCP)
Remote configuration via Bluetooth	MobileIQ via Android, IOS, Windows

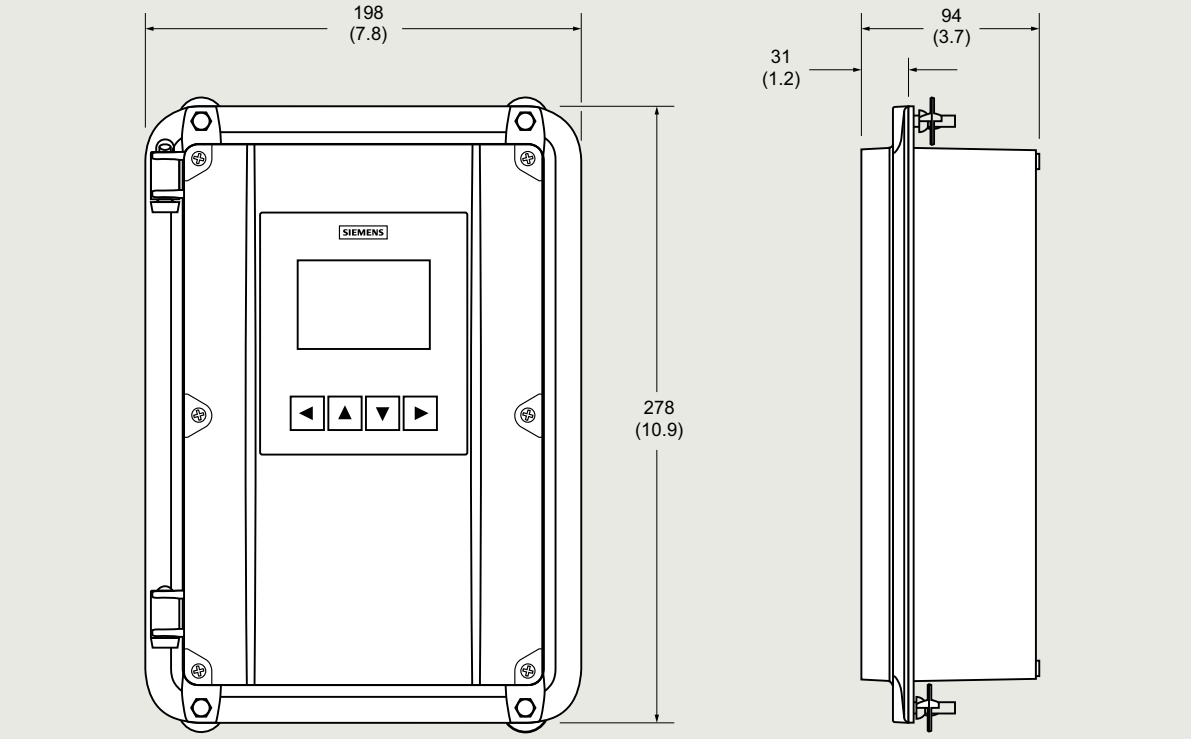
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Dimensional drawings

Wall mount dimensions



Panel mount dimensions

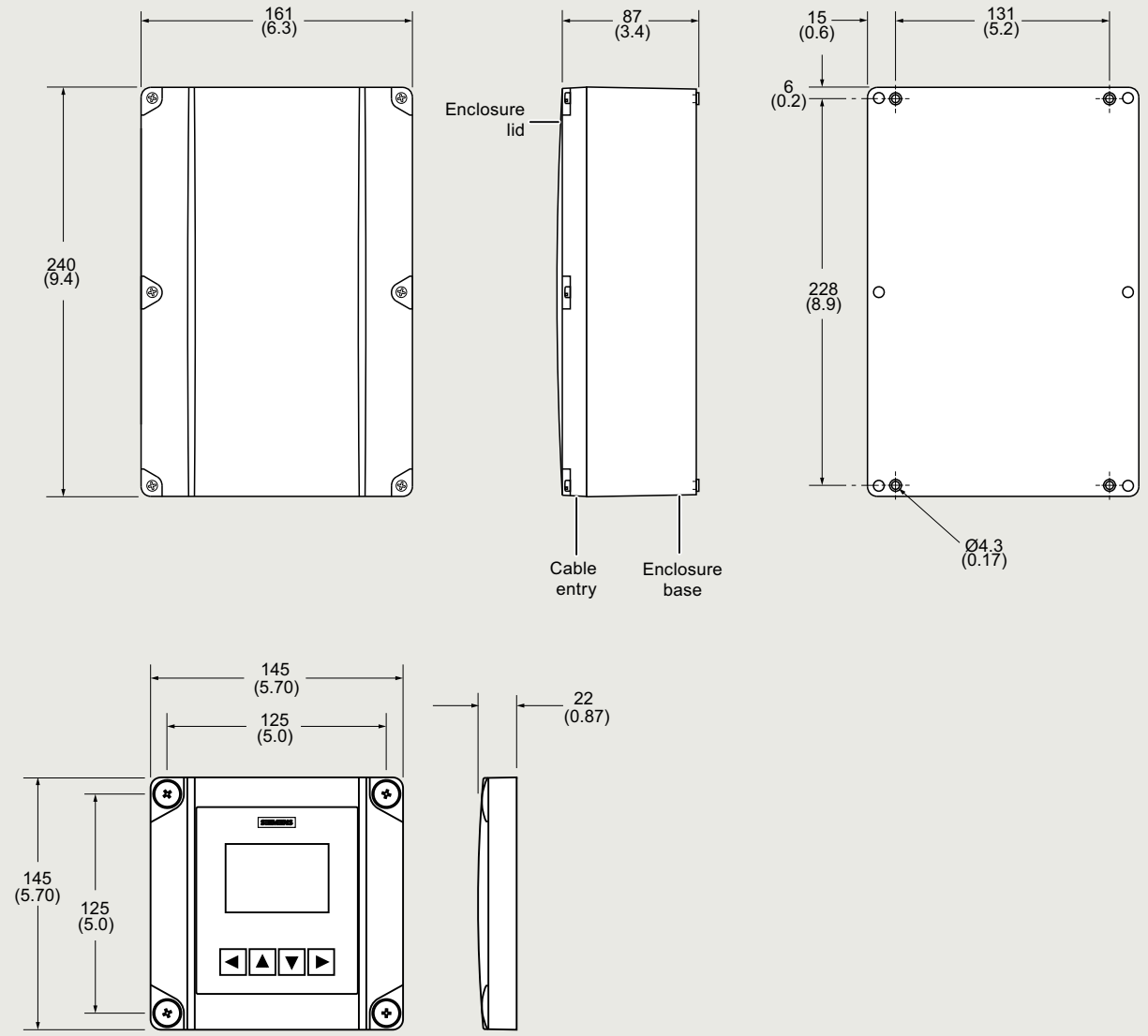


SITRANS LT500, dimensions in mm (inch)

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Dimensional drawings (continued)

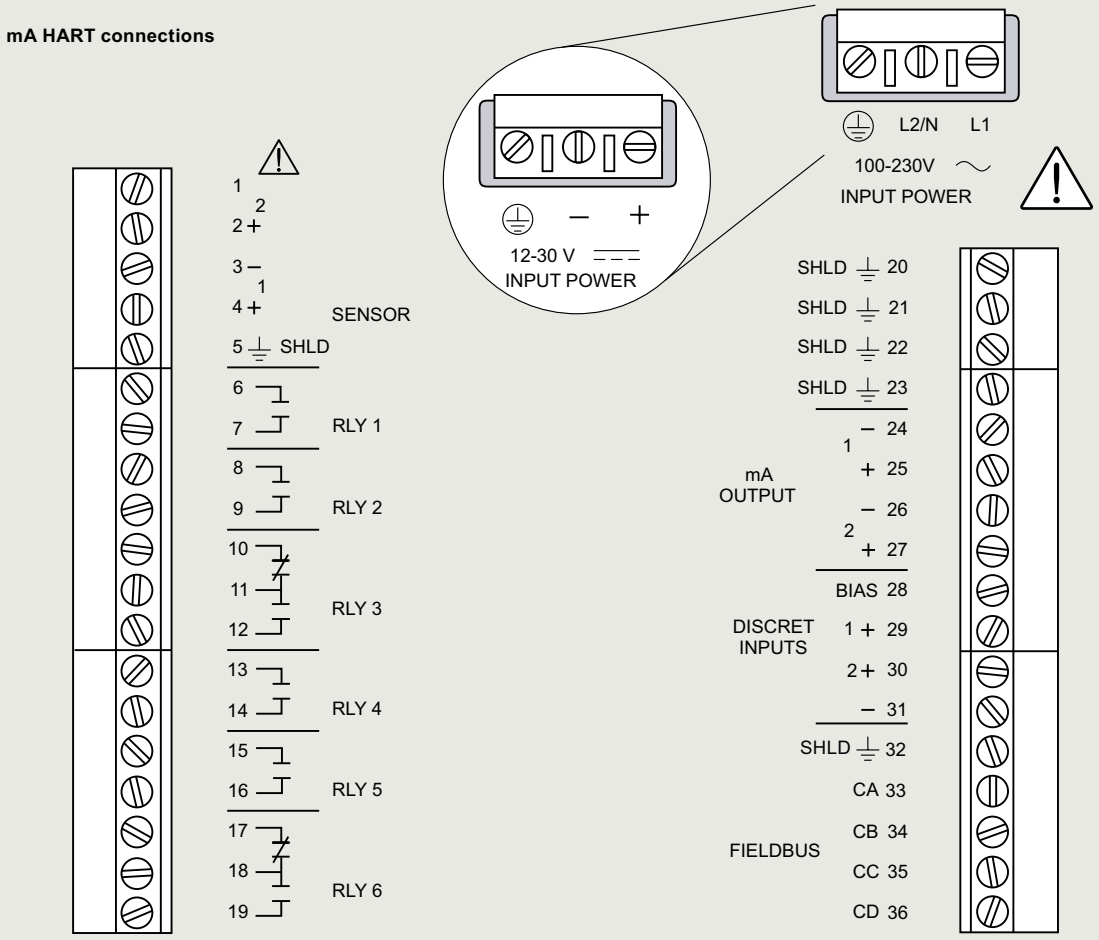
SITRANS LT500 Remote panel unit



SITRANS LT500 Remote panel unit, dimensions in mm (inch)

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Circuit diagrams



Note:

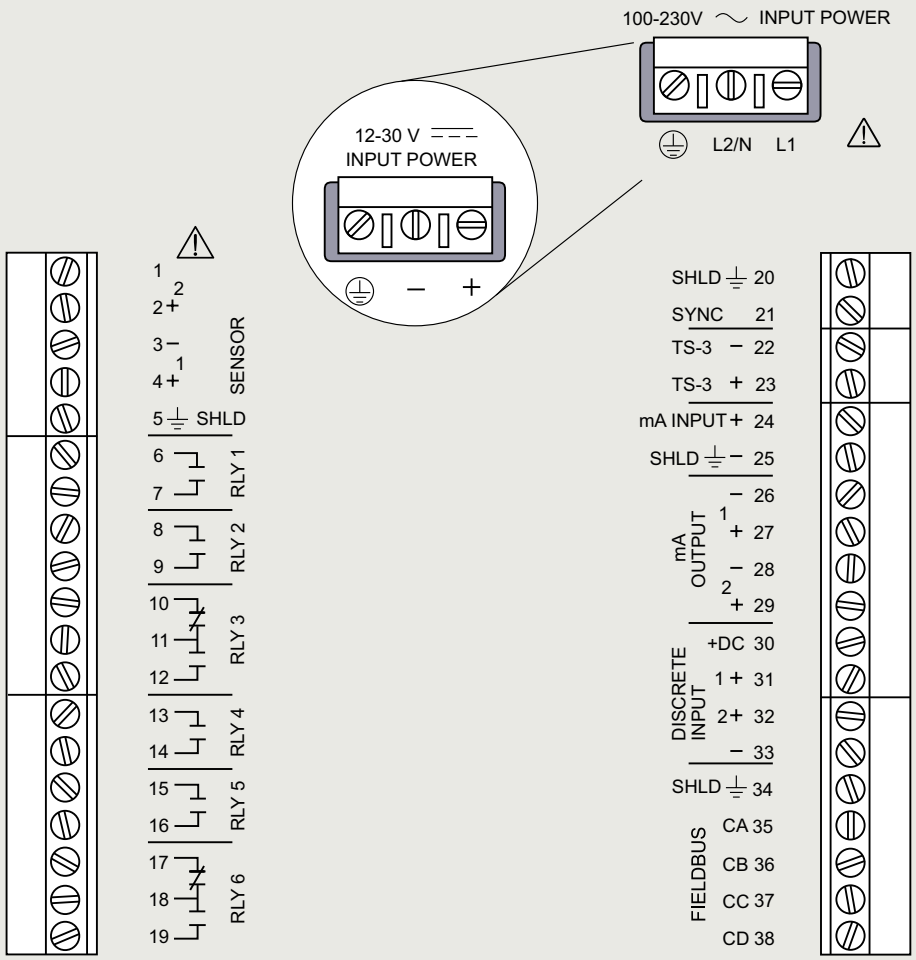
1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1 200 ft). Route cable in grounded metal conduit, separate from other cables.
2. Verify that all system components are installed in accordance with instructions.
3. Connect all cable shields to the SITRANS LT500 shield connections. Avoid differential ground potentials by not connecting cable shields to ground (earth) anywhere else.
4. Keep exposed conductors on shielded cables as short as possible to reduce noise on the line caused by stray transmissions and noise pickup.

SITRANS LT500 mA HART connections

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Circuit diagrams (continued)

Ultrasonic transducer connections



Relays shown in released state

Note:

1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1 200 ft). Route cable in grounded metal conduit, separate from other cables.
2. Verify that all system components are installed in accordance with instructions.
3. Connect all cable shields to the SITRANS LT500 shield connections. Avoid differential ground potentials by not connecting cable shields to ground (earth) anywhere else.
4. Keep exposed conductors on shielded cables as short as possible to reduce noise on the line caused by stray transmissions and noise pickup.

SITRANS LT500 Ultrasonic transducer connections

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Overview

Introduction

Ultrasonic measurement is based on the speed of sound. Sound can be used as a measurement tool because there is a measurable time lapse between sound generation and the "hearing" of the sound. This time lapse is then converted into usable information. Ultrasonic sensing equipment generates a sound above 20 000 Hz and then interprets the time lapse of the returned echo. The transducer creates the sound and senses the echo and then a transceiver interprets the sound and converts it into information.

Siemens ultrasonic units include Sonic Intelligence, a signal processing technology. Using unique algorithms, Sonic Intelligence differentiates between true echoes from the material and false echoes from obstructions or electrical noise, providing intelligent processing of echo profiles.

Typical System

Ultrasonic level measurement requires two components: one to generate the sound and catch the echo (transducer) and one to interpret the data and derive a measurement (transceiver). Even though some ultrasonic instruments combine the components in one unit, the individual functionality remains distinct. The measurement output is communicated to the unit, PLCs or PCs for process control.

Principle of Operation

A piezoelectric crystal inside the transducer converts an electrical signal into sound energy, firing a burst into the air which travels to the target and then is reflected back to the transducer. The transducer then acts as a receiving device and converts the sonic energy back into an electrical signal contained in the transceiver. An electronic signal processor analyzes the return echo and calculates the distance between the transducer and the target. The time lapse between firing the sound burst and receiving the return echo is directly proportional to the distance between the transducer and the material in the vessel. This basic principle lies at the heart of the ultrasonic measurement technology and is illustrated in the equation:
Distance = (Velocity of Sound x Time)/2.

Mode of operation

Common Terms

Attenuation

Denotes a decrease in signal magnitude in transmission from one point to another. Attenuation may be expressed as a scalar ratio of the input magnitude to the output magnitude or in decibels.

Beam angle

The diameter of a conical boundary centered around the axis of transmission when the power (radiating perpendicular to the transducer face on the axis of transmission) is reduced by half (-3 dB).

Blanking distance

Specified zone extending downward from the transducer face in which received echoes are ignored by the transceiver. Blanking distance ignores echoes from ringing.

Echo confidence

The recognition of the validity of the echo as material level. A measure of echo reliability.

Ringing

The inherent nature of the transducer to continue vibrating after the transmit pulse has ceased; the decay of the transmit pulse.

Transducer/Transceiver

A transducer provides the initial ultrasonic pulse and receives its echo. An ultrasonic transducer amplifies the sound wave created by the piezoelectric crystal and transmits that sound wave to the face of the transducer while at the same time dampening the sound wave from the other sides of the crystal.

Transceivers analyze the echo from the transducer to determine the required measurement.

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Overview

SITRANS Probe LU240

- Application
  - 2-wire loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels, and simple process vessels.
- Device description
  - Continuous level measurement up to 12 m (40 ft) range
  - Next generation Process Intelligence signal processing
  - Fast and easy configuration with quick start wizards

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Overview



SITRANS Probe LU240 ultrasonic level transmitter, ideal for level, volume, and volume flow measurements. It works with liquids, slurries, and bulk materials up to 12 m (40 ft).

Benefits

- Continuous level measurement up to 12 m (40 ft) range
- Easy installation and simple startup with quick commissioning wizards
- Programming using 4-button HMI or SIMATIC PDM
- Communication using HART
- ETFE or PVDF transducers for chemical compatibility
- Process Intelligence signal processing
- IQ Guard for health monitoring, 250 point diagnostic log, limit monitoring, 2010 point trend log, over 40 NE107 diagnostics, and quality verification report via Mobile IQ
- Auto False Echo Suppression for fixed obstruction avoidance
- Low power and current startup
- Optional Bluetooth configuration and monitoring via SITRANS mobile IQ
- Rotating enclosure for ease of installation

Application

SITRANS Probe LU240 is ideal for level monitoring in the water and wastewater industry, chemical storage vessels, and small bulk hoppers.

The range of SITRANS Probe LU240 is 3, 6, or 12 m (10, 20, or 40 ft). Probe LU240 provides unmatched reliability, using Process Intelligence, Auto False Echo Suppression for fixed obstruction avoidance, and accuracy of 0.15 % of range or 6 mm (0.25 inch) (on 6 m and 12 m models only).

SITRANS Probe LU240 offers HART communication on certain models and mA output on all models.

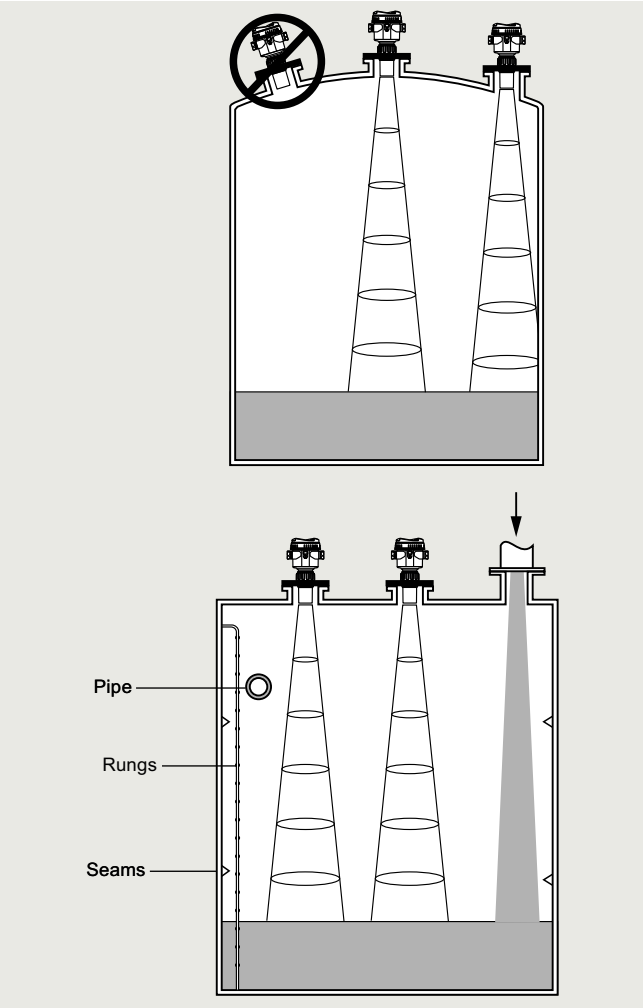
SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up, and monitor SITRANS Probe LU240 series (available for Android, Apple, and Windows devices). For more information: http://www.siemens.com/mobileIQ.

The transducer on the Probe LU240 is available as ETFE or PVDF to suit the chemical conditions of your application. As well, for applications with varying material and process temperatures, Probe LU240 incorporates an internal temperature sensor to compensate for temperature changes.

- Key Applications: chemical storage vessels, filter beds, liquid storage vessels

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Configuration



SITRANS Probe LU240 mounting

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Selection and ordering data

SITRANS Probe LU240 Ultrasonic level transmitter Continuous, non-contact, up to 12 m (40 ft) range. Monitors level, volume, and volume flow (model dependent) in liquids, slurries, and solids. With easy-to-use-quick-start wizards.	Article No. 7ML51	1	●	-	●	●	●	0	●	-	4	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.														
Communications														
HART (4 ... 20 mA) level, volume, volume flow[5]			0											
4 ... 20 mA[1] level only			7											
Ingress protection														
IP66, IP68, Type 4X, 6					1									
Measurement range/wetted parts														
200 ... 3 000 mm (7.87 ... 118.11 inch), PVDF Copolymer						B								
200 ... 3 000 mm (7.87 ... 118.11 inch), ETFE						C								
200 ... 6 000 mm (7.87 ... 236.22 inch), PVDF Copolymer						D								
200 ... 6 000 mm (7.87 ... 236.22 inch), ETFE						E								
200 ... 12 000 mm (7.87 ... 472.44 inch), PVDF Copolymer						G								
200 ... 12 000 mm (7.87 ... 472.44 inch), ETFE						H								
Process connection														
2" NPT [(Taper), ASME B1.20.1]							D							
R 2" [(BSPT), EN 10226]							E							
G 2" [(BSPP), EN ISO 228-1]							F							
Non-wetted parts														
Plastic (PBT/PC material)									7					
Type of protection														
Ordinary Locations/General Purpose (Non-Ex), $_{C}CSA_{US}$, CE, KC, RCM, EAC												A		
Ordinary Locations/General Purpose (Non-Ex), $_{C}CSA_{US}$, FM, CE, KC, RCM, EAC[2]												B		
Hazardous locations Ex ia / IS (Div. 1) / NI (Div. 2)[3]												C		
Electrical connections/cable entries														
2 x M20 x 1.5 (one general purpose Polyamide cable gland and one Polyamide blocking plug provided)													F	
1 x 1/2" NPT (no gland cable provided)													K	
For custom electrical connections/cable entries, contact a local sales person. For more information please visit: http://www.automation.siemens.com/aspa_app														
Local HMI														
Without display (blind lid of PBT/PC material)														0
With display (blind lid of PBT/PC material)														1
With display (clear lid of PC material)														3

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 32 characters) specify in plain text	**Y15**
Certificates	
Declaration of compliance DIN 55350-18, Type M / ISO 9001 delivery meets order requirements	**C19**
Certificate EN 10204-2.2	**C14**
Wireless communication [6]	
Bluetooth	**F50**
Approvals [4]	
ATEX II 1 G Ex ia IIC T4 Ga, Ta = -40 °C to +80 °C; IECEx Ex ia IIC T4 Ga, Ta = -40 °C to +80 °C; EAC Ex 0Ex ia IIC T4 Ga X; SABS Ex ia IIC T4 Ga, Ta = -40 °C to +80 °C;	**E31**
FM (Non-incendive) Class I, Div. 2, Groups A, B, C, D, T5 for Ta = -40 °C to +75 °C, T6 for Ta = -40 °C to +40 °C;[2]	**E32**

Selection and Ordering data	Order code
IECEx Ex ia IIC T4 Ga, Ta = -40 °C to +80 °C; KCs Ex ia IIC T4, Tamb = -40 °C to +80 °C; NEPSI Ex ia IIC T4 Ga;	**E33**
CSA Class I, Div. 2, Groups A, B, C, D, T4, CSA Class II, Div.1, Groups E, F, G, T4, CSA Class III; FM Class I, Div. 2, Groups A, B, C, D, T4, FM Class II, Div.1, Groups E, F, G, T4, FM Class III; CSA Class I, Zone 0, AEx ia IIC T4 Ga, Tamb = -40 °C to +80 °C; IECEx Ex ia IIC T4 Ga 2), Ta = -40 °C to +80 °C; INMETRO Ex ia IIC T4 Ga, -40 °C ≤ Ta ≤ +80 °C; KCs Ex ia IIC T4, Tamb = -40 °C to +80 °C;[2]	**E34**
VLAREM II (Available only with type of protection option A or B or C + E31.)	**E61**
For customs, contact a local sales person. For more information please visit http://www.automation.siemens.com/aspa_app.	

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Selection and ordering data (continued)

Spare parts and accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel, 12 x 45 mm, one text line (max. 16 characters)	**7ML1930-1AC**
Stainless steel FMS200 universal box bracket mounting kit	**7ML1830-1BK**
3" ASME/DIN Universal mounting adapter, 2" NPT, ETFE	**7ML1830-1BT**
3" ASME/DIN Universal mounting adapter, 2" BSP, ETFE	**7ML1830-1BU**
2" NPT nylon plastic locknut	**7ML1830-1DT**
2" BSP nylon plastic locknut	**7ML1830-1DQ**
Stainless steel sun shield	**A5E52107153**
Over-voltage protection up to 6 kV (external), M20 x 1.5	**7MF7903-7AB**
Over-voltage protection up to 6 kV (external), ½" NPT	**7MF7903-7AC**
Cable Gland Polyamide - General Purpose (-20 ... +60 °C)	**A5E34457564**
Bluetooth kit	**A5E50514198**
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00--0XX0**
SIMATIC RTU3030C compact, remove data manager with alarming	**6NH3112-3BA00--0XX0**
HART modem with USB interface	**7MF4997-1DC**
Intrinsically safe barrier	**7NG4124-1AA00**

Spare parts and accessories	Article No.
SITRANS RD100, loop powered display	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion	**7ML5744-.....-..**
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.	**7ML60..-.....-....**
Spare Parts	
Spare lid, clear	**A5E44267491**
Spare lid, blind	**A5E44267497**
Spare o-ring for lid	**A5E44267501**
Spare segmented display and 4-button HMI	**A5E44809382**

1) For use only with Measurement range/wetted parts options B, C, D, and E.
2) Available only with Electrical connections/cable entries option K only.
3) Available only with order codes E31, E32, E33, and E34.
4) Order codes E31, E32, E33, E34 only available with Type of protection option C.
5) For use only with Measurement range/wetted parts option D, E, G, and H.
6) For use only with Type of protection options A and B, and Communications option 0.

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Technical specifications

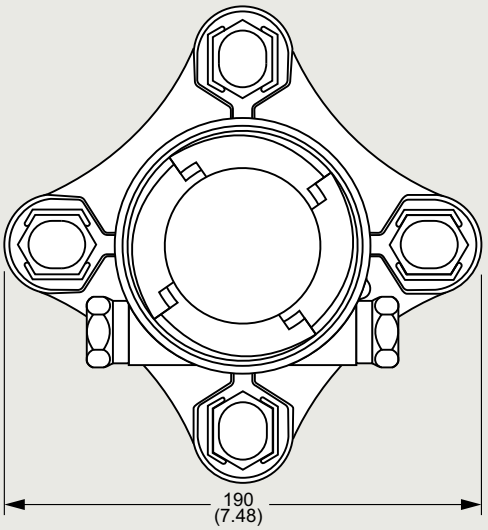
SITRANS Probe LU240	
Mode of operation	
Measuring principle	Ultrasonic level measurement
Typical application	Level measurement in storage vessels and simple process vessels
Inputs	
Measuring range	
• 3 m (10 ft)	0.2 ... 3 m (8 inch ... 10 ft)
• 6 m (20 ft) model	0.2 ... 6 m (8 inch ... 20 ft)
• 12 m (40 ft) model	0.2 ... 12 m (8 inch ... 40 ft)
Frequency	54 kHz
Sensor	Polarized Zirconate Titanate Piezoelectric ceramic crystal with acoustic impedance matching face and Toroid Transformer
Outputs	
mA/HART	
• Range	4 ... 20 mA
• Accuracy	± 0.0096 mA
• HART version	7
• Startup current	3.6 mA
• Fail-safe	Programmable as high, low, or hold (loss of echo) per NAMUR NE43
Performance	
Resolution	≤ 3 mm (0.12 inch)
Accuracy	
3 m (10 ft) version	10 mm (0.39 inch)
6 m (20 ft), 12 m (40 ft) version	• ± the greater of 0.15 % of range or 6 mm (0.25 inch) [valid from 0.25 m (0.82 ft)] • ± 2 mm (0.08 inch) on ranges 4 m (13 ft) or less
Non-repeatability	≤ 3 mm (0.12 inch)
Blanking distance	0.2 m (0.66 ft)
Update time	≤ 4 s
Temperature compensation	Built-in to compensate over temperature range
Beam angle	10°
Rated operating conditions	
Ambient conditions	
• Location	Indoor/outdoor
• Ambient temperature	• Storage: -40 ... +85 °C (-40 ... +185 °F) • Operating: -40 ... +80 °C (-40 ... +176 °F)
• Relative humidity/ingress protection	Suitable for outdoor
• Installation category	I
• Pollution degree	4
Medium conditions	
• Temperature at flange or threads	-40 ... +85 °C (-40 ... +185 °F)
• Pressure (vessel)	Normal atmospheric pressure / vent to atmosphere
Display	-20 ... +80 °C (-4 ... +176 °F)
Design	
Material (enclosure)	PBT (Polybutylene Terephthalate)
Degree of protection	Type 4X, Type 6, IP66, IP68
Weight	0.93 kg (2.1 lb)
Cable inlet	2 x M20 x 1.5 cable gland or 1 x ½" NPT thread
Material (transducer)	ETFE (Ethylene Tetrafluoroethylene) or PVDF (Polyvinylidene Fluoride) Buna-N seal
Process connection	
Threaded connection	2" NPT [(Taper), ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Flange connection	3 inch (80 mm) universal flange
Other connection	FMS 200 mounting bracket (see FMS mounting bracket product page for more information) or customer supplied mount.

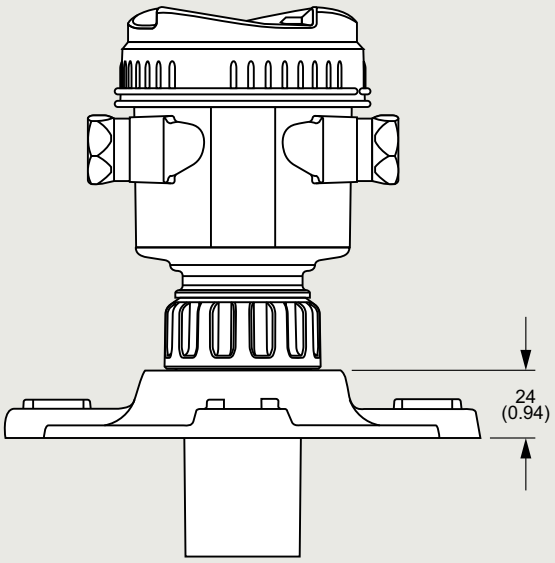
Technical specifications (continued)

SITRANS Probe LU240	
Display and Controls	
Interface	Local: LCD display Remote: Available via HART or Bluetooth
Configuration	4-button HMI
Memory	Non-volatile EEPROM, no battery required
Remote configuration	• PC running SIMATIC PDM • PC running PACTware (SITRANS DTM) • PC running Emerson AMS Device Manager • PC running a Field Device Tool (FDT) • Field Communicator 375/475 (FC375/FC475) • Mobile device running SITRANS Mobile IQ (AW050 bluetooth)
Power supply	
4 ... 20 mA/HART	10.5 ... 30 V DC
Certificates and Approvals	
General	FM, $_{C}$CSA$_{US}$, CE, RCM, EAC, KC, VLAREM II, RoHS, China RoHS, WEEE, REACH
Radio	FCC, IC, RED, CMIIT, WPC ETA
Hazardous	
• Intrinsically Safe	
- Europe	ATEX II 1G Ex ia IIC T4 Ga
- International	IECEx SIR 18.0013X Ex ia IIC T4 Ga
- USA/Canada	FM/$_{C}$CSA$_{US}$ Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 CSA Ex ia IIC T4 Ga Class I, Zone 0, AEx ia IIC T4 Ga Tamb: -40 °C to +80 °C
- Japan	Japan Ex Ex ia IIC T4 Ga
- Brazil	INMETRO Ex ia IIC T4 Ga
- China	NEPSI Ex ia IIC T4 Ga
- South Africa	SABS Ex ia IIC Tx Ga
- Russia	EAC Ex 1G Ex ia IIC T4 Ga
- Korea	KCs Ex ia IIC T4
• Non-incendive	
- USA	FM, Class I, Div. 2, Groups A, B, C, D Tx
Metrological	MCERTS, CPA, Kazakhstan metrology
Drinking water	NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;
Radio (Bluetooth) AW050	Australia, Brazil, Canada, Chile, China, Colombia, Ecuador, Egypt, EU, Hong Kong, India, Israel, Japan, Kazakhstan, Malaysia, Mexico, New Zealand, Pakistan, Peru, South Africa, South Korea, Taiwan, UAE, UK, USA, Vietnam
Other	FDA (wetted sensor), Environmental Product Declaration (EPD), Siemens EcoTech Profile (SEP)
Production and development certification	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC 62443-4-1 • EN ISO/IEC 80079-34 • IEC 62443-4-1, maturity level 3

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Options

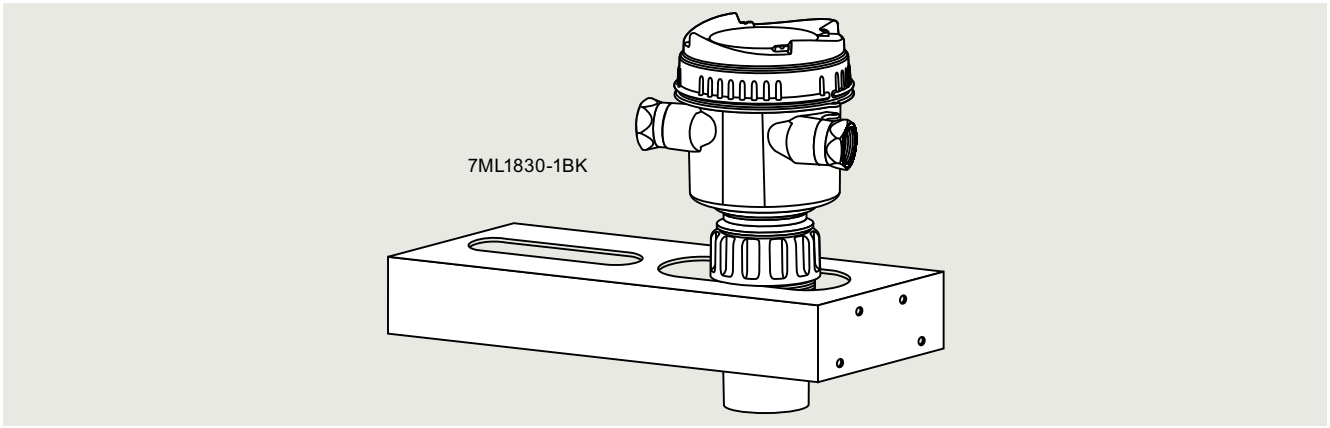




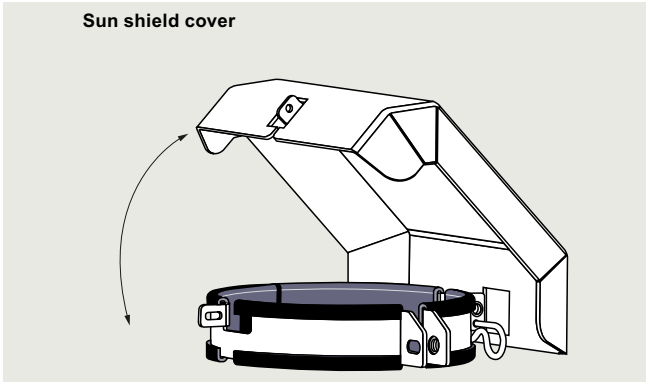
SITRANS Probe LU240 optional flange adapter, dimensions in mm (inch)

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Options (continued)



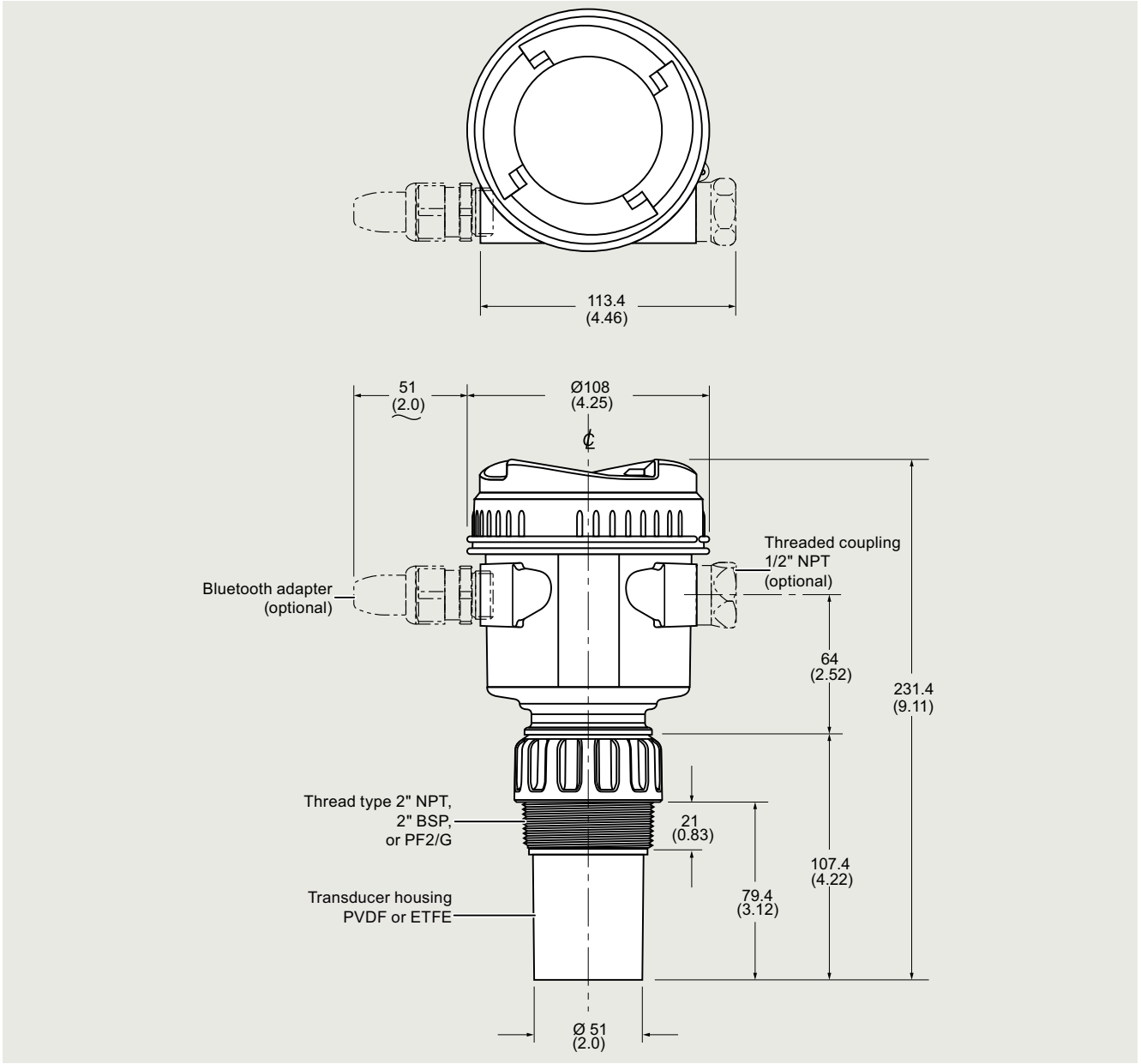
SITRANS Probe LU240 with optional FMS 200 universal box bracket



SITRANS Probe LU240 Sunshield

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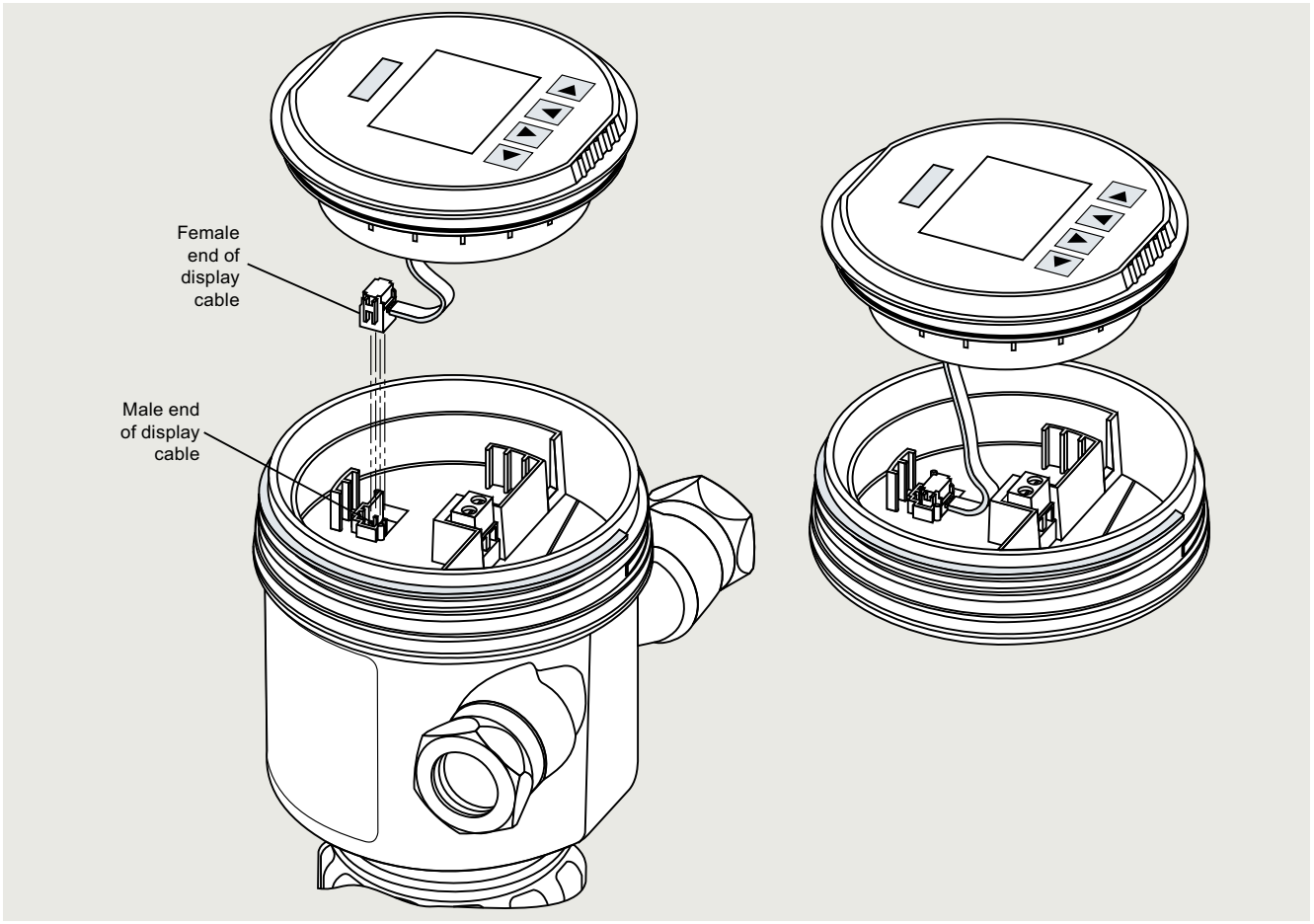
Dimensional drawings



SITRANS Probe LU240 with optional Bluetooth adapter, dimensions in mm (inch)

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Circuit diagrams



SITRANS Probe LU240 connections

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Overview

Ultrasonic Transducers

Ultrasonic measuring systems are the cost-effective choice for monitoring and control in short- to long-range applications for liquids, slurries, and solids in a wide range of industries. Transducers are impervious to dust, moisture, corrosion, vibration, flooding, and extreme temperature. They are easy to install and virtually maintenance-free. Choose from a wide selection of models designed for short or long range applications on liquids or solids.

Technical specifications

EchoMax Transducers	Liquids		Liquids and Solids Standard		
	XRS-5	**ST-H**	**XPS-10**	**XPS-15**	**XPS-30**
Max. range[1)]	8 m (26 ft)	10 m (33 ft)	10 m (33 ft)	15 m (50 ft)	30 m (100 ft)
Min. range	0.3 m (1 ft)	0.3 m (1 ft)	0.3 m (1 ft)	0.3 m (1 ft)	0.6 m (2 ft)
Max. temperature	65 °C (149 °F)	73 °C (164 °F)	95 °C (203 °F)	95 °C (203 °F)	95 °C (203 °F)
Min. temperature	-20 °C (-4 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)
Typical Applications	Wet wells and open channels	Chemical storage and liquid tanks	Dusty solids and slurries	Deep wet wells and solids	Powders, pellets and solids
Frequency	44 kHz	44 kHz	44 kHz	44 kHz	30 kHz
Beam angle (-3dB)	10°	12°	12°	6°	6°
Thread size	R 1" [(BSPT), EN 10226] 1" NPT	1" and 2" NPT R 2" [(BSPT), EN 10226] 2" [(BSPP), EN ISO 228-1]	R 1" [(BSPT), EN 10226] 1" NPT	R 1" [(BSPT), EN 10226] 1" NPT	R 1.5" [(BSPT), EN 10226] Universal thread 1.5" NPT
Enclosure	• PVDF Copolymer • CSM • Option: Flange with PTFE facing	• ETFE • Option: PVDF	• PVDF • Option: foam facing • Flange with PTFE facing	• PVDF • Option: foam facing • Flange with PTFE facing	• PVDF • Option: foam facing • Flange with PTFE facing
Compatible with:					
SITRANS LUT400	•	•	•	•	•
HydroRanger 200	•	•	•	•	
MultiRanger 100/200	•	•	•	•	

[1)] Max range is rated for measurement of liquids, recommended range for solids is 50 % of maximum. Application conditions such as extreme dust or angle of repose may reduce the usable maximum range. Consult a local sales person for more details.

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Overview



ST-H transducers use ultrasonic technology to measure level in chemical storage and liquid tanks.

Benefits

- Can be mounted on a narrow standpipe
- Integral temperature sensor
- Threaded process connection
- Self cleaning sensor face
- Impenetrable reinforced hermetic design resistant to vibration, moisture, and chemical attack

Application

The narrow design of the ST-H allows the transducer to be mounted on a narrow standpipe. When mounted correctly, it is completely protected from the process and can even be used in harsh, corrosive environments.

During operation, the ultrasonic transducer emits acoustic pulses in a narrow beam perpendicular to the transducer face. The level transceiver measures the propagation time between pulse emission and reception of the echo to calculate the distance from the transducer to the material. Variations in sound velocity due to changes in temperature within the permissible range are automatically compensated by the integral temperature sensor.

- Key Applications: chemical storage, liquid tanks

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Selection and ordering data

ST-H Ultrasonic level transducer Continuous, non-contact, 0.3 m (1 ft) range, for liquids.	Article No. 7ML1100-	●	●	A	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Process connection						
ETFE, 2" NPT [(Taper), ASME B1.20.1]		0				
ETFE, R 2" [(BSPT), EN 10226]		1				
ETFE, G 2" [(BSPP), EN ISO 228-1]		2				
PVDF copolymer, 2" NPT [(Taper), ASME B1.20.1]		3				
PVDF copolymer, R 2" [(BSPT), EN 10226]		4				
PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]		5				
Cable length						
5 m (16.40 ft)			A			
10 m (32.81 ft)			B			
30 m (98.43 ft)			C			
50 m (164.04 ft)			D			
75 m (246.06 ft)			L			
100 m (328.08 ft)			E			
200 m (656.17 ft)			M			
300 m (984.25 ft)			N			
Approvals						
FM Class I, II, Div. 1, Groups C, D, E, F, G T4A [3] NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					2	
CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T3; ATEX II 2G Ex mb IIC T5 Gb, Ta = -20°C to +60°C; EAC Ex 1Ex mb IIC T5 Gb X; INMETRO Ex mb IIC T5 Gb, -20 °C ≤Ta ≤+60 °C; RCM, CE, EAC Ex, KC[1] NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					3	
ATEX II 2G Ex mb IIC T5 Gb, Ta = -20°C to +60°C; EAC Ex 1Ex mb IIC T5 Gb X; INMETRO Ex mb IIC T5 Gb, -20 °C ≤Ta ≤+60 °C; CE, EAC Ex, RCM, KC[2] NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					4	

[1] Available with Process connection options 0 ... 2 only.
[2] Available with Process connection options 3 ... 5 only.
[3] Not suitable for Ketone, Hexane, Ester or Ethyl Acetate atmospheres.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text	**Y17**
VLAREM II (Available with approval options 3 or 4 only.)	**E61**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Sunshield	**A5E32964662**
Universal box bracket, mounting kit	**7ML1830-1BK**
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" NPT	**7ML1830-1BT**

Accessories	Article No.
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" BSPT	**7ML1830-1BU**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**

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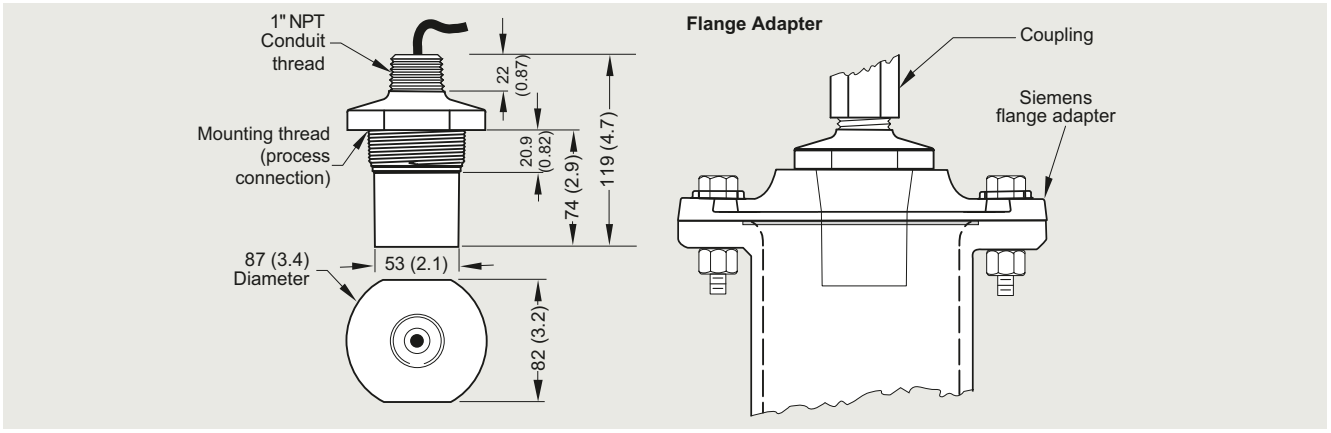
Technical specifications

ST-H	
Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	0.3 ... 10 m (1 ... 33 ft)
Output	
Frequency	44 kHz
Beam angle	12°
Sensor	Polarized Zirconate Titanate Piezoelectric ceramic crystal with acoustic impedance matching face and Toroid Transformer
Accuracy	
Temperature compensation	Compensated by integral temperature sensor
Rated operating conditions	
Pressure	Normal atmospheric pressure / vent to atmosphere
Ambient conditions	
Ambient temperature	-20 ... +60 °C (-5 ... +140 °F) (ATEX approved model) -40 ... +73 °C (-40 ... +163 °F) (CSA/FM approved model)
Storage temperature	-20 ... +60 °C (-5 ... +140 °F)
Design	
Weight[1)]	1.4 kg (3 lb)
Material (enclosure)	Base and lid made of ETFE or PVDF (epoxy fitted joint)[2)]
Process connection	2" NPT [(Taper), ASME B1.20.1], R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Degree of protection	IP68
Cable connection	AWM 20811 2-conductor copper twisted pair, aluminum braided shielded, XLPE insulated 0.75 mm² (18 AWG) UV resistant PVC jacket • Max voltage 600 V RMS • Min bend radius 75 mm (3") • Diameter 7.6 mm (0.3") • Flame rating FT-1
Cable (max. length)	365 m (1 200 ft)
Options	
Flange adapter	3" Universal (fits DN 65, PN 10 and 3" ASME)
Certificates and approvals	CE, RCM, KC, CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T3 (ETFE only); FM Class I, II, Div. 1, Groups C, D, E, F, G T4A; ATEX II 2G Ex mb IIC T5 Gb; EAC Ex 1Ex mb IIC T5 Gb X; INMETRO Ex mb IIC T5 Gb; VLAREM II RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, NSF/ANSI/CAN 372; FDA (wetted sensor) Environmental Product Declaration (EPD) Kazakhstan Metrology
Production and development certification	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC 62443-4-1 • EN ISO/IEC 80079-34

1) Approximate shipping weight of transducer with standard cable length
2) When measuring chemicals, check compatibility of ETFE or PVDF and epoxy, or mount joint external to process.

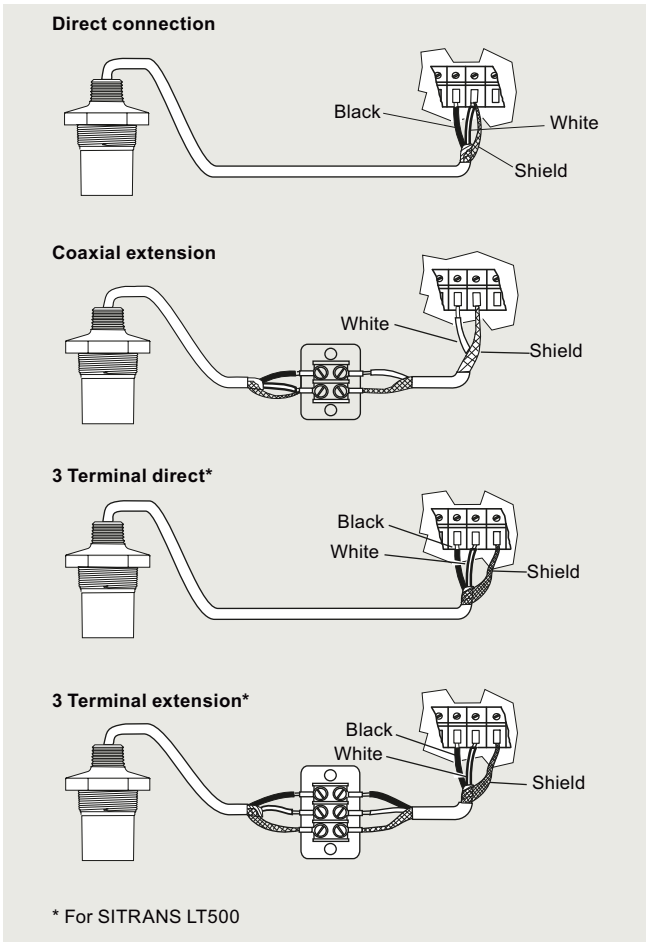
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Dimensional drawings



ST-H ultrasonic transducer, dimensions in mm (inch)

Circuit diagrams



ST-H ultrasonic transducer connections

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Overview



EchoMax XRS-5 ultrasonic transducer provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds using a beam angle of just 10° and a CSM rubber face.

Benefits

- Narrow beam angle of only 10°
- Integral temperature sensor
- Low ringing effect reduces blanking distance
- Easy installation
- Self cleaning sensor face
- Impenetrable reinforced hermetic design resistant to vibration, moisture, and chemical attack

Application

The XRS-5 is non-contacting with a measuring range from 0.3 to 8 m (1 to 26 ft). Advanced echo processing ensures reliable data even in conditions with obstructions, turbulence, and foam.

The hermetically sealed CSM rubber face and the PVDF copolymer enclosure are designed for maximum resistance to methane, salt water, caustics, and harsh chemicals common to wastewater installations. With an IP68 degree of protection, this rugged transducer is fully submersible in the event of flood conditions. Use a submergence shield if full submergence is possible in the application. A submergence shield will maintain a high level reading output during submerged conditions.

The low-cost XRS-5 transducer is compatible with the SITRANS LT500 controller, from a basic system for high/low alarm or simple pump control, up to advanced control systems with communications, telemetry and SCADA integration capabilities.

- Key Applications: wet wells, flumes, weirs, filter beds

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Selection and ordering data

EchoMax XRS-5 Ultrasonic level transducer Continuous, non-contact, 8 m (26 ft) range, for liquids and slurries.	Article No. 7ML1106-	●	●	●	●	0	-	0	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Process connection									
1" NPT [(Taper), ASME B1.20.1]		1							
R 1" [(BSPT), EN 10226]		2							
Cable length									
5 m (16.40 ft)			A						
10 m (32.81 ft)			B						
30 m (98.43 ft)			C						
50 m (164.04 ft)			F						
75 m (246.06 ft)			L						
100 m (328.08 ft)			K						
200 m (656.17 ft)			M						
300 m (984.25 ft)			N						
Facing									
Standard (CSM rubber)				A					
PTFE (flange versions)				B					
Approvals									
CSA Class I, Div. 2, Groups A, B, C, D; CSA Class II, Div. 1, Groups E, F, G; FM Class I, Zone 1, AEx m IIC, T6; FM Class II, III, Div. 1, Groups E, F, G T6; ATEX II 2GD Ex mb IIC T6 Gb, Ta = -20°C to +65°C; ATEX II 2GD Ex tb IIIC T85°C Db; IECEx Ex mb IIC T6 Gb, Ta = -20°C to +65°C; IECEx Ex tb IIIC T85°C Db; INMETRO Ex mb IIC T6 Gb, IP66/IP68, -20°C ≤ Ta ≤ +65°C; INMETRO Ex tb IIIC T85°C Db, IP66/IP68; EAC Ex 1Ex mb IIC T6 Gb X; EAC Ex Ex tb IIIC T85°C Db X; CE, RCM, KC, NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					2			
Mounting flange (flush mount)									
None									A
3" ASME, 150 lb, flat faced									B
4" ASME, 150 lb, flat faced									C
6" ASME, 150 lb, flat faced									D
DN 80, PN 10/16, Type A, flat faced									J
DN 100, PN 10/16, Type A, flat faced									K
DN 150, PN 10/16, Type A, flat faced									L
JIS10K 3B style									Q
JIS10K 4B style									R
JIS10K 6B style									S
Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.									

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text	**Y17**
VLAREM II	**E61**

Selection and ordering data	Article No.
Accessories	
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BH**
Sunshield	**A5E32964662**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
FMS-200 universal box bracket, mounting kit	**7ML1830-1BK**

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Selection and ordering data (continued)

Selection and ordering data	Article No.
FMS-210 channel bracket, wall mount	7ML1830-1BL
FMS-220 extended channel bracket, wall mount	7ML1830-1BM
FMS-310 channel bracket, floor mount	7ML1830-1BN
FMS-320 extended channel bracket, floor mount	7ML1830-1BP
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	7ML1830-1BQ
1" NPT locknut, plastic	7ML1830-1DS
1" BSP locknut, plastic	7ML1830-1DR
1" BSP locknut, flanged, plastic	7ML1830-1DN

Selection and ordering data	Article No.
Plastic adapter 1" BSP - 20 mm	7ML1830-1EA
Plastic adapter 1" NPT	7ML1930-1FX
Plastic adapter 1" NPT/M20	7ML1830-1EF
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

EchoMax XRS-5C Ultrasonic level transducer Continuous, non-contact, 8 m (26 ft) range, for liquids and slurries.	**Article No. 7ML1105-**	●	●	●	●	1	-	0	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Process connection									
1" NPT [(Taper), ASME B1.20.1]		1							
Cable length									
5 m (16.40 ft)			A						
10 m (32.81 ft)			B						
30 m (98.43 ft)			C						
50 m (164.04 ft)			F						
75 m (246.06 ft)			L						
100 m (328.08 ft)			K						
200 m (656.17 ft)			M						
300 m (984.25 ft)			N						
Facing									
Standard (CSM rubber)				A					
PTFE (flange versions)				B					
Approvals									
CSA Class I, Div. 1, Groups A, B, C, D; CSA Class II, Div. 1, Groups E, F, G; CSA Class III; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					1				
Mounting flange (flush mount)									
None									A
3" ASME, 150 lb, flat faced									B
4" ASME, 150 lb, flat faced									C
6" ASME, 150 lb, flat faced									D
Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.									
Operating Instructions									
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation									

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y17

Selection and ordering data	Article No.
Accessories	
Submergence shield kit	7ML1830-1BH
Sunshield	A5E32964662
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	7ML1830-1AQ
Easy Aimer 304, NPT with 1" stainless steel coupling	7ML1830-1AU
FMS-200 universal box bracket, mounting kit	7ML1830-1BK
FMS-210 channel bracket, wall mount	7ML1830-1BL
FMS-220 extended channel bracket, wall mount	7ML1830-1BM

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Selection and ordering data (continued)

Selection and ordering data	Article No.
FMS-310 channel bracket, floor mount	**7ML1830-1BN**
FMS-320 extended channel bracket, floor mount	**7ML1830-1BP**
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**

Technical specifications

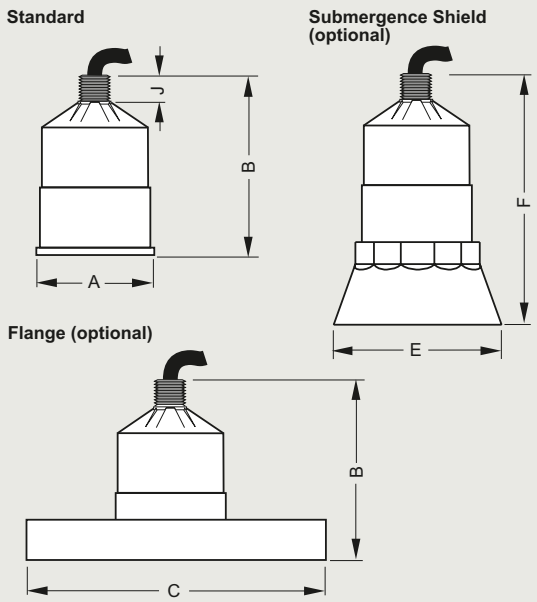
EchoMax XRS-5	
Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	0.3 ... 8 m (1 ... 26 ft), dependent on application
Output	
Frequency	44 kHz
Beam angle	10°
Sensor	Polarized Zirconate Titanate Piezoelectric ceramic crystal with acoustic impedance matching face and Toroid Transformer
Accuracy	
Temperature error	Compensated by integral temperature sensor
Rated operating conditions	
Vessel pressure	Normal atmospheric pressure / vent to atmosphere
Ambient Conditions	
• Ambient temperature	-20 ... +65 °C (-4 ... +149 °F)
• Storage temperature	-20 ... +65 °C (-4 ... +149 °F)
Design	
Weight (approximate shipping weight of transducer with standard cable length)	1.2 kg (2.6 lb)
Material (enclosure)	PVDF copolymer enclosure and CSM face
Material (flange)	• CPVC • Option: PTFE face with CPVC flange
Process connection	1" NPT [(Taper), ASME B1.20.1] or R 1" [(BSPT), EN 10226]
Degree of protection	IP66/IP68
Max submergence depth	2 m (6.5')
Cable connection	AWM 20811 2-conductor copper twisted pair, aluminum braided shielded, XLPE insulated 0.75 mm² (18 AWG) UV resistant PVC jacket • Max voltage 600 V RMS • Min bend radius 75 mm (3") • Diameter 7.6 mm (0.3") • Flame rating FT-1
Cable (max. length)	• 365 m
Options	
Flange version	Factory flange with PTFE face for ASME, EN or JIS configuration
Submergence shield	For applications with flooding possible

Technical specifications (continued)

EchoMax XRS-5	
Certificates and approvals	CE, RCM, KC, EAC Ex CSA Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1 Groups E, F, G; FM Class I, Zone 1, AEx m IIC, T6 Class II, III, Div. 1, Groups E, F, G T6; ATEX II 2GD / IECEx / INMETRO Ex mb IIC T6 Gb, Ex tb IIIC T85°C Db; EAC Ex 1Ex mb IIC T6 Gb X, Ex tb IIIC T85°C Db X: VLAREM II RoHS, China RoHS, WEEE REACH NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;[1)] [1)]Available on orders supplied from Canada only. Environmental Product Declaration (EPD) Kazakhstan Metrology
Production and development certification	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC 62443-4-1 • EN ISO/IEC 80079-34

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Dimensional drawings

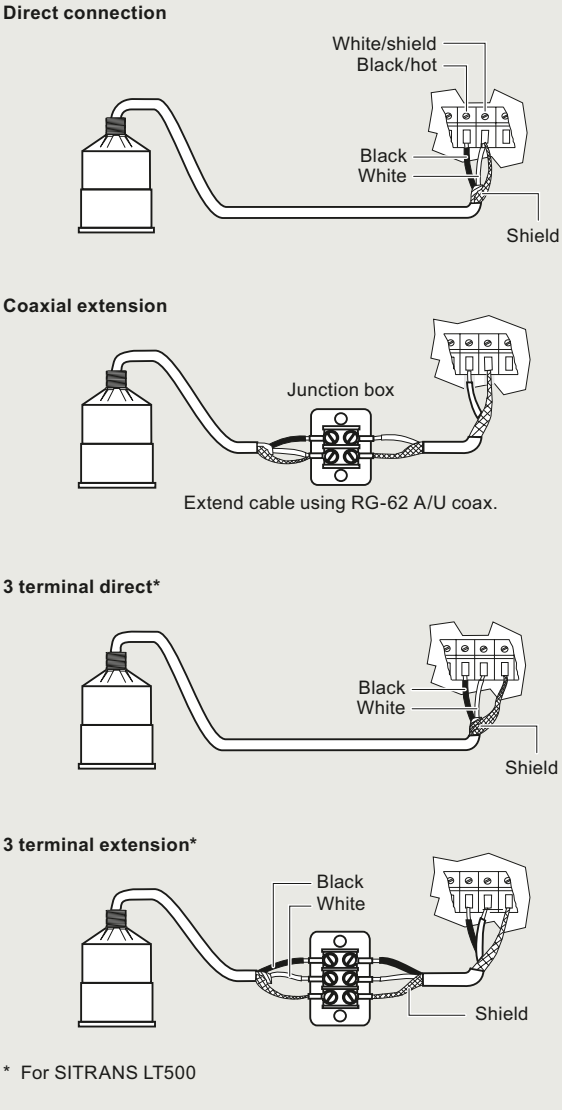


XRS-5 ultrasonic transducer, dimensions in mm (inch)

Dimensional drawings (continued)

Version Dimension	XRS-5	XRS-5C
A	89 mm (3.5 inch)	89 mm (3.5 inch)
B	127 mm (5.0 inch)	191 mm (7.5 inch)
C	According to ASME, DIN, or JIS	According to ASME, DIN, or JIS
E	124 mm (4.9 inch)	124 mm (4.9 inch)
F	195 mm (7.7 inch)	259 mm (10.2 inch)
J	25 mm (0.98 inch)	64 mm (2.5 inch)

Circuit diagrams



XRS-5 ultrasonic transducer connections

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Overview



EchoMax XPS transducers use ultrasonic technology to measure level in a wide range of liquids and solids.

Benefits

- Integral temperature compensation
- Low ringing effect reduces blanking distance
- Optional foam facing for dusty applications
- Self cleaning sensor face
- Impenetrable reinforced hermetic design resistant to vibration, moisture, and chemical attack

Application

XPS transducers can be fully immersed, are resistant to steam and corrosive chemicals, and can be installed without flanges.

The XPS series offers versions for various measuring ranges up to 30 m (100 ft) and up to a max. temperature of 95 °C (203 °F).

During operation, the EchoMax transducers emit acoustic pulses in a narrow beam. The level monitor measures the propagation time between pulse emission and its reflection (echo) to calculate the distance.

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Selection and ordering data

EchoMax XPS-10 Ultrasonic level transducer Continuous, non-contact, 10 m (32.81 ft) range, for liquids and solids.	Article No. 7ML1115-	●	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Mounting thread and facing						
1" NPT [(Taper), ASME B1.20.1]		0				
1" NPT [(Taper), ASME B1.20.1] with foam facing[1)]		1				
1" NPT [(Taper), ASME B1.20.1] with PTFE facing[2)]		2				
R 1" [(BSPT), EN 10226]		3				
R 1" [(BSPT), EN 10226] with foam facing[1)]		4				
R 1" [(BSPT), EN 10226] with PTFE facing[2)]		5				
Cable length						
5 m (16.40 ft)			B			
10 m (32.81 ft)			C			
30 m (98.43 ft)			E			
50 m (164.04 ft)			F			
75 m (246.06 ft)			L			
100 m (328.08 ft)			K			
200 m (656.17 ft)			M			
300 m (984.25 ft)			N			
Mounting flange						
None				A		
3" ASME, 150 lb, flat faced				C		
4" ASME, 150 lb, flat faced				D		
6" ASME, 150 lb, flat faced				E		
8" ASME, 150 lb, flat faced				F		
DN 80, PN 10/16, Type A, flat faced				G		
DN 100, PN 10/16, Type A, flat faced				J		
DN 150, PN 10/16, Type A, flat faced				L		
JIS10K3B Style				M		
JIS10K4B Style				P		
JIS10K6B Style (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard)				R		
Approvals						
ATEX II 2GD Ex mb IIC T4 Gb, ATEX II 2GD Ex tb IIIC T135°C Db, Ta = -40°C to +95°C; IECEx SIR 13.0009X Ex mb IIC T4 Gb, IECEx SIR 13.0009X Ex tb IIIC T135°C Db, Ta = -40°C to +95°C; FM Class I, Div. 2, Groups A, B, C, D; FM Class II, Div. 1, Groups E, F, G; FM Class III; INMETRO Ex mb IIC T4 Gb; INMETRO Ex tb IIIC T135°C Db; NEPSI Ex mb IIC T4 Gb; NEPSI Ex tb IIIC T135°C Db; EAC Ex 1Ex mb IIC T4 Gb X; EAC Ex Ex tb IIIC T135°C Db X; CE KC RCM Metrology Kazakhstan (KazInMetr) NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					3	
CSA Class I, Div. 1, Groups A, B, C, D; CSA Class II, Div. 1, Groups E, F, G; CSA Class III; [3)] NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					4	

[1)] Not available with flanged versions.
[2)] Available with flanged versions only.
[3)] Valid with mounting thread and facing options 0 ... 2 only.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**
VLAREM II (available with approval option 3 only)	**E61**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BH**
Sunshield	**A5E32964662**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**

Selection and ordering data	Article No.
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Universal box bracket, mounting kit	**7ML1830-1BK**
Channel bracket, wall mount	**7ML1830-1BL**
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**
1" BSP locknut, flanged, plastic	**7ML1830-1DN**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**

EchoMax XPS-10C Ultrasonic level transducer Continuous, non-contact, 0.3 ... 10 m (0.98 ... 32.81 ft) range, for liquids and solids. Includes integral temperature sensor	**Article No. 7ML1121-**	●	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Mounting thread and facing						
1" NPT [(Taper), ASME B1.20.1]		**0**				
1" NPT [(Taper), ASME B1.20.1] with foam facing[1)]		**1**				
1" NPT [(Taper), ASME B1.20.1] with PTFE facing[2)]		**2**				
Cable length						
5 m (16.40 ft)			**B**			
10 m (32.81 ft)			**C**			
30 m (98.43 ft)			**E**			
50 m (164.04 ft)			**F**			
75 m (246.06 ft)			**L**			
100 m (328.08 ft)			**K**			
200 m (656.17 ft)			**M**			
300 m (984.25 ft)			**N**			
Mounting flange						
None				**A**		
3" ASME, 150 lb, flat faced				**C**		
4" ASME, 150 lb, flat faced				**D**		
6" ASME, 150 lb, flat faced				**E**		
8" ASME, 150 lb, flat faced				**F**		
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 standard)						
Approvals						
CSA Class I, Div. 2; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					**5**	

[1)] Not available with flanged versions.
[2)] Available only with flanged versions.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BH**
Sunshield	**A5E32964662**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**

Selection and ordering data	Article No.
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Universal box bracket, mounting kit	**7ML1830-1BK**
Channel bracket, wall mount	**7ML1830-1BL**
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**

EchoMax XPS-15 Ultrasonic level transducer **Continuous, non-contact, 15 m (49.21 ft) range, for liquids and solids.**	**Article No.** **7ML1118-**	●	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Mounting thread and facing						
1" NPT [(Taper), ASME B1.20.1]		**0**				
1" NPT [(Taper), ASME B1.20.1] with foam facing[1)]		**1**				
1" NPT [(Taper), ASME B1.20.1] with PTFE facing[2)]		**2**				
R 1" [(BSPT), EN 10226]		**3**				
R 1" [(BSPT), EN 10226] with foam facing[1)]		**4**				
R 1" [(BSPT), EN 10226] with PTFE facing[2)]		**5**				
Cable length						
5 m (16.40 ft)			**B**			
10 m (32.81 ft)			**C**			
30 m (98.43 ft)			**E**			
50 m (164.04 ft)			**F**			
75 m (246.06 ft)			**L**			
100 m (328.08 ft)			**K**			
200 m (656.17 ft)			**M**			
300 m (984.25 ft)			**N**			
Mounting flange						
None				**A**		
6" ASME, 150 lb, flat faced				**D**		
8" ASME, 150 lb, flat faced				**E**		
DN 150, PN 10/16, Type A, flat faced				**J**		
DN 200, PN 10, Type A, flat faced				**K**		
JIS10K 6B				**N**		
JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)				**P**		
Approvals						
ATEX II 2GD Ex mb IIC T4 Gb, ATEX II 2GD Ex tb IIIC T135°C Db, Ta = -40°C to +95°C; IECEx SIR 13.0009X Ex mb IIC T4 Gb IECEx SIR 13.0009X Ex tb IIIC T135°C Db, Ta = -40°C to +95°C; INMETRO Ex mb IIC T4 Gb, INMETRO Ex tb IIIC T135°C Db; NEPSI Ex mb IIC T4 Gb, NEPSI Ex tb IIIC T135°C Db;					**3**	

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Selection and ordering data (continued)

EchoMax XPS-15 Ultrasonic level transducer Continuous, non-contact, 15 m (49.21 ft) range, for liquids and solids.	Article No. 7ML1118-	●	●	●	●	0
EAC Ex 1Ex mb IIC T4 Gb X, EAC Ex Ex tb IIIC T135°C Db X; CE KC RCM Metrology Kazakhstan (KazInMetr) FM Class I, Div. 2, Groups A, B, C, D; FM Class II, Div. 1, Groups E, F, G; FM Class III; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;						
CSA Class I, Div. 1, Groups A, B, C, D; CSA Class II, Div. 1, Groups E, F, G; CSA Class III; [3] NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					4	

[1] Not available with flanged versions.
[2] Available with flanged versions only.
[3] Available with mounting options 0 ... 2 only.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**
VLAREM II (available with approval option 3 only)	**E61**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BJ**
Sunshield	**A5E32964662**
Universal box bracket, mounting kit	**7ML1830-1BK**

Selection and ordering data	Article No.
Channel bracket, wall mount	**7ML1830-1BL**
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**
1" BSP locknut, flanged, plastic	**7ML1830-1DN**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**

EchoMax XPS-15F Ultrasonic level transducer Continuous, non-contact, 15 m (49.21 ft) range, for liquids and solids.	Article No. 7ML1171-	●	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Mounting thread and facing						
1" NPT [(Taper), ASME B1.20.1]		1				
Cable length						
5 m (16.40 ft)			B			
10 m (32.81 ft)			C			
30 m (98.43 ft)			D			
50 m (164.04 ft)			E			
75 m (246.06 ft)			L			
100 m (328.08 ft)			F			
200 m (656.17 ft)			M			
300 m (984.25 ft)			N			
Mounting flange, flush mount						
None				A		
6" ASME, 150 lb, flat faced				B		

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Selection and ordering data (continued)

EchoMax XPS-15F Ultrasonic level transducer Continuous, non-contact, 15 m (49.21 ft) range, for liquids and solids.	Article No. 7ML1171-	●	●	●	●	0
8" ASME, 150 lb, flat faced (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)				C		
Approvals						
FM Class I, Div. 1, Groups A, B, C, D; FM Class II, Div. 1, Groups E, F, G; FM Class III; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					1	

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BJ**
Sunshield	**A5E32964662**

Selection and ordering data	Article No.
Universal box bracket, mounting kit	**7ML1830-1BK**
Channel bracket, wall mount	**7ML1830-1BL**
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**

EchoMax XPS-15C Ultrasonic level transducer Continuous, non-contact, 0.3 m ... 15 m (0.98 ... 49.21 ft) range, for liquids and solids. Includes integral temperature sensor.	Article No. 7ML1124-	●	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Mounting thread and facing						
1" NPT [(Taper), ASME B1.20.1]		0				
1" NPT [(Taper), ASME B1.20.1] with foam facing[1)]		1				
1" NPT [(Taper), ASME B1.20.1] with PTFE facing[2)]		2				
Cable length						
5 m (16.40 ft)			B			
10 m (32.81 ft)			C			
30 m (98.43 ft)			E			
50 m (164.04 ft)			F			
75 m (246.06 ft)			L			
100 m (328.08 ft)			K			
200 m (656.17 ft)			M			
300 m (984.25 ft)			N			
Mounting flange						
None				A		
6" ASME, 150 lb, flat faced				D		
8" ASME, 150 lb, flat faced				E		
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 standard.)						
Approvals						
CSA Class I, Div. 2; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					5	

[1)] Not available with flanged versions.

[2)] Available only with flanged versions.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BJ**
Sunshield	**A5E32964662**
Universal box bracket, mounting kit	**7ML1830-1BK**
Channel bracket, wall mount	**7ML1830-1BL**

Selection and ordering data	Article No.
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**

EchoMax XPS-30 Ultrasonic level transducer **Continuous, non-contact, 30 m (98.42 ft) range, for liquids and solids.**	**Article No.** **7ML1123-**	●	●	●	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Mounting thread and facing						
1½" universal thread		**0**				
1½" universal thread, foam facing[1)]		**1**				
1½" universal thread, PTFE facing[2)]		**2**				
Cable length						
5 m (16.40 ft)			**B**			
10 m (32.81 ft)			**C**			
30 m (98.43 ft)			**E**			
50 m (164.04 ft)			**F**			
75 m (246.06 ft)			**L**			
100 m (328.08 ft)			**K**			
200 m (656.17 ft)			**M**			
300 m (984.25 ft)			**N**			
Mounting flange						
None				**A**		
6" ASME, 150 lb, flat faced				**D**		
8" ASME, 150 lb, flat faced				**E**		
DN 150, PN 10/16, Type A, flat faced				**J**		
DN 200, PN 10, Type A, flat faced				**K**		
JIS10K 6B				**N**		
JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)				**P**		
Approvals						
ATEX II 1D, 2G Ex mb IIC T4 Gb, ATEX II 1D, 2G Ex tb IIIC T135°C Da, Ta = -40°C to +95°C; IECEx SIR 13.0009X Ex mb IIC T4 Gb, IECEx SIR 13.0009X Ex tb IIIC T135°C Da, Ta = -40°C to +95°C; FM Class I, Div. 2, Groups A, B, C, D; FM Class II, Div. 1, Groups E, F, G; FM Class III; INMETRO Ex mb IIC T4 Gb, INMETRO Ex ta IIIC T135°C Da; NEPSI Ex mb IIC T4 Gb, NEPSI Ex ta IIIC T135°C Da; EAC Ex 1Ex mb IIC T4 Gb X,					**5**	

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Selection and ordering data (continued)

EchoMax XPS-30 Ultrasonic level transducer Continuous, non-contact, 30 m (98.42 ft) range, for liquids and solids.	Article No. 7ML1123-	●	●	●	●	0
EAC Ex Ex ta IIIC T135°C Da X; CE KC RCM Metrology Kazakhstan (KazInMetr) NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;						
CSA Class I, Div. 1, Groups A, B, C, D; CSA Class II, Div. 1, Groups E, F, G; CSA Class III;NSF/ANSI/CAN 61, NSF/ANSI/CAN 372					6	

1) Not available with flanged versions.
2) Available with flanged versions only.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**
VLAREM II (available with approval option 5 only)	**E61**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
1½" BSPT locknut, plastic	**7ML1830-1DP**
Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling	**7ML1830-1AN**
Easy Aimer 304, NPT with 1½" stainless steel coupling	**7ML1830-1AT**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Adapter 1½" BSP	**7ML1830-1EB**

EchoMax XPS-30C Ultrasonic level transducer Continuous, non-contact, 30 m (98.42 ft) range, for liquids and solids.	Article No. 7ML1155-	●	●	●	●	1
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Mounting thread and facing						
1½" universal thread		**0**				
1½" universal thread, foam facing[1)]		**1**				
1½" universal thread, PTFE facing[2)]		**2**				
Cable length						
5 m (16.40 ft)			**B**			
10 m (32.81 ft)			**C**			
30 m (98.43 ft)			**E**			
50 m (164.04 ft)			**F**			
75 m (246.06 ft)			**L**			
100 m (328.08 ft)			**K**			
200 m (656.17 ft)			**M**			
300 m (984.25 ft)			**N**			
Mounting flange						
None				**A**		
6" ASME, 150 lb, flat faced				**D**		
8" ASME, 150 lb, flat faced				**E**		
DN 150, PN 10/16, Type A, flat faced				**J**		
DN 200, PN 10, Type A, flat faced				**K**		
JIS10K 6B				**N**		
JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)				**P**		

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Selection and ordering data (continued)

EchoMax XPS-30C Ultrasonic level transducer Continuous, non-contact, 30 m (98.42 ft) range, for liquids and solids.	Article No. 7ML1155-	●	●	●	●	1
Approvals						
CSA Class I, Div. 2, Groups A, B, C, D; CSA Class II, Div. 1, Groups E, F, G; CSA Class III; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;					4	

[1] Not available with flanged version.
[2] Available for flanged versions only.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling	**7ML1830-1AN**
Easy Aimer 304, NPT with 1½" stainless steel coupling	**7ML1830-1AT**
1½" BSPT locknut, plastic	**7ML1830-1DP**
Adapter 1½" BSP	**7ML1830-1EB**

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Technical specifications

Input	XPS-10/XPS-10C	XPS-15/XPS-15C/XPS-15F	XPS-30/XPS-30C
Measuring range[1)]	0.3 ... 10 m (1 ... 33 ft)	Standard: 0.3 ... 15 m (1 ... 50 ft) XPS-15F: 0.45 ... 15 m (1.5 ... 50 ft)	0.6 ... 30 m (2 ... 100 ft)
Output			
Frequency	44 kHz	44 kHz	30 kHz
Beam angle	12°	6°	6°
Sensor	Polarized Zirconate Titanate Piezoelectric ceramic crystal with acoustic impedance matching face and Toroid Transformer	Polarized Zirconate Titanate Piezoelectric ceramic crystal with acoustic impedance matching face and Toroid Transformer	Polarized Zirconate Titanate Piezoelectric ceramic crystal with acoustic impedance matching face and Toroid Transformer
Environmental			
Location	Indoors/outdoors	Indoors/outdoors	Indoors/outdoors
Ambient temperature	-40 ... +95 °C (-40 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F) XPS-15F: -20 ... +95 °C (-4 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F)
Storage temperature	-40 ... +95 °C (-40 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F) XPS-15F: -20 ... +95 °C (-4 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F)
Pollution degree	4	4	4
Pressure	8 bar g (120 psi g) Flanged: 0.5 bar g (7.25 psi g)	8 bar g (120 psi g) Flanged: 0.5 bar g (7.25 psi g)	Normal atmospheric pressure / vent to atmosphere Flanged: 0.5 bar g (7.25 psi g)
Design			
Weight	0.8 kg (1.8 lb)	1.3 kg (2.8 lb) Flanged: 2 kg (4.4 lb)	4.3 kg (9.5 lb)
Power supply	Operation of transducer only with approved Siemens controllers	Operation of transducer only with approved Siemens controllers	Operation of transducer only with approved Siemens controllers
Material	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange
Color	Blue	Blue XPS-15F: Gray	Blue
Process connection	1" NPT or 1" BSPT	1" NPT or 1" BSPT XPS-15F: 1" NPT	1.5" universal thread (NPT or BSPT)
Degree of protection	IP66/68	IP66/68	IP66/68
Max submergence depth	2 m (6.5 ft)	2 m (6.5 ft)	n/a
Cable	AWM 20811 2-conductor copper twisted pair, aluminum braided shielded, XLPE insulated 0.75 mm² (18 AWG) UV resistant PVC jacket • Max voltage 600 V RMS • Min bend radius 75 mm (3") • Diameter 7.6 mm (0.3") • Flame rating FT-1	AWM 20811 2-conductor copper twisted pair, aluminum braided shielded, XLPE insulated 0.75 mm² (18 AWG) UV resistant PVC jacket • Max voltage 600 V RMS • Min bend radius 75 mm (3") • Diameter 7.6 mm (0.3") • Flame rating FT-1	AWM 20811 2-conductor copper twisted pair, aluminum braided shielded, XLPE insulated 0.75 mm² (18 AWG) UV resistant PVC jacket • Max voltage 600 V RMS • Min bend radius 75 mm (3") • Diameter 7.6 mm (0.3") • Flame rating FT-1
Separation	Max. 365 m (1 200 ft)	Max. 365 m (1 200 ft)	Max. 365 m (1 200 ft)
Certificates and approvals	Standard: CE, CSA, FM, ATEX, IEC Ex, NEPSI, Japan Ex, CRN, VLAREM II, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, FDA (wetted sensor), Environmental Product Declaration (EPD), Kazakhstan Metrology XPS-10C: CSA, CRN, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, FDA (wetted sensor), Environmental Product Declaration (EPD), Kazakhstan Metrology	Standard: CE, CSA, FM, ATEX, IEC Ex, NEPSI, Japan Ex, CRN, VLAREM II, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, FDA (wetted sensor), Environmental Product Declaration (EPD), Kazakhstan Metrology XPS-15C: CSA, CRN, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, FDA (wetted sensor), Environmental Product Declaration (EPD), Kazakhstan Metrology XPS-15F: FM Class I, Div. 1, Groups A, B, C, and D, Class II Div. 1, Groups E, F, and G, Class III, CRN, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, FDA (wetted sensor), Environmental Product Declaration (EPD), Kazakhstan Metrology	Standard: CE, CSA, FM, ATEX, IEC Ex, NEPSI, Japan Ex, VLAREM II, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, FDA (wetted sensor), Environmental Product Declaration (EPD), Kazakhstan Metrology XPS-30C: CSA, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, FDA (wetted sensor), Environmental Product Declaration (EPD), Kazakhstan Metrology

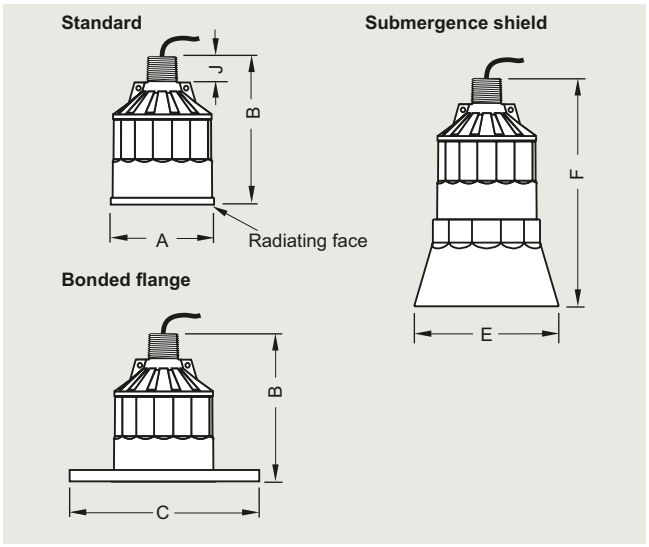
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Technical specifications (continued)

Input	XPS-10/XPS-10C	XPS-15/XPS-15C/XPS-15F	XPS-30/XPS-30C
Production and development certification	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC 62443-4-1 • EN ISO/IEC 80079-34 • PED 2014/68/EU	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC 62443-4-1 • EN ISO/IEC 80079-34 • PED 2014/68/EU	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC 62443-4-1 • EN ISO/IEC 80079-34

1) Max range is rated for measurement of liquids, recommended range for solids is 50 % of maximum. Application conditions such as extreme dust or angle of repose may reduce the usable maximum range. Consult a local sales person for more details.

Dimensional drawings



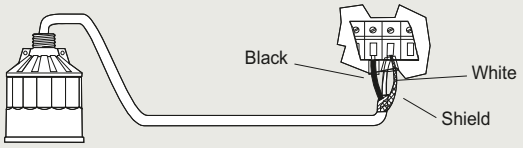
XPS ultrasonic transducer

Version Dimension	XPS-10/-10C	XPS-15/-15C	XPS-15F	XPS-30/-30C
A	88 mm (3.464 inch)	121 mm (4.764 inch)	121 mm (4.764 inch)	175 mm (6.890 inch)
B	122 mm (4.803 inch)	132 mm (5.197 inch)	168 mm (6.597 inch)	198 mm (7.795 inch)
C	According to ASME, DIN, and JIS	According to ASME, DIN, and JIS	According to ASME, DIN, and JIS	According to ASME, DIN, and JIS
E	124 mm (4.882 inch)	158 mm (6.220 inch)	158 mm (6.220 inch)	n/a
F	152 mm (5.984 inch)	198 mm (7.795 inch)	234 mm (9.195 inch)	n/a
J	28 mm (1.1 inch)	28 mm (1.1 inch)	64 mm (2.5 inch)	28 mm (1.1 inch)

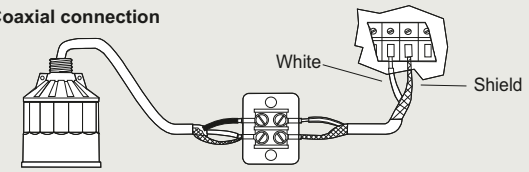
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Circuit diagrams

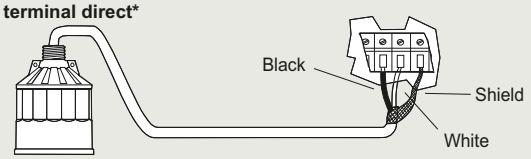
Direct connection



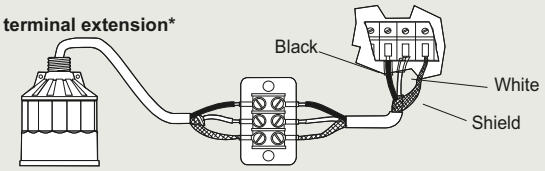
Coaxial connection



3 terminal direct*



3 terminal extension*



* For SITRANS LT500

Mounting
Make particularly sure that the radiating face of the transducer is protected from damage. Mount the transducer so that it is above the maximum material level by at least the blanking value. On liquid applications, the transducer must be mounted so that the axis of transmission is perpendicular to the liquid surface. On solids applications, an Easy Aimer should be used to facilitate aiming the transducer. Consider the optional temperature sensor when mounting the transducer.

Interconnection
Do not route cable openly or near high voltage or current runs, contactors and SCR control drives. For optimum isolation against electrical noise, run cable separately in a grounded metal conduit. Seal all thread connections to prevent ingress of moisture.

XPS ultrasonic transducer connections

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Overview

Accessories for ultrasonic transducers

- EA aiming devices
- FMS mounting brackets
- TS-3 temperature sensor

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Application

EA 304 aiming device

The Easy Aimer 304 flange is a stainless steel aiming device for alignment of Siemens level sensors used for level measurement of bulk solids.

The sensor must be mounted aimed towards the low level draw point in the silo. The sensor can be rotated through 360° and angled at 0 to 27° off vertical. It must be mounted using an access plate with welded studs or a flange in order to isolate the mounting holes from the pressurized environment. When installed properly, the EA 304 aiming device is capable of withstanding pressures up to 0.5 bar (Europe) or 15 psi (North America). It can even be used in corrosive and aggressive environments.

EA 2 aiming device

The Easy Aimer 2 flange is a cast aluminum aiming device for alignment of Siemens level sensors.

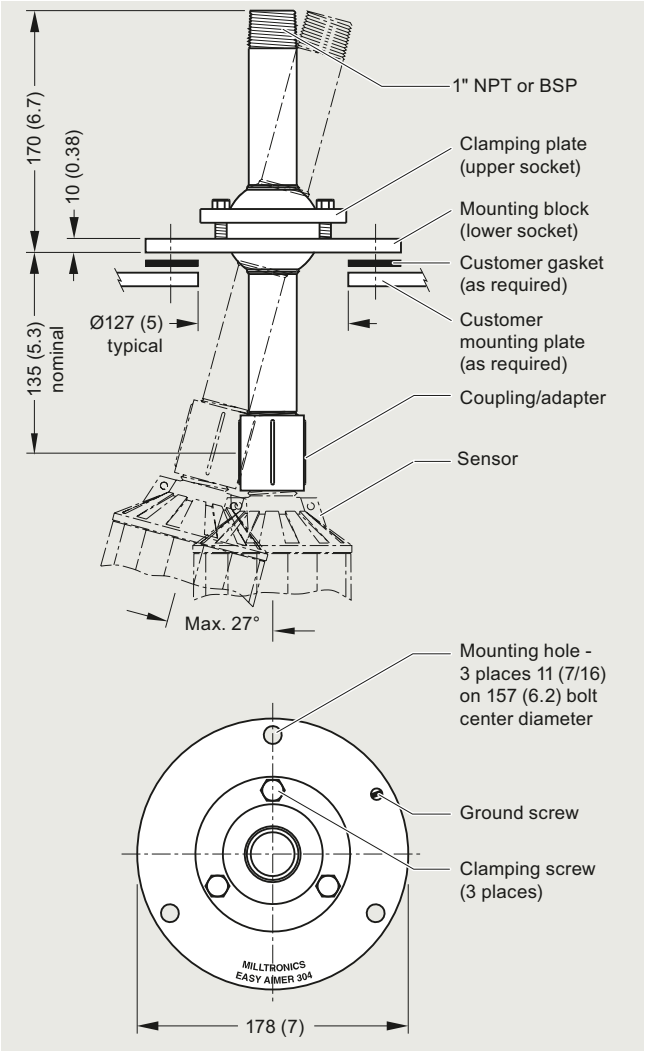
The flange has graduated adjustments and an adjustable insertion length. When used for applications with bulk solids, the sensor is mounted so that it is aimed towards the lower level draw point in the silo. The sensor can be rotated through 360° and angled at 0 to 20° off vertical. It must be mounted using an access plate with welded studs or a flange in order to isolate the mounting holes from the pressurized environment. When installed properly, the EA 2 aiming device is capable of withstanding pressures up to 0.5 bar (Europe) or 15 psi (North America). It can even be used in corrosive and aggressive environments.

Selection and ordering data

Easy Aimer Used on solids applications to aim level sensors for optimal performance. Available in a 304 stainless steel model, or a cast aluminum model.	Article No.
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Easy Aimer 2, aluminum, BSPT conduit	**7ML1830-1AL**
Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling[1)]	**7ML1830-1AN**
Easy Aimer 2, aluminum, NPT with 1" galvanized coupling	**7ML1830-1AP**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 304, BSPT conduit	**7ML1830-1AS**
Easy Aimer 304, NPT with 1½" stainless steel coupling[1)]	**7ML1830-1AT**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

[1)] For use with XPS-30 transducers only.

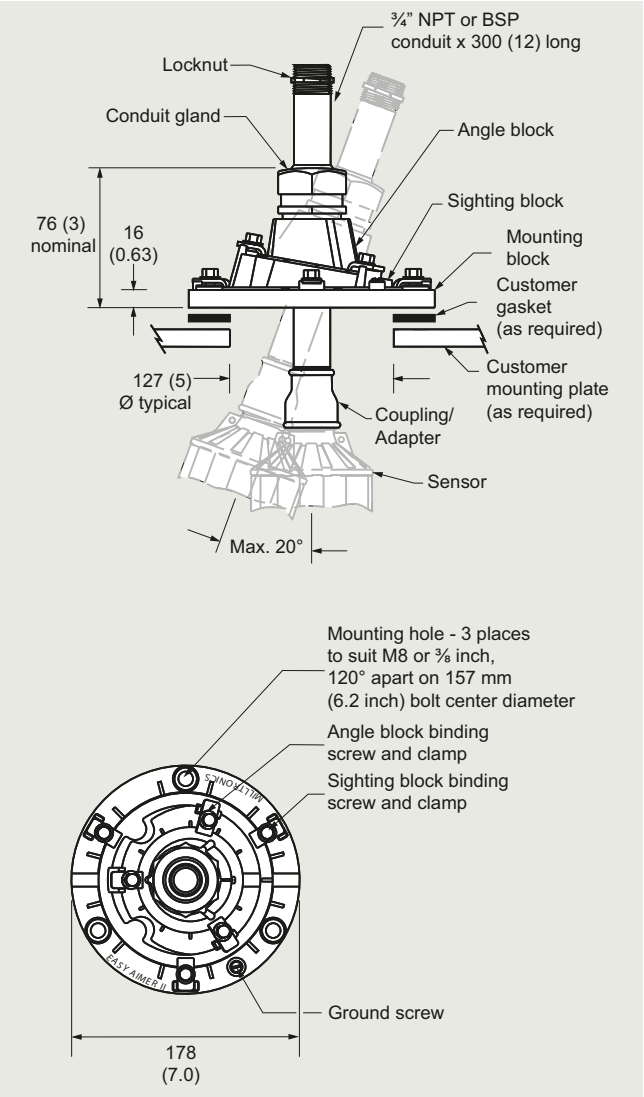
Dimensional drawings



EA 304 aiming device, dimensions in mm (inch)

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Dimensional drawings (continued)



EA 2 aiming device, dimensions in mm (inch)

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Application

Siemens mounting brackets permit simple, fast installation of ultrasonic transducers. These rugged, high quality mounting brackets are constructed of 304 (1.4301) stainless steel and are suitable for use indoors and outdoors. They adjust to fit almost any application, saving you the time and expense of building custom brackets. Each kit includes all mounting parts.

FMS-200
universal box bracket system

Mounting of units with 1 inch or 2 inch threaded connection.

Distance from sensor to wall or beam: 20 ... 31 cm (8 ... 12 inch).

The unique box design also acts as a sun shield for transducers with 1 inch threaded connections.

FMS-210
wall mounting set

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to wall or beam: 12 ... 48 cm (5 ... 19 inch).

FMS-220
extended wall mounting set

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to wall or beam: 32 ... 98 cm (13 ... 39 inch).

FMS-310
floor mounting set

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch).

Distance from mounting support: 5 ... 57 cm (2 ... 22 inch).

FMS-320
extended floor mounting set

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch).

Distance from mounting support: 41 ... 108 cm (16 ... 43 inch).

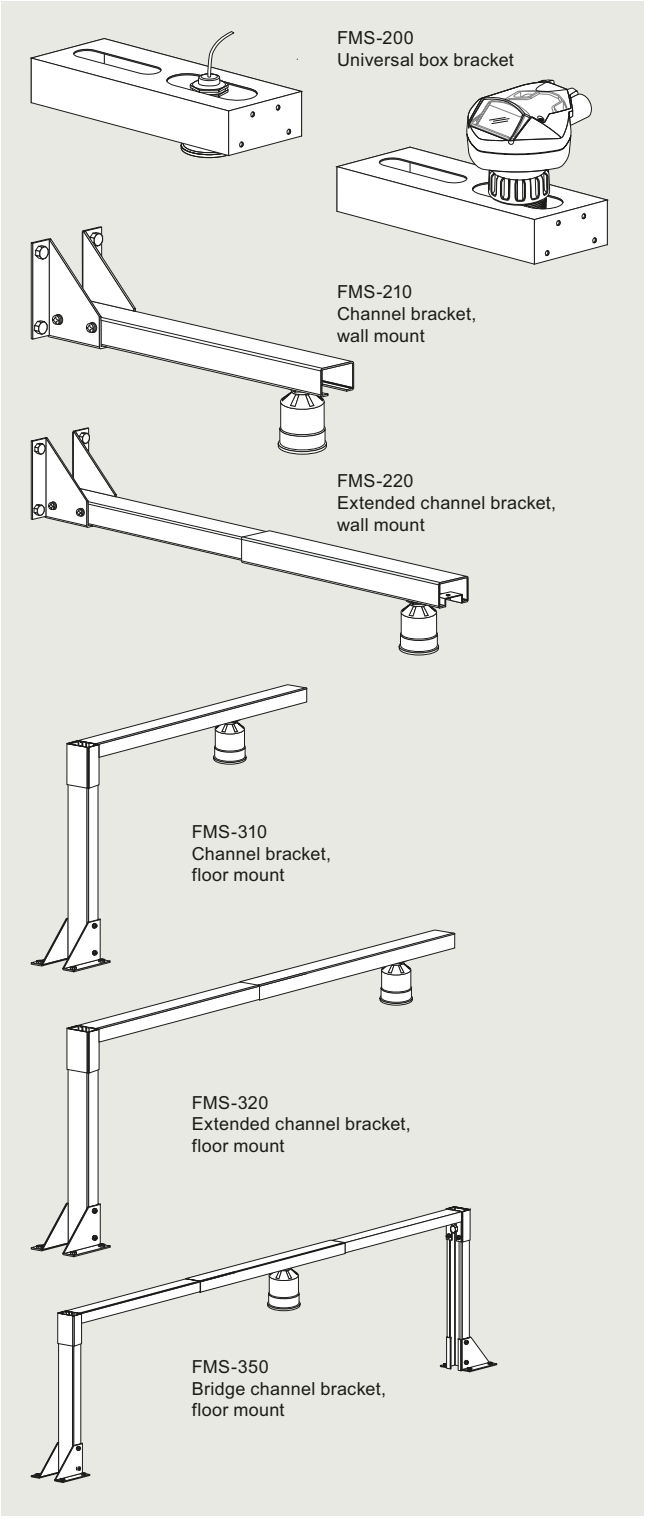
FMS-350
floor mounting set, bridge

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch), anywhere along the complete width of the bridge [166 cm (65 inch)].

This kit is particularly suitable for measurements on open channels (OCM) by providing a very stable mount for the transducer above a flume or weir.

Integration



FMS mounting brackets

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Selection and ordering data

Selection and Ordering data	Article No.
Mounting brackets for XPS-10 sensors	
FMS-200 universal box bracket set	**7ML1830-1BK**
FMS-210 wall mounting set	**7ML1830-1BL**
FMS-220 extended wall mounting set	**7ML1830-1BM**
FMS-310 floor mounting set	**7ML1830-1BN**
FMS-320 extended floor mounting set	**7ML1830-1BP**
FMS-350 floor mounting set, bridge	**7ML1830-1BQ**
Additional Operating Instructions	
FMS-200	**7ML1998BK61**
FMS-210	**7ML19985BL61**
FMS-220	**7ML19985BM61**
FMS-310	**7ML19985BN61**
FMS-320	**7ML19985BP61**
FMS-350 Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	**7ML19985BQ61**

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Overview



The TS-3 temperature sensor provides an input signal for temperature compensation of specific Siemens ultrasonic level controllers.

Benefits

- Chemically resistant ETFE enclosure
- Fast response time
- Approved for use in potentially explosive atmospheres

Application

Temperature compensation is essential in applications where temperature variations of the sound medium are expected.

By installing the temperature sensor close to the sound path of the associated ultrasonic transducer, a signal representative of the sound medium's ambient temperature is obtained. The temperature sensor should not be mounted in direct sunlight.

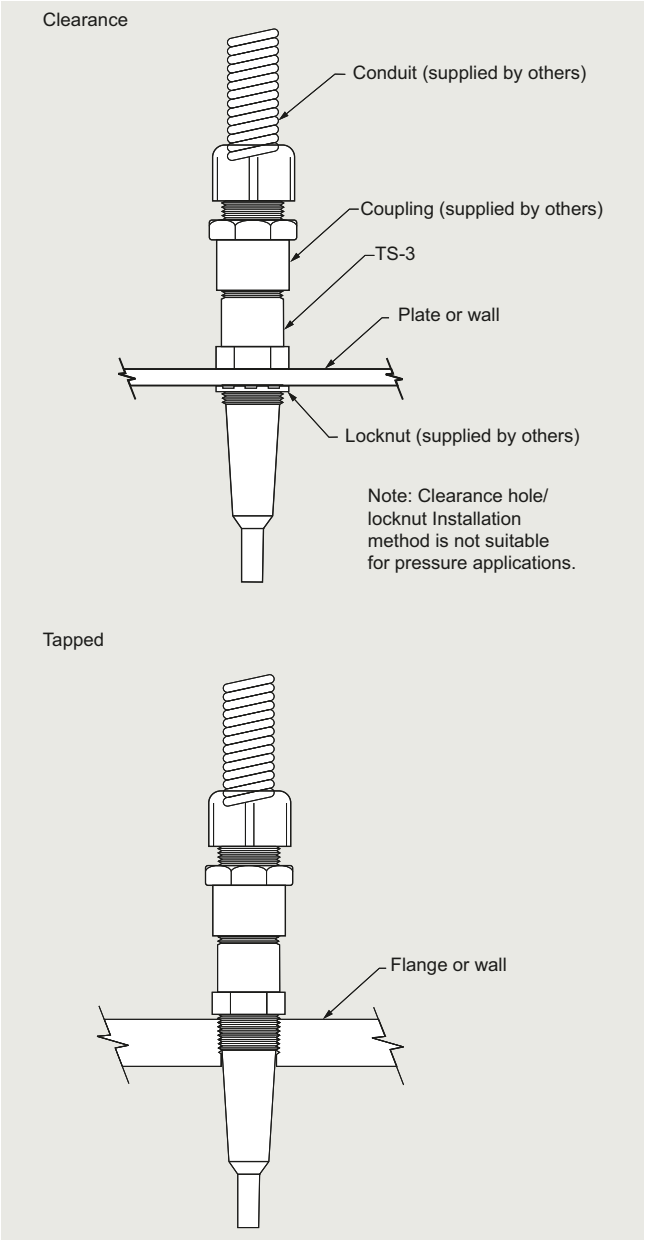
The TS-3 is used in conjunction with ultrasonic transducers that do not have an integral temperature sensor. It is also recommended in cases where the integral temperature sensor of the transducer cannot be used.

The following conditions are typical for use of the TS-3 sensor: where a fast reaction to temperature variations is required, where a flanged ultrasonic transducer is used, or where high temperatures are encountered.

The TS-3 is not compatible with devices using the TS-2 or LTS-1 temperature sensors. Refer to the associated controller manual for more details.

- Key Applications: for use in applications where temperature sensor measurement from transducer does not accurately represent vessel temperature. Used for applications requiring quick temperature response (open channel monitoring).

Design



TS-3 temperature sensor

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Selection and ordering data

TS-3 Temperature sensor Continuous, non-contact, sensor for use with ultrasonic level controllers.	Article No. 7ML1813-	●	●	B	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Cable length					
1 m (3.28 ft)		1			
5 m (16.40 ft)		2			
10 m (32.81 ft)		3			
30 m (98.43 ft)		4			
50 m (164.04 ft)		5			
70 m (229.66 ft)		6			
90 m (295.28 ft)		7			
Process connection					
¾" NPT [(Taper), ASME B1.20.1]			A		
R ¾" [(BSPT), EN 10226]			B		
Approvals					
CSA Class I, Div. 1, Groups A, B, C, D, T3C; CSA Class II, Div. 1, Groups E, F, G, T3C; CSA Class III; FM Class I, Div. 1, Groups C, D, T3C; FM Class II, Div. 1, Groups E, F, G, T3C; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372;						3
ATEX II 2 G Ex mb IIC T4 Gb, Ta = -40 °C to +100 °C; IECEx SIR 13.0010X Ex mb IIC T4 Gb, Ta = -40 °C to +100 °C; EAC Ex 1Ex mb IIC T4 Gb X; NSF/ANSI/CAN 61, NSF/ANSI/CAN 372; CE KC RCM						4

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
¾" NPT locknut, aluminum	**7ML1930-1BE**
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch) for fastening on sensors	**7ML1930-1BJ**

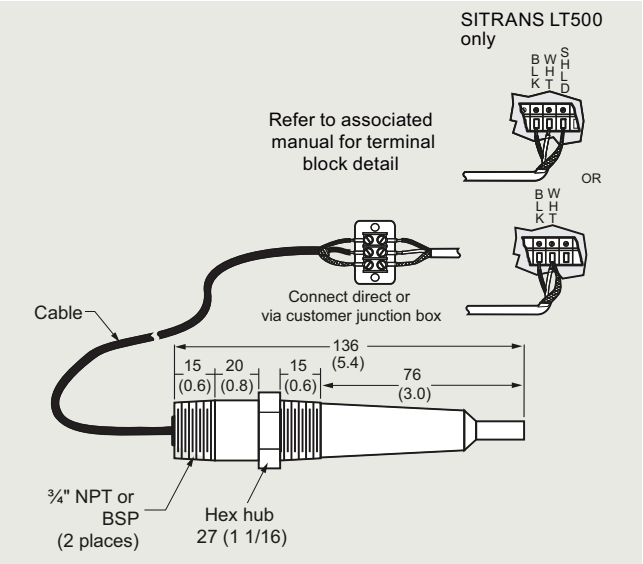
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Technical specifications

TS-3 temperature sensor	
Mode of operation	
Measuring principle	Temperature sensor IC
Input	
Measuring range	-40 ... +100 °C (-40 ... +212 °F)
Output	
Response time	
• Forced circulation (temperature variation: 63 %)	55 s
• Flange, forced circulation	90 s
• Natural convection	150 s
Rated operating conditions	
Installation instructions	Mounted indoors/outdoors, but not exposed to direct sunlight
Pressure	Max. 4 bar (60 psi/400 kPa)
Design	
Material (enclosure)	ETFE[1)]
Cable connection	2-conductor copper twisted pair, aluminum shielded, teflon insulated 0.5 mm² (20 AWG) silicon jacket • Max voltage 350 V RMS • Min bend radius 65 mm (2.5") • Diameter 6 mm (0.24") • Flame rating VW-1
Process connection	¾" NPT [(Taper), ASME B1.20.1] R ¾" [(BSPT), EN 10226], totally encapsulated
Certificates and approvals	CE, KC, RCM, ATEX, IECEx, CSA, FM, RoHS, China RoHS, WEEE, REACH, NSF/ANSI/CAN 61, Environmental Product Declaration (EPD), Kazakhstan Metrology
Production and development certification	• ISO 9001 • ISO 14001 • ISO 18001 • ISO 45001 • IEC 62443-4-1 • EN ISO/IEC 80079-34 • PED 2014/68/EU

1) ETFE is a fluoropolymer inert to most chemicals. For exposure to specific environments, check the chemical compatibility charts before installing the TS-3 in your application.

Dimensional drawings



TS-3 temperature sensor, dimensions in mm (inch)

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Overview



SITRANS LR100 Series and SITRANS LR500 Series

Introduction to Radar level transmitters

Radar measurement technology is non-contacting and low maintenance. Because microwaves require no carrier medium, they are virtually unaffected by the process atmosphere (vapor, pressure, dust, or temperature extremes). Siemens offers a variety of models to meet the specific needs of your application.

SITRANS LR100
- Compact design, 2-wire loop-powered, 80 GHz radar
- **Application:** continuous level measurement of liquids and slurries
- **Remote configuration:** Bluetooth for easy setup with SITRANS mobile IQ
- **Range:** 8 m (26 ft)
- **Cable connection:** 8 m (26 ft)



SITRANS LR110
- Compact design, 2-wire loop-powered, 80 GHz radar
- **Application:** continuous level measurement of liquids, slurries, and solids
- **Remote configuration:** Bluetooth for easy setup with SITRANS mobile IQ
- **Range:** 15 m (49.2 ft)
- **Communication:** HART
- **Approvals:** for hazardous areas



SITRANS LR120
- Compact design, 2-wire loop-powered, 80 GHz radar
- Submergence sheild accessory for flooding protection
- **Application:** continuous level measurement of liquids and solids
- **Remote configuration:** Bluetooth for easy setup with SITRANS mobile IQ
- **Range:** 30 m (98.4 ft)
- **Communication:** HART
- **Approvals:** for hazardous areas



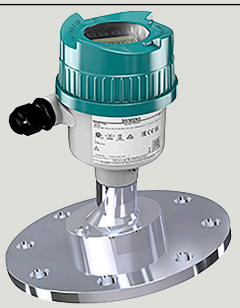
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Overview (continued)

SITRANS LR140 • Compact design, 2-wire loop-powered, 80 GHz radar • **Measurement:** continuous level measurement of liquids and slurries • **Remote configuration:** Bluetooth for easy setup with SITRANS mobile IQ • **Range:** 8 m (26 ft)	
SITRANS LR150 • Compact design, 2-wire loop-powered, 80 GHz radar • **Measurement:** continuous level measurement of liquids, slurries, and solids • **Remote configuration:** Bluetooth for easy setup with SITRANS mobile IQ • **Range:** 15 m (49.2 ft) • **Optional:** HMI, push button programming • **Communication:** HART	
SITRANS LR510 • Threaded lens antenna, 80 GHz radar • **Measurement:** continuous level measurement of liquids and slurries • **Remote configuration:** optional Bluetooth module for seamless connection to SITRANS mobile IQ • **Range:** 30 m (98 ft), depending on antenna type	
SITRANS LR530 • Flange encapsulated antenna, 80 GHz radar • **Measurement:** continuous monitoring of liquids and slurries • **Remote configuration:** optional Bluetooth module for seamless connection to SITRANS mobile IQ • **Range:** 120 m (394 ft), depending on antenna type	

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Overview (continued)

SITRANS LR550 • Polymeric-horn antenna, 80 GHz radar • **Measurement:** continuous monitoring of solids and liquids • **Remote configuration:** optional Bluetooth module for seamless connection to SITRANS mobile IQ • **Range:** 120 m (394 ft)	
SITRANS LR580 • Lens antenna, 80 GHz radar • **Measurement:** continuous monitoring of solids and liquids • **Remote configuration:** optional Bluetooth module for seamless connection to SITRANS mobile IQ • **Range:** 120 m (394 ft)	

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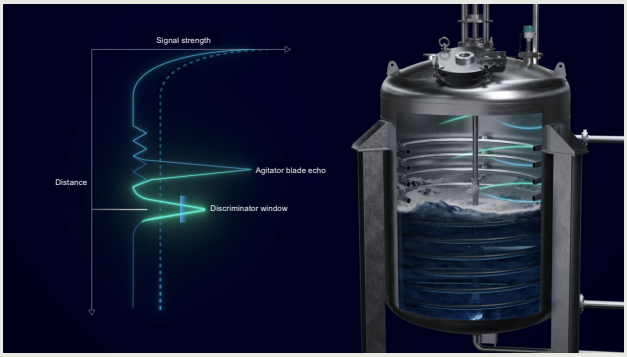
Mode of operation

Principle of Operation

Radar measurement technology measures the time of flight from the transmitted signal to the return signal. From this time, distance measurement and level are determined.

Unlike ultrasonic measurement, radar technology does not require a carrier medium and travels at the speed of light (300 000 000 m/s).

FMCW (Frequency Modulated Continuous Wave) radar devices send microwaves to the surface of the material. The wave frequency is modulated continuously. At the same time, the receiver is also receiving continuously and the difference in frequency between the transmitter and the receiver is directly proportional to the distance to the material.



Radar operation in a reactor vessel

Auto False-Echo Suppression

SITRANS LR instruments offer the unique advantage of Process Intelligence signal processing technology. This in-depth knowledge and experience is built into the software's advanced algorithms to provide intelligent processing of echo profiles. The result is repeatable, fast and reliable measurement.

A special feature of SITRANS radar devices is Auto False-Echo Suppression, an echo processing technique that automatically detects and suppresses false echoes from vessel obstructions. You can implement this feature using two parameters on the local interface, SIMATIC PDM, or SITRANS mobile IQ app.

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Overview



SITRANS LR100 is a 2 wire loop powered radar transmitter for continuous level measurement of liquids and slurries to a range of 10 m (32.8 ft).

Benefits

- Bluetooth connectivity for easy setup with SITRANS mobile IQ
- Chemically resistant PVDF enclosure
- W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications
- Approved for open air applications outside of a tank
- Compact design fits in limited space installations

Application

SITRANS LR100 is a W band FMCW radar level transmitter, packaged in a hermetically sealed PVDF enclosure for years of trouble-free reliable measurement service.

4 to 20 mA loop powered, it provides accurate level measurement to ranges of 10 m (32.8 ft). Measurement is possible non-intrusively through plastic vessel tops for easy installation. Programming is convenient using the Bluetooth connection and SITRANS mobile IQ application on your smart device.

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Selection and ordering data

SITRANS LR100 Radar level transmitter Continuous, non-contact, 10 m (32.8 ft) range, for liquids and slurries, 8 m (26 ft) integrated cable connection.	Article No. 7ML530	7 - 1 A ● 0 6 - 0 A A 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process connection		
1-½" NPT [(Taper), ASME B1.20.1]/electrical connection 1" NPT		A
R 1-½" [(BSPT), EN 10226]/electrical connection 1" BSPT		B
G 1-½" [(BSPP), EN ISO 228-1]/electrical connection 1" BSPT		C

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Bracket, 316L stainless steel,1 inch mount, 80 mm (3.1 inch) offset	**A5E50507509**
Bracket, 316L stainless steel,1 inch mount, 200 mm (7.9 inch) offset	**A5E50507511**
Bracket, 316 L stainlsess steel, 1.5 inch mount, 80 mm (3.1 inch) offset	**A5E50507514**
Bracket, 316 L stainless steel, 1.5 inch mount, 200 mm (7.9 inch) offset	**A5E50507516**
FMS-200 universal box bracket, mounting kit	**7ML1830-1BK**
FMS-210 channel bracket, wall mount	**7ML1830-1BL**
FMS-220 extended channel bracket, wall mount	**7ML1830-1BM**
FMS-310 channel bracket, floor mount	**7ML1830-1BN**
FMS-320 extended channel bracket, floor mount	**7ML1830-1BP**
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**

Accessories	Article No.
1" BSP locknut, plastic	**7ML1830-1DR**
1-½ BSP locknut, plastic	**7ML1830-1DP**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**
Polypropylene adapter flange, 2"/DN50, universal, 1.5" NPT	**A5E50868980**
Polypropylene adapter flange, 2"/DN50, universal, 1,5" BSPT	**A5E50868982**
Polypropylene adapter flange, 3"/DN80, universal, 1.5" NPT	**A5E50868988**
Polypropylene adapter flange, 3"/DN80, universal, 1,5" BSPT	**A5E50868998**
Polypropylene adapter flange, 4"/DN100, universal, 1.5" NPT	**A5E50869003**
Polypropylene adapter flange, 4"/DN100, universal, 1.5" BSPT	**A5E50869005**
Note: other polypropylene adapter flange sizes available via PVR request.	
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

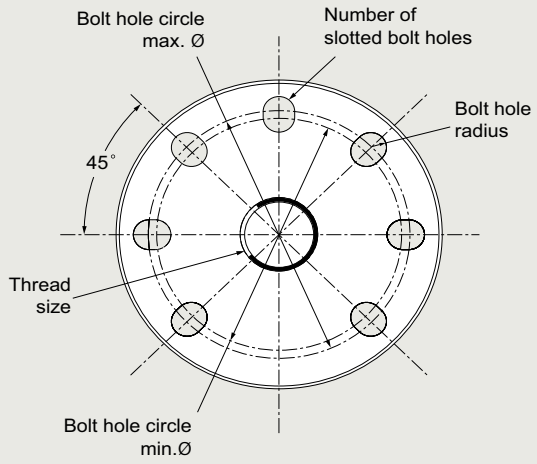
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Technical specifications

SITRANS LR100	
Mode of operation	
Measuring principle	W band FMCW radar
Measuring range	0 ... 10 m (0 ... 32.8 ft)
Frequency	80 GHz nominal
Beam angle	8°
Power Supply	
Voltage	12 ... 35 V DC
Current	4 ... 20 mA
Accuracy	± 5 mm
Rated operating conditions	
Vessel pressure	-1 ... +3 bar (14.50 ... 43.51 psi g)
Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
Process temperature	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Design	
Weight	0.5 kg (1.1 lb), plus 0.1 kg/m (0.2 lb/ft) cable length
Material (enclosure)	PVDF
Process connection	1-½" NPT, 1-½" BSPT, or 1-½" BSPP
Degree of protection	Type 4X/6P, IP66/68
Cable connection	• 8 m (26 ft) long, 2 conductor, twisted with shield 18 AWG, PVC jacket • 1" NPT or 1" BSPT threaded connection
Certificates and approvals	
General	CE, $_{C}$FM$_{US}$, $_{C}$CSA$_{US}$, RCM, EAC
Radio	CE, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC
Canadian Registration Number (CRN)	
• British Columbia	0F22218.51
• Alberta	0F20596.2
• Saskatchewan	0F2002.3
• Manitoba	0F7032.4
• Ontario	0F22218.5
• Quebec	0F05183.6
• New Brunswick	0F1490.07
• Nova Scotia	0F1490.08
• Prince Edward Island	0F1490.09
• Newfoundland and Labrador	0F1490.0
• Yukon	0F1490.0Y
• Northwest Territories	0F1490.0T
• Nunavut	0F1490.0N
Programming	
SITRANS mobile IQ App	SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up and monitor SITRANS LR100 series. For more information: http://www.siemens.com/mobileIQ

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Options

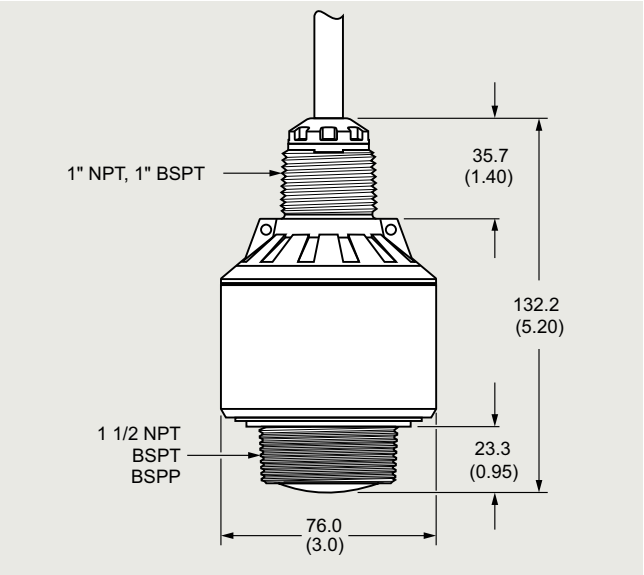


Part number	Adapter flange size	OD ± 1	B.C.D. max. for slotted holes (bmax.) ± 0.75	B.C.D. min. for slotted holes (bmin.) ± 0.75	Bolt hole radius ± 0.25	Number of slotted holes	Thread size
A5E50868980 A5E50868982 A5E50868983	2"/DN50	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868988 A5E50868998 A5E50869002	3"/DN80	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

SITRANS LR100, Polypropylene adapter flange

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Dimensional drawings

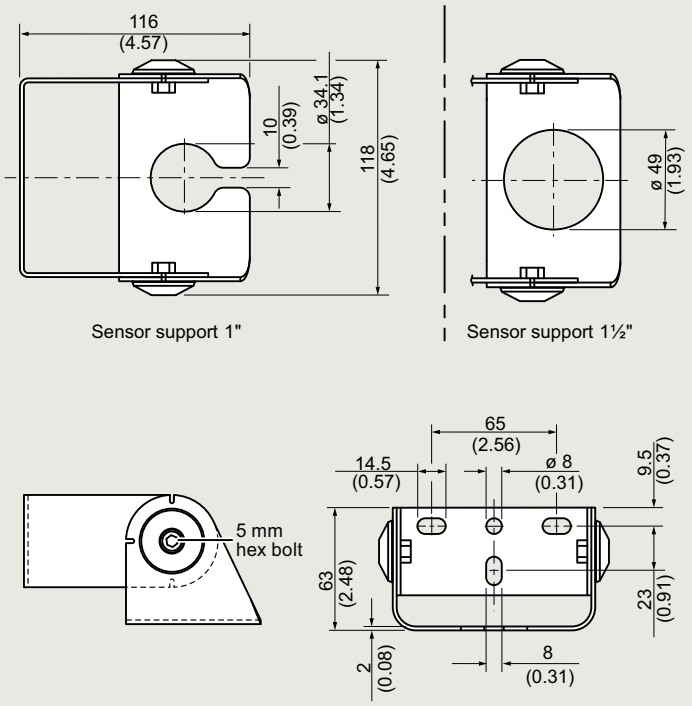


SITRANS LR100, dimensions in mm (inch)

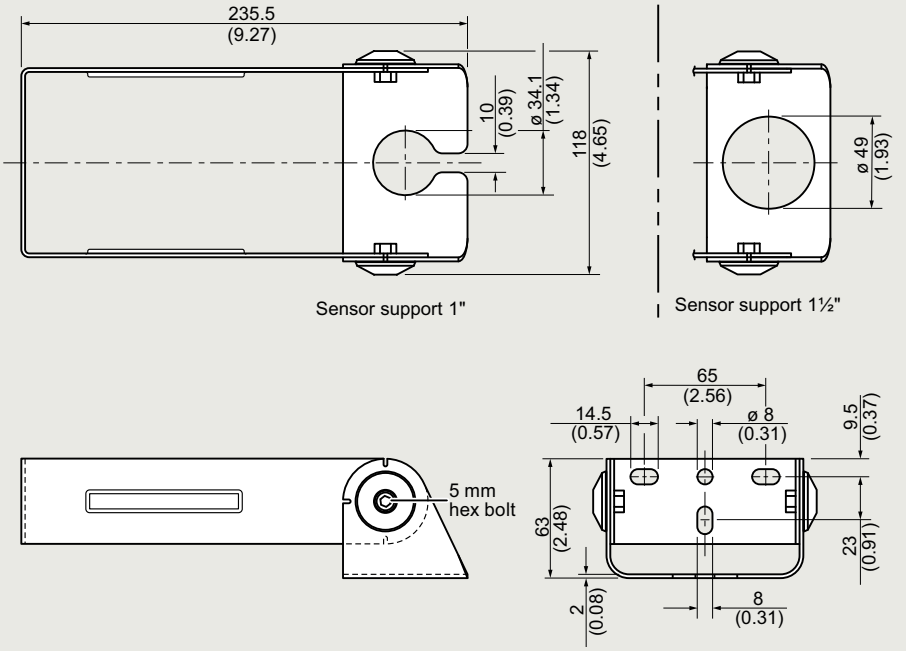
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Dimensional drawings (continued)

Mounting bracket, 80 mm



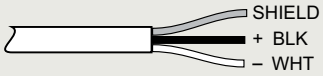
Mounting bracket, 200 mm



SITRANS LR100 mounting brackets, dimensions in mm (inch)

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Circuit diagrams



12 ... 35 V DC
4 ... 20 mA
Loop powered

SITRANS LR100 connections

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Overview



SITRANS LR110 is a compact radar transmitter for continuous level measurement of liquids, slurries, or solids to a range of 20 m (65.6 ft).

Benefits

- Bluetooth connectivity for easy setup with SITRANS mobile IQ.
- Chemically resistant PVDF enclosure.
- HART 7.0 or Modbus RTU communication for intelligent integration into your application.
- W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications.
- Approved for open air applications outside of a tank.
- 2 mm accuracy and zero near range distance yields optimum inventory management capability.
- Compact design fits in limited space installations.
- Hazardous area variants available for safe use in explosive gas or dust environments.

Application

SITRANS LR110 is a W band FMCW radar level transmitter, packaged in a hermetically sealed PVDF enclosure for years of trouble-free reliable measurement service.

4 to 20 mA loop powered with HART [optional 4-wire Modbus RTU], providing accurate level measurement to ranges of 20 m (65.6 ft). Measurement is possible non-intrusively through plastic vessel tops for easy installation. Programming is convenient using the Bluetooth connection and SITRANS mobile IQ application on your smart device.

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Selection and ordering data

SITRANS LR110 Radar level transmitter Continuous, non-contact, 20 m (65.6 ft) range, for liquids, slurries, or solids, integrated cable connection	Article No. 7ML531	● -	●	●	●	0	6	-	0	●	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.												
Communications												
HART (4 ... 20 mA)		0										
Modbus RTU[4)6)]		3										
Bluetooth function												
Without			0									
With			1									
Cable length												
5 m				A								
10 m				B								
30 m				C								
50 m				D								
100 m				E								
Process connection												
1-½" NPT [(Taper), ASME B1.20.1]/electrical connection 1" NPT					A							
R 1-½" [(BSPT), EN 10226]/electrical connection 1" BSPT					B							
G 1-½" [(BSPP), EN ISO 228-1]/electrical connection 1" BSPT					C							
Type of protection												
Ordinary Locations/General Purpose (Non-Ex), CE, $_{C}FM_{US}$, $_{C}CSA_{US}$, RCM[2)]										A		
ATEX II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb, ATEX II 1 D, 1/2 D Ex ia IIIC T134°C Da, Da/Db; Gas Ex-Zone 0/Class 1, Div. 1; Dust Ex-Zone 20, 21, Class II & III Div. 1[1)]										B		
ATEX II 2G Ex ib mb IIC T4 Gb; ATEX II 1D, 1/2D Ex ta, ta/tb IIIC T200 121 °C Da, Da/Db, ATEX II 2D Ex tb IIIC T200 134 °C Db; ATEX II 1D, 1/2D Ex ta, ta/tb IIIC T200 142 °C Da, Da/Db, ATEX II 2D Ex tb IIIC T200 155 °C Db; Zone 1, 1/2, Zone 20, 21, 22, (Class I, Div. 2), Class II & III, Div. 1[1)3)]										G		

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**
Inspection certificate 3.1 (EN 10204) - device with test data	**C25**
$_{C}FM_{US}$, $_{C}CSA_{US}$, ATEX, IECEx	**E49**
INMETRO, IA MASC	**E25**
NEPSI, CCOE	**E27**
ATEX, IECEx	**E47**
CSA-Japan-Ex	**E29**
EACEx[5)]	**E24**
WHG and VLAREM II	**E61**
NSF 61 Drinking Water and FDA, EG1935/2004	**E84**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**

Accessories	Article No.
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Bracket, 316L Stainless steel,1 inch mount, 80 mm (3.1 inch) offset	**A5E50507509**
Bracket, 316L Stainless steel, 1 inch mount, 200 mm (7.9 inch) offset	**A5E50507511**
Bracket, 316L Stainless steel, 1.5 inch mount, 80 mm (3.1 inch) offset	**A5E50507514**
Bracket, 316L Stainless steel, 1.5 inch mount, 200 mm (7.9 inch) offset	**A5E50507516**
FMS-200 universal box bracket, mounting kit	**7ML1830-1BK**
FMS-210 channel bracket, wall mount	**7ML1830-1BL**
FMS-220 extended channel bracket, wall mount	**7ML1830-1BM**
FMS-310 channel bracket, floor mount	**7ML1830-1BN**
FMS-320 extended channel bracket, floor mount	**7ML1830-1BP**
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**
1-½" BSP locknut, plastic	**7ML1830-1DP**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**
Polypropylene adapter flange, 2"/DN50, universal, 1.5" NPT	**A5E50868980**
Polypropylene adapter flange, 2"/DN50, universal, 1,5" BSPT	**A5E50868982**

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Selection and ordering data (continued)

Accessories	Article No.
Polypropylene adapter flange, 3"/DN80, universal, 1.5" NPT	**A5E50868988**
Polypropylene adapter flange, 3"/DN80, universal, 1,5" BSPT	**A5E50868998**
Polypropylene adapter flange, 4"/DN100, universal, 1.5" NPT	**A5E50869003**
Polypropylene adapter flange, 4"/DN100, universal, 1.5" BSPT	**A5E50869005**
Note: other polypropylene adapter flange sizes available via PVR request.	
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
HART modem with USB interface	**7MF4997-1DC**
Intrinsically Safe barrier	**7NG4124-1AA00**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**

Accessories	Article No.
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.	**7ML60..-.....-....**
For applicable back up point level switch - see point level measurement section	

1) Must be ordered in combination with order codes E49, E25, E27, E47, E29, or E24.
2) Not available in combination with order codes E49, E25, E27, E47, E29, or E24.
3) When ordered in combination with NPT thread types, this option is available with any order code. When ordered in combination with BSPP or BSPT thread types, this option is only available with order codes E49, E25, E27, E47, E29.
4) Available only with Type of protection options A and G.
5) Available only with Type of protection option B.
6) Available only with Bluetooth option 1.

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Technical specifications

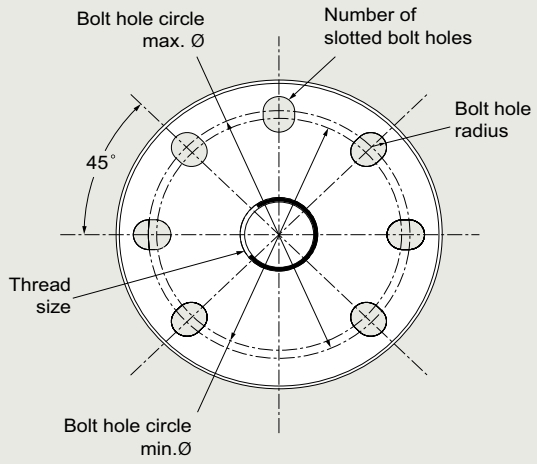
SITRANS LR110	
Mode of operation	
Measuring principle	W band FMCW radar
Measuring range	0 ... 20 m (0 ... 65.6 ft)
Frequency	80 GHz nominal
Beam angle	8°
Power Supply	
HART	
• Voltage	12 ... 35 V DC
• Current	4 ... 20 mA
Modbus	
• Voltage	8 ... 30 V DC
• Current	38 mA at 8 V DC/17 mA at 30 V DC
Communications	
4 ... 20 mA	HART 7.0
Modbus (4-wire option)	RTU
Accuracy	± 2 mm (range 0.25 ... 20 m) ± 10 mm (range 0 ... 0.25 m)
Rated operating conditions	
Vessel pressure	-1 ... +3 bar (14.50 ... 43.51 psi g)
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Process temperature	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Minimum dielectric of the medium	1.6
Design	
Weight	0.5 kg (1.1 lb), plus 0.1 kg/m (0.2 lb/ft) cable length
Material (enclosure)	PVDF
Process connection	1-½" NPT, 1-½" BSPT or 1-½" BSPP
Degree of protection	Type 4X/6P, IP66/68
Cable connection	1" NPT or 1" BSPT threaded connection
• HART	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 2 conductor, twisted with shield 18 AWG, PVC jacket
• Modbus version	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 4 conductor, twisted pairs, 22 AWG, polyurethane jacket
Certificates and approvals	
	CE, $_{C}$FM$_{US}$, $_{C}$CSA$_{US}$, ATEX, IECEx, EACEx, CSA-Japan-Ex, RCM, INMETRO, NEPSI, CCOE, PESO, FDA, Reg. (EC) No. 1935/2004
Radio	CE, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC
Marine	CCS, RINA, ClassNK, ABS, DNV, LR, BV
Water monitoring, flow	MCERTS Class 1
Canadian Registration Number (CRN)	
• British Columbia	0F22218.51
• Alberta	0F20596.2
• Saskatchewan	0F2002.3
• Manitoba	0F7032.4
• Ontario	0F22218.5
• Quebec	0F05183.6
• New Brunswick	0F1490.07
• Nova Scotia	0F1490.08
• Prince Edward Island	0F1490.09
• Newfoundland and Labrador	0F1490.0
• Yukon	0F1490.0Y
• Northwest Territories	0F1490.0T
• Nunavut	0F1490.0N
Programming	
SITRANS mobile IQ App	SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up and monitor SITRANS LR100 series. For more information: http://www.siemens.com/mobileIQ

Technical specifications (continued)

SITRANS LR110	
SIMATIC PDM	SIMATIC PDM allows for remote PC configuration and diagnostics (for installation on a network).
SITRANS DTM	

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Options

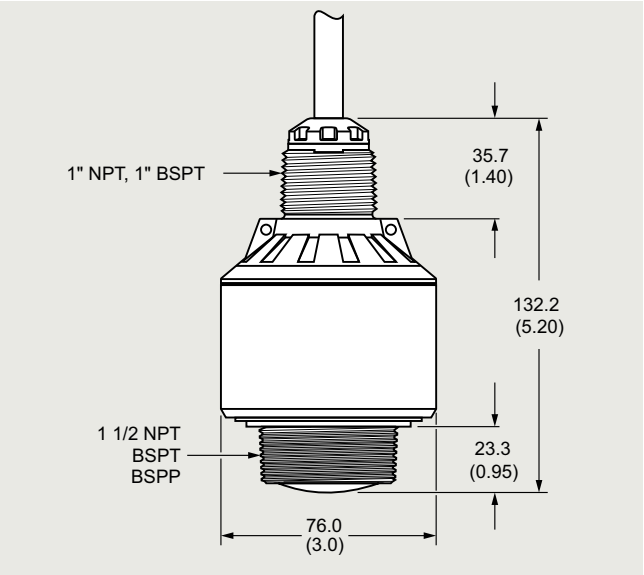


Part number	Adapter flange size	OD ± 1	B.C.D. max. for slotted holes (bmax.) ± 0.75	B.C.D. min. for slotted holes (bmin.) ± 0.75	Bolt hole radius ± 0.25	Number of slotted holes	Thread size
A5E50868980 A5E50868982 A5E50868983	2"/DN50	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868988 A5E50868998 A5E50869002	3"/DN80	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

SITRANS LR110, Polypropylene adapter flange

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Dimensional drawings

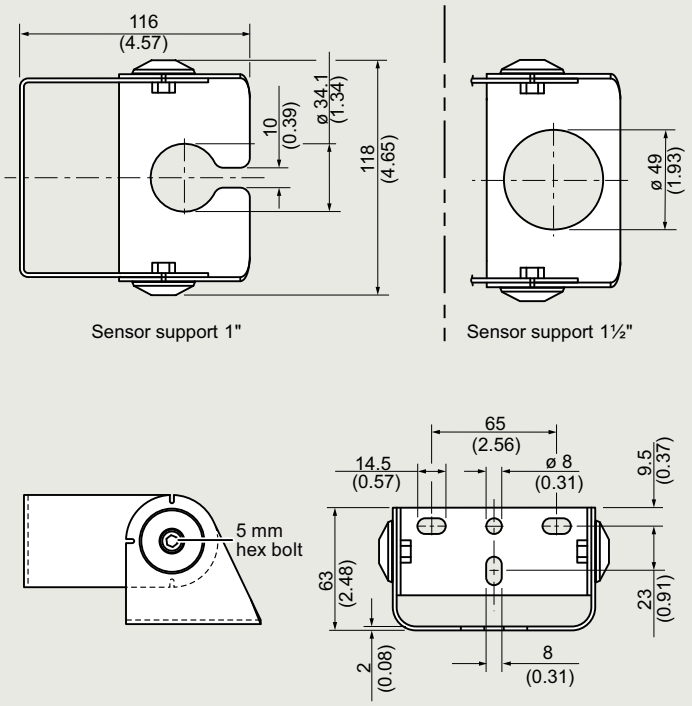


SITRANS LR110, dimensions in mm (inch)

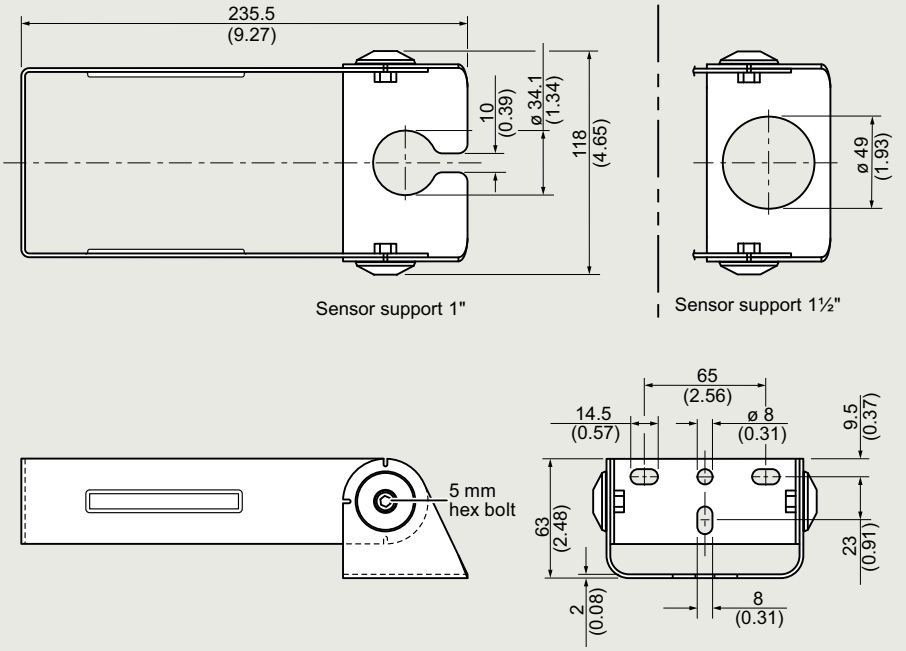
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Dimensional drawings (continued)

Mounting bracket, 80 mm



Mounting bracket, 200 mm

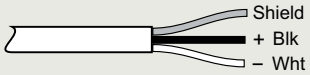


SITRANS LR110 mounting brackets, dimensions in mm (inch)

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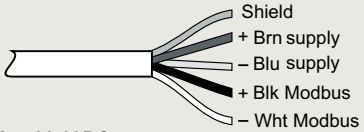
Circuit diagrams

HART



12 ... 35 V DC
4 ... 20 mA
Loop powered

Modbus



8 ... 30 V DC
30 mA at 8 V DC/
17 mA at 30 V DC
Modbus RTU

SITRANS LR110 connections

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Overview



SITRANS LR120 is a compact radar transmitter for continuous level measurement of liquids and solids to a range of 30 m (98.4 ft).

Benefits

- Bluetooth connectivity for easy setup with SITRANS mobile IQ.
- Chemically resistant PVDF enclosure.
- HART 7.0 or Modbus RTU communication for intelligent integration into your application.
- W band FMCW radar yields narrow beam with small antenna for superior performance in applications with obstructions.
- Approved for open air applications outside of a tank.
- 2 mm accuracy and zero near range distance yields optimum inventory management capability.
- Submergence shield accessory prevents build up on sensor during flooding conditions.
- Hazardous area variants available for safe use in explosive gas or dust environments.

Application

SITRANS LR120 is a W band FMCW radar level transmitter, packaged in a hermetically sealed PVDF enclosure for years of trouble-free reliable measurement service.

4 to 20 mA loop powered with HART [optional 4-wire Modbus RTU], providing accurate level measurement to ranges of 30 m (98.4 ft). Its long range, narrow beam make LR120 suitable for wet wells with obstructions or solids level measurement, for example aggregates or plastic pellets. Programming is convenient using the Bluetooth connection and SITRANS mobile IQ application on your smart device.

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Selection and ordering data

SITRANS LR120 Radar level transmitter Continuous, non-contact, 30 m (98.4 ft) range, for liquids, slurries, and solids, integrated cable connection	Article No. 7ML532	● - ● ● A 0 6 - 0 ● ● 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Communications		
HART (4 ... 20 mA)		0
Modbus RTU[4)6)]		3
Bluetooth function		
Without		0
With		1
Cable length		
5 m		A
10 m		B
30 m		C
50 m		D
100 m		E
Type of protection		
Ordinary Locations/General Purpose (Non-Ex), $_{C}FM_{US}$, $_{C}CSA_{US}$, CE, RCM [2)]		A
ATEX II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb, ATEX II 1 D, 1/2 D Ex ia IIIC T134 °C Da, Da/Db; Gas Ex-Zone 0/Class 1, Div. 1; Dust Ex-Zone 20, 21, Class II & III Div. 1[1)]		B
ATEX II 2G Ex ib mb IIC T4 Gb; ATEX II 1D, 1/2D Ex ta, ta/tb IIIC T200 121 °C Da, Da/Db, ATEX II 2D Ex tb IIIC T200 134 °C Db; ATEX II 1D, 1/2D Ex ta, ta/tb IIIC T200 142 °C Da, Da/Db, ATEX II 2D Ex tb IIIC T200 155 °C Db; Zone 1, 1/2, Zone 20, 21, 22, (Class I, Div. 2), Class II & III, Div. 1[1)3)]		G
Electrical connection of the cable entry		
1" BSPT		H
1" NPT		P

Selection and ordering data	Order Code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**
Inspection certificate 3.1 (EN 10204) - device with test data	**C25**
$_{C}FM_{US}$, $_{C}CSA_{US}$, ATEX, IECEx	**E49**
INMETRO, IA MASC	**E25**
NEPSI, CCOE	**E27**
ATEX, IECEx	**E47**
CSA-Japan-Ex	**E29**
EACEx[5)]	**E24**
WHG and VLAREM II	**E61**
NSF 61 Drinking Water and FDA, EG1935/2004	**E84**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Submergence shield kit	**A5E49069764**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**

Accessories	Article No.
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Bracket, 316L Stainless steel,1 inch mount, 80 mm (3.1 inch) offset	**A5E50507509**
Bracket, 316L Stainless steel, 1 inch mount, 200 mm (7.9 inch) offset	**A5E50507511**
Bracket, 316L Stainless steel, 1.5 inch mount, 80 mm (3.1 inch) offset	**A5E50507514**
Bracket, 316L Stainless steel, 1.5 inch mount, 200 mm (7.9 inch) offset	**A5E50507516**
FMS-200 universal box bracket, mounting kit	**7ML1830-1BK**
FMS-210 channel bracket, wall mount	**7ML1830-1BL**
FMS-220 extended channel bracket, wall mount	**7ML1830-1BM**
FMS-310 channel bracket, floor mount	**7ML1830-1BN**
FMS-320 extended channel bracket, floor mount	**7ML1830-1BP**
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**
Note: Polypropylene adapter flanges available via PVR request.	

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Selection and ordering data (continued)

Accessories	Article No.
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
HART modem with USB interface	**7MF4997-1DC**
Intrinsically Safe barrier	**7NG4124-1AA00**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**

Accessories	Article No.
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries. For applicable back up point level switch - see point level measurement section	**7ML60..-.....-....**

1) Must be ordered in combination with order codes E49, E25, E27, E47 E29, or E24.
2) Not available in combination with order codes E49, E25, E27, E47, E29, or E24
3) When ordered in combination with NPT thread types, this option is available with any order code. When ordered in combination with BSPP or BSPT thread types, this option is only available with order codes E49, E25, E27 or E47, E29
4) Available only with Type of protection options A and G.
5) Available only with Type of protection option B.
6) Available only with Bluetooth option 1.

Technical specifications

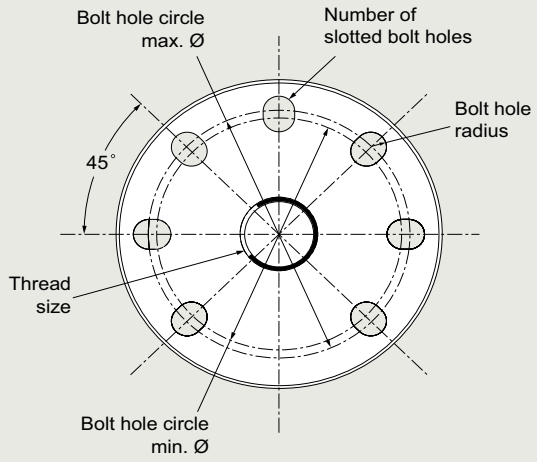
SITRANS LR120	
Mode of operation	
Measuring principle	W band FMCW radar
Measuring range	0 ... 30 m (0 ... 98.4 ft)
Frequency	80 GHz nominal
Beam angle	4°
Power Supply	
HART	
• Voltage	12 ... 35 V DC
• Current	4 ... 20 mA
Modbus	
• Voltage	8 ... 30 V DC
• Current	38 mA at 8 V DC/17 mA at 30 V DC
Communications	
4 ... 20 mA	HART 7.0
Modbus (4-wire option)	RTU
Accuracy	± 2 mm (range 0.25 ... 30 m), ± 10 mm (range 0 ... 0.25 m)
Rated operating conditions	
Vessel pressure	-1 ... +3 bar (14.50 ... 43.51 psi g)
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Process temperature	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Minimum dielectric of the medium	1.6
Design	
Weight	0.7 kg (1.5 lb), plus 0.1 kg/m (0.2 lb/ft) cable length
Material	
• Enclosure	PVDF
• Submergence shield	• Polypropylene • Silicone O-ring
Degree of protection	Type 4X/6P, IP66/68
Cable connection	1" NPT or 1" BSPT threaded connection
• HART	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 2 conductor, twisted with shield 18 AWG, PVC jacket
• Modbus version	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 4 conductor, twisted pairs, 22 AWG, polyurethane jacket
Certificates and approvals	
	CE, $_{c}FM_{US}$, $_{c}CSA_{US}$, ATEX, IECEx, EACEx, CSA-Japan-Ex, RCM, INMETRO, NEPSI, CCOE, PESO, FDA, Reg. (EC) No. 1935/2004
Radio	CE, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC

Technical specifications (continued)

SITRANS LR120	
Marine	ABS, CCS, DNV-GL, LR, NK, RINA
Canadian Registration Number (CRN)	
• British Columbia	0F22218.51
• Alberta	0F20596.2
• Saskatchewan	0F2002.3
• Manitoba	0F7032.4
• Ontario	0F22218.5
• Quebec	0F05183.6
• New Brunswick	0F1490.07
• Nova Scotia	0F1490.08
• Prince Edward Island	0F1490.09
• Newfoundland and Labrador	0F1490.0
• Yukon	0F1490.0Y
• Northwest Territories	0F1490.0T
• Nunavut	0F1490.0N
Programming	
SITRANS mobile IQ app	SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up and monitor SITRANS LR100 series. For more information: http://www.siemens.com/mobileIQ
SIMATIC PDM	SIMATIC PDM allows for remote PC configuration and diagnostics (for installation on a network).
SITRANS DTM	

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Options

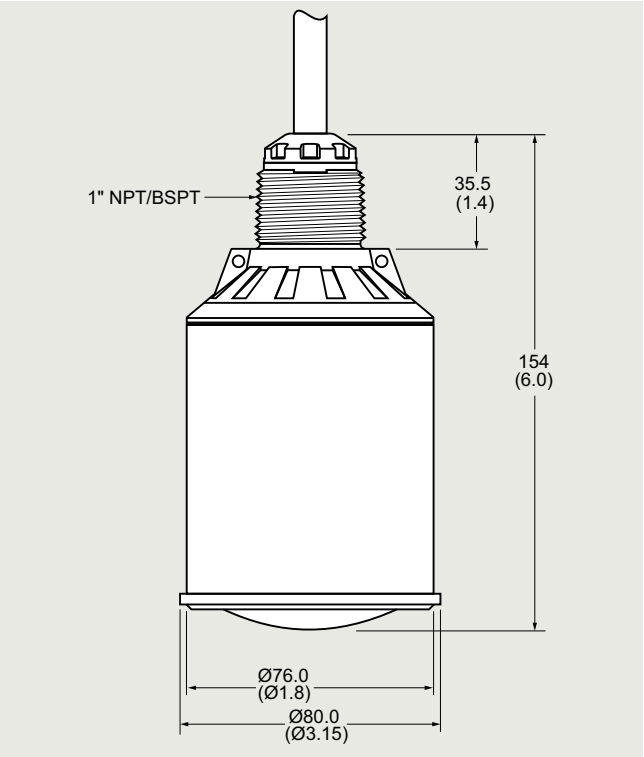


Part number	Adapter flange size	OD ± 1	B.C.D. max. for slotted holes (bmax.) ± 0.75	B.C.D. min. for slotted holes (bmin.) ± 0.75	Bolt hole radius ± 0.25	Number of slotted holes	Thread size
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

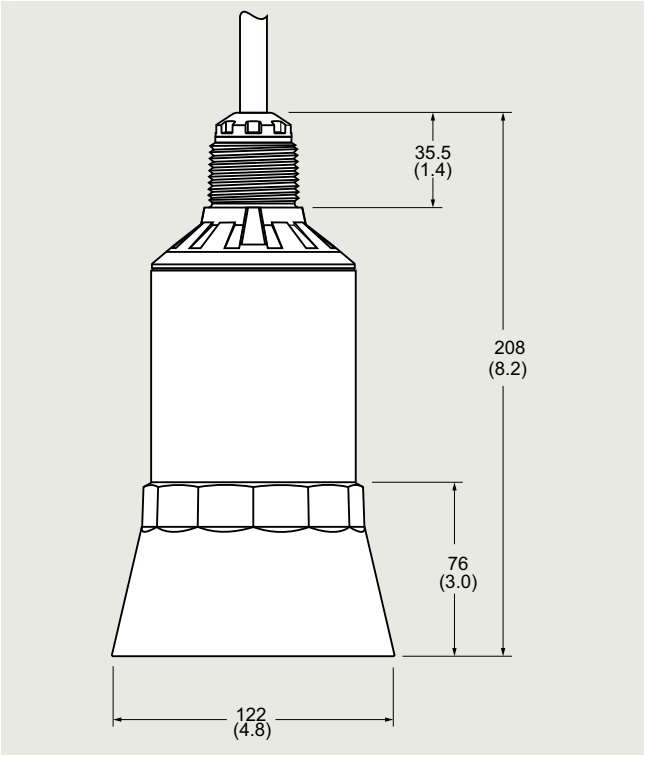
SITRANS LR120 Polypropylene adapter flange

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Dimensional drawings



SITRANS LR120, dimensions in mm (inch)

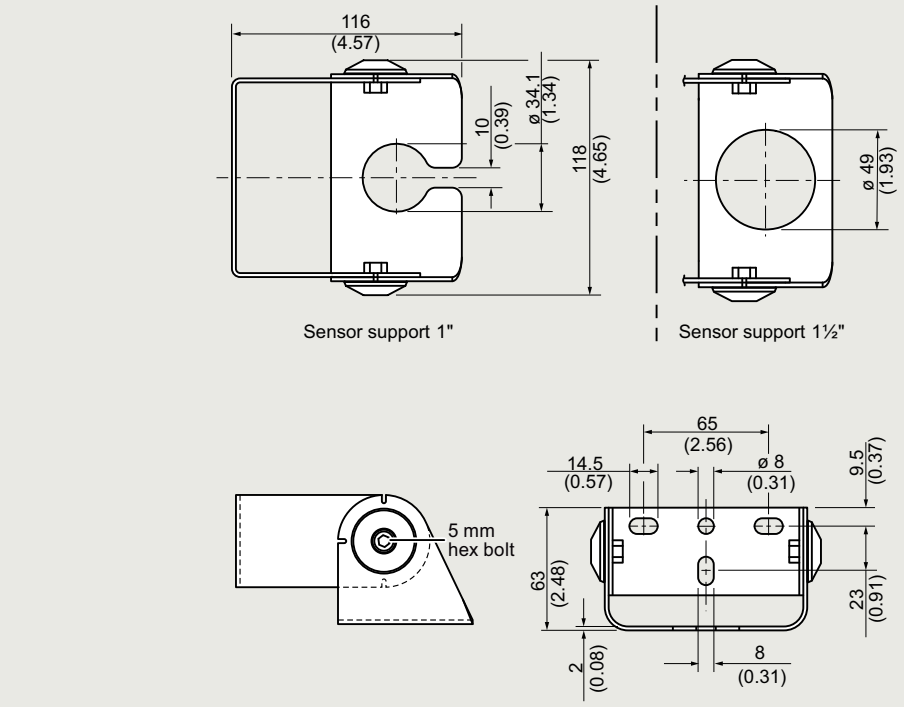


SITRANS LR120 Submergence shield accessory, dimensions in mm (inch)

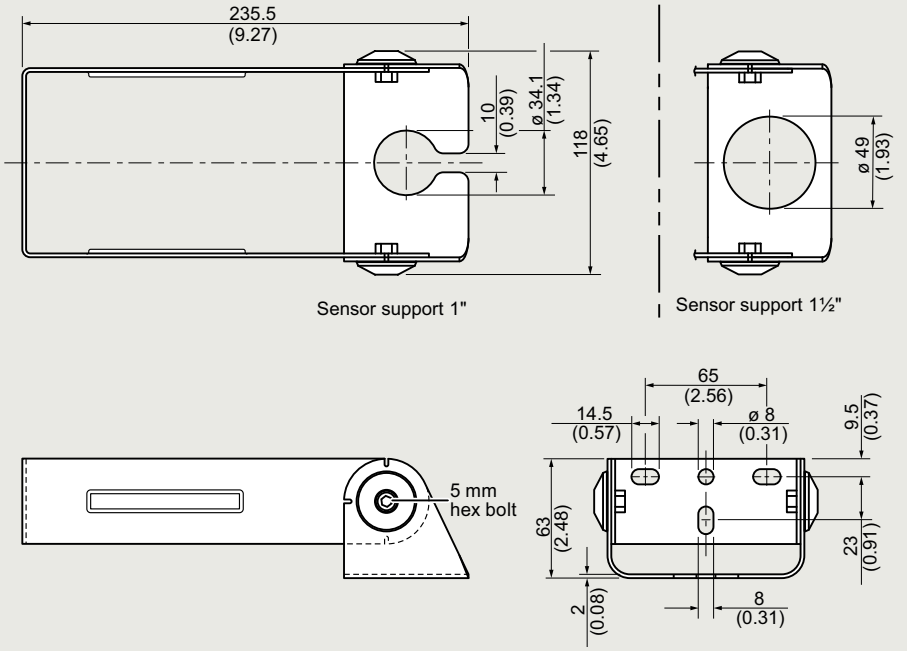
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Dimensional drawings (continued)

Mounting bracket, 80 mm



Mounting bracket, 200 mm

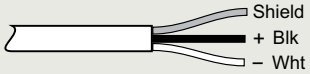


SITRANS LR120 mounting brackets, dimensions in mm (inch)

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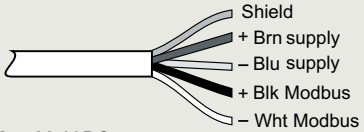
Circuit diagrams

HART



12 ... 35 V DC
4 ... 20 mA
Loop powered

Modbus



8 ... 30 V DC
30 mA at 8 V DC/
17 mA at 30 V DC
Modbus RTU

SITRANS LR120 connections

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Overview



SITRANS LR140 is a 2 wire loop powered radar transmitter for continuous level measurement of liquids and slurries to a range of 10 m (32.8 ft).

Benefits

- Bluetooth connectivity for easy setup with SITRANS mobile IQ.
- Chemically resistant PVDF sensor.
- W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications.
- Approved for open air applications outside of a tank.
- Compact design fits in limited space installations.

Application

SITRANS LR140 is a W band FMCW radar level transmitter, packaged in a chemically resistant enclosure with PVDF sensor for years of trouble-free reliable measurement service.

4 to 20 mA loop powered, it provides accurate level measurement to ranges of 10 m (32.8 ft). Measurement is possible, non-intrusively, through plastic vessel tops for easy installation. Programming is convenient using the Bluetooth connection and SITRANS mobile IQ application on your smart device.

Selection and ordering data

SITRANS LR140 Radar level transmitter Non-contact, 10 m (32.8 ft) range, for liquids and solids.	Article No. 7ML533	7	-	1	A	●	0	7	-	4	A	●	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Process connection													
1-½" NPT						A							
R 1-½" (BSPT)						B							
G 1-½" (BSPP)						C							
Electrical connections/Cable entry													
M20												F	
½" NPT												K	

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Bracket, 316L Stainless steel, 1.5 inch mount, 80 mm (3.1 inch) offset	**A5E50507514**
Bracket, 316L Stainless steel, 1.5 inch mount, 200 mm (7.9 inch) offset	**A5E50507516**
SITRANS LR140/LR150 Blind lid with o-ring	**A5E50822955**
Flat gasket, FKM, for G1.5 inch sensor	**A5E50822967**
1-½ BSP locknut, plastic	**7ML1830-1DP**
Polypropylene adapter flange, 2"/DN 50, universal, 1.5" NPT	**A5E50868980**
Polypropylene adapter flange, 2"/DN 50, universal, 1,5" BSPT	**A5E50868982**

Accessories	Article No.
Polypropylene adapter flange, 3"/DN 80, universal, 1.5" NPT	**A5E50868988**
Polypropylene adapter flange, 3"/DN 80, universal, 1,5" BSPT	**A5E50868998**
Polypropylene adapter flange, 4"/DN 100, universal, 1.5" NPT	**A5E50869003**
Polypropylene adapter flange, 4"/DN 100, universal, 1.5" BSPT	**A5E50869005**
Note: other polypropylene adapter flange sizes available via PVR request.	
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

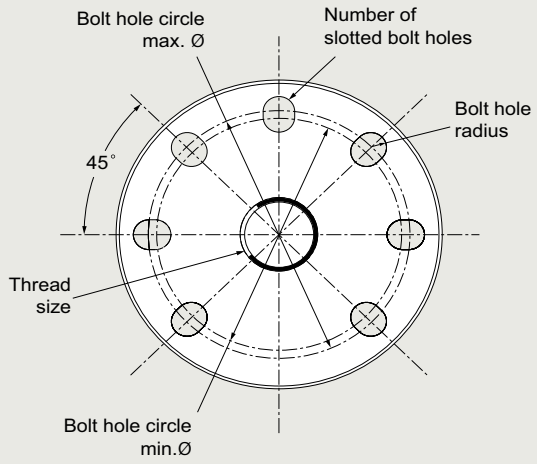
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Technical specifications

SITRANS LR140	
Mode of operation	
Measuring principle	W band FMCW radar
Measuring range	0 ... 10 m (0 ... 32.8 ft)
Frequency	80 GHz nominal
Beam angle	8°
Power Supply	
Voltage	12 ... 35 V DC
Current	4 ... 20 mA
Accuracy	± 5 mm
Rated operating conditions	
Vessel pressure	-1 ... +3 bar (14.50 ... 43.51 psi g)
Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
Process temperature	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Design	
Weight	0.5 kg (1.1 lb)
Material (sensor)	PVDF
Material (enclosure)	PBT
Process connection	1-½" NPT, 1-½" BSPT, or 1-½" BSPP
Degree of protection	Type 4X, IP66/67
Certificates and approvals	
General	CE, $_{C}FM_{US}$, $_{C}CSA_{US}$, RCM, EAC
Radio	CE, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC
Canadian Registration Number (CRN)	
British Columbia	0F22218.51
Alberta	0F20596.2
Saskatchewan	0F2002.3
Manitoba	0F7032.4
Ontario	0F22218.5
New Brunswick	0F05183.6
Nova Scotia	0F1490.07
Prince Edward Island	0F1490.08
Newfoundland and Labrador	0F1490.09
Yukon	0F1490.0
Northwest Territories	0F1490.0Y
Nunavut	0F1490.0T
Programming	0F1490.0N
SITRANS mobile IQ App	SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up and monitor SITRANS LR100 series. For more information: http://www.siemens.com/mobileIQ

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Options

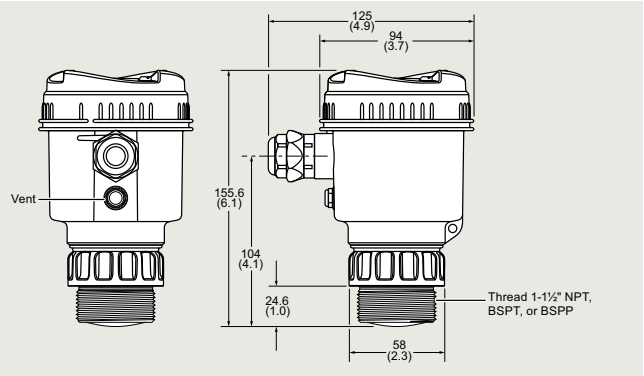


Part number	Adapter flange size	OD ± 1	B.C.D. max. for slotted holes (bmax.) ± 0.75	B.C.D. min. for slotted holes (bmin.) ± 0.75	Bolt hole radius ± 0.25	Number of slotted holes	Thread size
A5E50868980 A5E50868982 A5E50868983	2"/DN50	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868988 A5E50868998 A5E50869002	3"/DN80	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

SITRANS LR140, Polypropylene adapter flange

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Dimensional drawings

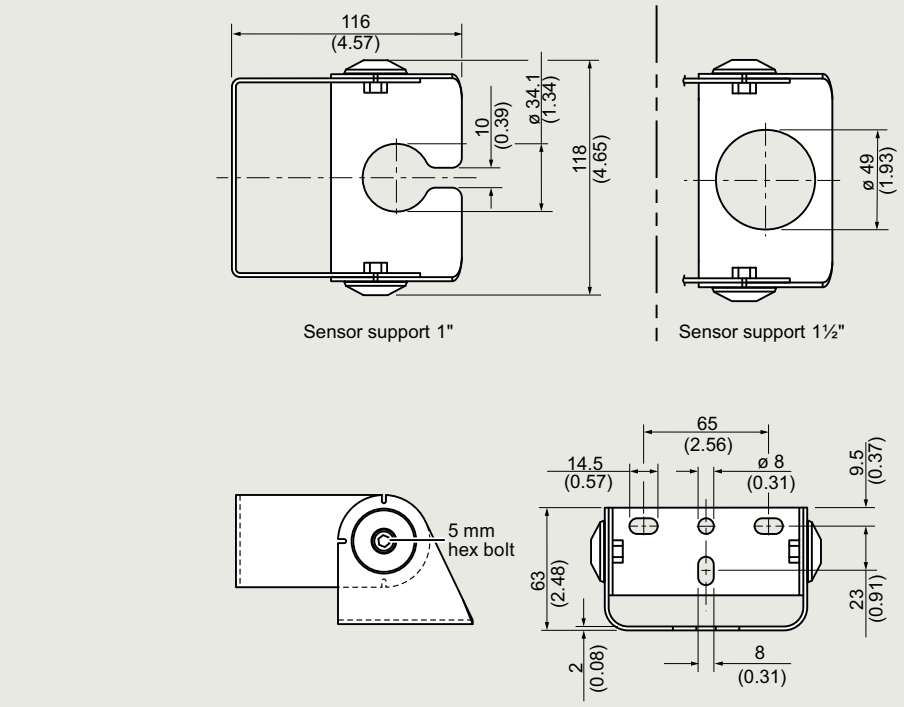


SITRANS LR140, dimensions in mm (inch)

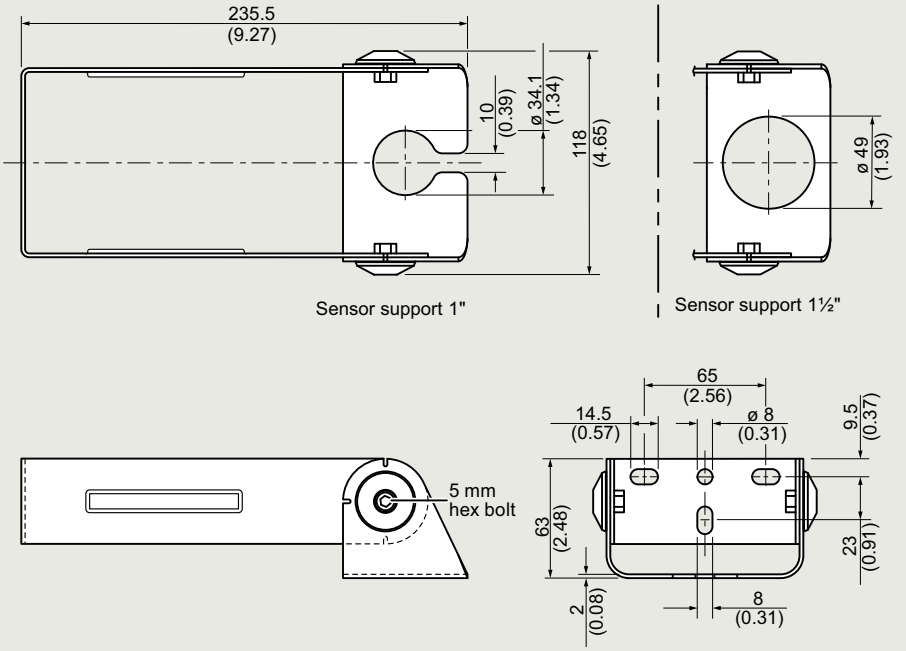
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Dimensional drawings (continued)

Mounting bracket, 80 mm



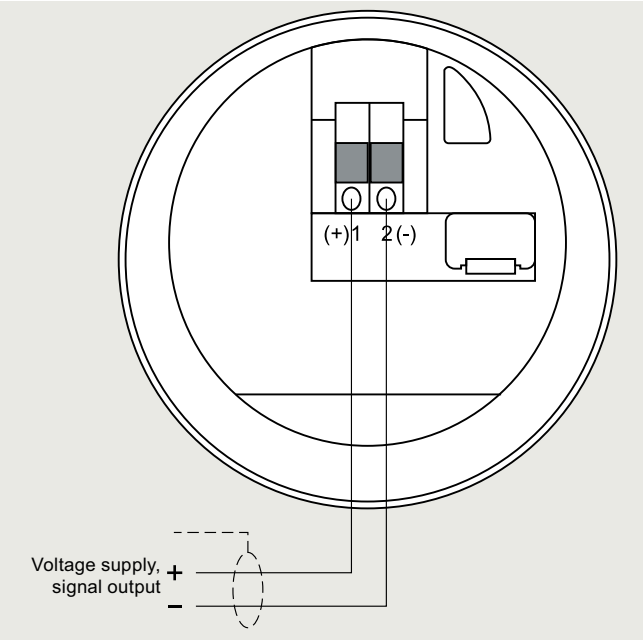
Mounting bracket, 200 mm



SITRANS LR140 mounting brackets, dimensions in mm (inch)

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Circuit diagrams



SITRANS LR140 connections

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Overview



SITRANS LR150 is a compact radar transmitter for continuous level measurement of liquids, slurries, and solids to a range of 20 m (65.6 ft).

Benefits

- Bluetooth connectivity for easy setup with SITRANS mobile IQ.
- Optional HMI with pushbutton programming and local diagnostic data.
- Chemically resistant PVDF sensor.
- HART 7.0 communication for intelligent integration into your application.
- W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications.
- Approved for open air applications outside of a tank.
- 2 mm accuracy and zero near range distance yields optimum inventory management capability.
- Compact design fits in limited space installations.
- Hazardous area variants available for safe use in explosive gas or dust environments.

Application

SITRANS LR150 is a W band FMCW radar level transmitter, with a chemically resistant PVDF sensor, for years of trouble-free, reliable measurement service.

4 to 20 mA loop powered with HART, providing accurate level measurement to ranges of 20 m (65.6 ft). Measurement is possible, non-intrusively, through plastic vessel tops for easy installation. Programming is convenient using the Bluetooth connection and SITRANS mobile IQ application on your smart device or locally with an optional HMI.

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Selection and ordering data

SITRANS LR150 Radar level transmitter Non-contact, HART, 20 m (65.6 ft) range, for liquids and solids.	Article No. 7ML534	0	-	●	A	●	0	7	-	4	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Bluetooth function													
Without				0									
With				1									
Process connection													
1-½" NPT						A							
R 1-½" (BSPT)						B							
G 1-½" (BSPP)						C							
Type of protection													
Ordinary Locations/General Purpose (Non-Ex)[2]											A		
ATEX II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb; Gas Ex-Zone 0/Class 1, Div. 1 & Div. 2[1]											C		
Electrical connections/cable entry													
M20												F	
½" NPT												K	
Local HMI													
Without display (closed lid of PBT/PC material)													0
With display (closed lid of PBT/PC material)													1
With display (clear lid with plastic window of PC material)													3

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**
Inspection certificate 3.1 (EN 10204) - device with test data	**C25**
INMETRO, IA MASC	**E25**
NEPSI, CCOE	**E27**
EACEx	**E24**
ATEX, IECEx, $_{C}FM_{US}$, $_{C}CSA_{US}$	**E49**
CSA-Japan-Ex	**E29**
WHG and VLAREM II	**E61**
NSF 61 Drinking Water and FDA, EG1935/2004	**E84**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Bracket, 316L Stainless steel, 1.5 inch mount, 80 mm (3.1 inch) offset	**A5E50507514**
Bracket, 316L Stainless steel, 1.5 inch mount, 200 mm (7.9 inch) offset	**A5E50507516**
SITRANS LR150 HMI with connection cable	**A5E50812988**
SITRANS LR140/LR150 Blind lid with o-ring	**A5E50822955**
SITRANS LR150 clear lid with o-ring	**A5E50822960**
Flat gasket, FKM, for G1.5 inch sensor	**A5E50822967**
1-½ BSP locknut, plastic	**7ML1830-1DP**

Accessories	Article No.
Polypropylene adapter flange, 2"/DN 50, universal, 1.5" NPT	**A5E50868980**
Polypropylene adapter flange, 2"/DN 50, universal, 1,5" BSPT	**A5E50868982**
Polypropylene adapter flange, 3"/DN 80, universal, 1.5" NPT	**A5E50868988**
Polypropylene adapter flange, 3"/DN 80, universal, 1,5" BSPT	**A5E50868998**
Polypropylene adapter flange, 4"/DN 100, universal, 1.5" NPT	**A5E50869003**
Polypropylene adapter flange, 4"/DN 100, universal, 1.5" BSPT	**A5E50869005**
Note: other polypropylene adapter flange sizes available via PVR request.	
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
HART modem with USB interface	**7MF4997-1DC**
Intrinsically Safe barrier	**7NG4124-1AA00**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion- see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch -see point level measurement section	

[1] Must be ordered in combination with order code E24, E25, E27, E49. or E29.
[2] Not available with order code E24, E25, E27, E49. or E29.

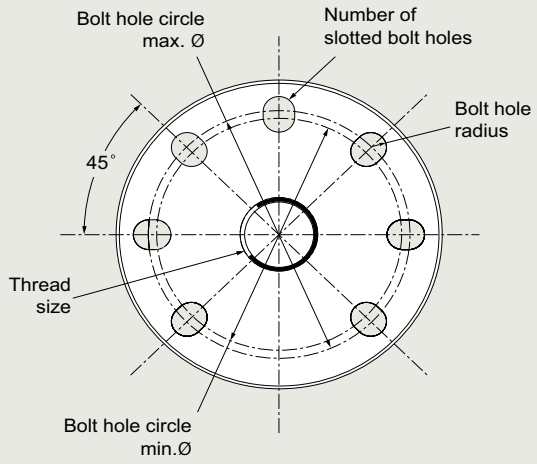
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Technical specifications

SITRANS LR150	
Mode of operation	
Measuring principle	W band FMCW radar
Measuring range	0 ... 20 m (0 ... 65.6 ft)
Frequency	80 GHz nominal
Beam angle	8°
Power Supply	
HART	
• Voltage	12 ... 35 V DC
• Current	4 ... 20 mA
Communications	
4 ... 20 mA	HART 7.0
Accuracy	± 2 mm (range 0.25 m ... 20 m) ± 10 mm (range 0 m ... 0.25 m)
Rated operating conditions	
Vessel pressure	-1 ... +3 bar (14.50 ... 43.51 psi g)
Ambient temperature	-40 ... +70 °C (-40 ... +158 °F)
Process temperature	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Minimum dielectric of the medium	1.6
Design	
Weight	0.5 kg (1.1 lb)
Material (sensor)	PVDF
Material (enclosure)	PBT
Process connection	1-½" NPT, 1-½" BSPT or 1-½" BSPP
Degree of protection	Type 4X, IP66/67
Cable inlet	M20 or ½" NPT
Certificates and approvals	
	CE, ATEX, IECEx, $_{C}FM_{US}$, $_{C}CSA_{US}$, EAC, NEPSI, FDA, Reg. (EC) No. 1935/2004
Radio	CE, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC
Water monitoring, flow	MCERTS Class 1
Canadian Registration Number (CRN)	
British Columbia	0F22218.51
Alberta	0F20596.2
Saskatchewan	0F2002.3
Manitoba	0F7032.4
Ontario	0F22218.5
New Brunswick	0F05183.6
Nova Scotia	0F1490.07
Prince Edward Island	0F1490.08
Newfoundland and Labrador	0F1490.09
Yukon	0F1490.0
Northwest Territories	0F1490.0Y
Nunavut	0F1490.0T
Programming	
SITRANS mobile IQ App	SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up and monitor SITRANS LR100 series (available for Android, Apple and Windows devices). For more information: http://www.siemens.com/mobileIQ
Optional HMI	4 button with display of variables and diagnostic data
SIMATIC PDM	SIMATIC PDM allows for remote PC configuration and diagnostics (for installation on a network).
SITRANS DTM	

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Options

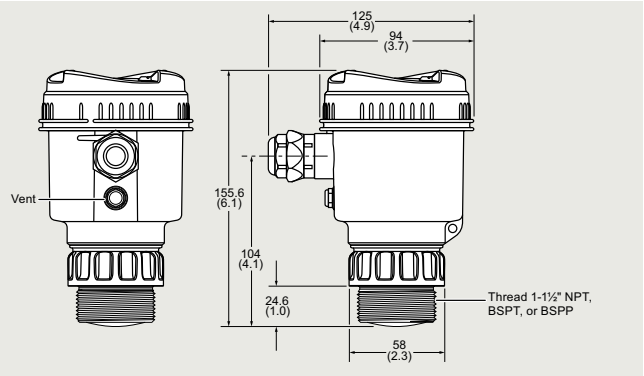


Part number	Adapter flange size	OD ± 1	B.C.D. max. for slotted holes (bmax.) ± 0.75	B.C.D. min. for slotted holes (bmin.) ± 0.75	Bolt hole radius ± 0.25	Number of slotted holes	Thread size
A5E50868980 A5E50868982 A5E50868983	2"/DN50	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868988 A5E50868998 A5E50869002	3"/DN80	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

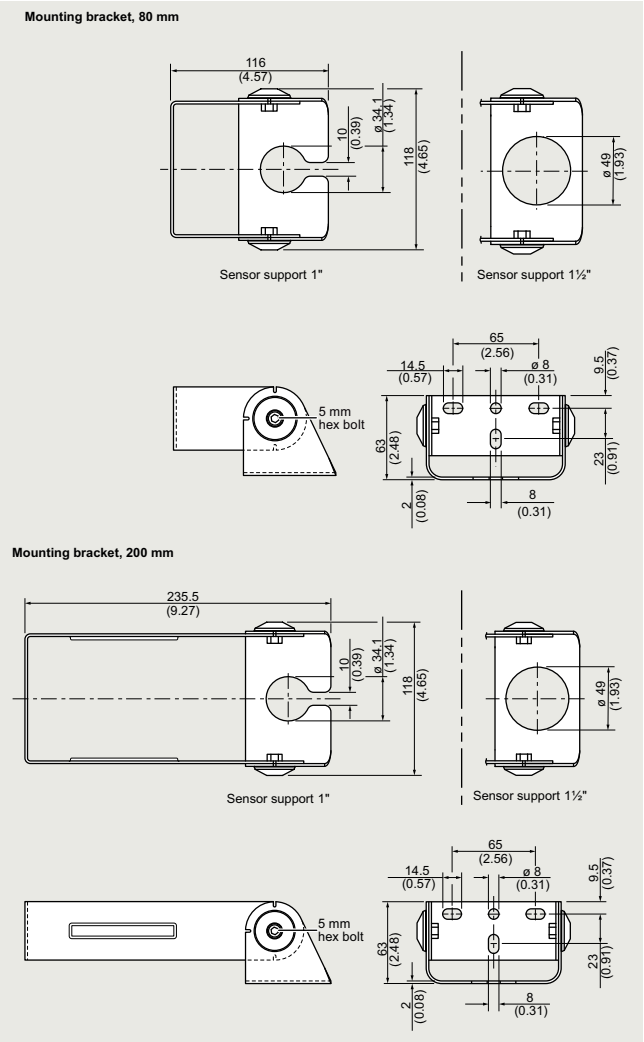
SITRANS LR150, Polypropylene adapter flange

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Dimensional drawings

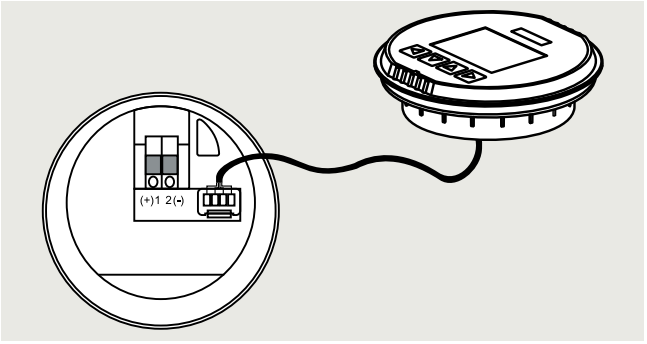


SITRANS LR150, dimensions in mm (inch)



SITRANS LR150 mounting brackets, dimensions in mm (inch)

Circuit diagrams



SITRANS LR150 connections

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Overview



SITRANS LR500 series are 80 GHz radar level transmitters for continuous monitoring of liquids, slurries, and solids in storage and process vessels including high temperature and pressure, to a range of 120 m (393 ft).

Benefits

- Continuous level measurement up to 120 m (393 ft)
- Easy installation and simple startup
- Programming using 4-button HMI, mobile IQ app using Bluetooth, SIMATIC PDM, SITRANS DTM, or Infrared handheld programmer
- IQ Guard for health monitoring, NE107 diagnostic messaging and quality verification report
- Communication using HART 7
- Graphical HMI with echo profile display and backlight
- Near Range Suppression for automatic detection and suppression of material build up noise
- Process Intelligence signal processing
- 1 mm accuracy in accordance with IEC 62828
- Suitable for API 2350
- Auto False Echo Suppression for fixed obstruction avoidance
- Low power consumption with EPD (environmental product declaration)
- Optional SLOD (second line of defense) for toxic material safety
- 100 000 points of data logging memory for process control analysis and optimization
- Siemens EcoTech Profile

Application

SITRANS LR500 series radar level transmitters include a graphical local user interface that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support.

The 80 GHz frequency creates a narrow, focused beam allowing for smaller antenna and decreasing sensitivity to obstructions.

SITRANS LR500 series radar level transmitters measure superbly on low dielectric media with high accuracy and repeatability. A very fast measurement response is ideal for process control applications.

- Key Applications: SITRANS LR500 Radar level transmitters are available with four antenna types for level measurement of liquid, slurry, and solid materials:
  - Threaded lens antenna
  - Flanged encapsulated antenna
  - Polymeric horn antenna
  - Flanged lens antenna

Selection and ordering data

SITRANS LR500 series Continuous, non-contact, 120 m (394 ft) range, for liquids, slurries, and solids in storage and process vessels, including high temperature and pressure.	Article No.
Antenna versions	
Threaded lens antenna	**7ML751.-.....-....**
Flanged encapsulated antenna	**7ML753.-.....-....**
Polymeric horn antenna	**7ML755.-.....-....**
Flanged lens antenna	**7ML758.-.....-....**

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Technical specifications

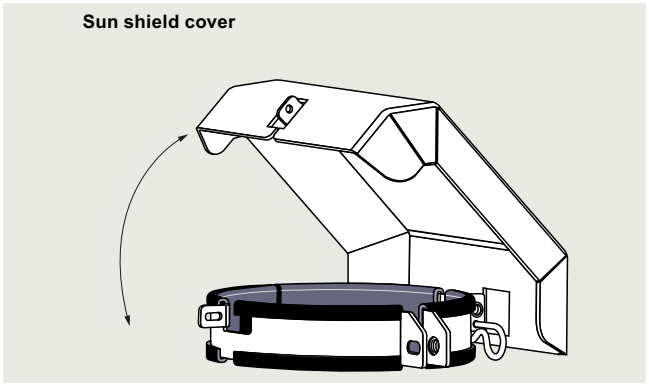
SITRANS LR500 Series	
Mode of operation	
Measuring principle	Radar level measurement
Frequency	W band (80 GHz nominal)
Minimum detectable distance	0 mm from end of the antenna (antenna dependent, reference conditions)
Maximum measuring range	120 m (394 ft), antenna dependent
Output	
HART	Version 7
• Analog output	4 ... 20 mA
• Fail-safe	Programmable as high, low, or hold (loss of echo)
• Update time	Up to 3 measurements per second
Performance (according to reference conditions IEC 62828)	
Maximum measured error	1 mm (0.039 inch)
Influence of ambient temperature	Less than 3 mm/10 K and maximum ±5 mm over full range from -40 ... +80 °C (-40 ... +176 °F)
	API 3.1B Inventory
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ϵ_r	> 1.6, antenna and application dependent
Process temperature	-196 ... 250 °C (-321 ... 482 °F), antenna and seal dependent
Process pressure	Up to 40 bar g (580 psi g), process connection and temperature dependent.
	Note: Pipe applications are not recommended. For exceptions, contact Siemens technical support.
Design	
Weight	Range from 2 ... 20 kg (4.4 ... 44.1 lb), version dependent
Enclosure	
• Material	Aluminum, polyester powder-coated, C5 corrosion equivalent
• Cable inlet	2 x M20 x 1.5 or 2 x ½" NPT
Degree of protection	Type 4X, Type 6, IP66, IP68
Display (local)	Optional graphical HMI with NE107 diagnostic data, echo profile display and backlight
Trend Logging	100 000 points, up to 8 variables including level, distance, space, volume, signal strength, confidence, temperature
Limit Monitoring	Min/Max of 3 variables with count function
Terminal voltage	Available from HMI or EDD
Asset management	Diagnostic logbook, parameter change logbook
Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 800 Ω
Certificates and approvals	
Ordinary locations	FM, $_C$CSA$_{US}$, CE, cFMus, EAC
Radio	CE, FCC, IC, RCM, NCC, WPC, MIC, RRA, ANATEL, MCMC, NBTC, ICASA
Hazardous areas	ATEX, IECEx, Intrinsically Safe Ex ia IIC T6 Ga ATEX, IECEx, Intrinsically Safe Ex ia IIIC Txx°C Da ATEX, IECEx, Dust Ignition proof Ex ta IIIC Txx °C Da EACEx, ATEX. IECEx, CSA, FM, NEPSI, PESO, INMETRO, KCs, Japan, EACEx EX II 1GD EX ia IIC T6 ... T4 Ga

Technical specifications (continued)

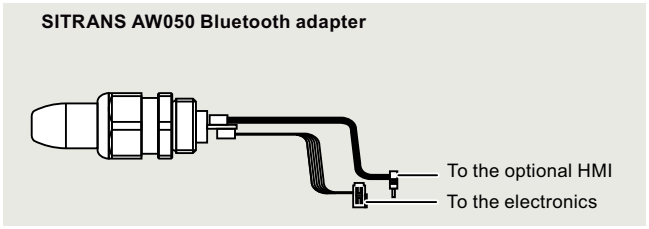
SITRANS LR500 Series	
	Ex ia IIIC T_{200} 95 °C Da Ta Ex ta IIIC T_{200} 137 °C Da CSA/FM Intrinsically Safe Ex ia Class I, II, III, Div 1, Groups A, B, C, D, E, F, G T6 CSA/FM Non-Incendive Class I, Div. 2, Groups A, B, C, D T6 cFMus Flameproof/XP Class I, Div. 1, Groups ABCD; T6...T4 Class I, Div. 1, AEx db IIC T6...T4Gb Class I, Zone 0/1, AEx db IIC T6...T4 Ga/Gb ATEX, IECEx, NEPSI Flameproof/XP FMG 25.00115X Ex db IIC T6...T4 Gb Ex db IIC T6...T4 Ga/Gb
Materials	3.1 of EN 10204, NACE MR 0175 and MR 0103, 2.2 of EN 10204, PMI
Pressure	CRN, PED
Canadian Registration Number (CRN) Note: CRN is not applicable for process temperatures below -40 °C (-40 °F).	
• British Columbia	0F7424.1
• Alberta	0F22399.2
• Saskatchewan	0F7424.13
• Manitoba	0F7424.14
• Ontario	0F7424.15
• Quebec	0F07424.16
• Atlantic Canada and Territories	0F1384.9870YNT
Materials	3.1 of EN 10204, NACE MR 0175 and MR 0103, 2.2 of EN 10204, PMI
Programming	
Remote, via HART	SIMATIC PDM, SITRANS DTM, AMS, TREX communicator
Display (local)	Optional graphical HMI with NE107 diagnostic data, echo profile display and backlight
SITRANS mobile IQ app	Optional AW050 Bluetooth module, for non-hazardous applications only
Infrared Handheld programmer	

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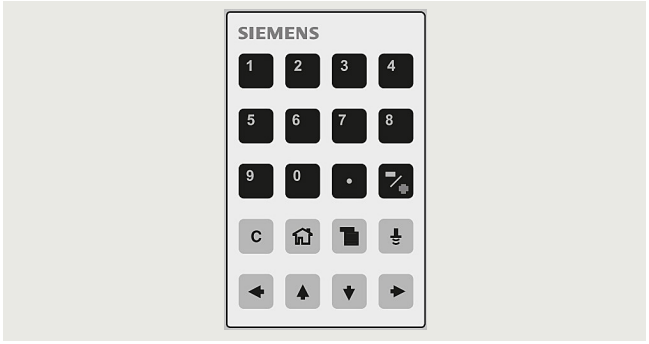
Options



SITRANS LR500 series sunshield



SITRANS AW050 Bluetooth adapter



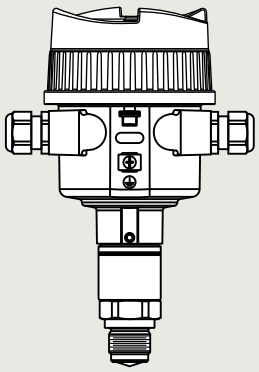
Only 4 bottom arrow keys are used

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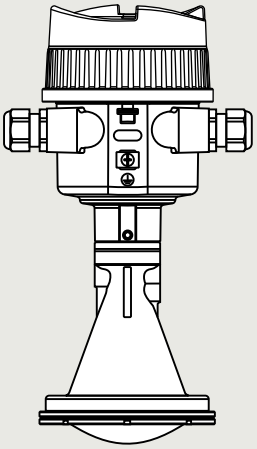
Dimensional drawings

SITRANS LR500 series antenna versions

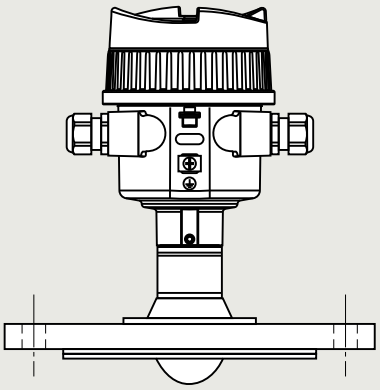
Thread with integrated antenna system



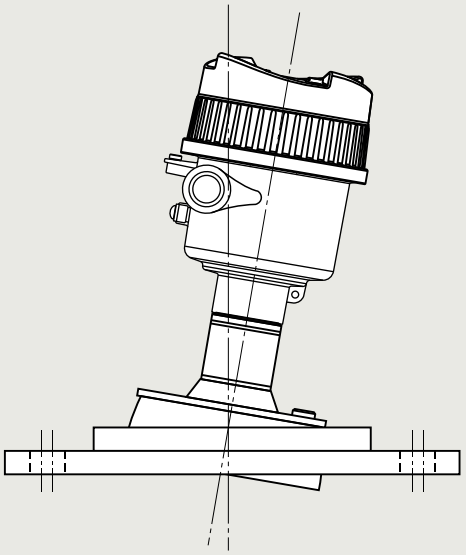
Plastic horn antenna



Flange with encapsulated antenna system



Flange with lens antenna



SITRANS LR500 Series antenna versions

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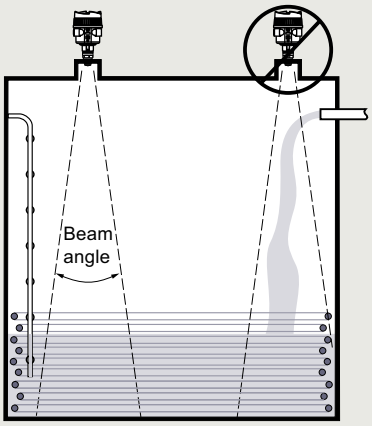
Overview



SITRANS LR510 threaded lens antenna provides continuous monitoring of liquids, including corrosive liquids, and slurries to a range of 30 m (98 ft).The small process connection makes it ideal for applications with challenging mounting conditions.

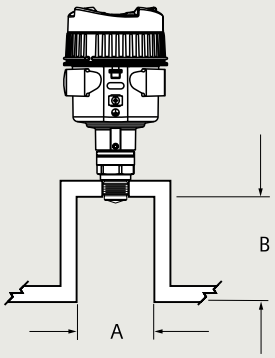
Configuration

Installation of SITRANS LR510



Size	Beam angle
G¾" ¾" NPT	14°
G1" 1" NPT	10°
G1½" 1½" NPT (+250°C)	10°
G1½" 1½" NPT (+150°C, +200°C)	7°

SITRANS LR510 threaded connection



Nozzle diameter "A"		Nozzle length "B"	
40 mm	1 1/2"	≤ 150 mm	≤ 5.9"
50 mm	2"	≤ 200 mm	≤ 7.9"
80 mm	3"	≤ 300 mm	≤ 11.8"
100 mm	4"	≤ 400 mm	≤ 15.8"
150 mm	6"	≤ 600 mm	≤ 23.6"

SITRANS LR510 Nozzle installation

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Selection and ordering data

SITRANS LR510 threaded connection Continuous, non-contact, 30 m (98 ft) range, for liquids and slurries.	Article No. 7ML751	● -	●	●	●	●	0 -	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Communications											
4 ... 20 mA HART		0									
Sealing material of the antenna/process connection											
PEEK / FKM -40 ... +150 °C (-40 ... +302 °F)			0								
PEEK / FKM -40 ... +200 °C (-40 ... +392 °F)			1								
PEEK / FFKM -20 ... +150 °C (-4 ... +302 °F)			2								
PEEK / FFKM -20 ... +250 °C (-4 ... +482 °F)			3								
Process connection type and material											
Thread, DIN 3852-2-A-G¾", 316/316L				A	A						
Thread, DIN 3852-2-A-G¾", Alloy C22 (2.4602)				A	B						
Thread, ASME B1.20.1, ¾" NPT, 316/316L				A	C						
Thread, ASME B1.20.1, ¾" NPT, Alloy C22 (2.4602)				A	D						
Thread, DIN 3852-2-A-G1", 316/316L				B	A						
Thread, DIN 3852-2-A-G1", Alloy C22 (2.4602)				B	B						
Thread, ASME B1.20.1, 1" NPT, 316/316L				B	C						
Thread, ASME B1.20.1, 1" NPT, Alloy C22 (2.4602)				B	D						
Thread, DIN 3852-2-A-G1-½", 316/316L				C	A						
Thread, DIN 3852-2-A-G1-½", Alloy C22 (2.4602)				C	B						
Thread, ASME B1.20.1, 1-½" NPT, 316/316L				C	C						
Thread, ASME B1.20.1, 1-½" NPT, Alloy C22 (2.4602)				C	D						
Second line of defence (SLOD) gas-tight seal											
SLOD not included						0					
SLOD included						1					
Enclosure											
Single compartment enclosure								4			
Type of protection											
Non Ex - General purpose									A		
Intrinsically safe Ex ia / IS (Class I, II, III, Division 1)[1]									B		
Flameproof Ex d (Class I, Division 1)									C		
Non-incendive (Class I, Division 2)[2]									D		
Dust Ignition proof, Ex t / DIP (Class II, Division 1)[1]									M		
Electrical connection											
M20										F	
½" NPT										K	
Local HMI											
None, with blind lid											0
Included, with blind lid											1
Included, with window lid											3

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Pressure test certificates	
Pressure test certificate inspection certificate EN 10204-3.1 (AD2000-A4 / EN12266-1)[8]	**C01**
Pressure test certificate inspection certificate EN 10204-3.1 (ASME B31.1 / B31.3)[9]	**C02**
Certificates	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 - performance	**C11**
Inspection certificate EN 10204-3.1, material	**C12**
Inspection certificate EN 10204-3.1, material with NACE MR0175 and MR0103	**C13**

Selection and Ordering data	Order code
Test report EN 10204-2.2, material	**C14**
Test report EN 10204-3.1, PMI test - XRF (X-Ray fluorescence)	**C15**
Tagging	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**
Regional Ex Approval [3][5]	
EAC Ex	**E24**
INMETRO, IA MASC	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**

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Selection and ordering data (continued)

Selection and Ordering data	Order code
PESO (India)	**E28**
Japan	**E29**
ATEX (Europe), IECEx (International)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe), IECEx (International), CSA (Canada), and FM (USA)	**E49**

Selection and ordering data	Article No.
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Hand Programmer, Intrinsically safe	**7ML1930-1BK**
Sun shield cover	**A5E52107153**
AW050 Bluetooth module kit (General purpose only), M20	**A5E51857118**
AW050 Bluetooth module kit (General purpose only), ½" NPT	**A5E52095588**
Lightning Arrestor, M20	**7MF7903-7AB**
Lightning Arrestor, ½" NPT	**7MF7903-7AC**
Polypropylene adapter flange, 2"/DN50, universal, 1.5" NPT	**A5E50868980**
Polypropylene adapter flange, 2"/DN50, universal, 1,5" BSPT	**A5E50868982**
Polypropylene adapter flange, 3"/DN80, universal, 1.5" NPT	**A5E50868988**
Polypropylene adapter flange, 3"/DN80, universal, 1,5" BSPT	**A5E50868998**
Polypropylene adapter flange, 4"/DN100, universal, 1.5" NPT	**A5E50869003**
Polypropylene adapter flange, 4"/DN100, universal, 1.5" BSPT	**A5E50869005**
Note: other polypropylene adapter flange sizes available via PVR request.	
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
Sealing plug, 316L/1.4404, Ex d, 1/2 NPT	**7MF79067BJ**

Selection and ordering data	Article No.
Sealing plug, 316L/1.4404, Ex d, M20 x 1.5	**7MF79067AJ**
HART modem with USB interface	**7MF4997-1DC**
Intrinsically Safe barrier	**7NG4124-1AA00**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.	**7ML60..-.....-....**
Spare parts	
¾" process seal for G thread types FKM, KLINGERSIL C-4400	**A5E53276254**
1" process seal for G thread types FKM, KLINGERSIL C-4400	**A5E53276255**
1-½" process seal for G thread types FKM, KLINGERSIL C-4400	**A5E53276256**
Electronic module, LR510, LR530, <DN80 / 3 inch, mA/HART	**A5E53276263**
LR500 lid with window, Non-Exd/XP	**A5E53276250**
LR500 lid with window, Exd/XP	**A5E53308680**
LR500 lid without window, all versions	**A5E53276252**
HMI graphical display, with interconnection cable	**A5E53276247**

1) Available only with one of -Z Regional hazardous Approval options.
2) Available only with -Z Regional hazardous Approval option E48.
3) Not available with Type of Protection option A.
5) Only one regional hazardous approval option can be selected.
8) Available only with Process connection type and material options AA, AB, BA, BB, CA, and CB.
9) Available only with Process connection type and material options AC, AD, BC, BD, CC, and CD.

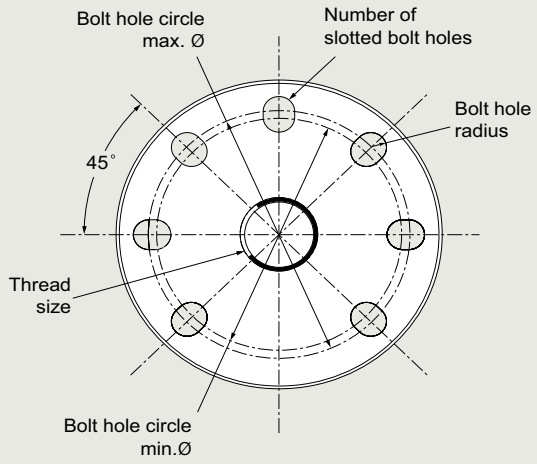
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Technical specifications

SITRANS LR510	
Mode of operation	
Recommended measuring range	• G¾", ¾" NPT: 10 m (32.81 ft) • G1", 1" NPT: 20 m (65.62 ft) • G1½", 1½ NPT (+150 °C, +200 °C): 30 m (98 ft)
Medium conditions	
Process temperature	• PEEK lens, FKM seal: -40 ... +150 °C (-40 ... +302 °F) • PEEK lens, FKM seal, thermal extension: -40 ... +200 °C (-40 ... +392 °F) • PEEK lens, FFKM seal: -20 ... +150 °C (-4 ... +302 °F) • PEEK lens, FFKM seal, thermal extension: -20 ... +250 °C (-4 ... 482 °F)
Process pressure	Up to 40 bar g (580 psi g), process connection and temperature dependent. See Pressure/Temperature curves for more information.
Design	
Materials	
• Threaded process connection	316L stainless steel or optional Alloy C22 (2.4602)
• Antenna lens	PEEK
• Antenna seal	FKM or FFKM (Kalrez 6375)
Process connection	• 3/4" thread, DIN3852-2-A, PN40 • 3/4" NPT, ASME B1.20.1 • 1" thread, DIN3852-2-A, PN40 • 1" NPT, ASME B1.20.1 • 1-½" thread, DIN3852-2-A, PN40 • 1-½" NPT, ASME B1.20.1
Second line of defence option (SLOD)	Internal fused glass seal

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Options



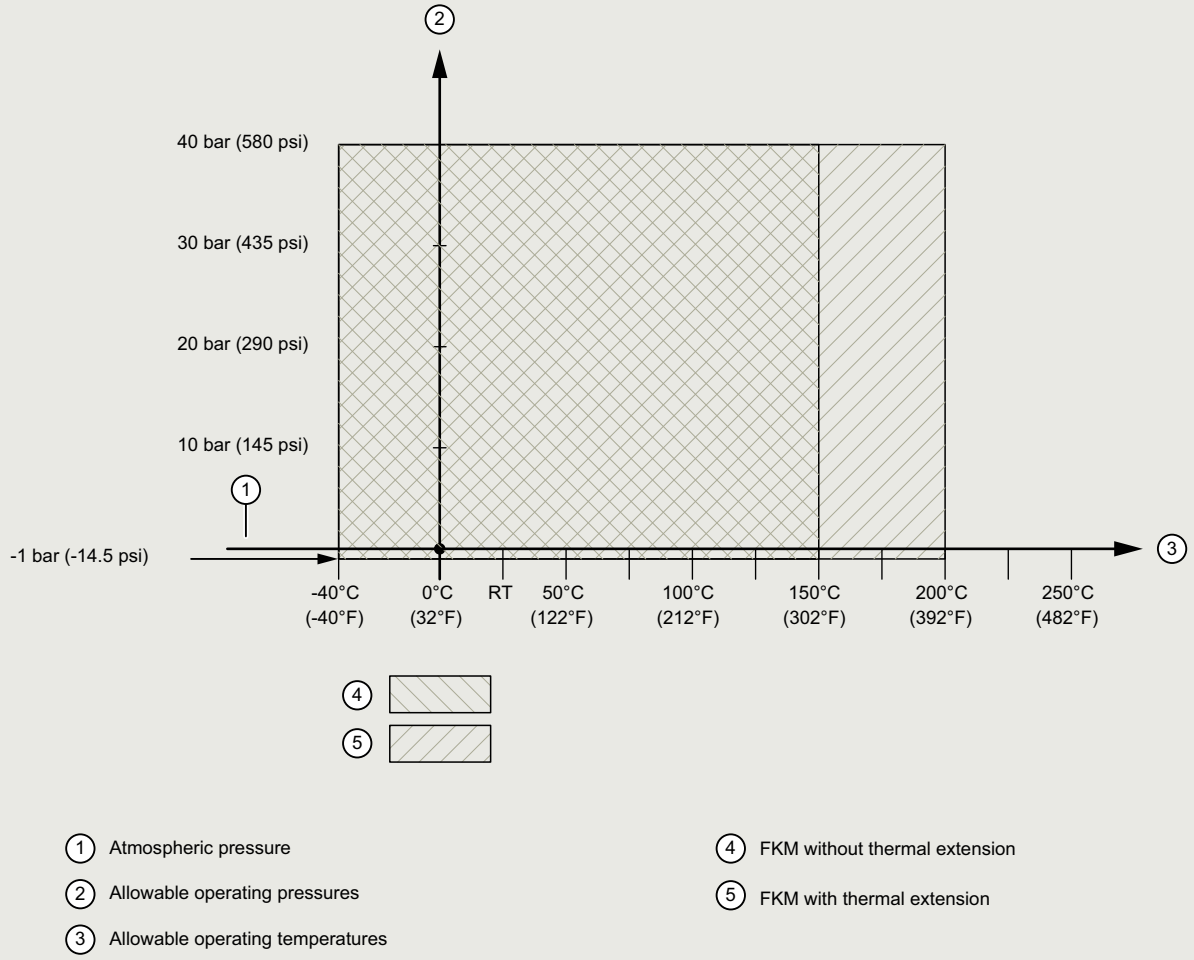
Part number	Adapter flange size	OD ± 1	B.C.D. max. for slotted holes (bmax.) ± 0.75	B.C.D. min. for slotted holes (bmin.) ± 0.75	Bolt hole radius ± 0.25	Number of slotted holes	Thread size
A5E50868980 A5E50868982 A5E50868983	2"/DN50	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868988 A5E50868998 A5E50869002	3"/DN80	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

SITRANS LR510, Polypropylene adapter flange

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Characteristic curves

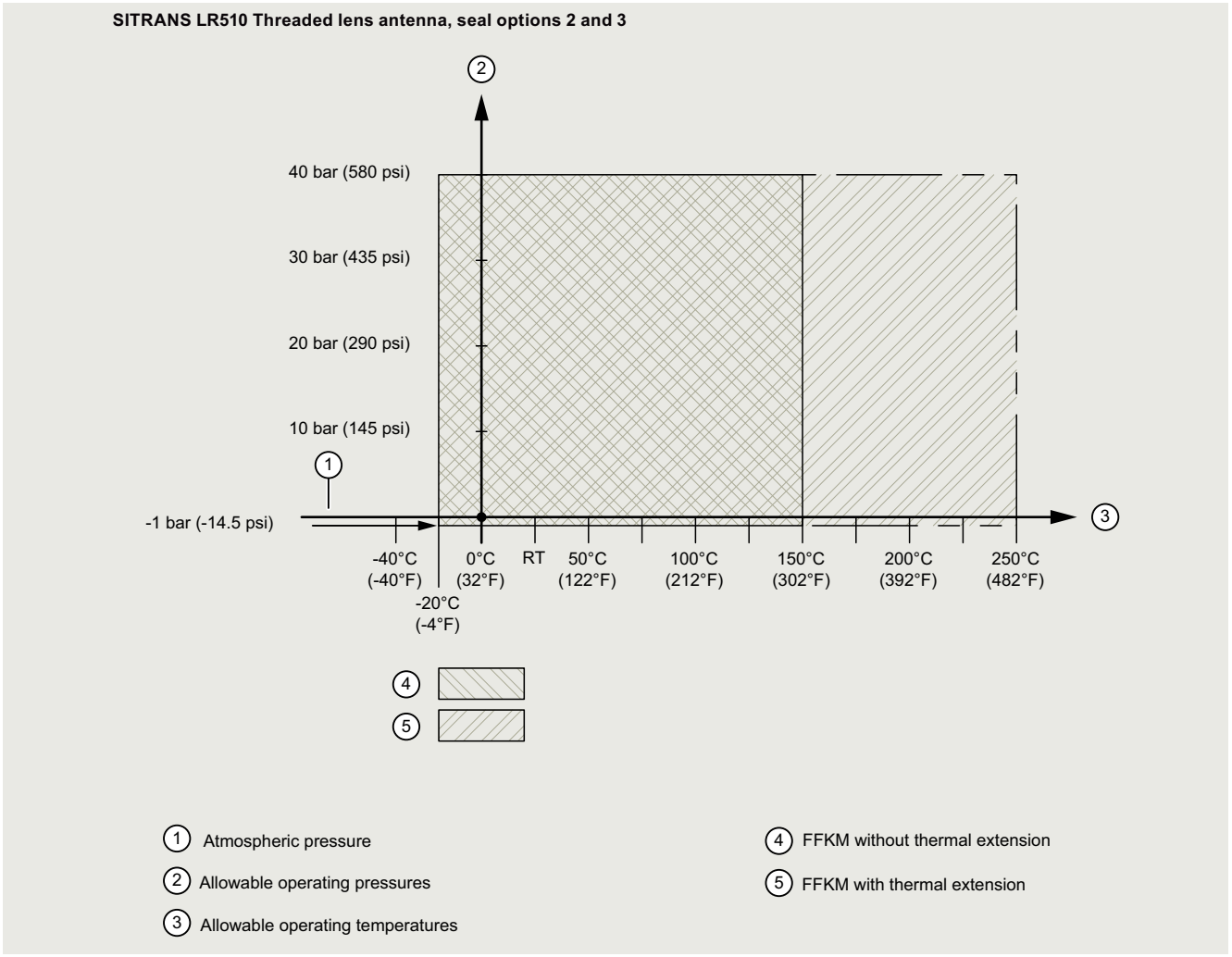
SITRANS LR510 Threaded lens antenna, seal options 0 and 1



SITRANS LR510 Threaded lens antenna, process pressure/temperature derating curve, seal options 0 and 1

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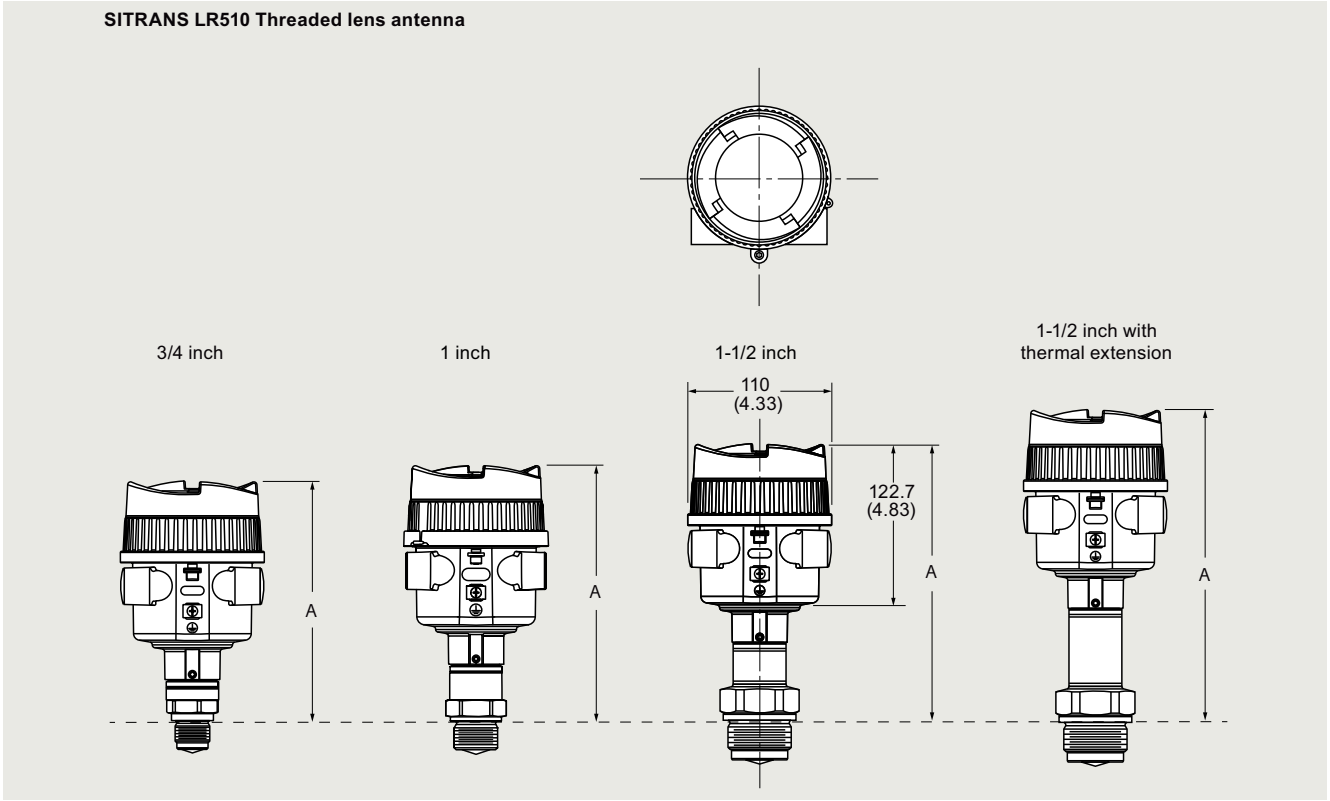
Characteristic curves (continued)



SITRANS LR510 Threaded lens antenna, process pressure/temperature derating curve, seal options 2 and 3

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Dimensional drawings



SITRANS LR510 Threaded lens antenna, dimensions in mm (inch)

Antenna type	A mm (inch)	Recommended max. range m (ft)	Beam angle	Process seal material	Temperature
Thread G3/4" PN40, DIN3852-A	182.3 (7.18)	10 (32.8)	14°	FKM	-40 ... +150 °C (-40 ... +302 °F)
Thread 3/4" NPT, ASME B1.20.1	182.3 (7.18)	10 (32.8)	14°	FKM	-40 ... +150 °C (-40 ... +302 °F)
Thread G1" PN40, DIN3852-2-A	193.8 (7.63)	20 (65.6)	10°	FKM	-40 ... +150 °C (-40 ... +302 °F)
Thread 1" NPT, ASME B1.20.1	194 (7.64)	20 (65.6)	10°	FKM	-40 ... +150 °C (-40 ... +302 °F)
Thread G1-1/2" PN40, DIN3852-2-A	213.8 (8.42)	30 (98.4)	7°	FKM	-40 ... +150 °C (-40 ... +302 °F)
Thread 1-1/2" NPT, ASME B1.20.1	214 (8.43)	30 (98.4)	7°	FKM	-40 ... +150 °C (-40 ... +302 °F)
Thread G3/4" PN40, DIN3852-2-A	182.3 (7.18)	10 (32.8)	14°	FFKM	-20 ... +150 °C (-4 ... +302 °F)
Thread 3/4" NPT, ASME B1.20.1	182.3 (7.18)	10 (32.8)	14°	FFKM	-20 ... +150 °C (-4 ... +302 °F)
Thread G1" PN40, DIN3852-2-A	193.8 (7.63)	20 (65.6)	10°	FFKM	-20 ... +150 °C (-4 ... +302 °F)
Thread 1" NPT, ASME B1.20.1	194 (7.64)	20 (65.6)	10°	FFKM	-20 ... +150 °C (-4 ... +302 °F)
Thread G1-1/2" PN40, DIN3852-2-A	213.8 (8.42)	30 (98.4)	7°	FFKM	-20 ... +150 °C (-4 ... +302 °F)
Thread 1-1/2" NPT, ASME B1.20.1	214 (8.43)	30 (98.4)	7°	FFKM	-20 ... +150 °C (-4 ... +302 °F)

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Dimensional drawings (continued)

Antenna type Thermal extension	A mm (inch)	Recommended max. range m (ft)	Beam angle	Process seal material	Temperature
Thread G3/4" PN40, DIN3852-2-A	234.2 (9.22)	10 (32.8)	14°	FKM	-40 ... +200 °C (-40 ... +392 °F)
Thread 3/4" NPT, ASME B1.20.1	234.2 (9.22)	10 (32.8)	14°	FKM	-40 ... +200 °C (-40 ... +392 °F)
Thread G1" PN40, DIN3852-2-A	245.8 (9.68)	20 (65.6)	10°	FKM	-40 ... +200 °C (-40 ... +392 °F)
Thread 1" NPT, ASME B1.20.1	245.8 (9.68)	20 (65.6)	10°	FKM	-40 ... +200 °C (-40 ... +392 °F)
Thread G1-1/2" PN40, DIN3852-2-A	265.8 (10.46)	30 (98.4)	7°	FKM	-40 ... +200 °C (-40 ... +392 °F)
Thread 1-1/2" NPT, ASME B1.20.1	266 (10.47)	30 (98.4)	7°	FKM	-40 ... +200 °C (-40 ... +392 °F)
Thread G3/4" PN40, DIN3852-2-A	234.3 (9.22)	10 (32.8)	14°	FFKM	-20 ... +250 °C (-4 ... +392 °F)
Thread 3/4" NPT, ASME B1.20.1	234.5 (9.32)	10 (32.8)	14°	FFKM	-20 ... +250 °C (-4 ... +392 °F)
Thread G1" PN40, DIN3852-2-A	245.8 (9.68)	20 (65.6)	10°	FFKM	-20 ... +250 °C (-4 ... +392 °F)
Thread 1" NPT, ASME B1.20.1	246 (9.68)	20 (65.6)	10°	FFKM	-20 ... +250 °C (-4 ... +392 °F)
Thread G1-1/2" PN40, DIN3852-2-A	237.8 (9.36)	30 (98.4)	10°	FFKM	-20 ... +250 °C (-4 ... +392 °F)
Thread 1-1/2" NPT, ASME B1.20.1	238 (9.37)	30 (98.4)	10°	FFKM	-20 ... +250 °C (-4 ... +392 °F)

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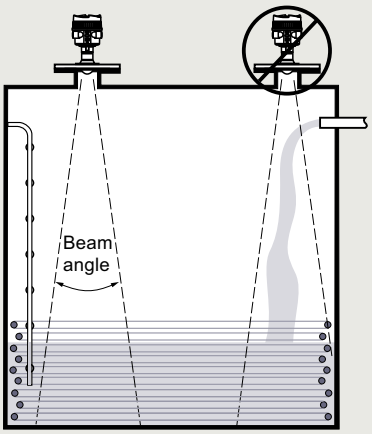
Overview



SITRANS LR530 flange encapsulated antenna provides continuous monitoring of liquids and slurries to a range of 120 m (394 ft).The PTFE lens and integrated gasket is easy to clean and ideal for highly corrosive media.

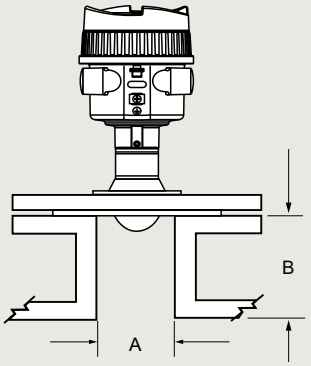
Configuration

Installation of SITRANS LR530



Size	Beam angle
1", DN25	10°
2", DN50	6°
≥3", DN80	3°

SITRANS LR530 nozzle mounting restrictions



Nozzle diameter "A"		Nozzle height "B"	
50 mm	2"	≤200 mm	≤ 7.9"
80 mm	3"	≤400 mm	≤ 15.8"
100 mm	4"	≤500 mm	≤ 19.7"
150 mm	6"	≤800 mm	≤ 31.5"

SITRANS LR530 Nozzle installation

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Selection and ordering data

SITRANS LR530 Flanged encapsulated PTFE Continuous, non-contact, 120 m (394 ft) range, for liquids and slurries.	Article No. 7ML753	● -	●	●	●	●	0 -	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Communications											
4 ... 20 mA, HART		0									
Sealing material of the antenna/process connection											
PTFE / PTFE / -60 ... +150 °C (-76 ... +302 °F)			0								
PTFE / PTFE / -196 ... +200 °C (-321 ... +392 °F)			1								
Process connection type and material											
Flange DN 25 PN 6, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				K	A						
Flange DN 50 PN 6, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				K	B						
Flange DN 80 PN 6, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				K	C						
Flange DN 100 PN 16, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				K	D						
Flange DN 150 PN 16, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				K	E						
Flange DN 200 PN 16, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				K	F						
Flange DN 25 PN 40, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				L	A						
Flange DN 50 PN 40, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				L	B						
Flange DN 80 PN 40, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				L	C						
Flange DN 100 PN 40, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				L	D						
Flange DN 150 PN 40, raised face, Form B1, EN 1092-1, DIN 2501 / 316/316L				L	E						
Flange 1" 150 lb RF, ASME B16.5 / 316/316L				M	A						
Flange 2" 150 lb RF, ASME B16.5 / 316/316L				M	B						
Flange 3" 150 lb RF, ASME B16.5 / 316/316L				M	C						
Flange 4" 150 lb RF, ASME B16.5 / 316/316L				M	D						
Flange 6" 150 lb RF, ASME B16.5 / 316/316L				M	E						
Flange 8" 150 lb RF, ASME B16.5 / 316/316L				M	F						
Flange 1" 300 lb RF, ASME B16.5 / 316/316L				N	A						
Flange 2" 300 lb RF, ASME B16.5 / 316/316L				N	B						
Flange 3" 300 lb RF, ASME B16.5 / 316/316L				N	C						
Flange 4" 300 lb RF, ASME B16.5 / 316/316L				N	D						
Flange 6" 300 lb RF, ASME B16.5 / 316/316L				N	E						
Flange 8" 300 lb RF, ASME B16.5 / 316/316L				N	F						
Flange DN 25 5K RF, JIS / 316/316L				V	A						
Flange DN 50 10K RF, JIS / 316/316L				V	B						
Flange DN 80 10K RF, JIS / 316/316L				V	C						
Flange DN 100 10K RF, JIS / 316/316L				V	D						
Flange DN 150 10K RF, JIS / 316/316L				V	E						
Second line of defense (SLOD) gas tight seal											
SLOD not included						0					
SLOD included						1					
Enclosure											
Single compartment enclosure								4			
Type of protection											
Non Ex - General purpose									A		
Intrinsically safe Ex ia / IS (Class I, II, III, Division 1)[1]									B		
Flameproof Ex d (Class I, Division 1)									C		
Non-incendive (Class I, Division 2)[2]									D		
Dust Ignition proof, Ex t / DIP (Class II, Division 1)[1]									M		
Electrical connection											
M20										F	
½" NPT										K	
Local HMI											
None, with blind lid											0
Included, with blind lid											1
Included, with window lid											3

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Pressure Test Certificates	
Pressure test certificate inspection certificate EN 10204-3.1 (AD2000-A4 / EN 12266-1)[8]	**C01**
Pressure test certificate inspection certificate EN 10204-3.1 (ASME B31.1 / B31.3)[9]	**C02**
Test certificates	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 - performance	**C11**
Inspection certificate EN 10204-3.1, material	**C12**
Inspection certificate EN 10204-3.1, material with NACE MR0175 and MR0103	**C13**
Test report EN 10204-2.2, material	**C14**
Test report EN 10204-3.1, PMI test - XRF (X-Ray Fluorescence)	**C15**
Tagging	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**
Regional Ex Approval [3][5]	
EAC Ex	**E24**
INMETRO, IA MASC	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
Japan	**E29**
ATEX (Europe) and IECEx (International)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe), IECEx (International), CSA (Canada), and FM (USA)	**E49**

1) Available only with one of -Z Regional hazardous Approval options.
2) Available only with -Z Regional Ex Approval option E48.
3) Not available with Type of Protection option A.
5) Only one regional hazardous approval can be selected
8) Available only with Process connection type and material options KA ... KF, LA ... LE, and VA ... VE.
9) Available only with Process connection type and material options MA ... MF and NA ... NF.

Selection and Ordering data	Order code
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Hand Programmer, Intrinsically safe	**7ML1930-1BK**
Sun shield cover	**A5E52107153**
AW050 BlueTooth module kit, M20 (General purpose only)	**A5E51857118**
AW050 BlueTooth module kit, ½" NPT (General purpose only)	**A5E52095588**
Lightning Arrestor M20	**7MF7903-7AB**

Selection and Ordering data	Order code
Lightning Arrestor ½" NPT	**7MF7903-7AC**
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
Sealing plug, 316L/1.4404, Ex d, 1/2 NPT	**7MF79067BJ**
Sealing plug, 316L/1.4404, Ex d, M20 x 1.5	**7MF79067AJ**
HART modem with USB interface	**7MF4997-1DC**
Intrinsically Safe barrier	**7NG4124-1AA00**
SITRANS RD100, loop powered display	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion	**7ML5744-.....-..**
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries. For applicable back up point level switch - see point level measurement catalog	**7ML60..-.....-....**
Spare parts	
Electronic module, LR510, LR530, <DN 80 / 3 inch, mA/HART	**A5E53276263**
Electronic module, LR530, LR550, LR580, >DN 50 / 2 inch, mA/HART	**A5E53276249**
LR500 lid with window, Non-Exd/XP	**A5E53276250**
LR500 lid with window, Exd/XP	**A5E53308680**
LR500 lid without window, all versions	**A5E53276252**
HMI graphical display, with interconnection cable	**A5E53276247**
Spring washers (x 40) kit for all process connection sizes	**A5E53276258**
Spring washers x 4, M10 and 3/8", stainless steel	**A5E53308674**
Spring washers x 4, ½", stainless steel	**A5E53308675**
Spring washers x 4, M12, stainless steel	**A5E53308676**
Spring washers x 8, M16 and 5/8", stainless steel	**A5E53308677**
Spring washers x 12. M20 and ¾", stainless steel	**A5E53308678**
Spring washers x 12, M24 and 7/8", stainless steel	**A5E53308679**

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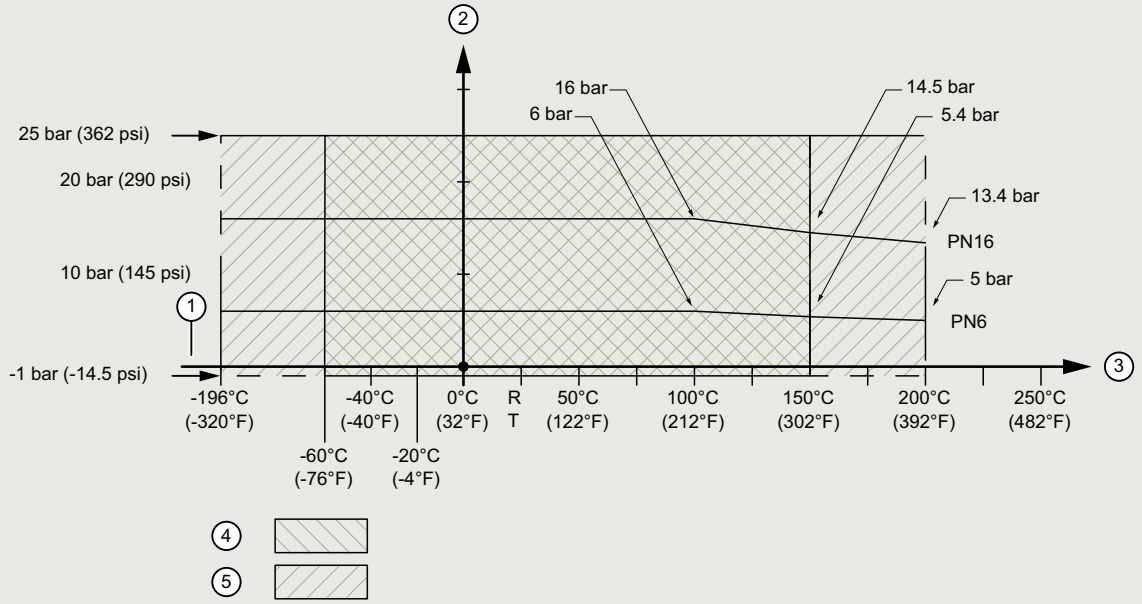
Technical specifications

SITRANS LR530			
Mode of operation			
Recommended measuring range Note: Maximum measurement range depends on the flange size, refer to the table in dimension drawings.	• DN 25: 20 m (66 ft) • DN 50, 2": 30 m (98 ft) • ≥DN 80, 3": 120 m (394 ft)		
Medium conditions			
Process temperature	• Standard version: -60 ... +150 °C (-76 ... +302 °F) • Thermal extension version: -196 ... +200 °C (-320 ... +392 °F)		
Process pressure	Process connection and temperature dependent. See Pressure/Temperature curves for more information.		
Design			
Flange material	316/316L stainless steel		
Wetted materials			
• Antenna lens	PTFE lens with integral PTFE gasket		
Process connections	Raised face, Form B1, EN1092-1. DIN2501 • Flange DN25 PN6 • Flange DN50 PN6 • Flange DN50 PN6 • Flange DN100 PN16 • Flange DN150 PN16 • Flange DN200 PN16 • Flange DN25 PN40 • Flange DN50 PN40 • Flange DN80 PN40 • Flange DN100 PN40 • Flange DN150 PN40	Raised face, ASME B16.5 • Flange 1" 150lb • Flange 2" 150lb • Flange 3" 150lb • Flange 4" 150lb • Flange 6" 150lb • Flange 8" 150lb • Flange 1" 300lb • Flange 2" 300lb • Flange 3" 300lb • Flange 4" 300lb • Flange 6" 300lb • Flange 8" 300lb	Raised face, JIS • Flange DN25 5K • Flange DN50 10K • Flange DN80 10K • Flange DN100 10K • Flange DN150 10K
Second line of defence option (SLOD)	Internal fused glass seal		

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Characteristic curves

SITRANS LR530 Flanged encapsulated antenna, EN 1092-1



1 Atmospheric pressure
2 Allowable operating pressures
3 Allowable operating temperatures
4 PTFE without thermal extension
5 PTFE with thermal extension

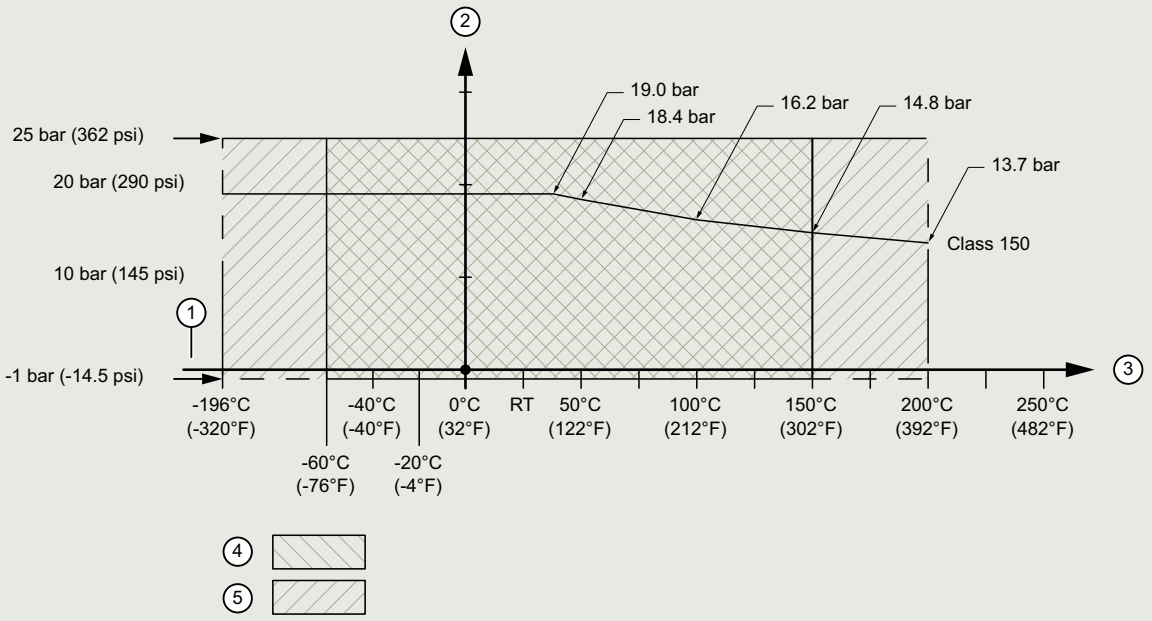
Note: PN40 flange maximum allowable working pressure is 25 bar (362 psi).

SITRANS LR530 Flanged encapsulated antenna, process pressure/temperature derating curve, EN 1092-1

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Characteristic curves (continued)

SITRANS LR530 Flanged encapsulated antenna, ASME B16.5



1 Atmospheric pressure
2 Allowable operating pressures
3 Allowable operating temperatures
4 PTFE without thermal extension
5 PTFE with thermal extension

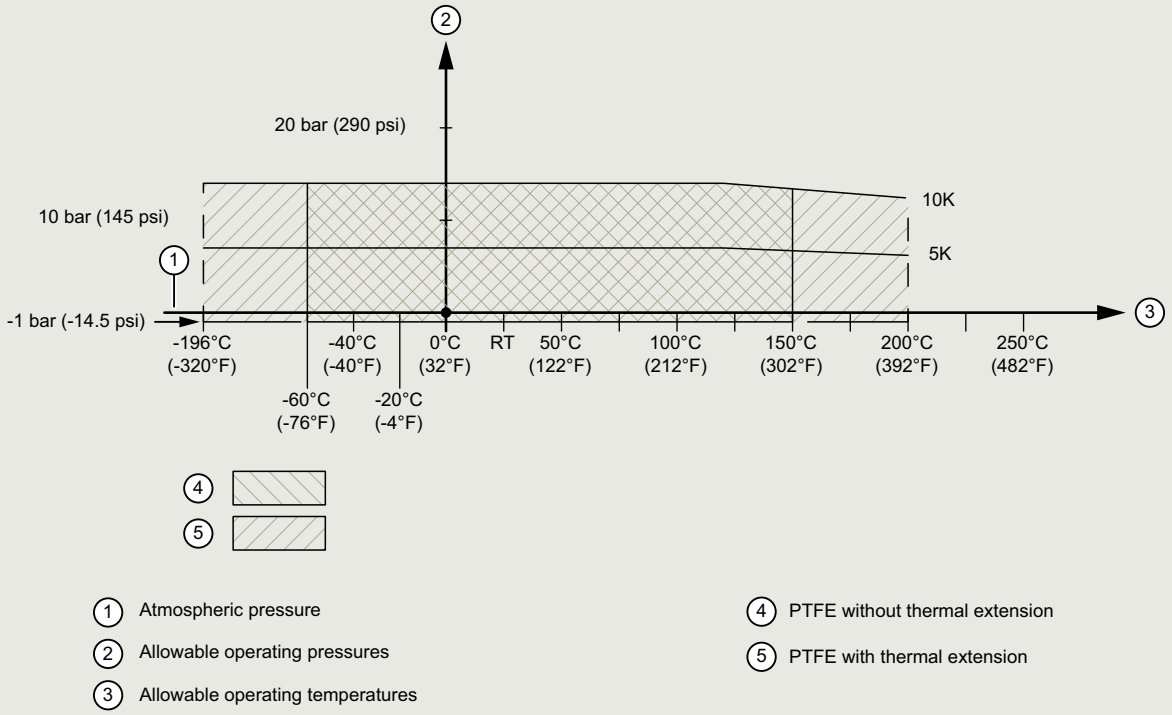
Note: Class 300 flange maximum allowable working pressure is 25 bar (362 psi).

SITRANS LR530 Flanged encapsulated antenna, process pressure/temperature derating curve, ASME B16.5

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Characteristic curves (continued)

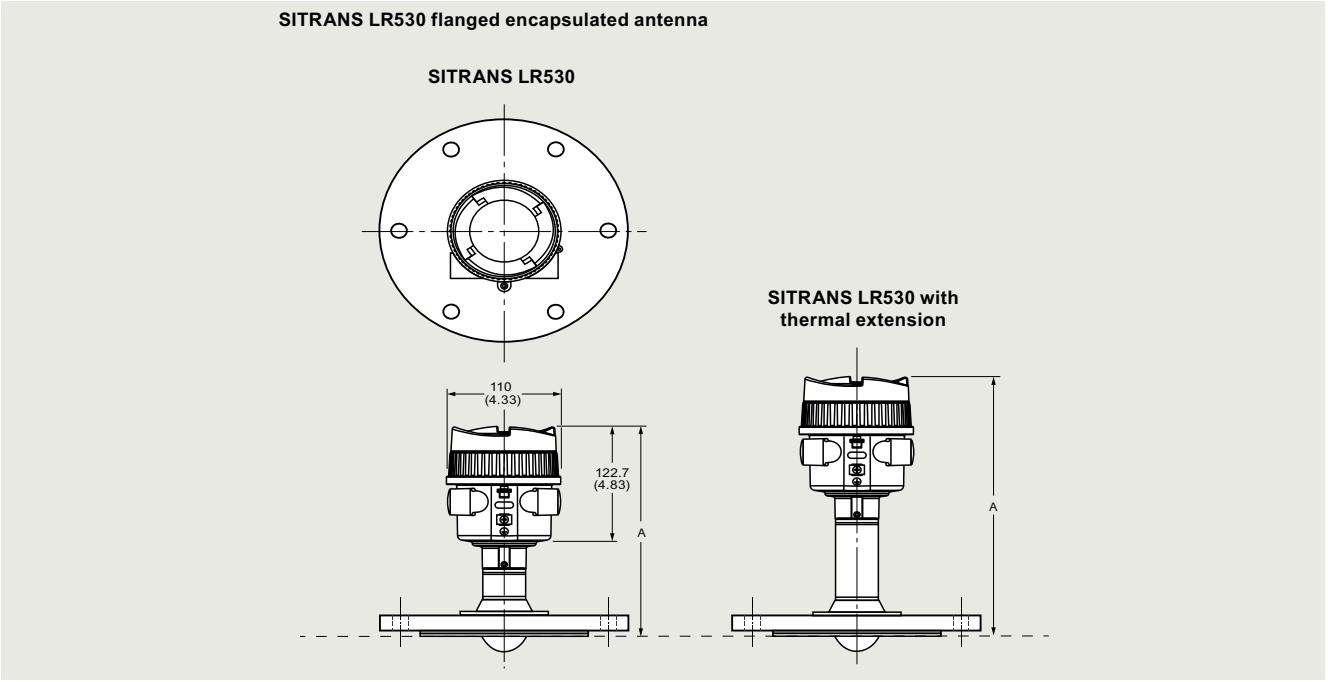
SITRANS LR530 Flange encapsulated antenna, JIS B 2220



SITRANS LR530 Flanged encapsulated antenna, process pressure/temperature derating curve, JIS B 2220

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Dimensional drawings



SITRANS LR530 Flanged encapsulated antenna, dimensions in mm (inch)

Process connection type	A mm (inch)	A with thermal extension	Beam angle	Recommended max. range [m (ft)]	Flange O.D. [mm (inch)]	Bolt hole circle Ø [mm (inch)]	Bolt hole Ø [mm (inch)]	No. of bolt holes	Flange thickness- [mm (inch)]
Flange DN25 PN6, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	201.7 (7.94)	221.7 (8.73)	10°	20 (65.6)	100 (3.94)	75 (2.95)	11 (0.43)	4	16 (0.63)
Flange DN50 PN6, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	216.1 (8.51)	268.1 (10.56)	6°	30 (98.4)	140 (5.51)	110 (4.33)	14 (0.55)	4	20 (0.79)
Flange DN80 PN6, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	190 (7.48)	150 (5.91)	18 (0.71)	4	20 (0.79)
Flange DN100 PN16, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	220 (8.66)	180 (7.09)	18 (0.71)	8	20 (0.79)
Flange DN150 PN16, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	285 (11.22)	240 (9.45)	22 (0.87)	8	22 (0.87)
Flange DN200 PN16, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	340 (13.39)	295 (11.61)	22 (0.87)	12	24 (0.94)

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Dimensional drawings (continued)

Process connection type	A mm (inch)	A with thermal extension	Beam angle	Recommended max. range [m (ft)]	Flange O.D. [mm (inch)]	Bolt hole circle Ø [mm (inch)]	Bolt hole Ø [mm (inch)]	No. of bolt holes	Flange thickness- [mm (inch)]
Flange DN25 PN40, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	201.7 (7.94)	221.7 (8.73)	10°	20 (65.6)	115 (4.53)	85 (3.35)	14 (0.55)	4	18 (0.71)
Flange DN50 PN40, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	216.1 (8.51)	268.1 (10.56)	6°	30 (98.4)	165 (6.5)	125 (4.92)	18 (0.71)	4	20 (0.79)
Flange DN80 PN40, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	200 (7.87)	160 (6.3)	18 (0.71)	8	24 (0.94)
Flange DN100 PN40, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	235 (9.25)	190 (7.48)	22 (0.87)	8	24 (0.94)
Flange DN150 PN40, raised face, Form B1, EN1092-1, DIN2501 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	300 (11.81)	250 (9.84)	26 (1.02)	8	28 (1.1)
Flange 1" 150lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	10°	20 (65.6)	108 (4.25)	79.2 (3.13)	15.7 (0.62)	4	16 (0.63)
Flange 2" 150lb RF, ASME B16.5 / 316/316L	216.1 (8.51)	268.1 (10.56)	6°	30 (98.4)	152.4 (6)	120.7 (4.75)	19.1 (0.75)	4	19.1 (0.75)
Flange 3" 150lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	190.5 (7.5)	152.4 (6)	19.1 (0.75)	4	23.9 (0.94)
Flange 4" 150lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	228.6 (9)	190.5 (7.5)	19.1 (0.75)	8	23.9 (0.94)
Flange 6" 150lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	279.4 (11)	241.3 (9.5)	22.4 (0.88)	8	25.4 (1)
Flange 8" 150lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	342.9 (13.5)	298.5 (11.75)	22.4 (0.88)	8	28.4 (1.12)
Flange 1" 300lb RF, ASME B16.5 / 316/316L	201.7 (7.94)	221.7 (8.73)	10°	20 (65.6)	124 (4.88)	88.9 (3.5)	19.1 (0.75)	4	17.5 (0.69)
Flange 2" 300lb RF, ASME B16.5 / 316/316L	216.1 (8.51)	268.1 (10.56)	6°	30 (98.4)	165.1 (6.5)	127 (5)	19.1 (0.75)	8	22.4 (0.88)
Flange 3" 300lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	209.5 (8.25)	168.1 (6.62)	22.4 (0.88)	8	28.4 (1.12)
Flange 4" 300lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	254 (10)	200.2 (7.88)	22.4 (0.88)	8	31.8 (1.25)
Flange 6" 300lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	317.5 (12.5)	269.7 (10.62)	22.5 (0.89)	12	36.6 (1.43)
Flange 8" 300lb RF, ASME B16.5 / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	381 (15)	330.2 (13)	25.4 (1)	12	41.1 (1.63)
Flange DN25 5K RF, JIS / 316/316L	201.7 (7.94)	221.7 (8.73)	10°	20 (65.6)	95 (3.74)	75 (2.95)	12 (0.47)	4	16 (0.63)
Flange DN50 10K RF, JIS / 316/316L	216.1 (8.51)	268.1 (10.56)	6°	30 (98.4)	155 (6.1)	120 (4.72)	19 (0.75)	4	20 (0.79)

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Dimensional drawings (continued)

Process connection type	A mm (inch)	A with thermal extension	Beam angle	Recommended max. range [m (ft)]	Flange O.D. [mm (inch)]	Bolt hole circle Ø [mm (inch)]	Bolt hole Ø [mm (inch)]	No. of bolt holes	Flange thickness- [mm (inch)]
Flange DN80 10K RF, JIS / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	185 (7.28)	150 (5.91)	19 (0.75)	8	20 (0.79)
Flange DN100 10K RF, JIS / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	210 (8.27)	175 (6.89)	19 (0.75)	8	20 (0.79)
Flange DN150 10K RF, JIS / 316/316L	243.2 (9.57)	295.2 (11.62)	3°	120 (393.7)	280 (11.02)	240 (9.45)	23 (0.91)	8	22 (0.87)

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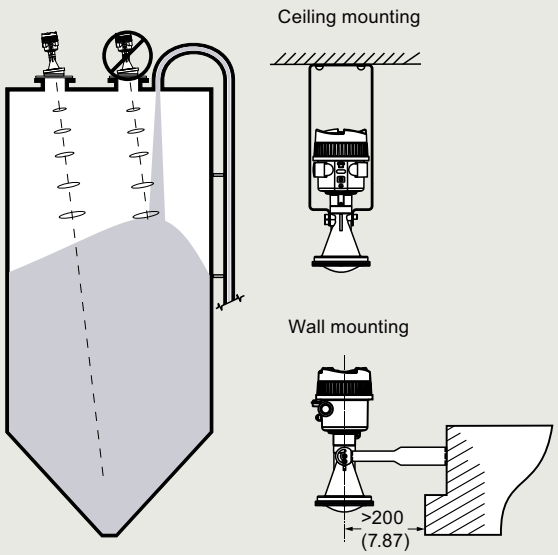
Overview



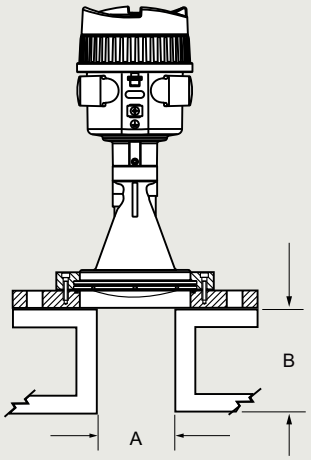
SITRANS LR550 polymeric horn antenna provides continuous monitoring of solids or liquids to a range of 120 m (394 ft). The lightweight design is suitable for open air applications and inventory measurement of basic materials in silos and vessels, or river level monitoring.

Configuration

Installation of SITRANS LR550



SITRANS LR550 nozzle mounting restrictions



Nozzle diameter "A"		Nozzle height "B"	
80 mm	3"	≤400 mm	≤ 15.8"
100 mm	4"	≤500 mm	≤ 19.7"
150 mm	6"	≤800 mm	≤ 31.5"

SITRANS LR550 Nozzle installation

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Selection and ordering data

SITRANS LR550 polymeric horn antenna Continuous, non-contact, 120 m (394 ft) range, for solids or liquids.	Article No. 7ML755	● -	●	●	●	0	● -	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Communications											
4 ... 20 mA, HART		0									
Sealing material of the antenna/process connection											
PP / PP / -40 ... +80 °C (-40 ... +176 °F)[7]			0								
PP / FKM / -40 ... +80 °C (-40 ... +176 °F)[6]			1								
PP / EPDM / -40 ... +80 °C (-40 ... +176 °F)[6]			2								
Process connection type and material											
Universal, plastic horn antenna / PP/PBT				D	A						
Without flange, with mounting bracket 300 mm / 316/316L				D	C						
Universal bolted flange 3" 150 lb, DN 80 PN16 / PP-GF30				E	C						
Flange DN 100 PN 6, flat face, / PP-GF30				F	L						
Flange DN 100 PN16, flat face, / PP-GF30				F	D						
Flange DN 150 PN16, flat face, / PP-GF30				F	E						
Flange DN 200 PN16, flat face, / PP-GF30				F	F						
Flange DN 250 PN16, flat face, / PP-GF30				F	G						
Flange 3" 150lb FF, PP-GF30				H	C						
Flange 4" 150lb FF, PP-GF30				H	D						
Flange 6" 150lb FF, PP-GF30				H	E						
Flange 8" 150lb FF, PP-GF30				H	F						
Flange DN 100 10K FF, JIS / PP-GF30				J	D						
Flange DN 150 10K FF, JIS / PP-GF30				J	E						
Purge (self-cleaning) connection											
No purge connection						0					
With purge connection[5][9][10]						1					
Enclosure											
Single compartment enclosure								4			
Type of protection											
Non Ex - General purpose									A		
Intrinsically safe Ex ia / IS (Class I, II, III, Division 1)[1]									B		
Flameproof Ex d (Class I, Division 1)									C		
Non-incendive (Class I, Division 2)[2]									D		
Dust Ignition proof, Ex t / DIP (Class II, Division 1)[1]									M		
Electrical connection											
M20										F	
½" NPT										K	
Local HMI											
None, with blind lid											0
Included, with blind lid											1
Included, with window lid											3

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Test certificates	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 - performance	**C11**
Tagging	
Stainless steel tag [69 × 50 mm (2.71 × 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**
Regional Ex Approval [3]	
EAC Ex	**E24**

Selection and Ordering data	Order code
INMETRO, IA MASC	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
Japan	**E29**
ATEX (Europe) and IECEx (International)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe), IECEx (International), CSA (Canada), and FM (USA)	**E49**

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Process connection specials	
Non-return valve for purging air connection[8)]	**J01**

Selection and Ordering data	Order code
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Hand Programmer, Intrinsically safe	**7ML1930-1BK**
Sun shield cover	**A5E52107153**
AW050 BlueTooth module kit, M20 (General purpose only)	**A5E51857118**
AW050 BlueTooth module kit, ½" NPT (General purpose only)	**A5E52095588**
Lightning Arrestor M20	**7MF7903-7AB**
Lightning Arrestor ½" NPT	**7MF7903-7AC**
Mounting bracket, 300 mm	**A5E52885008**
EPDM Aiming Gasket DN 80	**A5E52607563**
EPDM Aiming Gasket DN 100	**A5E52607570**
EPDM Aiming Gasket 3"	**A5E52607582**
EPDM Aiming Gasket 4"	**A5E52607584**
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**
Sealing plug, 316L/1.4404, Ex d, 1/2 NPT	**7MF79067BJ**
Sealing plug, 316L/1.4404, Ex d, M20 x 1.5	**7MF79067AJ**
HART modem with USB interface	**7MF4997-1DC**
Intrinsically Safe barrier	**7NG4124-1AA00**
SITRANS RD100, loop powered display	**7ML5741-.....-.**

Selection and Ordering data	Order code
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion	**7ML5744-.....-..**
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.	**7ML60..-.....-....**
For applicable back up point level switch - see point level measurement catalog	
Spare parts	
Electronic module, LR530, LR550, LR580, >DN 50 / 2 inch, mA/HART	**A5E53276249**
LR500 lid with window, Non-Exd/XP	**A5E53276250**
LR500 lid with window, Exd/XP	**A5E53308680**
LR500 lid without window, all versions	**A5E53276252**
HMI graphical display, with interconnection cable	**A5E53276247**

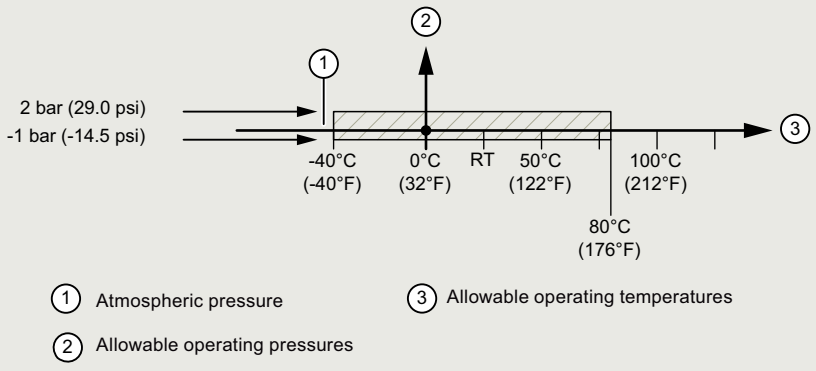
1) Available only with one -Z Regional hazardous Approval options.
2) Available only with -Z Regional hazardous Approval option E48.
3) Not available with Type of Protection option A.
4) Must be used with -Z option Y01.
5) If selecting Type of Protection options B, C, D, or M, then -Z option J01 must also be selected.
6) Not available with Process connection type and material options DA, DC, and EC.
7) Available only with Process connection type and material options DA, DC, and EC.
8) Available only with Purge connection option 1.
9) Not available with Process connection type and material options DA, DC, EC, and HC.
10) Only suitable for use with 15 psi or less process pressure applications.

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Technical specifications

SITRANS LR550	
Mode of operation	
Recommended measuring range	Beam angle 3°: 120 m (394 ft)
Medium conditions	
Process temperature	• PP lens, PP seal: -40 ... +80 °C (-40 ... +176 °F) • PP lens, FKM seal: -40 ... +80 °C (-40 ... +176 °F) • PP lens, EPDM: -40 ... +80 °C (-40 ... +176 °F)
Process pressure	2 bar max.
Design	
Flange material	PP-GF30
Wetted materials	
• Antenna lens	PP, FKM, or EPDM
• Antenna seal	FKM or EPDM
Wall and ceiling bracket	316/316L stainless steel
Process connections	• DN100 PN 6, flat face • DN100 PN16, flat face • DN150 PN16, flat face • DN200 PN16, flat face • DN250 PN16, flat face • 3" 150lb FF • 4" 150lb FF • 6" 150lb FF • 8" 150lb FF • DN100 10K FF, JIS • DN150 10K FF, JIS

Characteristic curves



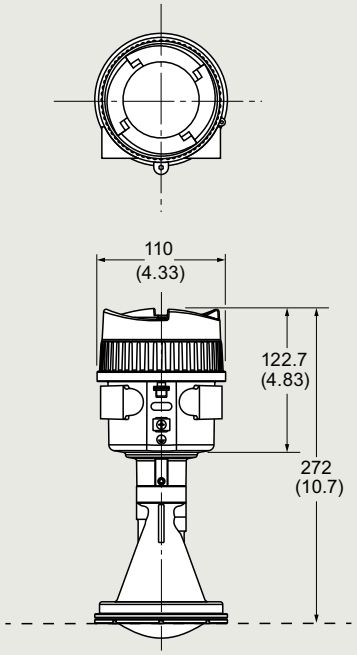
SITRANS LR550 Polymeric horn antenna, process pressure/temperature derating curve

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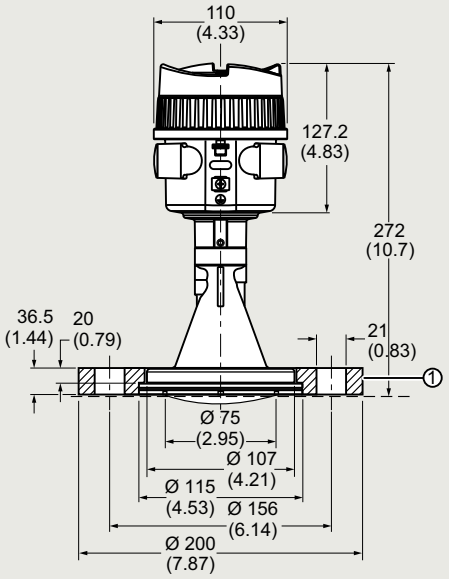
Dimensional drawings

SITRANS LR550 Polymeric horn antenna

LR550 without flange

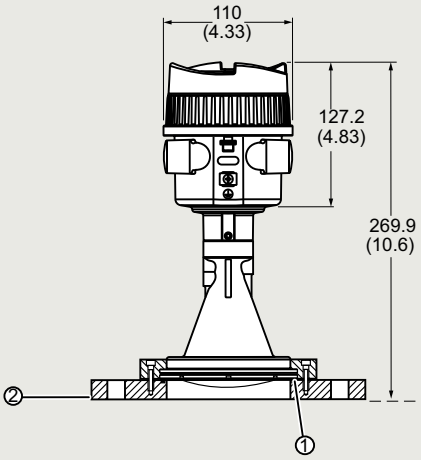


LR550 with universal bolted flange 3"



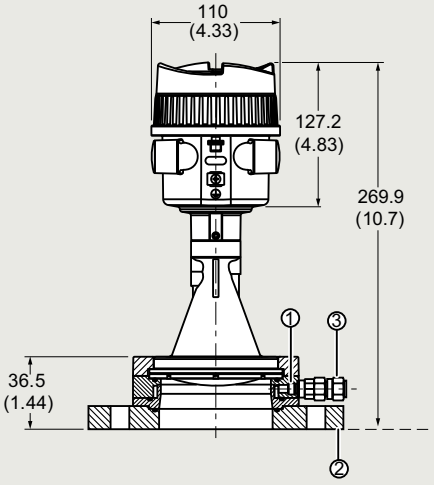
① 3" Universal bolted flange

LR550 with flange



① Process seal
② Device flange

LR550 with flange and purge connection



① Air purge inlet
② Non return valve
③ Device flange

SITRANS LR550 Polymeric horn antenna, dimensions in mm (inch)

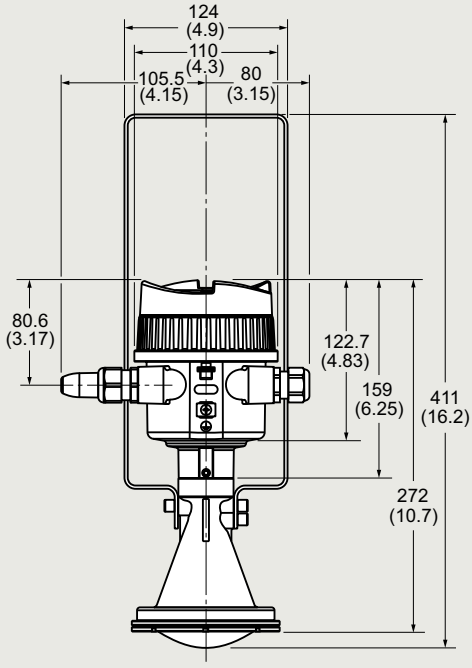
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Dimensional drawings (continued)

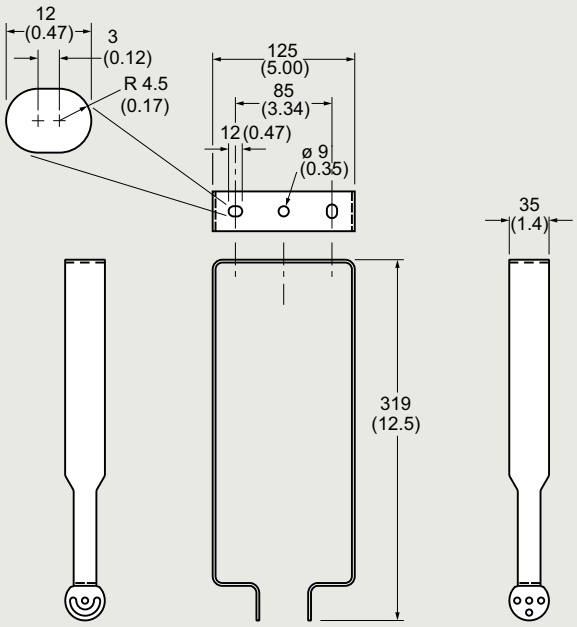
SITRANS LR550 with flange

Flange	Flange O.D. [mm (inch)]	Bolt hole circle Ø [mm (inch)]	Bolt hole Ø [mm (inch)]	No. of bolt holes	Flange thickness [mm (inch)]
DN100 PN 6, flat face	210 (8.27)	170 (6.7)	18 (0.71)	4	20 (0.79)
DN100 PN16, flat face	220 (8.99)	180 (7.09)	18 (0.71)	8	
DN150 PN16, flat face	285 (11.22)	240 (9.49)	22 (0.87)	8	
DN200 PN16, flat face	340 (13.38)	295 (11.61)	22 (0.87)	12	
DN250 PN16, flat face	405 (15.94)	355 (13.98)	26 (1.02)	12	
3" 150lb FF	190.5 (7.5)	152.4 (6)	19.1 (0.75)	4	
4" 150lb FF	228.6 (9)	190.5 (7.5)	19.1 (0.75)	8	
6" 150lb FF	279.4 (11)	241.3 (9.5)	22.4 (0.88)	8	
8" 150lb FF	342.9 (13.5)	298.5 (11.75)	22.4 (0.88)	8	
DN100 10K FF, JIS	210 (8.27)	175 (6.89)	19 (0.75)	8	
DN150 10K FF, JIS	280 (11.02)	240 (9.49)	23 (0.9)	8	

SITRANS LR550 with mounting bracket



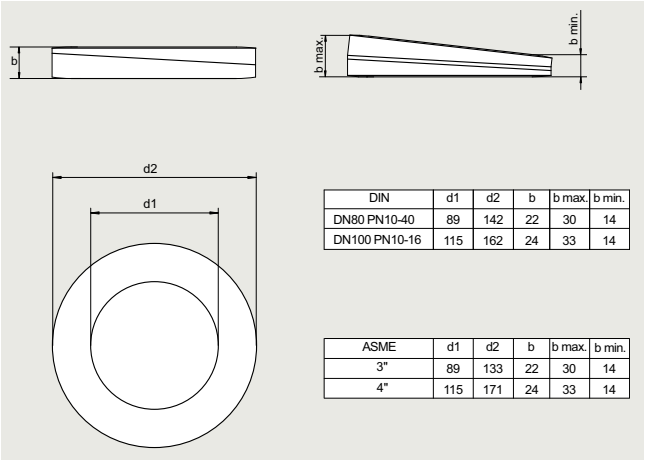
SITRANS LR550 mounting bracket side and top view



SITRANS LR550 with mounting bracket, dimensions in mm (inch)

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Dimensional drawings (continued)



DIN	d1	d2	b	b max.	b min.
DN80 PN10-40	89	142	22	30	14
DN100 PN10-16	115	162	24	33	14

ASME	d1	d2	b	b max.	b min.
3"	89	133	22	30	14
4"	115	171	24	33	14

SITRANS LR550 EPDM aiming gasket

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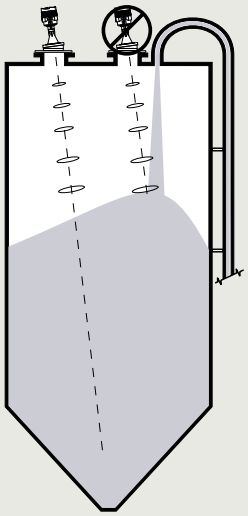
Overview



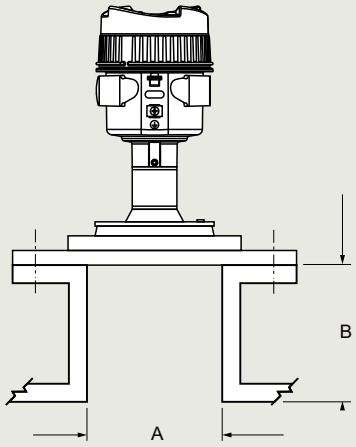
SITRANS LR580 lens antenna provides continuous monitoring of solids or liquids to a range of 120 m (394 ft). The design includes an aimer feature as well as integrated air purge connection for inventory measurement applications in silos. It is also well suited to high temperature applications in the cement and power industries.

Configuration

Installation of SITRANS LR580



SITRANS LR580 nozzle mounting restrictions



Nozzle diameter "A"		Nozzle height "B"	
80 mm	3"	≤400 mm	≤15.8"
100 mm	4"	≤500 mm	≤19.7"
150 mm	6"	≤800 mm	≤31.5"

SITRANS LR580 Nozzle installation

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Selection and ordering data

SITRANS LR580 Flanged lens antenna Continuous, non-contact, 120 m (394 ft) range, for solids or liquids.	Article No. 7ML758	● -	●	●	●	●	0 -	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Communications											
4 ... 20 mA, HART		0									
Sealing material of the antenna/process connection											
PEEK / FKM / -40 ... +150 °C (-40 ... +302 °F)			0								
PEEK / FKM / -40 ... +200 °C (-40 ... +392 °F)			1								
PEEK / FFKM / -15 ... +250 °C (5 ... +482 °F)			2								
Process connection type and material											
Flanges											
DN 80 PN 16, flat face, 316/316L				P	C						
DN 100 PN 16, flat face, 316/316L				P	D						
DN 150 PN 16, flat face, 316/316L				P	E						
3" 150lb, FF, 316/316L				Q	C						
4" 150lb, FF, 316/316L				Q	D						
6" 150lb, FF, 316/316L				Q	E						
DN 80 10K, FF, JIS / 316/316L				R	C						
DN 100 10K, FF, JIS / 316/316L				R	D						
DN 150 10K, FF, JIS / 316/316L				R	E						
Aiming flanges											
Universal DN 100/4", 316/316L				E	D						
Universal DN 150/6", 316/316L				E	E						
Second line of defense (SLOD) gas tight seal											
SLOD not included						0					
SLOD included						1					
Enclosure											
Single compartment enclosure								4			
Type of protection											
Non Ex - General purpose									A		
Intrinsically safe Ex ia / IS (Class I, II, III, Division 1)[1]									B		
Flameproof Ex d (Class I, Division 1)									C		
Non-incendive (Class I, Division 2)[2]									D		
Dust Ignition proof, Ex t / DIP (Class II, Division 1)[1]									M		
Electrical connection											
M20										F	
½" NPT										K	
Local HMI											
None, with blind lid											0
Included, with blind lid											1
Included, with window lid											3

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Test certificates	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 - performance	**C11**
Inspection certificate EN 10204-3.1, material	**C12**
Inspection certificate EN 10204-3.1, material with NACE MR0175 and MR0103	**C13**
Test report EN 10204-2.2, material	**C14**
Test report EN 10204-3.1, PMI test - XRF (X-Ray Fluorescence)	**C15**
Tagging	
Stainless steel tag [69 × 50 mm (2.71 × 1.97 inch)]	

Selection and Ordering data	Order code
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	**Y15**
Regional Ex Approval [3]	
EAC Ex	**E24**
INMETRO, IA MASC	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
Japan	**E29**
ATEX (Europe) and IECEx (International)	**E47**
CSA (Canada) and FM (USA)	**E48**

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Selection and ordering data (continued)

Selection and Ordering data	Order code
ATEX (Europe), IECEx (International), CSA (Canada), and FM (USA)	**E49**
Process connection specials	
Non-return valve for purging air connection	**J01**

Selection and Ordering data	Order code
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Hand Programmer, Intrinsically safe	**7ML1930-1BK**
Sun shield cover	**A5E52107153**
AW050 BlueTooth module kit, M20 (General purpose only)	**A5E51857118**
AW050 BlueTooth module kit, ½"NPT (General purpose only)	**A5E52095588**
Lightning Arrestor M20	**7MF7903-7AB**
Lightning Arrestor ½" NPT	**7MF7903-7AC**
Mounting bracket, 300 mm	**A5E52885008**
EPDM Aiming Gasket DN 80	**A5E52607563**
EPDM Aiming Gasket DN 100	**A5E52607570**
EPDM Aiming Gasket 3"	**A5E52607582**
EPDM Aiming Gasket 4"	**A5E52607584**
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0X-X0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0X-X0**

Selection and Ordering data	Order code
Sealing plug, 316L/1.4404, Ex d, 1/2 NPT	**7MF79067BJ**
Sealing plug, 316L/1.4404, Ex d, M20 x 1.5	**7MF79067AJ**
HART modem with USB interface	**7MF4997-1DC**
SITRANS RD100, loop powered display	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion	**7ML5744-.....-..**
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries. For applicable back up point level switch - see point level measurement catalog	**7ML60..-.....-....**
Spare parts	
Electronic module, LR530, LR550, LR580, >DN 50 / 2 inch, mA/HART	**A5E53276249**
LR500 lid with window, Non-Exd/XP	**A5E53276250**
LR500 lid with window, Exd/XP	**A5E53308680**
LR500 lid without window, all versions	**A5E53276252**
HMI graphical display, with interconnection cable	**A5E53276247**

1) Available only with one -Z Regional hazardous Approval options.
2) Available only with -Z Regional hazardous Approval option E48.
3) Not available with Type of Protection option A.

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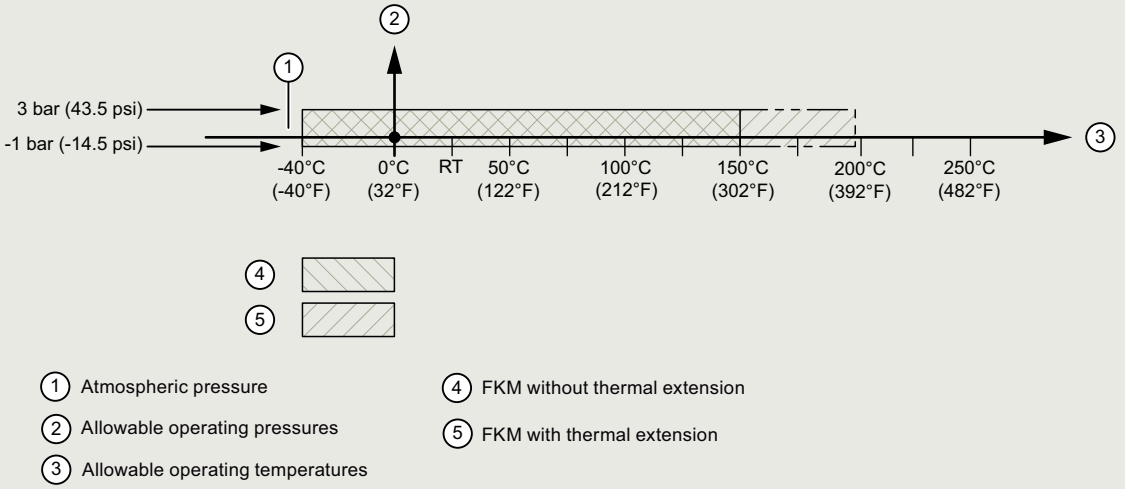
Technical specifications

SITRANS LR580	
Mode of operation	
Recommended measuring range	Beam angle 3°: 120 m (394 ft)
Medium conditions	
Process temperature	• PEEK/FKM: -40 ... +150 °C (-40 ... +302 °F) • PEEK/FKM, thermal extension: -40 ... +200 °C (-40 ... +392 °F) • PEEK/FFKM, thermal extension: -15 ... +250 °C (5 ... +392 °F)
Process pressure	-1 ... 3 bar max.
Design	
Flange material	316/316L
Wetted materials	
• Antenna lens	PEEK
• Antenna seal	FKM/FFKM (Perlast G75B)
Process connections	• DN80 PN16, flat face • DN100 PN16, flat face • DN150 PN16, flat face • 3" 150 lb, flat face • 4" 150 lb, flat face • 6" 150 lb, flat face • DN80 10K, flat face, JIS • DN100 10K, flat face, JIS • DN150 10K, flat face, JIS • Aiming flange universal DN100/4" • Aiming flange universal DN150/6"
EPDM aiming gasket	
Maximum adjustment	8°

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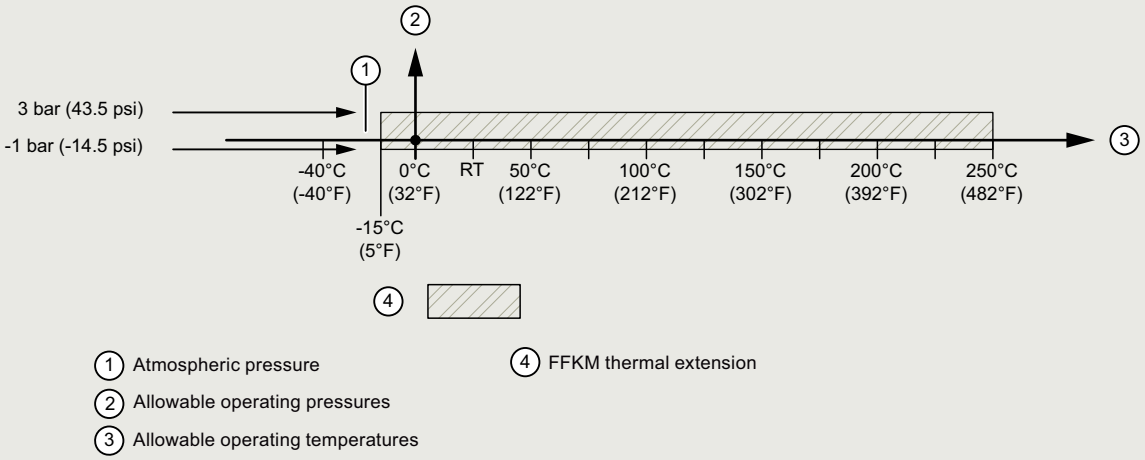
Characteristic curves

SITRANS LR580 Flanged lens antenna, seal options 0 and 1



SITRANS LR580 Flanged lens antenna, process pressure/temperature derating curve, seal options 0 and 1

SITRANS LR580 Flanged lens antenna, seal option 2

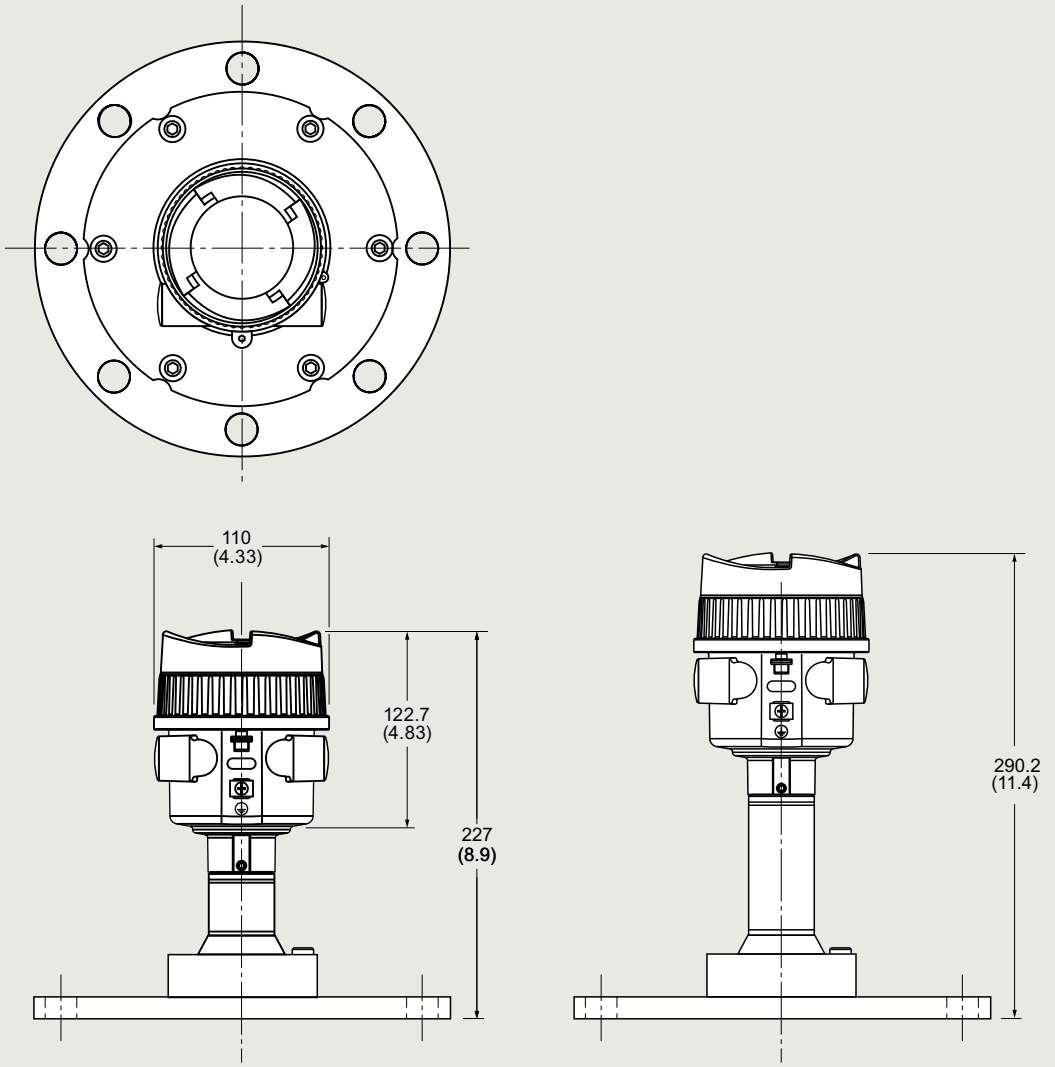


SITRANS LR580 Flanged lens antenna, process pressure/temperature derating curve, seal option 2

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Dimensional drawings

SITRANS LR580 Flat face flanges

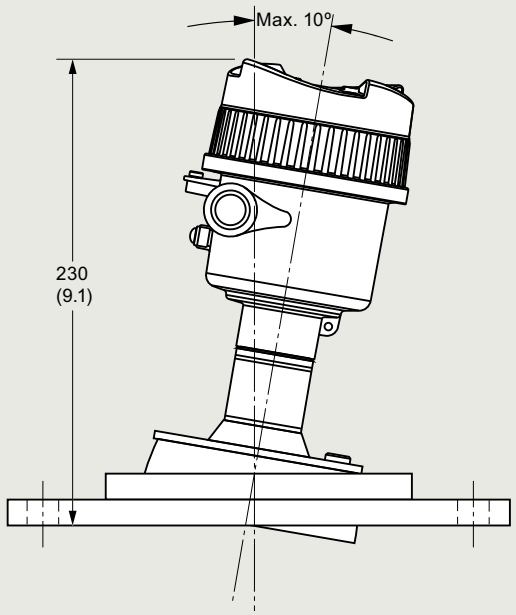


SITRANS LR580 Flat face flanges, dimensions in mm (inch)

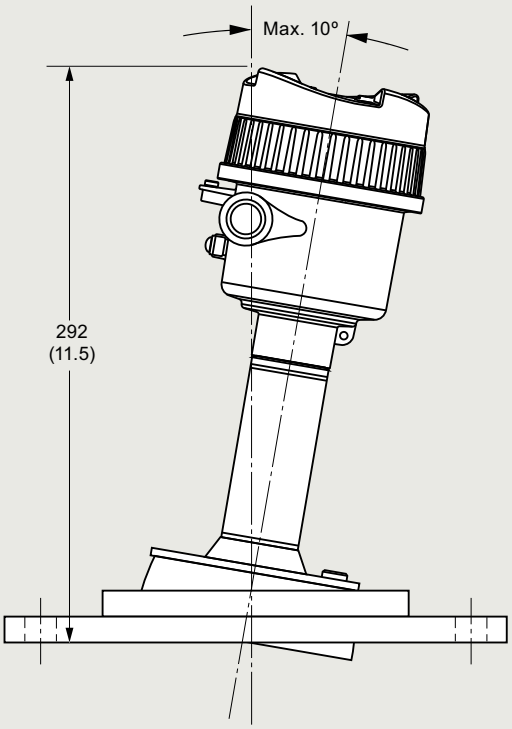
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Dimensional drawings (continued)

SITRANS LR580 Aiming flange



SITRANS LR580 Aiming flange with thermal extension



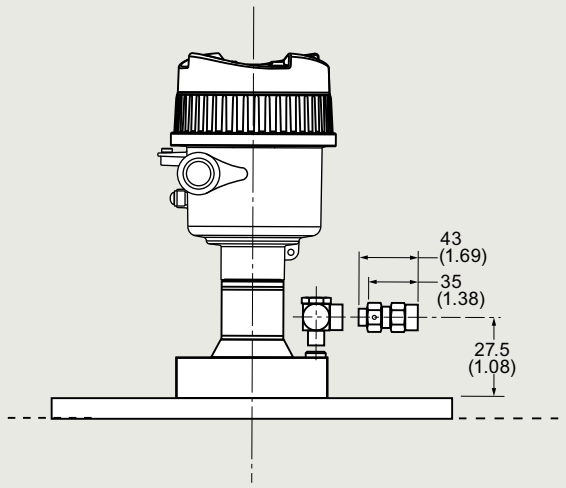
SITRANS LR580 Aiming flanges, dimensions in mm (inch)

Flange	Flange O.D. [mm (inch)]	Bolt hole circle Ø [mm (inch)]	Bolt hole Ø [mm (inch)]	No. of bolt holes	Flange thickness [mm (inch)]
DN80 PN16, flat face	200 (7.87)	160 (6.93)	18 (0.06)	8	11.5 (0.04)
DN100 PN16, flat face	220 (8.66)	180 (7.09)	18 (0.06)	8	
DN150 PN16, flat face	285 (11.22)	240 (9.45)	22 (0.07)	8	
3" 150lb flat face	190.5 (7.5)	152.4 (6)	19.1 (0.06)	4	
4" 150lb flat face	228.6 (9)	190.5 (7.5)	19.1 (0.06)	8	
6" 150lb flat face	279.4 (11)	241.3 (9.5)	22.4 (0.07)	8	
DN80 10K, flat face, JIS	185 (7.28)	150 (5.9)	19 (0.06)	8	
DN100 10K, flat face, JIS	210 (8.27)	175 (6.89)	19 (0.06)	8	
DN150 10K, flat face, JIS	280 (11.02)	240 (9.45)	23 (0.07)	8	
Aiming flange universal DN100/4"	228.6 (9)	175 ... 191	19.1 (0.06)	8	
Aiming flange universal DN150/6"	285 (11.22)	241 (9.49)	24 (0.08)	8	

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Dimensional drawings (continued)

SITRANS LR580 Lens antenna with purge connection



SITRANS LR580 Lens Antenna with purge connection, dimensions in mm (inch)

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Overview

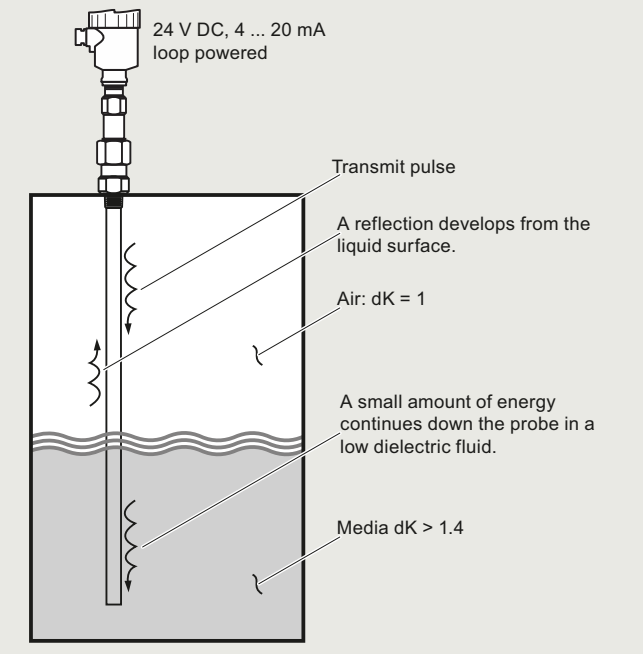
Introduction

Guided Wave Radar transmitters use TDR (time domain reflectometry).

Time Domain Reflectometry (TDR)

TDR uses pulses of electromagnetic (EM) energy to measure distances or levels. When a pulse reaches a dielectric discontinuity (created by media surface), part of the energy is reflected. The greater the dielectric difference, the greater the amplitude (strength) of the reflection.

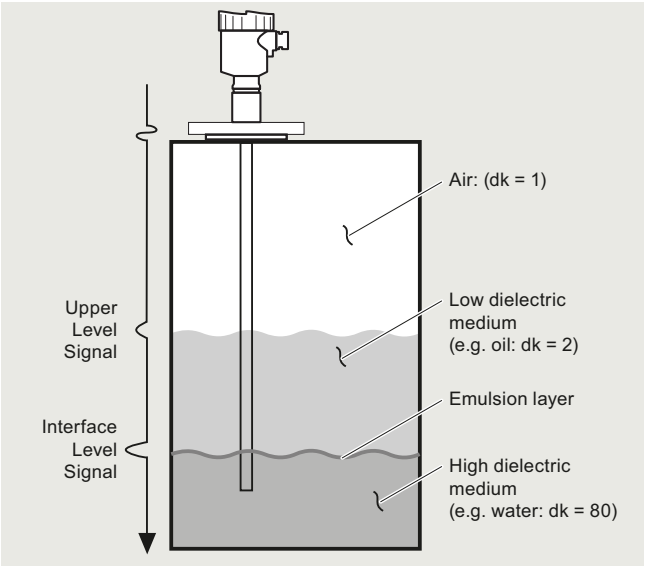
The SITRANS LG includes a transmitter and waveguide that has a characteristic impedance in air and is used as a probe. When part of the probe is immersed in a material other than air, there is lower impedance due to the increase in the dielectric. When an EM pulse is sent down the probe and meets the dielectric discontinuity, a reflection is generated.



Mode of operation

Interface Detection

The SITRANS LG, is a transmitter capable of measuring both an upper level and an interface level. The upper liquid must have a dielectric constant between 1.6 and 10 and the two liquids have a difference in dielectric constants greater than 10. A typical application would be oil over water, with the upper layer of oil being non-conductive with a dielectric constant of approximately 2 and the lower layer of water being very conductive with a dielectric constant of approximately 80. This interface measurement can only be accomplished when the dielectric constant of the upper medium is lower than the dielectric constant of the lower medium.



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Overview



The Siemens SITRANS LG series are guided wave radar transmitters for level, level/interface, and volume measurement of liquids and solids. The SITRANS LG product line can handle changes in process conditions, high temperatures and pressures, and steam.

Benefits

- High accuracy to +/- 2 mm
- Advanced Diagnostics available for high degree of safety
- Simple menu driven display offers ease of setup
- Large range of options offers reliability in most continuous level measurement applications
- Ease of maintenance through module design and field replaceable and adjustable probe options
- Perfect solution for wide range of applications from storage to interface with options for extreme pressure and temperature conditions
- Universally applicable in liquids, interface, slurries and solids
- Highly immune to buildup using auto learn function
- Ability to measure in loss of echo situations with probe end tracking
- Suitable for API 2350
- Convenient access using USB and remote interface accessories

Application

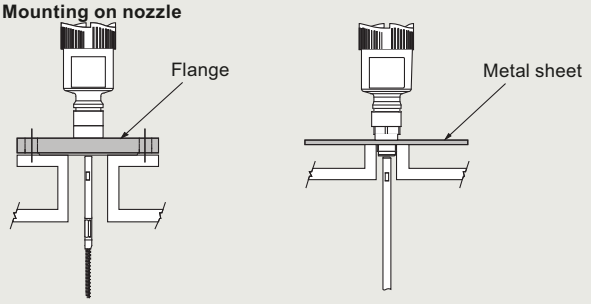
The SITRANS LG series comes in four different models, depending on the applications, level of performance, and functionality required:

- SITRANS LG240 offers configuration options for your hygienic and corrosive application requirements
- SITRANS LG250 Highly flexible solution for liquid level and interface applications. Extremely versatile offering solutions for storage, separation of materials or difficult ammonia applications
- SITRANS LG260 Ideal for measuring level in medium range solids applications including; grains, plastics, and cement
- SITRANS LG270 offers configuration options for extreme conditions including high temperature and high pressure applications such as: harsh applications found in chemical, HPI and energy industries for example, LPG gas tanks, steam boilers and distillation columns

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Configuration

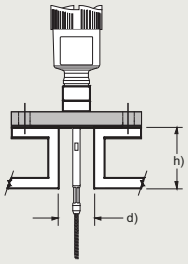
Mounting on nozzle



Installation in non-metal vessel

The guided microwave principle requires a metal surface on the process fitting. Therefore, use in plastic vessels etc. an instrument version with flange (from DN 50) or place a metal sheet, Ø > 200 mm (8 inch), beneath the process fitting when screwing it in.
Make sure that the plate has direct contact with the process fitting

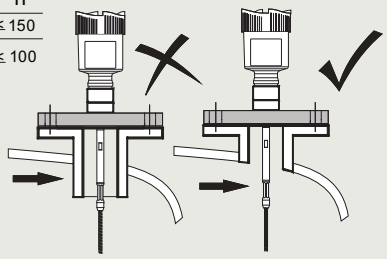
Mounting socket



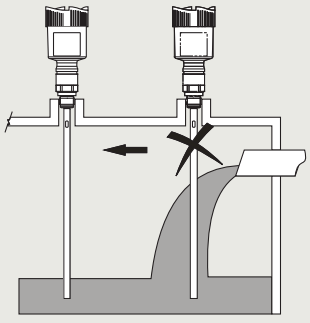
If possible, avoid sockets, mount the sensor flush with the vessel top. If this is not possible, use short sockets with small diameter. Higher sockets or sockets with a bigger diameter can generally be used. They simply increase the upper blocking distance. Check if this is relevant for your measurement. In such cases, always carry out a false signal suppression after installation.

d	h
DN 40 ... DN 150	≤ 150
> DN 150 ... DN 200	≤ 100

Socket must be installed flush



When welding the socket, make sure that the socket is flush to the vessel top.
Before beginning the welding work, remove the electronics module from the sensor. By doing this, you avoid damage to the electronics through inductive coupling.



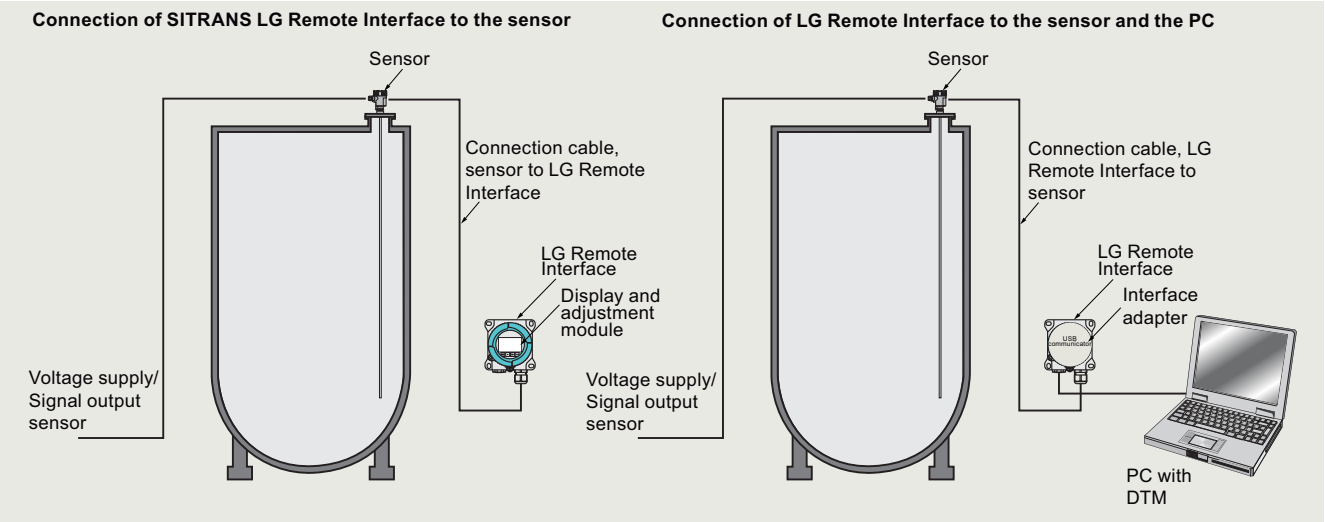
Inflowing medium

Do not mount the instruments in or above the filling stream. Make sure that you detect the product surface, not the inflowing product.

SITRANS LG Series installation

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Configuration (continued)



SITRANS LG Remote Interface installation

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Selection and ordering data

SITRANS LG240 Guided radar level transmitter Continuous, contact, 32 m (105 ft) range. Monitors level and interface in aggressive liquids. Ideal for hygienic applications.	Article No. 7ML5880-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Approvals			
General purpose (CSA, FM, CE)[20]		0 A	
Overfill protection (WHG; VLAREM)[11]		0 C	
ATEX II 1G, ½G, 2G Ex ia IIC T6[14]		0 E	
ATEX II 1G, ½G, 2G Ex ia IIC + Overfill (WHG; VLAREM)[11]		0 F	
ATEX II 1G, ½G 2G Ex ia IIC + ATEX II 1D, ½D, 2D IP6x[1)15)17]		0 H	
ATEX II ½G, 2G Ex d ia IIC T6[3)13)16]		0 J	
ATEX II ½G, 2G Ex d ia IIC + ATEX II ½D, 2D IP6x[3)13)16)17]		0 K	
ATEX II 1D, ½D, 2D IP6x[1)17)18]		0 N	
ATEX II 1G, II ½G, II 2G Ex ia IIC T6 ... T1 Ga, Ga/Gb, Gb /IEC Ex ia IIC T6 ... T1 Ga, Ga/Gb, Gb[1)14]		0 W	
IEC Ex ia IIC T6[14]		0 P	
IEC Ex ia IIC T6 + IEC IP6x T tD[1)15)17]		0 Q	
IEC Ex d ia IIC T6[3)13)16]		0 R	
IEC Ex d ia IIC T6 + IEC IP6x T tD[3)13)16]		0 S	
FM (NI) Class I, Div. 2, Groups A, B, C, D2[9)12)16]		1 A	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[9)15]		1 B	
FM (XP-AIS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[3)13)16]		1 C	
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G[1)17]		1 E	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[14]		1 F	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[3)13)16]		1 G	
NEPSI Ex ia IIC T6[14]		2 A	
NEPSI Ex ia IIC T6 + DIP A20/21 TA T*[1)15]		2 B	
NEPSI Ex d ia IIC T6[9)10)13)16]		2 C	
NEPSI Ex d ia IIC T6 + DIP A20/21 TA T*[9)10)13)16]		2 D	
NEPSI DIP A20/21 TA T*[1)16]		2 G	
INMETRO Ex ia IIC T6 ... T1[14]		3 A	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb[1)10)15]		3 B	
INMETRO Ex d ia IIC T6 ... T1[9)10)13)16]		3 C	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb[9)10)13)16]		3 D	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db[1)10)13)16]		3 G	
Korea KC ex free area		6 A	
EAC 0 Ex ia IIC T1 ... T6 X[14]		5 A	
EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[1)15]		5 B	
EAC 1 Ex d ia IIC T1 ... T6 X[9)10)13)16]		5 C	
EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[9)10)13)16]		5 D	
Note: Version/Material, Process fitting/Material, and Length options are available only with options of corresponding type.			
Probe version/Material			
Probe cable ø 4 mm (0.16 inch) with gravity weight/PFA[17]		A	
Probe exchangeable rod ø 8 mm (0.31 inch)/1.4435 (Basle standard)[17]		B	
Probe exchangeable rod ø 8 mm (0.31 inch)/ 1.4435 (Basle standard) can be autoclaved[17]		C	
Probe rod ø 10 mm (0.39 inch)/PFA[17]		D	
Probe exchangeable rod (ø 8 mm) /1.4435 (BN2), electropolished (Ra < 0.38 µm)[17]		E	
Process fitting/Material			
Clamp 2" PN 16 (ø 64 mm) DIN 32676, ISO2852/1.4435 (BN2)		0 0	
Clamp 2" PN 16 (ø 64 mm) DIN 32676, ISO2852/PTFE-TFM 1600		0 1	
Clamp 2 1/2" PN 10 (ø 77.5 mm) DIN 32676, ISO2852/1.4435 (BN2)		0 2	
Clamp 2 1/2" PN 10 (ø 77.5 mm) DIN 32676, ISO2852/PTFE-TFM 1600		0 3	
Clamp 3" PN 10 (ø 91 mm) D N 32676, ISO2852/1.4435 (BN2)		0 4	
Clamp 3" PN 10 (ø 91 mm) DIN 32676, ISO2852/PTFE-TFM 1600		0 5	

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Selection and ordering data (continued)

SITRANS LG240 Guided radar level transmitter Continuous, contact, 32 m (105 ft) range. Monitors level and interface in aggressive liquids. Ideal for hygienic applications.	Article No. 7ML5880-	● ● ● ● ● - ● ● ● ● ●	Order Code ● ● ●
Clamp 4" PN 6 (ø 119 mm) DIN 32676, ISO2852/1.4435(BN2)		0 6	
Clamp 4" PN 6 (ø 119 mm) DIN 32676, ISO2852/PTFE-TFM 1600		0 7	
Clamp 1½" PN 16 (ø 50.5 mm) DIN 32676, ISO2852/1.4435 (BN2)		4 0	
Bolting DN 32, PN 40 DIN 11851/1.4435(BN2)		0 8	
Bolting DN 32, PN 40 DIN 11851/PTFE-TFM 1600		1 0	
Bolting DN 40, PN 40 DIN 11851/1.4435 (BN2)		1 1	
Bolting DN 40, PN 40 DIN 11851/PTFE-TFM 1600		1 2	
Bolting DN 50, PN 25 DIN 11851/1.4435(BN2)		1 3	
Bolting DN 50, PN 25 DIN 11851/PTFE-TFM 1600		1 4	
Bolting DN 65, PN 25 DIN 11851/PTFE-TFM 1600		1 5	
Flange DN 25, PN 40 Form C, DIN 2501/PTFE-TFM 1600		2 0	
Flange DN 40, PN 40 Form C, DIN 2501/PTFE-TFM 1600		2 1	
Flange DN 50, PN 40 Form C, DIN 2501/PTFE-TFM 1600		2 2	
Flange DN 50, PN 40 Form V13, DIN 2513/PTFE-TFM 1600		2 3	
Flange DN 65, PN 40 Form C, DIN 2513/PTFE-TFM 1600		2 4	
Flange DN 80, PN 40 Form C, DIN 2501/PTFE-TFM 1600		2 5	
Flange DN 100, PN 16 Form C, DIN 2501/PTFE-TFM 1600		2 6	
Flange DN 80, PN 40 EN 1092-1 Form B1/PTFE-TFM 1600		2 7	
Flange DN 100, PN 40 EN 1092-1 Form B1/PTFE-TFM 1600		2 8	
Flange 2" 150 lb RF, ASME B16.5/PTFE-TFM 1600		3 0	
Flange 2" 300 lb RF, ASME B16.5/PTFE-TFM 1600		3 1	
Flange 3" 150 lb RF, ASME B16.5/PTFE-TFM 1600		3 2	
Flange 4" 150 lb RF, ASME B16.5/PTFE-TFM 1600		3 3	
Note: The pressure limit for all PTFE coated versions is 16 bar (per manual).			
Electronics			
Two-wire 4 ... 20 mA/HART		0	
Four-wire Modbus[3)13)]		1	
Two-wire 4 ... 20 mA/HART with SIL qualification[9)]		2	
Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz[3)13)]		3	
Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC[3)13)]		4	
PROFIBUS PA[9)]		5	
FOUNDATION Fieldbus[9)]		6	
Seal/Second line of defense/Process temperature			
Without glass seal/-40 ... +150 °C (-40 ... +302 °F)[2)]		A	
FFKM (Kalrez 6221)/-20 ... 150 °C (-4 ... +302 °F)[4)]		B	
EPDM (Freudenberg 70 EPDM 291)/ -20 ... 130 °C (-4 ... +266 °F)[4)]		C	
Housing/Protection/Cable			
Note: for installation of remote display, 7ML5840, with LG two chamber housing options, contact PVC			
Plastic IP66/IP67 M20 x 1.5/blind stopper		A	
Plastic IP66/IP67 1/2" NPT/blind stopper		B	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		C	
Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		D	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		E	
Aluminum double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		F	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		G	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		H	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		J	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		K	
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		L	
Stainless steel double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		M	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		N	

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Selection and ordering data (continued)

SITRANS LG240 Guided radar level transmitter Continuous, contact, 32 m (105 ft) range. Monitors level and interface in aggressive liquids. Ideal for hygienic applications.	Article No. 7ML5880-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		P	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		Q	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		R	
Aluminum single chamber / IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		W	
Aluminum double chamber / IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		X	
Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar) M20 x 1.5/ cable gland brass nickel-plated		Y	
Stainless steel double chamber / IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		S	
Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable);M20 x 1.5/blind plug[10)]		Z	Q 2 A
Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug[10)]		Z	Q 2 B
Lengths			
Rod ø 8 mm (0.31 inch)/1.4435 (Basle standard 300 ... 4 000 mm)			
300 ... 1 000 mm (11.81 ... 39.37 inch)[6)]		0	
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[6)]		1	
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[6)]		2	
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[6)]		3	
Rod ø 10 mm (0.24 inch)/PFA (300 ... 4 000 mm)			
300 mm (11.81 inch)[6)]		9	R 1 A
500 mm (19.69 inch)[6)]		9	R 1 B
300 ... 1 000 mm (11.81 ... 39.37 inch)[6)]		9	R 1 C
1 001 ... 5 000 mm (39.41 ... 78.74 inch)[6)]		9	R 1 D
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[6)]		9	R 1 E
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[6)]		9	R 1 F
Cable ø 4 mm (0.16 inch)/PFA (500 ... 32 000 mm)			
500 mm (9.69 inch)		9	R 1 G
501 ... 1 000 mm (19.72 ... 39.37 inch)		9	R 1 H
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		9	R 1 J
2 001 ... 4 000 mm (78.78 ... 157.40 inch)		9	R 1 K
4 001 ... 5 000 mm (157.52 ... 196.85 inch)		9	R 1 L
5 001 ... 10 000 mm (196.89 ... 393.70 inch)		9	R 1 M
10 001 ... 15 000 mm (393.74 ... 590.55 inch)		9	R 1 N
15 001 ... 20 000 mm (590.59 ... 787.40 inch)		9	R 1 P
20 001 ... 25 000 mm (787.44 ... 984.25 inch)		9	R 1 Q
25 001 ... 32 000 mm (984.29 ... 1 259.52 inch)		9	R 1 R
Exchange. rod ø 8 mm (0.31 inch)/1.4435 (BN2), electropolished (Ra < 0.38 µm)			
300 ... 1 000 mm (11.81 ... 39.37 inch)[6)]		9	R 2 A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[6)]		9	R 2 B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[6)]		9	R 2 C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[6)]		9	R 2 D

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs (mandatory)	
Please add "**-Z**" to Article No. and specify Order code(s).	
Supplementary electronics	
Without	**A00**
Additional current output 4 ... 20 mA[10)]	**A01**
Indicating/adjustment module	
Without	**E00**
Mounted	**E01**
Laterally mounted	**E02**
Language of display	
German	**L00**
English	**L01**
French	**L02**
Dutch	**L03**
Italian	**L04**
Spanish	**L05**
Portuguese	**L06**
Russian	**L07**
Chinese	**L08**
Japanese	**L09**
No language pre-set	**L10**
Operating instructions	
German	**M00**
English	**M01**
French	**M02**
Spanish	**M03**
Further designs (optional)	
Please add "**-Z**" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description	**Y01**
Enter the total length of rigid part (cable version only) range from 100 ... 1 000 mm	**Y02**
Cleaning included certificate: oil, grease and silicone free	**W01**
Remote electronic cable lengths: 2 m (6.6 ft). Only available with Housing options Q2A and Q2B	**Y10**
Remote electronic cable lengths: 5 m (16.4 ft). Only available with Housing options Q2A and Q2B	**Y11**
Remote electronic cable lengths: 10 m (32.8 ft). Only available with Housing options Q2A and Q2B	**Y12**
Identification label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y17**
Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y18**
Material Inspection certificate 3.1 of EN 10204	**C05**
3.1-Inspection Certificate for instrument (EN 10204)[8)]	**C12**
Inspection certificate 3.1 (EN 10204, NACE MR 0175) - material[8)19)] Note: 316L probes include NACE MR 0175 and MR 0103, non 316L probes include MR 0175 only and plated flange designs are not available with NACE certificate.	**D07**
3.1-Inspection Certificate for instrument with test data (EN 10204)[8)]	**C25**
2.2-Factory certificate for material (EN 10204)[8)]	**C15**
Quality and test plan[8)]	**C26**
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN 10204)[8)]	**C13**
X-ray test + 3.1 certificate/instrument[8)]	**C14**
Positive material identification test + 3.1 certificate/instrument[8)]	**C16**
Roughness test + 3.1 certificate/instrument[8)]	**C18**

Selection and Ordering data	Order code
Pressure test + 3.1 certificate/instrument[8)]	**C31**
Helium leak test + 3.1 certificate/instrument[8)]	**C32**
Ferrite measuring accuracy to DIN 32514-1 + 3.1 certificate/instrument[8)]	**C60**
Pressure test according to NORSOK + 3.1 certificate/instrument[8)]	**C61**
5 point calibration certificate (min. length 300 mm)[8)]	**C62**

Selection and Ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
SITRANS LG series/SITRANS RD150 sensor display module	**A5E34143449**
SITRANS LG, two-wire 4 ... 20 mA/HART electronic	**A5E35637821**
SITRANS LG, USB communicator	**A5E35192015**
SITRANS LG, Mounting eye M12 x 20	**PBD:51041448**
SITRANS LG, Mounting spring	**PBD:51041449**
Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	**7NG4124-0AA00**
HART modem with USB interface	**7MF4997-1DC**
SITRANS RD100, loop powered display -see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

Note: some configuration options are not available. For restriction information see the online PIA configuration tool.

1) Some approvals are not available with Plastic and Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.
2) Available only with Rod ø 10 mm/PFA and Cable ø 4 mm/PFA Length options.
3) Available only with Supplementary electronic option A00 and Indicating/adjustment module options E00, E01.
4) Not available with Remote Housing/Protection/Cable options Q2A and Q2B.
5) Not available with Electronic option 5.
6) Not available with Y02.
7) Available only with Electronic options 0, 2, and 6.
8) Listed Certificates are not available with all configurations, please contact factory for more information.
9) Available only with Supplementary electronic option A00.
10) Not available with Indicating/adjustment module option E02.
11) Available only with Electronics options 0, 2, and 5.
12) Some approvals are not available with Remote or Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.
13) Available only with Double chamber, Metallic Housing/Protection/Cable options and certain glands.
14) Available only with Electronics options 0, 2, 5, 6.
15) Available only with Electronics options 0 and 2.
16) Available only with Electronics options 0 ... 4.
17) Not available with some Seal/Second line of defense/Process temperature options.

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Selection and ordering data (continued)

18) Available only with Electronic options 0, 2, 3, and 4.

19) Available only with 316L Probes. NACE is not available with coated, plated, or hygienic connections.

20) FM and CSA approvals are not available with plastic housing enclosures.

Note: Please consult manual for further detail.

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Approvals			
General purpose (CSA, FM, CE)[40]		0 A	
Shipping approval[4)6)7)8)13)]		0 B	
Overfill protection (WHG; VLAREM)[9)10)13)]		0 C	
ATEX II 1G, ½G, 2G Ex ia IIC T6[10)13)]		0 E	
ATEX II 1G, ½G, 2G Ex ia IIC + Overfill (WHG; VLAREM)[10)13)]		0 F	
ATEX II 1G, ½G, 2G Ex ia IIC T6 + shipping approval[4)6)7)8)13)]		0 G	
ATEX II 1G, ½G 2G Ex ia IIC + ATEX II 1D, ½D,2D IP6x[1)13)]		0 H	
ATEX II ½G, 2G Ex d ia IIC T6[2)8)11)12)13)]		0 J	
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1/2D, 2D IP6x[2)8)11)12)13)]		0 K	
ATEX II 1/2G, 2G Ex d IIC T6[1)11)14)]		0 L	
ATEX II 1/2G, 2G Ex d IIC + ATEX II 1/2D, 2D IP6x[1)11)13)14)]		0 M	
ATEX II 1D, 1/2D, 2D IP6x T[1)13)14)]		0 N	
ATEX II 1G, II 1/2G, II 2G Ex ia IIC T6...T1 Ga, Ga/Gb, Gb /IEC Ex ia IIC T6...T1 Ga, Ga/Gb, Gb[13)]		0 W	
ATEX II 1/2G, II 2G Ex db IIC T6 ... T1 Ga/Gb, Gb / IEC Ex db IIC T6 ... T1 Ga/Gb, Gb[13)14)18)]		1 K	
ATEX II 1/2G, II 2G Ex d ia IIC T6 ... T1 Ga/Gb, Gb + Ship approval[2)6)8)11)12)13)]		7 A	
ATEX II 1/2G, II 2G Ex db IIC T6 ... T1 Ga/Gb, Gb + Ship approval[1)6)8)11)13)]		7 B	
ATEX II 1/2G, II 2G Ex db IIC T6 ... T1 Ga/Gb, Gb + Overfill protection (WHG, VLAREM)[1)11)14)]		7 P	
IEC Ex ia IIC T6[10)13)]		0 P	
IEC Ex ia IIC T6 + IEC IP6x T tD[1)14)15)]		0 Q	
IEC Ex d ia IIC T6[2)8)11)12)13)]		0 R	
IEC Ex d ia IIC T6 + IEC IP6x T tD[2)8)11)12)13)15)]		0 S	
IEC Ex d IIC T6[1)11)14)]		0 T	
IEC Ex d IIC T6 + IEC IP6x T tD[1)11)14)]		0 U	
IEC Ex db IIC T6...T1 Ga/Gb, Gb + Ship approval[1)6)8)11)13)14)]		7 C	
IEC Ex ia IIC T6...T1 Ga, Ga/Gb, Gb + Ship approval[6)8)13)16)]		7 D	
IEC Ex d ia IIC T6...T1 Ga/Gb, Gb + Ship approval[2)6)8)11)13)15)]		7 E	
FM (NI) Class I, Div. 2, Groups A, B, C, D[3)8)13)17)]		1 A	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F[5)8)13)]		1 B	
FM (XP-AIS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2)8)11)12)13)]		1 C	
FM (XP) Class I, Div. 1, Groups A, B, C, D[2)11)13)14)]		1 D	
FM (NI) Class I, II, III, Div. 2, Groups A, B, C, D, F, G + Ship approval[4)6)8)13)17)]		7 F	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[6)8)13)16)]		7 G	
FM (XP-AIS) Class I, Div. 1, Groups A, B, C, D, + Ship approval[6)8)11)13)16)]		7 H	
FM (XP) Class I, Div. 1, Groups A, B, C, D + Ship approval[2)6)8)13)14)]		7 J	
CSA (NI) Class I, Div. 2, Groups A, B, C ,D (DIP) Class II, III, Div. 1, Groups E, F, G[1)]		1 E	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[5)13)]		1 F	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2)8)11)12)13)]		1 G	
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[8)13)14)18)]		1 H	

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Selection and ordering data (continued)

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
CSA (NI) Class I, II, III Div. 2, Groups A, B, C, D, F, G + Ship approval[1)6)13)]		7 K	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[6)13)16)]		7 L	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[6)8)11)32)]		7 M	
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[6)8)13)14)18)]		7 N	
NEPSI Ex ia IIC T6[5)13)]		2 A	
NEPSI Ex ia IIC T6 + DIP A20/21 TA T*[1)13)]		2 B	
NEPSI Ex d ia IIC T6[2)8)11)13)]		2 C	
NEPSI Ex d ia IIC T6 + DIP A20/21 TA T*[2)8)11)13)]		2 D	
NEPSI Ex d IIC T6[1)11)13)14)]		2 E	
NEPSI Ex d IIC T6 + DIP A20/21TA T[1)11)13)14)]		2 F	
NEPSI DIP A20/21 TA T*[1)13)14)]		2 G	
INMETRO Ex ia IIC T6 ... T1[5)13)]		3 A	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb[1)11)13)]		3 B	
INMETRO Ex d ia IIC T6 ... T1[2)8)11)13)]		3 C	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb[1)8)11)13)]		3 D	
INMETRO Ex d IIC T6 ... T1[1)11)13)14)]		3 E	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d IIC T6 Ga/Gb[1)11)13)14)]		3 F	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db[1)11)13)14)]		3 G	
KOSHA Ex d IIC T6 ... T1 – KE[1)11)13)14)]		4 A	
Korea KC ex free area		6 A	
EAC 0 Ex ia IIC T1 ... T6 X[13)]		5 A	
EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[1)13)]		5 B	
EAC 1 Ex d ia IIC T1 ... T6 X[2)8)11)13)]		5 C	
EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[2)8)11)13)]		5 D	
EAC 1 Ex d IIC T1 ... T6 X[1)11)13)]		5 E	
EAC 0 Ex d IIC T1 ... T6 X + Ex t IIIC T ... IP66[1)11)13)]		5 F	
EAC Ex t IIIC T ... IP66[1)13)]		5 G	
Note: Version/Material, Process fitting/Material, and Length options are available only with options of corresponding type.			
Probe version/Material			
Probe exchangeable cable ø 2 mm (0.08 inch) with gravity weight/316[19)20)]		A	
Probe exchangeable cable ø 2 mm (0.08 inch) center weight/316L[19)20)]		B	
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/316L[9)19)20)]		C	
Probe exchangeable cable ø 4 mm (0.16 inch) with center weight/316L[9)19)20)]		D	
Probe exchangeable rod ø 8 mm (0.31 inch)/316L[9)19)]		E	
Probe exchangeable rod ø 12 mm (0.47 inch)/316L[9)19)]		F	
Probe coax version ø 21.3 mm (0.84 inch) with single hole/316L[9)19)20)]		G	
Probe coax version ø 21.3 mm (0.84 inch) with multiple hole/316L[19)20)]		H	
Probe coax version ø 42.2 mm (1.66 inch) with multiple hole/316L[9)19)20)]		K	
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/Alloy C22 (2.4602)[9)]		L	
Probe exchangeable cable ø 4 mm (0.16 inch) with centre weight/Alloy C22 (2.4602)[9)]		M	
Probe exchangeable rod ø 8 mm (0.31 inch)/Alloy C22 (2.4602)[9)]		N	
Probe exchangeable rod ø 12 mm (0.47 inch)/Alloy C22 (2.4602)[9)]		P	
Probe coax version ø 21.3 mm (0.84 inch) with multiple hole/Alloy C22 (2.4602)[9)]		Q	
Probe coax version ø 42.2 mm (1.66 inch) with multiple hole/Alloy C22 (2.4602)[9)]		R	
Probe exchangeable rod ø 8 mm (0.31 inch)/ Duplex (1.4462)[9)]		S	
Exchangeable rod ø 12 mm (0.47 inch)/Alloy C22 and 400 (2.4360)[9)]		T	

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Selection and ordering data (continued)

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Exchangeable coated cable ø 4 mm with uncoated centering weight/PFA and 316[21)24)30)35)36)]		U	
Process fitting/Material			
Thread G 3/4" (DIN 3852-A) PN 6/316L			0 0
Thread 3/4" NPT (ASME B1.20.1) PN 6/316L			0 1
Thread G 3/4" (DIN 3852-A) PN 40/316L			0 2
Thread 3/4" NPT (ASME B1.20.1) PN 40/316L			0 3
Thread G 3/4" (DIN 3852-A) PN 100 / 316L[22)]			0 4
Thread 3/4" NPT (ASME B1.20.1) PN 100/316L[22)]			0 5
Thread G 1" (DIN 3852-A) PN 40/316L			0 6
Thread 1" NPT (ASME B1.20.1) PN 40/316L			0 7
Thread G 1" (DIN 3852-A) PN 100/316L[22)]			0 8
Thread 1" NPT (ASME B1.20.1) PN 100/316L[22)]			1 0
Thread G 1 1/2" (DIN 3852-A) PN 40/316L			1 1
Thread 1 1/2" NPT (ASME B1.20.1) PN 40/316L			1 2
Thread G1 1/2" (DIN 3852-A) PN 100/316L[22)]			1 3
Thread 1 1/2" NPT (ASME B1.20.1) PN 100/316L[22)]			1 4
Thread 2 NPT PN 40, ASME B1.20.1/316L[23)24)]			1 5
Flange DN 25 PN 40 Form C, DIN 2501/316L			2 0
Flange DN 25 PN 40 Form F, DIN 2501/316L			2 1
Flange DN 40 PN 40 Form C, DIN 2501/316L			2 2
Flange DN 50 PN 40 Form C, DIN 2501/316L			2 3
Flange DN 50 PN 40 Form V13, DIN 2513/316L			2 4
Flange DN 80 PN 40 Form C, DIN 2501/316L			2 5
Flange DN 80 PN 40 Form V13, DIN 2501/316L			2 6
Flange DN 100 PN 16 Form C, DIN 2501/316L			2 7
Flange DN 100 PN 16 Form V13, DIN 2501/316L			2 8
Flange DN 100 PN 40 Form C, DIN 2501 /316L			3 0
Flange DN 100 PN 40 Form V13, DIN 2513/316L			3 1
Flange DN 150 PN 16 Form C, DIN 2501/316L			3 2
Flange DN 50 PN 40 EN 1092-1 Form B1/316L			3 3
Flange DN 80 PN 40 EN 1092-1 Form B1/316L			3 4
Flange 1" 150 lb RF, ASME B16.5/316L			3 5
Flange 1 1/2" 150 lb RF, ASME B16.5/316L			3 6
Flange 2" 150 lb RF, ASME B16.5/316L			3 7
Flange 2" 300 lb RF, ASME B16.5/316L			3 8
Flange 3" 150 lb RF, ASME B16.5/316L			4 0
Flange 3" 300 lb RF, ASME B16.5/316L			4 1
Flange 4" 150 lb RF, ASME B16.5/316L			4 2
Flange 4" 300 lb RF, ASME B16.5/316L			4 3
Flange 6" 150 lb RF, ASME B16.5/316L			4 4
Flange 6" 300 lb RF, ASME B16.5/316L			4 5
Thread G 3/4" PN 40, DIN3852-A/Alloy C22 (2.4602)[37)]			4 6
Thread G 1" PN 40, DIN 3852-A/Alloy C22 (2.4602)[37)]			4 7
Thread G 1 1/2" PN 40, DIN 3852-A/Alloy C22 (2.4602)			4 8
Thread 1 1/2" NPT PN 40, ASME B1.20.1/Alloy C22 (2.4602)			5 0
Flange DN 50 PN 40 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating			5 1
Flange DN 50 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating			5 2
Flange DN 80 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating			5 3
Flange DN 100 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating			5 4
Flange DN 150 PN 16 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating			5 5

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Selection and ordering data (continued)

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Flange DN 200 PN 16 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating		5 6	
Flange 2" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		5 7	
Flange 2" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		5 8	
Flange 3" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		6 0	
Flange 4" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		6 1	
Flange 4" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		6 2	
Flange 6" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		6 3	
Flange 6" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		6 4	
Thread G 3/4" (DIN 3852-A) PN 40/Duplex 1.4462		6 5	
Flange DN 80 PN 40 Form F, DIN 2501/Duplex (1.4462)		6 6	
Flange DN 50 PN 40 Form B1, EN 1092-1/ Duplex (1.4462)		6 7	
Flange 1" 150 lb RF, ASME16.5/Duplex (1.4462)		6 8	
Flange 1 1/2" 150 lb RF, ASME B16.5/Duplex (1.4462)		7 0	
Flange 2" 150 lb RF, ASME B16.5/Duplex (1.4462)		7 1	
Flange 2" 300 lb RF, ASME B16.5/Duplex (1.4462)		7 2	
Flange 2" 600 lb RF, ASME B16.5/Duplex (1.4462)		7 3	
Flange 3" 150 lb RF, ASME B16.5/Duplex (1.4462)		7 4	
Flange 3" 300 lb RF, ASME B16.5/Duplex (1.4462)		7 5	
Flange 4" 150 lb RF, ASME B16.5/Duplex (1.4462)		7 6	
Flange 4" 150 lb FF, ASME B16.5/Duplex (1.4462)		7 7	
Flange 4" 300 lb RF, ASME B16.5/Duplex (1.4462)		7 8	
Flange 4" 600 lb RF, ASME B16.5/Duplex (1.4462)		8 0	
Thread 1 1/2" NPT PN 40, ASME B1.20.1/Alloy 400 (2.4360)		8 1	
Flange 2" 150 lb RF, ASME B16.5/Alloy 400 (2.4360)		8 2	
Flange 2" 300 lb RF, ASME B16.5/Alloy 400 (2.4360) solid		8 3	
Flange 3" 150 lb RF, ASME B16.5/Alloy 400 (2.4360)		8 4	
Flange 3" 300 lb RF, ASME B16.5/Alloy 400 (2.4360)		8 5	
Flange 3" 300 lb RJF, ASME B16.5/Alloy 400 (2.4360)		8 6	
Flange 4" 150 lb RF, ASME B16.5/Alloy 400 (2.4360)		8 7	
Flange 4" 300 lb RF, ASME B16.5/Alloy 400 (2.4360)		8 8	
Flange DN 25 PN 40 Form C, DIN 2501/ Alloy C22 (2.4602) solid[37)]		9 0	L 1 A
Flange DN 25 PN 40 Form B1, EN 1092-1/ Alloy C22 (2.4602) solid[37)]		9 0	L 1 B
Flange DN 80 PN 40 Form B1, EN 1092-1/ Alloy C22 (2.4602) solid		9 0	L 1 C
Flange 1" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) solid[37)]		9 0	L 1 D
Flange 1 1/2" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) solid[37)]		9 0	L 1 E
Flange 1 1/2" 300 lb RF, ASME B16.5/Alloy C22 (2.4602) solid[37)]		9 0	L 1 F
Flange 2" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 G
Flange 2" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 H
Flange 2" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 J
Flange 2" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 K
Flange 3" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 L
Flange 3" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 M
Flange 3" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		9 0	L 1 N
Flange 4" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 P
Flange 4" 150 lb FF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 Q
Flange 4" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 R

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Selection and ordering data (continued)

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881-	● ● ● ● ● - ● ● ● ● ●	Order Code ● ● ●
Flange 4" 300 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 S
Flange 4" 300 lb LT, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 T
Flange 4" 600 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 U
Flange 6" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 V
Flange 2 1/2" 600 lb RF, Masoneilan/ Alloy C22 (2.4602) solid		9 0	L 1 W
Flange 2" 600 lb RF, ASME B16.5/316/316 L[24)]		9 0	L 1 X
Flange 3" 600 lb RF, ASME B16.5/316/316L[24)25)]		9 0	L 1 Y
Flange 4" 600 lb RF, ASME B16.5/316/316L[31)]		9 0	L 2 A
Thread R1½ PN40, EN 10226-1/316L[38)]		9 0	L 2 B
Flange NPS 2" Class 1500 RF, ASME B16.5 / 316/316L[39)]		9 0	L 2 C
Electronics			
Two-wire 4 ... 20 mA/HART		0	
Four-wire Modbus[2)8)11)]		1	
Two-wire 4 ... 20 mA/HART with SIL qualification[9)10)]		2	
Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60Hz[2)8)11)34)]		3	
Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC[2)8)11)34)]		4	
PROFIBUS PA[5)8)]		5	
FOUNDATION Fieldbus[5)8)]		6	
Seal/Second line of defense/Process temperature			
FKM (SHS FPM 70C3 GLT)/without glass seal/-40 ... +80 °C (-40 ... +176 °F)		A	
FKM (SHS FPM 70C3 GLT)/without glass seal/ -40 ... +150 °C (-40 ... +302 °F)		B	
FKM (SHS FPM 70C3 GLT)/with glass seal/-40 ... +150 °C (-40 ... +302 °F)[26)]		C	
FFKM (Kalrez 6375)/without/-20 ... 150 °C (-4 ... +302 °F)		D	
FFKM (Kalrez 6375)/with/-20 ... +150 °C (-4 ... +302 °F)[5)]		E	
FFKM (Kalrez 6375)/with glass seal/-20 ... +200 °C (-4 ... +392 °F)[26)]		F	
EPDM (A+P 75.5/KW75F)/without glass seal/ -40 ... +80 °C (-40 ... +176 °F)		G	
EPDM (A+P 75.5/KW75F)/without glass seal/ -40 ... +150 °C (-40 ... +302 °F)[26)]		H	
EPDM (A+P 75.5/KW75F)/with glass seal/-40 ... +150 °C (-40 ... +302 °F)[26)]		J	
Silicone FEP coated (A+P FEP-O-SEAL)/without glass seal/-40 ... +80 °C (-40 ... +176 °F)		K	
Silicone FEP coated (A+P FEP-O-SEAL)/without glass seal/-40 ... +150 °C (-40 ... +302 °F)		L	
Silicone FEP coated (A+P FEP-O-SEAL)/with glass seal/-40 ... +150 °C (-40 ... +302 °F)[26)]		M	
With borosilicate glass lead through for volatile substances, e.g. ammonia/with glass seal/-60 ... +150 °C (-76 ... +302 °F)[26)]		N	
FFKM (Kalrez 6375)/without glass seal/-20 ... +200 °C (-4 ... +392 °F)		P	
FKM (SHS FPM 70C3 GLT)/with glass seal/-40 ... 80 °C (-40 ... +176 °F)[26)]		Q	
FFKM (Kalrez 6375)/without/-10 ... +150 °C		R	
FFKM (Kalrez 6375)/without/-10 ... +200 °C		S	
FFKM (Kalrez 6375)/with/-10 ... +150 °C		T	
FFKM (Kalrez 6375)/with/-10 ... +200 °C		U	
Housing/Protection/Cable			
Note: for installation of remote display, 7ML5840, with LG two chamber housing options, contact PVC			
Plastic IP66/IP67 M20 x 1.5/blind stopper[11)15)]		A	
Plastic IP66/IP67 1/2" NPT/blind stopper[8)11)]		B	
Plastic 2-chamber/IP66/IP67/M20 x 1.5/blind stopper[41)]		G	
Plastic 2-chamber/IP66/IP67 /1/2" NPT/blind stopper[41)]		H	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/ Blind stopper[8)11)]		C	
Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper[8)11)]		D	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5 / Blind stopper[41)]		E	

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Selection and ordering data (continued)

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881- ● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Aluminum double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper[41]	F	
Stainless Steel (precision casting) 316L/ IP66/IP68 (0.2 bar) M20 x 1.5/Blind stopper[9)11]	L	
Stainless Steel (precision casting) 316L/ IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper[8)11]	M	
Stainless Steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/Blind stopper[8)11]	N	
Stainless Steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper[8)11]	P	
Stainless Steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/Blind stopper[41]	Q	
Stainless Steel double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper[41]	R	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/ Cable gland stainless steel[8)11]	S	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland stainless steel[41]	T	
Stainless Steel (precision casting) 316L/ IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland stainless steel[11)28]	U	
Stainless Steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland stainless steel[11)28]	V	
Stainless steel single chamber (precision casting)/IP66/IP68 (0.2 bar) M20 x 1.5/ Cable gland brass nickel-plated[41]	W	
Aluminum single chamber/IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland brass nickel-plated[41]	X	
Stainless steel single chamber (precision casting)/IP66/ IP68 (0.2 bar) M20 x 1.5/ Cable gland brass nickel-plated[41]	Y	
Stainless steel double chamber / IP66/ IP68 (0.2 bar) M20 x 1.5 / Cable gland brass nickel-plated	J	
Aluminum single chamber/IP66/IP68 (0.2 bar) with M20 x 1.5/Plug connector Harting HAN 7D (straight)[41]	Z	Q 1 A
Aluminum single chamber/IP66/IP68 (0.2 bar) with M20 x 1.5/Special HARTING plug (bent) according to Tier One (ZB7555)[41]	Z	Q 1 B
Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug[11)27)41]	Z	Q 2 A
Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug[11)27)41]	Z	Q 2 B
Lengths		
Rod ø 8 mm/316L		
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]	0	
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[29]	1	
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]	2	
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]	3	
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[29]	4	
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[29]	5	
Rod ø 8 mm/Duplex		
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]	9	R 1 A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[29]	9	R 1 B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]	9	R 1 C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]	9	R 1 D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[29]	9	R 1 E
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[29]	9	R 1 F
Rod ø 8 mm or ø 12 mm /Alloy C22 and 400		
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]	9	R 1 J
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[29]	9	R 1 K
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]	9	R 1 L
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]	9	R 1 M
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[29]	9	R 1 N
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[29]	9	R 1 P
Rod ø 12 mm/316L		
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]	9	R 2 A
1 001 ... 2 000 mm (39.41 ... 78.74)[29]	9	R 2 B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]	9	R 2 C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]	9	R 2 D
Cable lengths ø 2 or 4 mm/316L		

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Selection and ordering data (continued)

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881-												Order Code		
		●	●	●	●	●	-	●	●	●	●		●	●	●
501 ... 1 000 mm (19.72 ... 39.37 inch)											9		R	2	E
1 000 ... 5 000 mm (39.37 ... 196.85 inch)											9		R	2	F
5 001 ... 10 000 mm (196.89 ... 393.70 inch)											9		R	2	G
10 001 ... 15 000 mm (393.74 ... 590.55 inch)											9		R	2	H
15 001 ... 20 000 mm (590.59 ... 787.40 inch)											9		R	2	J
20 001 ... 25 000 mm (787.44 ... 984.25 inch)											9		R	2	K
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)											9		R	2	L
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)											9		R	2	M
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)											9		R	2	N
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)											9		R	2	P
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)											9		R	2	Q
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)											9		R	2	R
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)											9		R	2	S
60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)											9		R	2	T
65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)											9		R	2	U
70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)											9		R	2	V
Cable Lengths ø 2 mm or ø 4 mm/Alloy C22															
501 ... 1 000 mm (19.72 ... 39.37 inch)											9		R	4	A
1 001 ... 5 000 mm (39.41 ... 196.85 inch)											9		R	4	B
5 001 ... 10 000 mm (196.89 ... 393.70 inch)											9		R	4	C
10 001 ... 15 000 mm (393.74 ... 590.55 inch)											9		R	4	D
15 001 ... 20 000 mm (590.59 ... 787.40 inch)											9		R	4	E
20 001 ... 25 000 mm (787.44 ... 984.25 inch)											9		R	4	F
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)											9		R	4	G
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)											9		R	4	H
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)											9		R	4	J
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)											9		R	4	K
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)											9		R	4	L
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)											9		R	4	M
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)											9		R	4	N
60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)											9		R	4	P
65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)											9		R	4	Q
70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)											9		R	4	R
Coax ø 21.3 mm/316L															
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]											9		R	3	A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[29]											9		R	3	B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]											9		R	3	C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]											9		R	3	D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[29]											9		R	3	E
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[29]											9		R	3	F
Coax ø 21.3 mm/Alloy C22															
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]											9		R	5	A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[29]											9		R	5	B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]											9		R	5	C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]											9		R	5	D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[29]											9		R	5	E

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Selection and ordering data (continued)

SITRANS LG250 Guided radar level transmitter Continuous, contact, 75 m (246 ft) range. Monitors level and interface in liquids.	Article No. 7ML5881- ● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[29]	9	R 5 F
Coax ø 42.2 mm/316L		
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]	9	R 3 G
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[29]	9	R 3 H
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]	9	R 3 J
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]	9	R 3 K
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[29]	9	R 3 L
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[29]	9	R 3 M
Coax ø 42.2 mm/Alloy C22		
300 ... 1 000 mm (11.81 ... 39.37 inch)[29]	9	R 5 G
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[29]	9	R 5 H
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[29]	9	R 5 J
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[29]	9	R 5 K
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[29]	9	R 5 L
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[29]	9	R 5 M
Cable lengths ø 4 mm PFA		
300 ... 1 000 mm (12 ... 39.37 inch)	9	R 6 A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	9	R 6 B
2 001 ... 5 000 mm (78.77 ... 196.85 inch)	9	R 6 C
5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9	R 6 D
10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9	R 6 E
15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9	R 6 F
20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9	R 6 G
25 001 ... 32 000 mm (984.29 ... 1 259.84 inch)	9	R 6 H

Selection and Ordering data	Order code
Further designs (mandatory) Please add "**-Z**" to Article No. and specify Order code(s).	
Supplementary electronics	
Without	**A00**
Additional current output 4 ... 20 mA[11]	**A01**
Dimensions centering weight (diameter/height)	
Without	**B00**
ø 40/30 mm	**B01**
ø 45/30 mm (for 2 inch tubes)	**B02**
ø 75/30 mm (for 3 inch tubes)	**B03**
ø 95/30 mm (for 4 inch tubes)	**B04**
ø 40 mm/30 mm ø 1.57/1.18 inch (for 2 inch Schedule 160)	**B05**
ø 45 mm/30 mm (for 2 inch tubes) ø 1.77/1.18 inch (for 2 inch Schedule 40/80)	**B06**
ø 75 mm/30 mm (for 3 inch tubes) ø 2.95/1.18 inch (for 3 inch Schedule 10/40)	**B07**
ø 95 mm/30 mm (for 4 inch tubes) ø 3.74/1.18 inch (for 4 inch Schedule 80)	**B08**
Rod mounted	
Without Rod, applicable for coax or cable probe types only	**C00**
Mounted	**C01**
Not mounted	**C02**
Indicating/adjustment module	
Without	**E00**
Mounted	**E01**

Selection and Ordering data	Order code
Laterally mounted	**E02**
Language of display	
German	**L00**
English	**L01**
French	**L02**
Dutch	**L03**
Italian	**L04**
Spanish	**L05**
Portuguese	**L06**
Russian	**L07**
Chinese	**L08**
Japanese	**L09**
No language pre-set	**L10**
Operating instructions	
German	**M00**
English	**M01**
French	**M02**
Spanish	**M03**
Further designs (optional)	
Please add "**-Z**" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description	**Y01**
Enter the total length of rigid part (cable version only) range from 100 ... 1 000 mm	**Y02**
Remote electronic cable lengths: 2 m (6.6 ft). Only available with Housing options Q2A and Q2B	**Y10**

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Remote electronic cable lengths: 5 m (16.4 ft). Only available with Housing options Q2A and Q2B	**Y11**
Remote electronic cable lengths: 10 m (32.8 ft). Only available with Housing options Q2A and Q2B	**Y12**
Identification Label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y17**
Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y18**
Material Inspection certificate 3.1 of EN 10204	**C05**
3.1-Inspection Certificate for instrument (EN 10204)[30)]	**C12**
Inspection certificate 3.1 (EN 10204, NACE MR 0175) - material[30)31)] Note: 316L probes include NACE MR 0175 and MR 0103, non 316L probes include MR 0175 only and plated flange designs are not available with NACE certificate.	**D07**
3.1-Inspection Certificate for instrument with test data (EN 10204)[30)]	**C25**
2.2-Factory certificate for material (EN 10204)[30)]	**C15**
Quality and test plan[30)]	**C26**
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN 10204)[30)]	**C13**
X-ray test + 3.1 certificate/instrument[30)]	**C14**
Positive material identification test + 3.1 certificate/instrument[30)]	**C16**
Roughness test + 3.1 certificate/instrument[30)]	**C18**
Pressure test + 3.1 certificate/instrument[30)]	**C31**
Helium leak test + 3.1 certificate/instrument[30)]	**C32**
Pressure test according to NORSOK + 3.1 certificate/instrument[30)]	**C61**
5 point calibration certificate (min. length 500 mm)[30)]	**C62**
Pressure test (acc. to ASME B31.1), incl. 3.1 Inspection certificate[30)]	**C63**
Certificate suitable for tropical regions with, all attachment parts of metal (2.1 factory certificate)	**C65**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
SITRANS LG series/SITRANS RD150 sensor display module	**A5E34143449**
SITRANS LG, two-wire 4 ... 20 mA/HART electronic	**A5E35637821**
SITRANS LG, USB communicator	**A5E35192015**
SITRANS LG, Mounting eye M8 x 20	**A5E36653574**
SITRANS LG, Mounting eye M12 x 20	**PBD:51041448**
SITRANS LG, Mounting spring	**PBD:51041449**
Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	**7NG4124-0AA00**
HART modem with USB interface	**7MF4997-1DC**
SITRANS RD100, loop powered display -see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

Note: some configuration options are not available. For restriction information see the online PIA configuration tool.

[1)] Not available with Plastic and Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.
[2)] Available only with Metallic, Double chamber Housing/Protection/Cable options and certain glands.
[3)] Not available with Remote or Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.
[4)] Not available with Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.
[5)] Not available with certain glands.
[6)] Not available with Version/Material option K, L, M, N, P, Q, R, S, T, and U.
[7)] Not available with Length options 3, 4, 5, R2C, and R2D.
[8)] Available only with Supplementary electronic option A00.
[9)] Not available with Seal/Second line of defense/Process temperature option N.
[10)] Not available with Housing/Protection/Cable option Q1B.
[11)] Not available with Indicating/adjustment module option E02.
[12)] Not available with Process fitting/Material options 00 and 01.
[13)] Available only with Electronic options 0 ... 4.
[14)] Available only with glass seal options.
[15)] Available only with Seal/Second line of defense/Process temperature options C, D, E, F, H, J, M, N, Q.
[16)] Not Available with Housing/Protection/Cable options W, X, Y, J, Q1A, and Q1B.
[17)] Not Available with Seal/Second line of defense/Process temperature option P.
[18)] Available only with Single chamber, Aluminum and Stainless steel (precision casting) Housing/Protection/Cable options.
[19)] Available only with Dimensions centering weight option B00.
[20)] Available only with Rod mounted option C00.
[21)] Not available with Dimensions centering weight option B00.
[22)] Available only with Seal/Second line of defense/Process temperature option N.
[23)] Not available with Version/Material options F, L, M, N, P, Q, R, S, and T.
[24)] Not available with Seal/Second line of defense/Process temperature options A, G, K, N, and Q.
[25)] Available only with Version/Material options A ... K.
[26)] Not available with Remote Housing/Protection/Cable options.
[27)] Not available with some Seal/Second line of defense/Process temperature options including glass.
[28)] Not available with Supplementary electronics options.
[29)] Not available with Y02.
[30)] Listed Certificates are not available with all configurations, please contact factory for more information.
[31)] Available only with 316L Probes. NACE is not available with coated, plated, or hygienic connections.
[32)] Available only with Housing/Protection/Cable options E, F, N, Q, R, T.
[34)] Available only with Double chamber, Plastic and Metallic Housing/Protection/Cable options and certain glands.
[35)] Available only with Approvals options OA (CE only) and 1D.
[36)] Available only with ø 4 mm PFA Length options.
[37)] Not available with Probe version/Material option P.
[38)] Available only with Probe version/Material options G and H.
[39)] Available only with Probe version/Material options A ... E and H.
[40)] FM and CSA approvals are not available with plastic housing enclosures.

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Selection and ordering data (continued)

41) Not available with Process fitting/Material options 80, L1U, L1Y, L2A when combined with low temperature seal options A, B, C, D, E, G, H, J, K, L, M, N, Q, and R and double chamber housings.

Note: Please consult manual for further details.

SITRANS LG260 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level in solids.	Article No. 7ML5882-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Approvals			
General purpose (CSA, FM, CE)[6)20)]		0 A	
Shipping approval[4)5)7)8)9)]		0 B	
Overfill protection (WHG; VLAREM)[5)8)]		0 C	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6[5)8)]		0 E	
ATEX II 1G, 1/2G, 2G Ex ia IIC + Overfill (WHG; VLAREM)[5)8)]		0 F	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + shipping approval[4)5)7)8)9)10)]		0 G	
ATEX II 1G,1/2G,2G Ex ia IIC + II 1D,1/2D,1/3D, 2D IP66[1)5)8)]		0 H	
ATEX II 1/2G, 2G Ex d ia IIC T6[2)5)8)9)10)]		0 J	
ATEX II 1/2G, 2G Ex d ia IIC + shipping approval[2)5)7)8)9)10)]		0 L	
ATEX II 1/2G, II 2G Ex db ia IIC T6 ... T1 Ga/Gb, Gb + II 1D, 1/2D, 1/3D, 2D Ext IIIC T* Da, Da/Db, Da/Dc, Db[2)5)8)9)10)]		0 M	
ATEX II 1/2G, 2G Ex d IIC T6[1)8)10)11)]		0 N	
ATEX II 1G, II 1/2G, II 2G Ex ia IIC T6...T1 Ga, Ga/Gb, Gb /IEC Ex ia IIC T6...T1 Ga, Ga/Gb, Gb[8)]		0 W	
ATEX II 1/2G, 2G Ex d IIC + shipping approval[1)7)8)9)10)11)]		0 Q	
ATEX II 1/2G,2G Ex d IIC + II 1D, 1/2D, 1/3D, 2D IP66[1)8)10)11)]		0 R	
ATEX II 1D, 1/2D, 2D IP6x T[1)8)11)]		0 S	
IEC Ex ia IIC T6[5)8)]		0 T	
IEC Ex ia IIC T6...T1 Ga, Ga/Gb, Gb + Ex t IIIC T[1)8)11)]		0 U	
IEC Ex d ia IIC T6[2)5)8)9)10)]		1 A	
IEC Ex d ia IIC T6 + IEC IP6x T tD[2)5)8)9)10)]		1 B	
IEC Ex db IIC T6 ... T1 Ga/Gb, Gb[1)8)10)11)]		1 C	
IEC Ex db IIC T6 ... T1 Ga/Gb, Gb + IEC Ex t IIIC T[8)10)11)19)]		1 D	
FM (NI) Class I, Div. 2, Groups A, B, C, D[3)5)8)9)]		1 F	
FM (NI) Class I, Div. 2, Groups A, B, C, D + Ship approval[3)5)7)8)9)10)]		1 G	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F[5)8)9)]		1 H	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval[4)5)7)8)9)10)]		1 J	
FM (XP-AIS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2)5)8)9)10)]		1 K	
FM (XP-AIS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval[2)5)7)8)9)10)]		1 L	
FM (XP) Class I, Div. 1, Groups A, B, C, D[8)10)19)]		1 M	
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G[1)5)10)]		1 N	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[5)8)]		1 P	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2)5)8)9)10)]		1 Q	
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[8)9)10)11)19)]		1 R	
NEPSI Ex ia IIC T6[5)8)]		2 A	
NEPSI Ex ia IIC T6 + DIP A20/21 TA T*[1)5)8)]		2 B	
NERSI Ex d ia IIC T6[2)5)8)9)10)]		2 C	
NEPSI Ex d ia IIC T6 + DIP A20/21 TA T*[2)5)8)9)10)]		2 D	
NEPSI Ex d IIC T6[8)10)19)]		2 E	
NEPSI Ex d IIC T6 + DIP A20/21 TA T*[8)10)19)]		2 F	
NEPSI DIP A20/21 TA T*[1)8)]		2 G	
INMETRO Ex ia IIC T6 ... T10[5)8)]		3 A	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb[1)5)8)10)]		3 B	
INMETRO Ex d ia IIC T6 ... T1[2)5)8)9)10)]		3 C	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb[2)5)8)9)10)]		3 D	

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Selection and ordering data (continued)

SITRANS LG260 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level in solids.	Article No. 7ML5882-	●	●	●	●	●	-	●	●	●	●	Order Code ●	●	●
INMETRO Ex d IIC T6 ... T1[8)10)19)]		3	E											
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d IIC T6 Ga/Gb[8)10)19)]		3	F											
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db[1)5)8)10)]		3	G											
KOSHA Ex d IIC T6 ... T1 – KE[8)10)19)]		4	A											
Korea KC ex free area[8)]		6	A											
EAC 0 Ex ia IIC T1 ... T6 X[8)]		5	A											
EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[1)8)]		5	B											
EAC 1 Ex d ia IIC T1 ... T6 X[2)8)9)10)]		5	C											
EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[2)8)9)10)]		5	D											
EAC 1 Ex d IIC T1 ... T6 X[8)10)19)]		5	E											
EAC 0 Ex d IIC T1 ... T6 X + Ex t IIIC T ... IP66[8)10)19)]		5	F											
EAC Ex t IIIC T ... IP66[1)8)]		5	G											
Note: Version/Material, Process fitting/Material, and Length options are available only with options of corresponding type.														
Probe version/Material														
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/316[13)14)]				A										
Probe exchangeable cable ø 6 mm (0.24 inch) with gravity weight/316[13)14)]				B										
Probe exchangeable cable ø 6 mm (0.24 inch) with gravity weight/PA coated[15)]				C										
Probe exchangeable cable ø 11 mm (0.43 inch) with gravity weight/PA coated[15)]				D										
Probe exchangeable rod ø 16 mm (0.63 inch)/316L[13)]				E										
Process fitting/Material														
Thread G 3/4" (DIN 3852-A) PN 40/316L					0	0								
Thread 3/4" NPT (ASME B1.20.1) PN 40/316L					0	1								
Thread G 1" (DIN 3852-A) PN 40/316L					0	2								
Thread 1" NPT (ASME B1.20.1) PN 40/316L					0	3								
Thread G 1 1/2" (DIN 3852-A) PN 40/316L					0	4								
Thread 1 1/2" NPT (ASME B1.20.1) PN 40/316L					0	5								
Thread G 2" (DIN 3852-A) PN 40/316L					0	6								
Flange DN 50 PN 40 Form C, DIN 2501/316L					1	0								
Flange DN 80 PN 40 Form C, DIN 2501/316L					1	2								
Flange DN 100 PN 16 Form C, DIN 2501/316L					1	3								
Flange DN 100 PN 40 Form C, DIN 2501/316L					1	4								
Flange DN 150 PN 16 Form C, DIN 2501/316L					1	5								
Flange DN 50 PN 40 EN 1092-1 Form B1/316L					1	6								
Flange DN 80 PN 40 EN 1092-1 Form B1/316L					1	7								
Flange DN 100 PN 16 EN 1092-1 Form B1/316L					1	8								
Flange 2" 150 lb RF, ASME B16.5/316L					3	0								
Flange 2" 300 lb RF, ASME B16.5/316L					3	2								
Flange 3" 150 lb RF, ASME B16.5/316L					3	3								
Flange 3" 300 lb RF, ASME B16.5/316L					3	4								
Flange 4" 150 lb RF, ASME B16.5/316L					3	5								
Flange 4" 300 lb RF, ASME B16.5/316L					3	6								
Flange 6" 150 lb RF, ASME B16.5/316L					3	7								
Electronics														
Two-wire 4 ... 20 mA/HART								0						
Four-wire Modbus[2)9)10)]								1						
Two-wire 4 ... 20 mA/HART with SIL qualification[9)]								2						
Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz[2)9)10)]								3						

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Selection and ordering data (continued)

SITRANS LG260 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level in solids.	Article No. 7ML5882-	● ● ● ● ● -	● ● ● ●	Order Code ● ● ●
Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC[2)9)10)]		4		
PROFIBUS PA[9)]		5		
FOUNDATION Fieldbus[9)]		6		
Seal/Second line of defense/Process temperature				
FKM (SHS FPM 70C3 GLT)/-40 ... +80 °C (-40 ... +176 °F)[16)]			A	
FKM (SHS FPM 70C3 GLT)/-40 ... +150 °C (-40 ... +302 °F)			B	
FFKM (Kalrez 6375)/-20 ... +200 °C (-4 ... +392 °F)			C	
EPDM (A+P 70.10-02)/-40 ... +80 °C (-40 ... +176 °F)[16)]			D	
EPDM (A+P 70.10-02)/-40 ... +150 °C (-40 ... +392 °F)			E	
Housing/Protection/Cable				
Note: for installation of remote display, 7ML5840, with LG two chamber housing options, contact PVC				
Plastic IP66/IP67 M20 x 1.5/blind stopper[9)10)]			A	
Plastic IP66/IP67 1/2" NPT/blind stopper[9)10)]			B	
Plastic 2-chamber/IP66/IP67/M20 x 1.5/blind stopper			C	
Plastic 2-chamber/IP66/IP67/ 1/2" NPT/blind stopper			D	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper[9)10)]			E	
Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper[9)10)]			F	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper			G	
Aluminum double chamber/IP66/ IP68 (0.2 bar) 1/2" NPT/blind stopper			H	
Stainless Steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper[9)10)]			J	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper[9)10)]			K	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper[9)10)]			L	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper[9)10)]			M	
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper			N	
Stainless steel double chamber/IP66/ IP68 (0.2 bar) 1/2" NPT/blind stopper			P	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel[9)10)]			Q	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel			R	
Stainless steel (precision casting) 316L/ IP66/ IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel[9)10)]			S	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel[9)10)]			T	
Aluminum single chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated			W	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated			X	
Stainless steel single chamber (precision casting)/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated			Y	
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated			U	
Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug[10)]			Z	Q 2 A
Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug[10)]			Z	Q 2 B
Lengths				
Rod ø 16 mm/316L				
500 mm (19.69 inch)			0	
501 ... 1 000 mm (19.72 ... 39.37 inch)			1	
1 001 ... 2 000 mm (39.41 ... 78.74 inch)			2	
2 001 ... 3 000 mm (78.78 ... 118.11 inch)			3	
3 001 ... 4 000 mm (118.15 ... 157.48 inch)			4	
4 001 ... 5 000 mm (157.52 ... 196.85 inch)			5	
5 001 ... 6 000 mm (196.89 ... 236.22 inch)			6	
Cable lengths ø 4 mm/316				
501 ... 1 000 mm (19.72 ... 39.37 inch)			9	R 2 E
1 001 ... 5 000 mm (39.41 ... 196.85 inch)			9	R 2 F
5 001 ... 10 000 mm (196.89 ... 393.70 inch)			9	R 2 G

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Selection and ordering data (continued)

SITRANS LG260 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level in solids.	Article No. 7ML5882-	Order Code
10 001 ... 15 000 mm (393.74 ... 590.55 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 H
15 001 ... 20 000 mm (590.59 ... 787.40 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 J
20 001 ... 25 000 mm (787.44 ... 984.25 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 K
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 L
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 M
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 N
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 P
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 Q
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 R
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	● ● ● ● ● - ● ● ● ● 9	R 2 S
Cable lengths ø 6 mm/316L		
500 mm (19.69 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 A
501 ... 1 000 mm (19.72 ... 39.37 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 B
1 001 ... 5 000 mm (39.41 ... 196.85 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 C
5 001 ... 10 000 mm (196.89 ... 393.70 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 D
10 001 ... 15 000 mm (393.74 ... 590.55 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 E
15 001 ... 20 000 mm (590.59 ... 787.40 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 F
20 001 ... 25 000 mm (787.44 ... 984.25 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 G
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 H
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 J
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 K
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 L
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 M
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 N
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	● ● ● ● ● - ● ● ● ● 9	R 4 P
Cable lengths ø 6 mm or ø 11 mm/PA coated		
501 ... 1 000 mm (19.72 ... 39.37 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 A
1 001 ... 5 000 mm (39.41 ... 196.85 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 B
5 001 ... 10 000 mm (196.89 ... 393.70 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 C
10 001 ... 15 000 mm (393.74 ... 590.55 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 D
15 001 ... 20 000 mm (590.59 ... 787.40 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 E
20 001 ... 25 000 mm (787.44 ... 984.25 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 F
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 G
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 H
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 J
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 K
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 L
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 M
55 001 ... 65 000 mm (2 165.39 ... 2 559.06 inch)	● ● ● ● ● - ● ● ● ● 9	R 6 N

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs (mandatory)	
Please add "**-Z**" to Article No. and specify Order code(s).	
Supplementary electronics	
Without	**A00**
Additional current output 4 ... 20 mA[10)]	**A01**
Rod mounted	
Without Rod, applicable for coax or cable probe types only	**C00**
Mounted	**C01**
Not mounted	**C02**
Indicating/adjustment module	
Without	**E00**
Mounted	**E01**
Laterally mounted	**E02**
Language of display	
German	**L00**
English	**L01**
French	**L02**
Dutch	**L03**
Italian	**L04**
Spanish	**L05**
Portuguese	**L06**
Russian	**L07**
Chinese	**L08**
Japanese	**L09**
No language pre-set	**L10**
Operating instructions	
German	**M00**
English	**M01**
French	**M02**
Spanish	**M03**

Selection and Ordering data	Order code
Further designs (optional)	
Please add "**-Z**" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description	**Y01**
Remote electronic cable lengths: 2 m (6.6 ft). Only available with Housing options Q2A and Q2B.	**Y10**
Remote electronic cable lengths: 5 m (16.4 ft). Only available with Housing options Q2A and Q2B.	**Y11**
Remote electronic cable lengths: 10 m (32.8 ft). Only available with Housing options Q2A and Q2B.	**Y12**
Identification Label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y17**
Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y18**
Material Inspection certificate 3.1 of EN 10204	**C05**
3.1-Inspection Certificate for instrument (EN 10204)[17)]	**C12**
Inspection certificate 3.1 (EN 10204, NACE MR 0175) - material.[17)18)] Note: 316L probes include NACE MR 0175 and MR 0103, non 316L probes include MR 0175 only and plated flange designs are not available with NACE certificate.	**D07**
3.1-Inspection Certificate for instrument with test data (EN 10204)[17)]	**C25**
2.2-Factory certificate for material (EN 10204)[17)]	**C15**
Quality and test plan[17)]	**C26**

Selection and Ordering data	Order code
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN 10204)[17)]	**C13**
X-ray test + 3.1 certificate/instrument[17)]	**C14**
Positive material identification test + 3.1 certificate/instrument[17)]	**C16**
Roughness test + 3.1 certificate/instrument[17)]	**C18**
Pressure test + 3.1 certificate/instrument[17)]	**C31**
Helium leak test + 3.1 certificate/instrument[17)]	**C32**
Pressure test according to NORSOK + 3.1 certificate/instrument[17)]	**C61**
5 point calibration certificate (min. length 500 mm)[17)]	**C62**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
SITRANS LG series/SITRANS RD150 sensor display module	**A5E34143449**
SITRANS LG, two-wire 4 ... 20 mA/HART electronic	**A5E35637821**
SITRANS LG, USB communicator	**A5E35192015**
SITRANS LG, Mounting eye M12 x 20	**PBD:51041448**
SITRANS LG, Mounting spring	**PBD:51041449**
Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	**7NG4124-0AA00**
HART modem with USB interface	**7MF4997-1DC**
SITRANS RD100, loop powered display -see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

Note: some configuration options are not available. For restriction information see the online PIA configuration tool.

1) Not available with Plastic and Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.

2) Available only with Double chamber, Metallic Housing/Protection/Cable options and certain glands.

3) Not available with Remote and Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.

4) Not available with Stainless steel (electropolished) Housing/Protection/Cable options and certain glands.

5) Not available with Seal/Second line of defense/Process temperature option C.

6) Not available with Housing/Protection/Cable options W, X, Y, and U.

7) Not available with Probe version/Material option E.

8) Available only with certain Electronics options.

9) Available only with Supplementary electronic option A00.

10) Not available with Indicating/adjustment module option E02.

11) Not available with Seal/Second line of defense/Process temperature options B and E.

12) Available only with Seal/Second line of defense/Process temperature option C.

13) Not available with Seal/Second line of defense/Process temperature options A and D.

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Selection and ordering data (continued)

14) Available only with Rod mounted option C00.
15) Available only with Seal/Second line of defense/Process temperature options A and D.
16) Not available with Housing/Protection/Cable options Q2A and Q2B.
17) Listed Certificates are not available with all configurations, please contact factory for more information.
18) Available only with 316L Probes. NACE is not available with coated, plated, or hygienic connections.
19) Available only with Single chamber, Aluminum and Stainless steel (precision casting) Housing/Protection/Cable options.
20) FM and CSA approvals are not available with plastic housing enclosures.
Note: Please consult manual for further details.

SITRANS LG270 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level and interface in liquids in extreme environments.	Article No. 7ML5883-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Approvals			
General purpose (CSA, FM, CE)[32)36)]		0 A	
Shipping approval[1)2)3)4)5)]		0 B	
Overfill protection (WHG; VLAREM)[2)3)]		0 C	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6[2)32)]		0 E	
ATEX II 1G, 1/2G, 2G Ex ia IIC + Overfill (WHG; VLAREM)[2)3)]		0 F	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + shipping approval[1)2)3)4)5)]		0 G	
ATEX II 1G,1/2G 2G Ex ia IIC + ATEX II 1D, 1/2D, 2D IP6x[2)7)]		0 H	
ATEX II 1/2G, 2G Ex d ia IIC T6[2)5)6)8)32)]		0 J	
ATEX II 1/2G, 2G Ex d ia IIC + shipping approval[1)2)3)5)6)8)]		0 L	
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1/2D, 2D IP6x[2)5)6)8)]		0 M	
ATEX II 1/2G, 2G Ex d IIC T6[6)7)32)]		0 N	
ATEX II 1G, II 1/2G, II 2G Ex ia IIC T6 ... T1 Ga, Ga/Gb, Gb /IEC Ex ia IIC T6 ... T1 Ga, Ga/Gb, Gb[2)3)]		0 W	
ATEX II 1/2G, 2G Ex d IIC + ship approval[1)2)3)5)6)7)]		0 Q	
ATEX II 1/2G, 2G Ex d IIC + ATEX II 1/2D, 2D IP6x[2)6)7)]		0 R	
ATEX II 1D, 1/2D, 2D IP6x T[2)7)]		0 S	
ATEX II 1/2G, II 2G Ex db IIC T6 ... T1 Ga/Gb, Gb + Overfill protection (WHG, VLAREM)[6)7)32)]		7 P	
IEC Ex ia IIC T6[2)]		0 T	
IEC Ex ia IIC T6 + IEC IP6x T tD[2)7)32)]		0 U	
IEC Ex d ia IIC T6[2)5)6)8)32)]		1 A	
IEC Ex d ia IIC T6 + IEC IP6x T tD[2)5)6)8)]		1 B	
IEC Ex d IIC T6[3)6)7)]		1 C	
IEC Ex d IIC T6 + IEC IP6x T tD[2)3)6)7)]		1 D	
IEC Ex db IIC T6 ... T1 Ga/Gb, Gb + Ship approval[2)3)5)6)7)9)]		7 C	
IEC Ex ia IIC T6 ... T1 Ga, Ga/Gb, Gb + Ship approval[2)9)12)]		7 D	
IEC Ex d ia IIC T6 ... T1 Ga/Gb, Gb + Ship approval[2)5)6)8)9)]		7 E	
FM (NI) Class I, Div. 2, Groups A, B, C, D[2)5)10)32)]		1 F	
FM (NI) Class I, Div. 2, Groups A, B, C, D + ship approval[1)2)3)5)8)]		1 G	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F[2)5)32)]		1 H	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + ship approval[1)2)3)4)5)]		1 J	
FM (XP-AIS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2)5)6)8)32)]		1 K	
FM (XP-AIS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval[1)2)3)5)6)8)]		1 L	
FM (XP) Class I, Div. 1, Groups A, B, C, D[6)11)32)]		1 M	
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G[3)6)7)]		1 N	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2)3)]		1 P	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2)3)5)6)8)]		1 Q	
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[3)5)6)11)19)]		1 R	
CSA (NI) Class I, II, III Div. 2, Groups A, B, C, D, F, G + Ship approval[2)3)6)7)9)]		7 K	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[2)6)9)12)]		7 L	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval[2)3)5)6)8)9)]		7 M	
NEPSI Ex ia IIC T6[2)3)]		2 A	

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Selection and ordering data (continued)

SITRANS LG270 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level and interface in liquids in extreme environments.	Article No. 7ML5883-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
NEPSI Ex ia IIC T6 + DIP A20/21 TA T*[2)5)7)]		2 B	
NERSI Ex d ia IIC T6[2)3)5)6)8)]		2 C	
NEPSI Ex d ia IIC T6 + DIP A20/21 TA T*[2)3)5)6)8)]		2 D	
NEPSI Ex d IIC T6[2)3)6)11)]		2 E	
NEPSI Ex d IIC T6 + DIP A20/21 TA T*[2)3)6)11)]		2 F	
NEPSI DIP A20/21 TA T*[2)3)7)]		2 G	
INMETRO Ex ia IIC T6 ... T1[2)32)]		3 A	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb[2)6)7)]		3 B	
INMETRO Ex d ia IIC T6 ... T1[2)5)6)8)32)]		3 C	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb[2)5)68)]		3 D	
INMETRO Ex d IIC T6 ... T1[2)6)11)32)]		3 E	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d IIC T6 Ga/Gb[2)6)11)]		3 F	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db[2)6)7)]		3 G	
KOSHA Ex d IIC T6 ... T1 – KE[2)3)6)11)]		4 A	
Korea KC ex free area[2)32)]		6 A	
EAC 0 Ex ia IIC T1 ... T6 X[2)13)]		5 A	
EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[2)7)]		5 B	
EAC 1 Ex d ia IIC T1 ... T6 X[2)5)6)8)]		5 C	
EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIIC T ... IP66[2)5)6)8)]		5 D	
EAC 1 Ex d IIC T1 ... T6 X[2)6)11)]		5 E	
EAC 0 Ex d IIC T1 ... T6 X + Ex t IIIC T ... IP66[2)6)11)]		5 F	
EAC Ex t IIIC T ... IP66[2)14)]		5 G	
Note: Version/Material, Process fitting/Material, and Length options are available only with options of corresponding type.			
Version/Material			
Probe exchangeable cable ø 2 mm (0.08 inch) with gravity weight/316[15)16)17)]		A	
Probe exchangeable cable ø 2 mm (0.08 inch) center weight/316L[15)17)18)]		B	
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/316L[15)16)17)]		C	
Probe exchangeable cable ø 4 mm (0.16 inch) with center weight/316L[15)17)18)]		D	
Probe exchangeable rod ø 16 mm (0.63 inch)/316L[16)19)20)]		E	
Probe coax version ø 42.2 mm (1.66 inch) with multiple hole/316L[16)17)20)]		F	
Probe coax version ø 42.2 mm (1.66 inch); multiple hole; reference distances/316L[16)17)20)21)26)]		G	
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/Alloy C22 (2.4602)[22)30)]		H	
Probe exchangeable rod ø 16 mm (0.63 inch)/Alloy C22 (2.4602)[22)30)]		J	
Coax version ø 42.2 mm (1.66 inch) with multiple hole/Alloy C22 (2.4602)[22)30)]		K	
Exchangeable rod, diameter 8 mm (0.32 inch)/316L[19)23)]		L	
Coax ø 21.3 mm (0.838 inch) with multiple hole/316L[23)]		M	
Process fitting/Material			
Thread G 1 1/2" (DIN 3852-A) PN 400/316L[20)]		0 0	
Thread 1 1/2" NPT (ASME B1.20.1) PN 400/316L[20)]		0 1	
Thread G1 1/2" PN 400, DIN 3852-A/Alloy C22 (2.4602)		0 2	
Thread 1 1/2" NPT PN 400, ASME B1.20.1/ Alloy C22 (2.4602)		0 3	
Flange DN 50 PN 40 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating		0 4	
Flange DN 80 PN 40 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating		0 5	
Flange DN 100 PN 16 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating		0 6	
Flange DN 50 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating		0 7	
Flange DN 50 PN 63 Form B1, EN 1092-1/ 316L with Alloy C22		0 8	
Flange DN 50 PN 40 Form C, DIN 2501/316L		1 0	
Flange DN 50 PN 40 form V13, DIN 2513/316L		1 1	

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Selection and ordering data (continued)

SITRANS LG270 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level and interface in liquids in extreme environments.	Article No. 7ML5883-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Flange DN 65 PN 64 Form V13, DIN 2501/316L		1 2	
Flange DN 80 PN 40 Form C, DIN 2501/316L		1 3	
Flange DN 80 PN 40 Form V13, DIN 2501/316L		1 4	
Flange DN 80 PN 100 Form L, DIN 2501/316L[20)]		1 5	
Flange DN 100 PN 16 Form C, DIN 2501/316L		1 6	
Flange DN 100 PN 16 Form V13, DIN 2501/316L		1 7	
Flange DN 100 PN 40 Form C, DIN 2501/316L		1 8	
Flange DN 100 PN 40 Form V13, DIN 2513/316L		2 0	
Flange DN 150 PN 16 Form C, DIN 2501/316L		2 1	
Flange DN 50 PN 40 EN 1092-1 Form B1/316L		2 2	
Flange DN 100 PN 160 GOST 12815-80.7/316L[20)]		2 3	
Flange 2" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		2 4	
Flange 2" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		2 5	
Flange 2" 600 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		2 6	
Flange 3" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		2 7	
Flange 3" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		2 8	
Flange DN 80 PN 160 Form C, DIN 2501/316L[20)]		6 0	
Flange DN 80 PN 250 Form L, DIN 2501/316L[20)]		6 1	
Flange DN 50 PN 160, EN 1092-1 Form B1/316L[20)]		6 2	
Flange DN 50 PN 160, EN 1092-1 Form B2/316L[20)]		6 3	
Flange DN 50 PN 32, EN 1092-1 Form B1/316L[20)]		6 4	
Flange DN 65 PN 250, EN 1092-1 Form B1/316L[20)]		6 5	
Flange DN 100 PN 160, EN 1092-1 Form B2/316L[20)]		6 6	
Flange DN 80 PN 63, EN 1092-1 Form B2/316L		6 7	
Flange 4" 600 lb RF, ASME B16.5/ 316L with Alloy C22 (2.4602) coating		6 8	
Flange 2" 150 lb RF, ASME B16.5/316L		3 0	
Flange 2" 300 lb RF, ASME B16.5/316L		3 1	
Flange 2" 600 lb RF, ASME B16.5/316L		3 2	
Flange 2" 1 500 lb RF, ASME B16.5/316L		3 3	
Flange 3" 150 lb RF, ASME B16.5/316L		3 4	
Flange 3" 300 lb RF, ASME B16.5/316L		3 5	
Flange 3" 600 lb RF, ASME B16.5/316L		3 6	
Flange 3" 900 lb RF, ASME B16.5/316L		3 7	
Flange 3" 2 500 lb RF, ASME B16.5/316L		3 8	
Flange 3 1/2" 600 lb RF, ASME B16.5/316L		4 0	
Flange 4" 150 lb RF, ASME B16.5/316L		4 1	
Flange 4" 300 lb RF, ASME B16.5/316L		4 2	
Flange 4" 600 lb RF, ASME B16.5/316L		4 3	
Flange 6" 150 lb RF, ASME B16.5/316L		4 4	
Flange 6" 300 lb RF, ASME B16.5/316L		4 5	
Flange 6" 600 lb RF, ASME B16.5/316L		4 6	
Flange 2" 150 lb Fisher special return/316L		4 7	
Flange 3" 900 lb RJF, ASME B16.5/ Alloy C22 (2.4602)		4 8	
Flange 2" 900 lb RF, ASME B16.5/316L		5 0	
Flange 3" 1 500 lb RF, ASME B16.5/316L		5 1	
Flange 4" 900 lb RF, ASME B16.5/316L		5 2	
Flange 4" 1 500 lb RF, ASME B16.5/316L		5 3	
Flange 4" 2 500 lb RJF, ASME B16.5/316L[20)]		5 4	
Flange 4" 1500 lb RJF, ASME B16.5/316L[20)]		5 5	

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Flange 3" 600 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		5 6	
Flange 4" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		5 7	
Flange 4" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		5 8	
Flange 6" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating		7 0	
Flange DN 50 PN 40 Form C, DIN 2501/Alloy C22 (2.4602) solid		7 1	
Flange DN 100 PN 16 Form C, DIN 2501/C22 solid		7 2	
Flange DN 100 PN 40 Form N, DIN 2501/Alloy C22 (2.4602) solid		7 3	
Flange DN 50 PN 40 Form B1, EN 1092-1/Alloy C22 (2.4602) solid		7 4	
Flange 2" 150 lb RF, ASME B16.5/Alloy C22 (2.4602) solid		7 5	
Flange 2" 300 lb RF, ASME B16.5/Alloy C22 (2.4602) solid		7 6	
Flange 2" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		7 7	
Flange 2" 900 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		7 8	
Flange 2" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		8 0	
Flange 3" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		8 1	
Flange 3" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		8 2	
Flange 3" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		8 3	
Flange 4" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		8 4	
Flange 4" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		8 5	
Flange 3" 600 lb RJF for R31, ASME B16.5/ Alloy C22 (2.4602) solid		8 6	
Flange 2" 2 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 A
Flange 3" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 B
Flange 3" 2 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 C
Flange 4" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 D
Flange 4" 600 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 E
Flange 4" 900 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 F
Flange 4" 900 lb RJF, ASME B16.5/ Alloy C22 (2.4602) massiv		9 0	L 1 G
Flange 4" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 H
Flange 4" 2 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 J
Flange 8" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid		9 0	L 1 K
Flange 3½" 600 lb Fisher type 249B and 259B/Alloy C22 (2.4602) solid		9 0	L 1 L
Flange 2½" 300 lb RF, ASME B16.5/316/316L		9 0	L 2 A
Flange 2½" 600 lb RF, ASME B16.5/316/316L		9 0	L 2 B
Flange DN 50 PN 40 Form D, EN 1092-1/316/316L[24)]		9 0	L 2 C
Flange 2½" 1 500 lb RF, ASME B16.5/316/316L		9 0	L 2 D
Flange 2" 600 lb RF, ASME B16.5/316L (NORSOK)[34)35)]		9 0	L 2 E
Flange 3" 1500lb RJF, ASME B16.5 / 316/316L[32)]		9 0	L 2 F
Thread G 1" (DIN 3852-A) PN 100/316L		9 0	L 3 C
Thread 1" NPT, ASME B1.20.1/PN 100/316L		9 0	L 3 D
Thread G 1½" (DIN 3852-A) PN 100/316L		9 0	L 3 E
Thread 1½" NPT, ASME B1.20.1/PN 100/316L		9 0	L 3 F
Thread 2" NPT, ASME B1.20.1/PN 100/316L		9 0	L 3 G
Thread G ¾ PN100, DIN 3852-A/316L[31)]		9 0	L 3 H

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Thread ¾ NPT PN100, ASME B1.20.1/31[31)]		9 0	L 3 J
Electronics			
Two-wire 4 ... 20 mA/HART		0	
Four-wire Modbus[5)6)8)]		1	
Two-wire 4 ... 20 mA/HART with SIL qualification[5)]		2	
Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz[5)6)8)]		3	
Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC[5)6)8)]		4	
PROFIBUS PA[5)]		5	
FOUNDATION Fieldbus[5)]		6	
Seal/Second line of defense/Process temperature			
Ceramic-graphite/with glass seal/ -196 ... +280 °C (-321 ... +536 °F)		A	
Ceramic-graphite/with glass seal/ -196 ... +450 °C (-321 ... +842 °F)		B	
Ceramic-graphite/with glass seal/ -196 ... +400 °C (-321 ... +752 °F)[21)]		C	
PEEK-FFKM (Kalrez 6375) /with glass seal/ -20...+250 °C (-4 ... +482 °F)[21)]		D	
Housing/Protection/Cable			
Note: for installation of remote display, 7ML5840, with LG two chamber housing options, contact PVC			
Plastic IP66/IP67 M20 x 1.5/blind stopper		A	
Plastic IP66/IP67 1/2" NPT/blind stopper		B	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		C	
Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		D	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		E	
Aluminum double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		F	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		L	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		M	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		N	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		P	
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		Q	
Stainless steel double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		R	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		S	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		T	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		U	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		V	
Aluminum single chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		W	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		X	
Stainless steel single chamber (precision casting)/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		Y	
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		J	
Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug[6)]		Z	Q 2 A
Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug[6)]		Z	Q 2 B
Lengths			
Rod ø 16 mm/316L			
300 mm (11.81 inch)[25)]		0	
500 mm (19.69 inch)[25)]		1	
501 ... 1 000 mm (19.72 ... 39.37 inch)[25)]		2	
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[25)]		3	
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[25)]		4	
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[25)]		5	
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[25)]		6	
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[25)]		7	

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Selection and ordering data (continued)

SITRANS LG270 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level and interface in liquids in extreme environments.	Article No. 7ML5883-	● ● ● ● ● - ● ● ● ●	Order Code ● ● ●
Rod ø 16 mm/C22			
501 ... 1 000 mm (19.72 ... 39.37 inch)[25]		9	R 1 A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[25]		9	R 1 B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[25]		9	R 1 C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[25]		9	R 1 D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[25]		9	R 1 E
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[25]		9	R 1 F
Rod ø 8 mm/316L			
300 ... 1 000 mm (11.81 ... 39.37 inch)		9	R 1 H
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		9	R 1 J
2 001 ... 3 000 mm (78.78 ... 118.11 inch)		9	R 1 K
3 001 ... 4 000 mm (118.15 ... 157.48 inch)		9	R 1 L
4 001 ... 5 000 mm (157.52 ... 196.85 inch)		9	R 1 M
5 001 ... 6 000 mm (196.89 ... 236.22 inch)		9	R 1 N
Cable lengths ø 2 or 4 mm/316L			
501 ... 1 000 mm (19.72 ... 39.37 inch)		9	R 2 E
1 000 ... 5 000 mm (39.37 ... 196.85 inch)		9	R 2 F
5 001 ... 10 000 mm (196.89 ... 393.70 inch)		9	R 2 G
10 001 ... 15 000 mm (393.74 ... 590.55 inch)		9	R 2 H
15 001 ... 20 000 mm (590.59 ... 787.40 inch)		9	R 2 J
20 001 ... 25 000 mm (787.44 ... 984.25 inch)		9	R 2 K
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)		9	R 2 L
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)		9	R 2 M
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)		9	R 2 N
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)		9	R 2 P
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)		9	R 2 Q
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)		9	R 2 R
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)		9	R 2 S
Cable lengths ø 4 mm/ C22			
501 ... 1 000 m (19.72 ... 39.37 inch)		9	R 4 A
1 000 ... 5 000 mm (39.37 ... 196.85 inch)		9	R 4 B
5 001 ... 10 000 mm (196.89 ... 393.70 inch)		9	R 4 C
10 001 ... 15 000 mm (393.74 ... 590.55 inch)		9	R 4 D
15 001 ... 20 000 mm (590.59 ... 787.40 inch)		9	R 4 E
20 001 ... 25 000 mm (787.44 ... 984.25 inch)		9	R 4 F
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)		9	R 4 G
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)		9	R 4 H
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)		9	R 4 J
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)		9	R 4 K
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)		9	R 4 L
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)		9	R 4 M
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)		9	R 4 N
Coax ø 42.2 mm/316L			

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Selection and ordering data (continued)

SITRANS LG270 Guided radar level transmitter Continuous, contact, 60 m (197 ft) range. Monitors level and interface in liquids in extreme environments.	Article No. 7ML5883-										Order Code		
	●	●	●	●	●	-	●	●	●	●	●	●	●
300 ... 1 000 mm (11.81 ... 39.37 inch)[25]										9	R	3	G
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[25][26]										9	R	3	H
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[25]										9	R	3	J
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[25]										9	R	3	K
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[25]										9	R	3	L
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[25]										9	R	3	M
Coax ø 42.2 mm/C22													
300 ... 1 000 mm (11.81 ... 39.37 inch)[25]										9	R	3	Q
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[25][26]										9	R	3	R
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[25]										9	R	3	S
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[25]										9	R	3	T
4 001 ... 5 000 mm (157.52 ... 196.85 inch)[25]										9	R	3	U
5 001 ... 6 000 mm (196.89 ... 236.22 inch)[25]										9	R	3	V
Coax ø 21.3 mm/316L													
300 ... 1 000 mm (11.81 ... 39.37 inch)										9	R	5	A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)										9	R	5	B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)										9	R	5	C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)										9	R	5	D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)										9	R	5	E
5 001 ... 6 000 mm (196.89 ... 236.22 inch)										9	R	5	F

Selection and Ordering data	Order code
Further designs (mandatory)	
Please add "**-Z**" to Article No. and specify Order code(s).	
Supplementary electronics	
Without	**A00**
Additional current output 4 ... 20 mA[6]	**A01**
Dimensions centering weight (diameter/height)	
Without	**B00**
ø 40/30 mm	**B01**
ø 45/30 mm (for 2 inch tubes)	**B02**
ø 75/30 mm (for 3 inch tubes)	**B03**
ø 95/30 mm (for 4 inch tubes)	**B04**
ø 40 mm/30 mm ø 1.57 inch/1.18 inch (for 2 inch Schedule 160)	**B05**
ø 45 mm/30 mm (for 2 inch tubes) ø 1.77 inch/1.18 inch (for 2 inch Schedule 40/80)	**B06**
ø 75 mm/30 mm (for 3 inch tubes) ø 2.95 inch/1.18 inch (for 3 inch Schedule 10/40)	**B07**
ø 95 mm/30 mm (for 4 inch tubes) ø 3.74 inch/1.18 inch (for 4 inch Schedule 80)	**B08**
Rod mounted	
Without Rod, applicable for coax or cable probe types only	**C00**
Mounted	**C01**
Not mounted	**C02**
Indicating/adjustment module	
Without	**E00**
Mounted	**E01**
Laterally mounted	**E02**

Selection and Ordering data	Order code
Language of display	
German	**L00**
English	**L01**
French	**L02**
Dutch	**L03**
Italian	**L04**
Spanish	**L05**
Portuguese	**L06**
Russian	**L07**
Chinese	**L08**
Japanese	**L09**
No language pre-set	**L10**
Operating instructions	
German	**M00**
English	**M01**
French	**M02**
Spanish	**M03**
Further designs (optional)	
Please add "**-Z**" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description	**Y01**
Y02 rigid part is 100 mm, only applicable for cable versions	**Y02**
Reference probe G length of reference distance = 260 mm/10.24 inches (note blanking 450 mm required with min. probe 1 000 mm)	**Y05**
Reference probe G length of reference distance = 500 mm/19.69 inches (note blanking 690 mm required with min. probe 1 250 mm)	**Y06**

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Reference probe G length of reference distance = 750 mm/29.53 inches (note blanking 940 mm required with min. probe 1 500 mm)	**Y07**
Remote electronic cable lengths: 2 m (6.6 ft). Only available with Housing options Q2A and Q2B	**Y10**
Remote electronic cable lengths: 5 m (16.4 ft). Only available with Housing options Q2A and Q2B	**Y11**
Remote electronic cable lengths: 10 m (32.8 ft). Only available with Housing options Q2A and Q2B	**Y12**
Customer specific adjustment (unit value, 100 % distance from seal, 0 % distance from seal)	**Y20**
Cleaning included certificate: oil, grease and silicone free	**W01**
Identification Label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y17**
Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	**Y18**
Material Inspection certificate 3.1 of EN 10204	**C05**
3.1-Inspection Certificate for instrument (EN 10204)[27]	**C12**
Inspection certificate 3.1 (EN 10204, NACE MR 0175) - material.[27] Note: 316L probes include NACE MR 0175 and MR 0103, non 316L probes include MR 0175 only and plated flange designs are not available with NACE certificate.	**D07**
3.1-Inspection Certificate for instrument with test data (EN 10204)[27]	**C25**
2.2-Factory certificate for material (EN 10204)[27]	**C15**
Quality and test plan[27]	**C26**
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN 10204)[27]	**C13**
X-ray test + 3.1 certificate/instrument[27]	**C14**
Positive material identification test + 3.1 certificate/instrument[27]	**C16**
Roughness test + 3.1 certificate/instrument[27]	**C18**
Pressure test + 3.1 certificate/instrument[27]	**C31**
Helium leak test + 3.1 certificate/instrument[27]	**C32**
Pressure test according to NORSOK + 3.1 certificate/instrument[27][33]	**C61**
5 point calibration certificate (min. length 500 mm)[27]	**C62**
Pressure test (acc. to ASME B31.1), incl. 3.1 Inspection certificate[28]	**C63**
Certificate: Approval for steam boiler according to EN 12952-11, EN 12953-9[29]	**C70**

Selection and Ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
SITRANS LG series/SITRANS RD150 sensor display module	**A5E34143449**
SITRANS LG, two-wire 4 ... 20 mA/HART electronic	**A5E35637821**
SITRANS LG, USB communicator	**A5E35192015**
SITRANS LG, Mounting eye M12 x 20	**PBD:51041448**
SITRANS LG, Mounting spring	**PBD:51041449**
Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	**7NG4124-0AA00**
HART modem with USB interface	**7MF4997-1DC**
SITRANS RD100, loop powered display -see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 For applicable back up point level switch - see point level measurement section	**7ML5744-.....-..**

Note: some configuration options are not available. For restriction information see the online PIA configuration tool.

[1] Not available with Version/Material options E, F, G, J, and K.

[2] Available only with certain Electronic options.

[3] Not available with Seal/Second line of defense/Process temperature option D.

[4] Not available with Stainless Steel (electropolished) Housing/Protection/Cable options and certain glands.

[5] Available only with Supplementary electronic option A00.

[6] Not available with Indicating/adjusting module E02.

[7] Not available with Plastic and Stainless Steel (electropolished) Housing/Protection/Cable options and certain glands.

[8] Available only with Double chamber, Metallic Housing/Protection/Cable options and certain glands.

[9] Available only with Version/Material options A, B, C, D, and H.

[10] Not available with Remote and Stainless Steel (electropolished) Housing/Protection/Cable options and certain glands.

[11] Available only with Single chamber, Aluminum and Stainless steel (precision casting) Housing/Protection/Cable options.

[12] Available only with Housing/Protection/Cable options N, P, V, and Q2A.

[13] Not available with Housing/Protection/Cable options W, X, Y, and J.

[14] Available only with Housing/Protection/Cable options C, E, L, Q.

[15] Not available with Seal/Second line of defense/Process temperature option C.

[16] Available only with Dimensions centering weight option B00.

[17] Available only with Rod mounted option C00.

[18] Not available with Dimensions centering weight option B00.

[19] Not available with Rod mounted option C00.

[20] Not available with Seal/Second line of defense/Process temperature options C and D.

[21] Not available with Remote Housing/Protection/Cable options.

[22] Not available with Seal/Second line of defense/Process temperature options B and D.

[23] Available only with Seal/Second line of defense/Process temperature option D.

[24] Available only with Seal/Second line of defense/Process temperature options A, B, and C.

[25] Not available with Order code Y02.

[26] Accuracy is application dependent, please consult factory.

[27] Listed Certificates are not available with all configurations, please contact factory for more information.

[28] Available only with ASME Process fitting/Material options.

[29] Available with Version/Material options G, L, M and Electronic options 2 and 6.

[30] Available only with Alloy C22 Process fitting/Material options.

[31] Available only with Version/Material option M.

[32] Available only with some Version/Material options.

[33] Available only with Process fitting options.

[34] Available only with Seal/Second line of defense/Process temperature options A and B.

[35] Available only with 316L probe Version/material options. Nace not available with coated, plated, or hygienic connections.

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Selection and ordering data (continued)

36) FM and CSA approvals are not available with plastic housing enclosures.

Note: Please consult manual for further details.

Selection and Ordering data SITRANS LG Remote Interface Provides remote display and configuration for SITRANS LG series guided radar level transmitters.	Article No. 7ML5840-	● ● ● ● ● - ● ● ● ● 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal. Note: for installation of remote display, 7ML5840, with LG two chamber housing options, contact PVC		
Approval		
For Ex-free area		0 A
ATEX II 1G, 2G, Ex ia IIC T6 Ga, Gb		0 C
ATEX II 2G, Ex d IIC T6 Gb[1)]		0 E
IEC Ex ia IIC T6 Ga, Gb		0 F
IEC Ex d IIC T6 Gb[1)]		0 G
$_{c}CSA_{US}$ (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G		0 H
$_{c}CSA_{US}$ (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G		0 J
$_{c}CSA_{US}$(XP) Class I, Div. 1, Groups A, B, C, D[1)]		0 K
INMETRO Ex ia IIC T6 Ga, Gb		0 L
INMETRO Ex d IIC T6 Gb[1)]		0 M
Shipping Approval (DNV/GL)[6)]		0 N
ATEX II 1G, 2G Ex ia IIC T6 Ga, Gb + Ship approval		0 P
ATEX II 2G Ex db IIC T6 Gb + Ship approval[1)]		0 Q
IEC Ex ia IIC T6 Ga, Gb + Ship approval		0 R
IEC Ex db IIC T6 Gb + Ship approval[1)]		0 S
$_{c}CSA_{us}$ (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + Ship approval		0 T
$_{c}CSA_{us}$(XP) Class I, Div. 1, Groups A, B, C, D + Ship approval[1)]		0 U
Electronics		
Digital (I^2C communication)		A
Housing		
Plastic[2)4)]		0
Aluminum[3)5)]		1
Stainless Steel (precision casting)[3)5)]		2
Housing protection		
IP66/IP67 NEMA 4X		0
IP66/IP68 NEMA 6P (0.2 bar)		1
Cable entry		
M20 x 1.5/ Blind plug		3
½" NPT/ Blind plug		5
Display		
Without		A
Mounted		B
Mounting		
For wall mounting with Aluminum or stainless steel housing		A
For carrier rail and wall mounting with plastic housing		B
For carrier rail with Aluminum or stainless steel housing		C
For tube mounting (29 ... 60 mm) including mounting material		D
Certificates		
None		0
3.1 Certificate/Instrument with test data		1
Quality and Test plan		2

1) Available only with Housing options 1 and 2.
2) Available only with Housing option 0.
3) Available only with Housing option 1.
4) Available only with Mounting options B and D.
5) Not available with Mounting option B.
6) Shipping approval is only available with housing options 0 and 1.

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Selection and ordering data (continued)

SITRANS LG Replacement Probes For use with SITRANS LG series guided radar level transmitters.	Article No. 7ML5841-	● ● ● ● ● - ● ● ● 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Instrument		
LG240[4)]		0
LG250[6)]		1
LG260[7)]		2
LG270[9)10)]		3
Probe Type[3)]		
Exchangeable cable ø 2 mm with gravity weight/316[1)11)]		A A
Exchangeable cable ø 2 mm center weight/316[2)11)]		A C
Exchangeable cable ø 4 mm without weight/316[1)11)]		A D
Exchangeable cable ø 4 mm with gravity weight/316[1)11)]		A E
Exchangeable cable ø 4 mm with center weight/316[2)11)]		A G
Exchangeable cable ø 6 mm with gravity weight/316[1)8)11)]		A H
Exchangeable rod ø 8 mm/316L[1)]		A P
Exchangeable rod ø 8 mm/1.4435 (acc. to Basle Standard)[1)]		A Q
Exchangeable rod ø 12 mm/316L[1)]		A U
Exchangeable rod ø 16 mm/316L[1)]		A W
Exchangeable coated cable ø4 mm with uncoated centering weight / PFA and 316[11)12)]		B A
Process fitting		
Thread less than or equal to 1½ inch		0
Thread greater than or equal to 2 inch		1
Flange less than DN 50 or 2 inch		2
Flange greater or equal to DN 50 or 2 inch or hygienic fitting (not for safety ingold 25 x 46 mm)		3
Dimension centering weight		
Without		0
ø 40 mm/30 mm		1
ø 45 mm/30 mm (for 2 inch tubes)		2
ø 75 mm/30 mm (for 3 inch tubes)		3
ø 95 mm/30 mm (for 4 inch tubes)		4
ø 1.57 inch/1.18 inch (for 2 inch Schedule 160)		5
ø 1.77 inch/1.18 inch (for 2 inch Schedule 40/80)		6
ø 2.95 inch/1.18 inch (for 3 inch Schedule 10/40)		7
ø 3.74 inch/1.18 inch (for 4 inch Schedule 80)		8
Certificates		
Without		0
2.2 Material certificate		1
3.1 Material certificate		2
Lengths		
Rod ø 8 mm		
300 ... 1 000 mm (11.81 ... 39.37 inch)		A A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		A B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)		A C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)		A D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)		A E
5 001 ... 6 000 mm (196.89 ... 236.22 inch)		A F
Rod ø 12 mm		
300 ... 1 000 mm (11.81 ... 39.37 inch)		A G
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		A H
2 001 ... 3 000 mm (78.78 ... 118.11 inch)		A J
3 001 ... 4 000 mm (118.15 ... 157.48 inch)		A K
4 001 ... 5 000 mm (157.52 ... 196.85 inch)		A L

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Selection and ordering data (continued)

SITRANS LG Replacement Probes For use with SITRANS LG series guided radar level transmitters.	Article No. 7ML5841-	● ● ● ● ● -	● ● ● 0
5 001 ... 6 000 mm (196.89 ... 236.22 inch)			A M
Rod ø 16 mm			
300 ... 1 000 mm (11.81 ... 39.37 inch)			A N
1 001 ... 2 000 mm (39.41 ... 78.74 inch)			A P
2 001 ... 3 000 mm (78.78 ... 118.11 inch)			A Q
3 001 ... 4 000 mm (118.15 ... 157.48 inch)			A R
4 001 ... 5 000 mm (157.52 ... 196.85 inch)			A S
5 001 ... 6 000 mm (196.89 ... 236.22 inch)			A T
Cable Lengths ø 2 mm and 4 mm/316			
501 ... 1 000 mm (19.72 ... 39.37 inch)			A U
1 001 ... 5 000 mm (39.41 ... 196.85 inch)			A V
5 000 ... 10 000 mm (196.85 ... 393.70 inch)			A W
10 001 ... 15 000 mm (393.74 ... 590.55 inch)			A X
15 001 ... 20 000 mm (590.59 ... 787.40 inch)			A Y
20 001 ... 25 000 mm (787.44 ... 984.25 inch)			B A
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)			B B
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)			B C
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)			B D
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)			B E
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)			B F
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)			B G
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)			B H
60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)			B J
65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)			B K
70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)			B L
Cable Lengths ø 6 mm/316			
501 ... 1 000 mm (19.72 ... 39.37 inch)			B M
1 001 ... 5 000 mm (39.41 ... 196.85 inch)			B N
5 000 ... 10 000 mm (196.89 ... 393.70 inch)			B P
10 001 ... 15 000 mm (393.74 ... 590.55 inch)			B Q
15 001 ... 20 000 mm (590.59 ... 787.40 inch)			B R
20 001 ... 25 000 mm (787.44 ... 984.25 inch)			B S
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)			B T
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)			B U
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)			B V
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)			B W
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)			B X
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)			B Y
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)			C A
60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)			C B
65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)			C C
70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)			C D
Cable Lengths ø 4 mm/316			
300 ... 1 000 mm (12 ... 39.37 inch)			D A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)			D B
2 001 ... 5 000 mm (78.77 ... 196.85 inch)			D C
5 001 ... 10 000 mm (196.89 ... 393.70 inch)			D D
10 001 ... 15 000 mm (393.74 ... 590.55 inch)			D E
15 001 ... 20 000 mm (590.59 ... 787.40 inch)			D F
20 001 ... 25 000 mm (787.44 ... 984.25 inch)			D G
25 001 ... 32 000 mm (984.29 ... 1 259.84 inch)			D H

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description	**Y01**
Total length: Enter the total length of rigid part (range 100 ... 1 000 mm LG270 limited to 100 mm) (cable versions only)	**Y02**

1) Available only with Dimension centering weight option 0.
2) Available only with Dimension centering weight options 1 ... 8.
3) All Probe types are only available with corresponding Probe lengths.
4) Not available with Probe type options AH, AQ, and AW.
5) Available only with Process fitting options 2 and 3.
6) Not available with Probe type options AQ and AW.
7) Available only with Probe type options AE, AH, and AW.
8) Not available with Process fitting option 2.
9) Available only with Probe type options AA, AC, AE, AG, and AW.
10) Available only with Process fitting options 0 and 3.
11) Not available with certificate options 1 and 2.
12) Available only with Dimension centering weight options 1 ... 4.

SITRANS LG Spacers **For use with SITRANS LG series guided radar level transmitters.**	**Article No.** **7ML5842-**	●	●	●	●	-	0	0	A	A	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Instrument											
LG240[1]		**0**									
LG250[2]		**1**									
LG260[3]		**2**									
LG270[3]		**3**									
Version/Material											
Cable ø 4 mm/ PFA[4]			**A**	**A**							
Rod ø 8 mm including fastening/ PEEK can be shortened[5]			**A**	**B**							
Rod ø 10 mm/ PFA[4]			**A**	**C**							
Rod ø 12 mm including fastening/ PEEK can be shortened[5]			**A**	**D**							
Rod ø 16 mm, cable with gravity weight, including fastening/ PEEK can be shortened[5][7]			**A**	**E**							
Cable ø 2 mm including fastening/ PEEK and 316L			**A**	**F**							
Rod ø 16 mm including fastening/ 1.4568 (AISI 631) flexible[8]			**A**	**G**							
Rod ø 8 mm including fastening/ PTFE can be shortened[5]			**A**	**H**							
Rod ø 12 mm including fastening/ 1.4568 (AISI 631) flexible[6]			**A**	**G**							
Tube Diameter											
50 mm (2 inch) up to 100 mm (4 inch)					**1**						
49.2 mm (1.9 inch) up to 56.3 mm (2.2 inch)					**2**						
66.6 mm (2.6 inch) up to 84.9 mm (3.3 inch)					**3**						

1) Available only with Version/Material options AA and AC.
2) Available only with Version/Material options AB, AD, AE, AH and AJ.
3) Available only with Version/Material options AE and AG.
4) Available only with Tube Diameter option 1 and LG240.
5) Available only with Tube Diameter options 2 and 3 and LG250.
6) Available only with Tube Diameter option 1 and LG250.
7) Available only with Tube Diameter option 1 and LG260 or LG270.
8) Available only with Tube Diameter options 2 and 3 and LG260 or LG270.

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Technical specifications

SITRANS LG series	
Mode of operation	
Measuring principle	Guided wave radar measurement
Measuring range	300 ... 75 000 mm (11.81 ... 2 952.75 inch)
Output	
mA analog output with HART digital signal	4 ... 20 mA/HART (SIL optional)
Output range	
• Analog	Current: minimum 3.8 mA, maximum 20.5 mA
• Startup current	≤ 10 mA for 5 ms after switching on, ≤ 3.6 mA
Diagnostic alarm	Failure signal current output (adjustable): last valid measured value, ≥ 21 mA, ≤ 3.6 mA
Digital communication	HART Version 7 x and multidrop compatible
Modbus	Modbus RTU, Modbus ASCII
PROFIBUS PA	PROFIBUS PA profile 3.02
FOUNDATION Fieldbus	FOUNDATION Fieldbus protocol Physical layer according to IEC 61158-2
Performance	Process reference conditions according to DIN EN 61298-1
• Measuring cycle time	< 500 ms
• Step response time	≤ 3 s
• Temperature Effects	The measurement error from the process conditions is in the specified pressure and temperature range of below 1 %
Non-linearity	
• Coaxial	
• Single rod probes	
• Interface models	See manual for more details
Resolution and repeatability	Accuracy +/- 2 mm (0.08 inch)
Accuracy	
• Coaxial/rod/cable probes	+/- 2 mm (0.08 inch)
• Interface models	+/- 5 mm (0.197 inch) Note: Typical deviation, Interface measurement. See manual for full explanation.
Rated operating conditions	
Ambient temperature for enclosure	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
LCD readable temperature range	-40 ... +80 °C (-40 ... +176 °F) with display heated option
Location	Indoor/outdoor
Installation category	II
Pollution degree	2
Relative Humidity	20 ... 85 %
Medium conditions	
Dielectric constant	dK ≥ 1.4 (configuration dependent) Note: for measurement below 1.4 use probe end tracking.
Process temperature range	-196 ... +450 °C (-321 ... +842 °F)
Vessel pressure	-1 ... +400 bar (-100 ... +40 000 kPa)
Design	
Instrument weight (dependent on process fitting) - see manual for further details	Approx. 0.8 ... 8 kg (0.176 ... 17.64 lb)
Materials	
• Enclosure	• Plastic housing plastic PBT (Polyester) • Aluminum die-cast housing, aluminum die-cast AlSi10 mg, powder-coated- basis: polyester • Stainless steel housing, precision casting 316L • Stainless steel housing, electropolished 316L
• Degree of protection	• Type 4/NEMA 4, IP65 • Plastic housing IP66/IP67 • Aluminum and stainless steel housings are IP66/68
• Cable inlet	2 x M20 x 1.5 or 2 x ½" NPT
Process connections	

SITRANS LG series	
• Pipe thread, cylindrical (ISO 228 T1)	G¾" A, G1" A, G1½" A according to DIN 3852-A
• American pipe thread, conical (ASME B1.20.1)	¾" NPT, 1" NPT, 1½" NPT
• Flanged	DIN from DN 25, ASME from 1"
• Hygienic	Hygienic fittings
Process seal instrument side	FKM (SHS FPM 70C3 GLT), FFKM (Kalrez 6375), EPDM (A+P 70.10-02), silicone FEP coated (A+P FEPO-SEAL) or Borosilicate glass GPC 540
Second line of defense (glass seal) (optional)	Borosilicate glass GPC 540 Note: The second line of defense is a second level of the process separation in the form of a gas-tight feedthrough in the lower part of the housing, preventing product from penetrating into the housing.
Programming	
Local	Four button, menu-driven data entry
Handheld communicator	Hart communicator
PC	SIMATIC PDM, AMS, PACTware
Power	
2-wire Hart version	9.6 ... 35 V DC
4-wire versions	9.6 ... 48 V DC, 20 ... 42 V AC, 50/60 Hz, and 90 ... 253 V AC, 50/60 Hz
Modbus	8 ... 30 V DC
PROFIBUS PA	9 ... 32 V DC
FOUNDATION Fieldbus	9 ... 32 V DC Note: see manual for specific power based on ordered options
Certificates and approvals	
Hazardous approvals:	ATEX, FM, CSA, IECex Note: other regional approvals are available
Hygienic approvals:	EHEDG, FDA
Overfill protection	WHG, Vlarem
Ship approval	ABS, CCS, GL, BV, LR

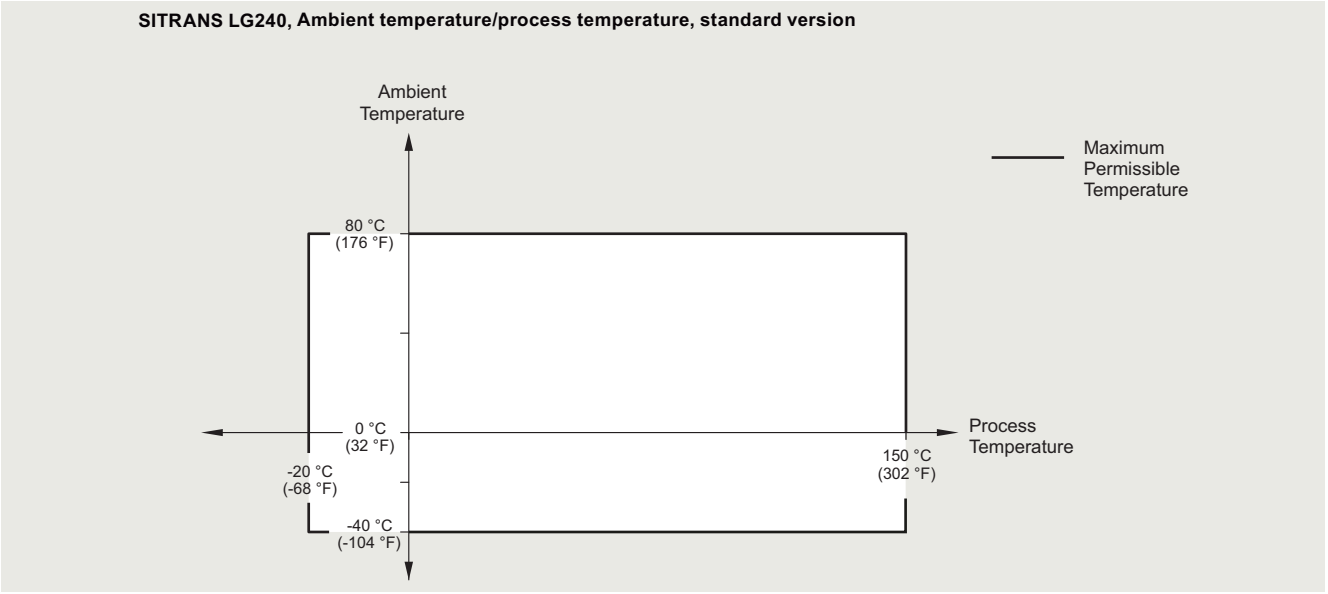
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Technical specifications (continued)

Industries	SITRANS LG240 Food, Beverage and Pharmaceutical	SITRANS LG250 Chemical/HPI/Power/General	SITRANS LG260 Cement, power generation, food, processing, mineral processing, mining	SITRANS LG270 Chemical/HPI/Power/General
Applications	Hygienic and corrosive applications	Liquids, storage and process vessels with agitators, vaporous liquids, interface	Cement, fly ash, grain, coal, flour, plastics	Aggressive applications in liquids, storage and process vessels with agitators, vaporous liquids, high temperatures and pressures, low dielectric media
Range	32 m	75 m	60 m	60 m
Performance	± 2 mm	± 2 mm	± 2 mm	± 2 mm
Temperature	-40 ... +150 °C (-40 ... +302 °F)	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +200 °C (-40 ... +392 °F)	-196 ... +450 °C (-320.8 ... +842 °F)
Process pressure				
Standard version	-	-1 ... +40 bar/ -100 ... +4 000 kPa (-14.5 ... +580 psig), depending on the process fitting	-	-
With borosilicate glass leadthrough	-	-1 ... +100 bar/ -100 ... +10 000 kPa (-14.5 ... +1 450 psig), depending on the process fitting	-	-
Communications	• 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare	• 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare	• 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare	• 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare

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Characteristic curves

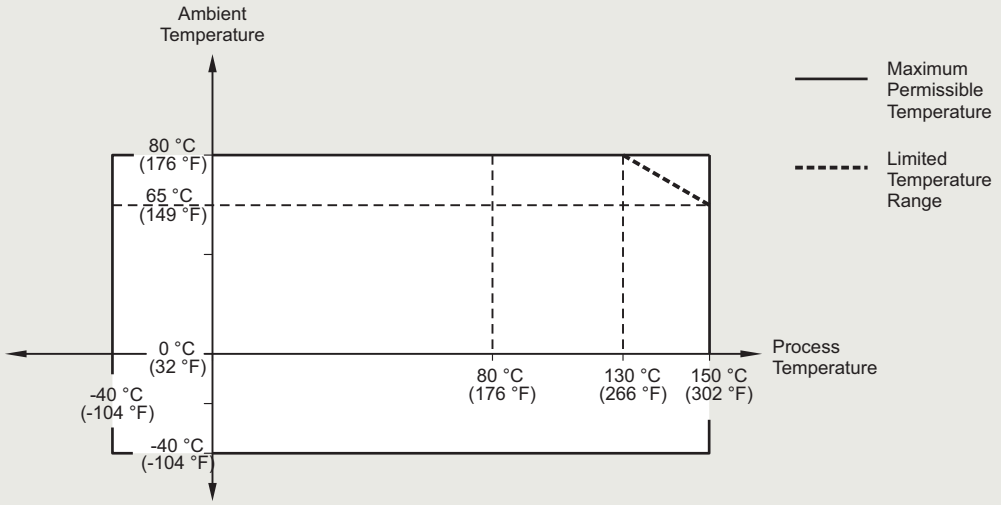


SITRANS LG240, ambient temperature/process temperature curve

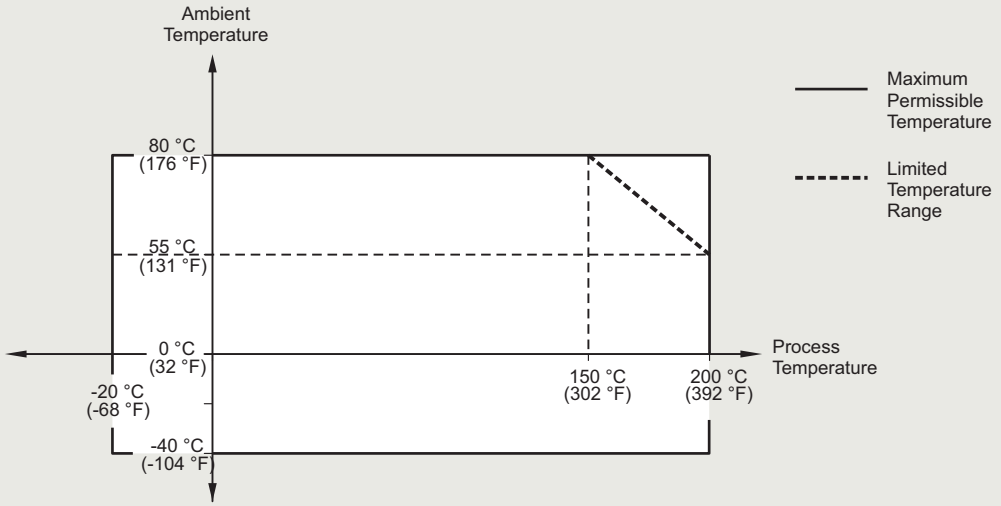
© Siemens AG 2026

Characteristic curves (continued)

SITRANS LG250, Ambient temperature/process temperature, standard version



SITRANS LG250, Ambient temperature/process temperature, temperature adapter version

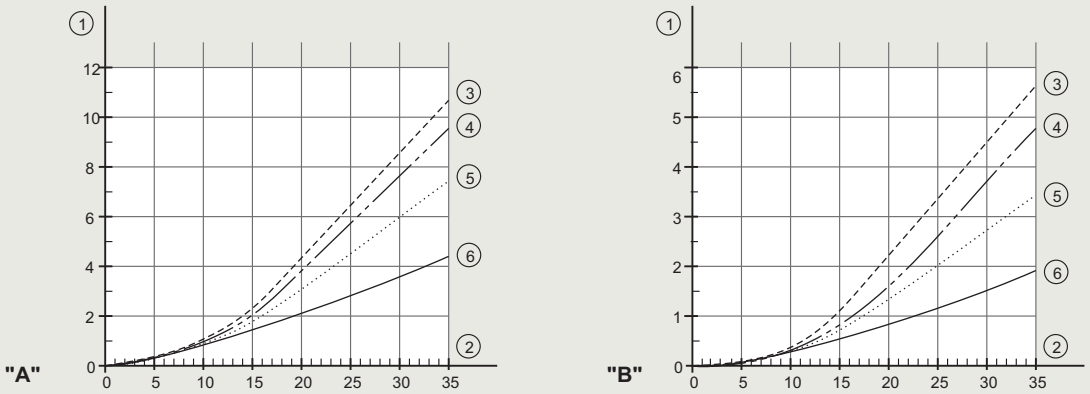


SITRANS LG250, ambient temperature/process temperature curves

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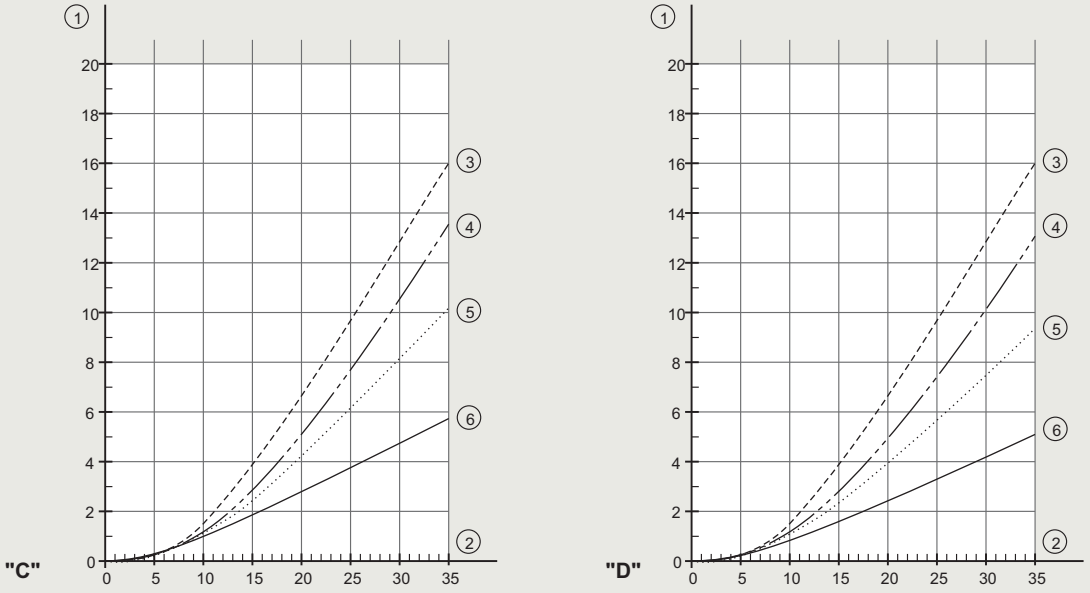
Characteristic curves (continued)

SITRANS LG260, Maximum tensile load with cereals and plastic granules - cable: ø 4 mm (0.157 inch)



A. Cereals
B. Plastic granules
1. Tensile force in kN (the determined value must be multiplied with safety factor 2)
2. Cable length in m
3. Vessel diameter 12 m (39.37 ft)
4. Vessel diameter 9 m (29.53 ft)
5. Vessel diameter 6 m (19.69 ft)
6. Vessel diameter 3 m (9.843 ft)

SITRANS LG260, Maximum tensile load with sand and cement - cable: ø 4 mm (0.157 inch)



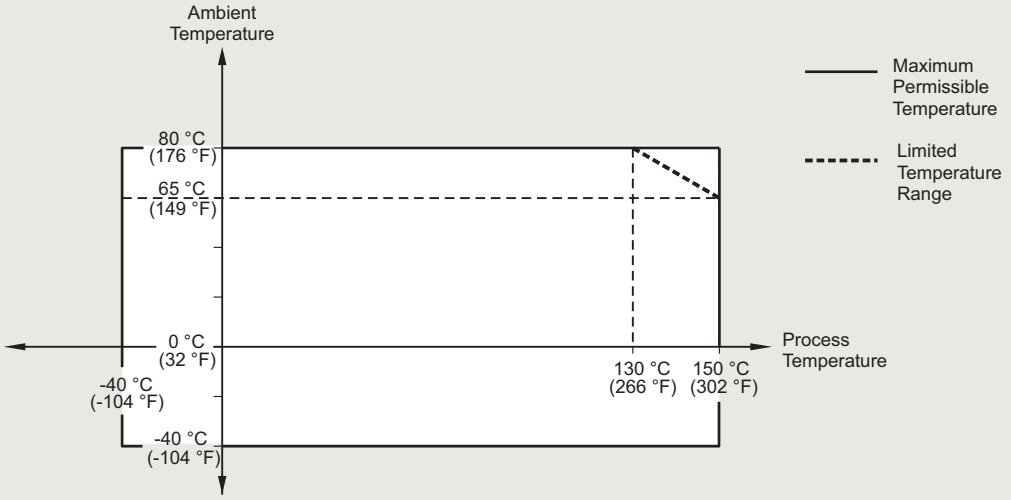
C. Sand
D. Cement
1. Tensile force in kN (the determined value must be multiplied with safety factor 2)
2. Cable length in m
3. Vessel diameter 12 m (39.37 ft)
4. Vessel diameter 9 m (29.53 ft)
5. Vessel diameter 6 m (19.69 ft)
6. Vessel diameter 3 m (9.843 ft)

SITRANS LG260, maximum tensile load curves

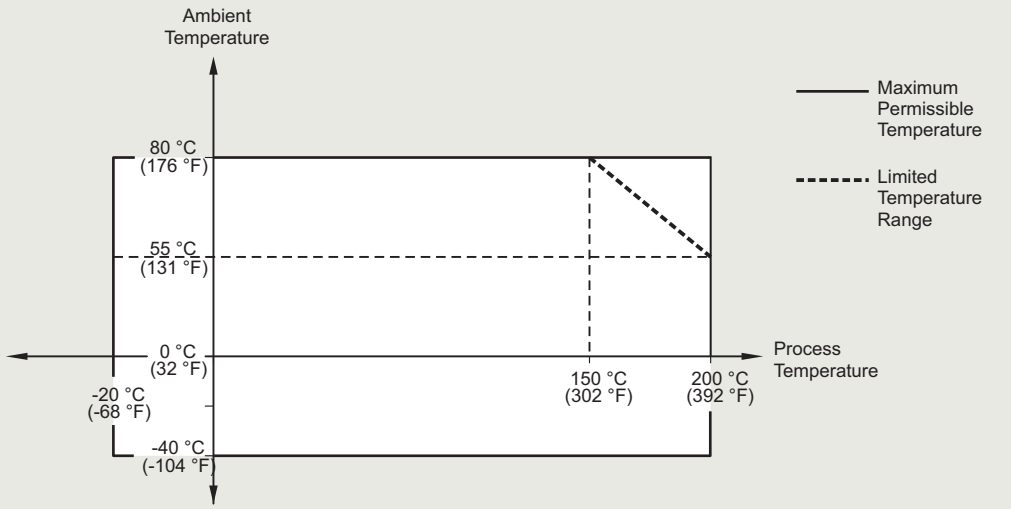
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Characteristic curves (continued)

SITRANS LG260, Ambient temperature/process temperature, standard version
Cable version with ø 4 mm (0.157 inch)
Cable version, PA coated with ø 6 mm (0.236 inch)



SITRANS LG260, Ambient temperature/process temperature, temperature adapter version
Cable version with ø 4 mm (0.157 inch)
Cable version, PA coated with ø 6 mm (0.236 inch)

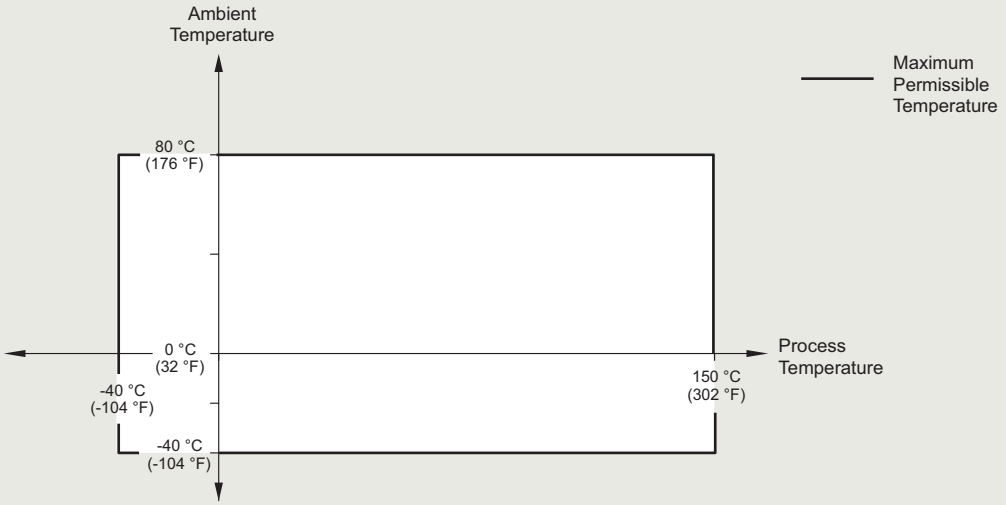


SITRANS LG260, ambient temperature/process temperature curves

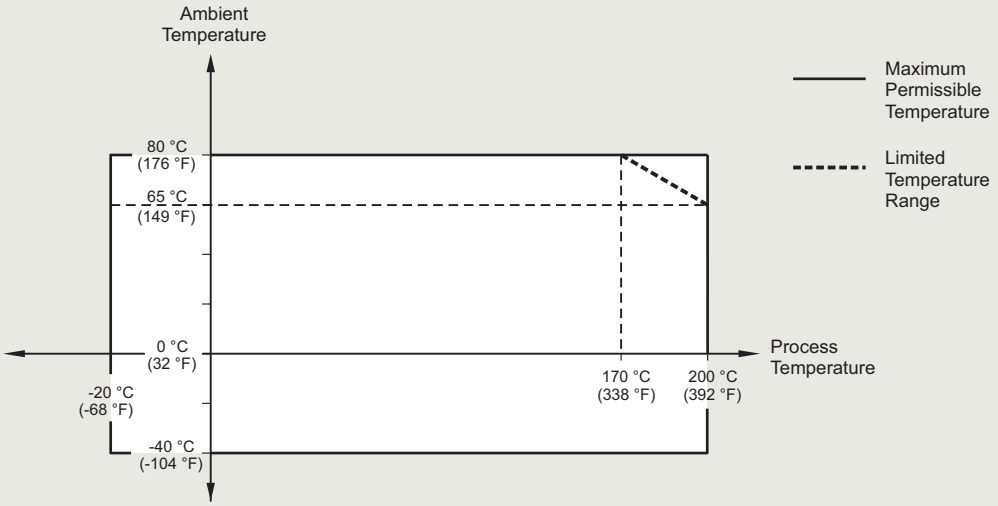
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Characteristic curves (continued)

SITRANS LG260, Ambient temperature/process temperature, standard version
Cable version with ø 6 mm (0.236 inch)
Cable version, PA coated with ø 11 mm (0.433 inch)



SITRANS LG260, Ambient temperature/process temperature, temperature adapter version
Cable version with ø 6 mm (0.236 inch)
Cable version, PA coated with ø 11 mm (0.433 inch)

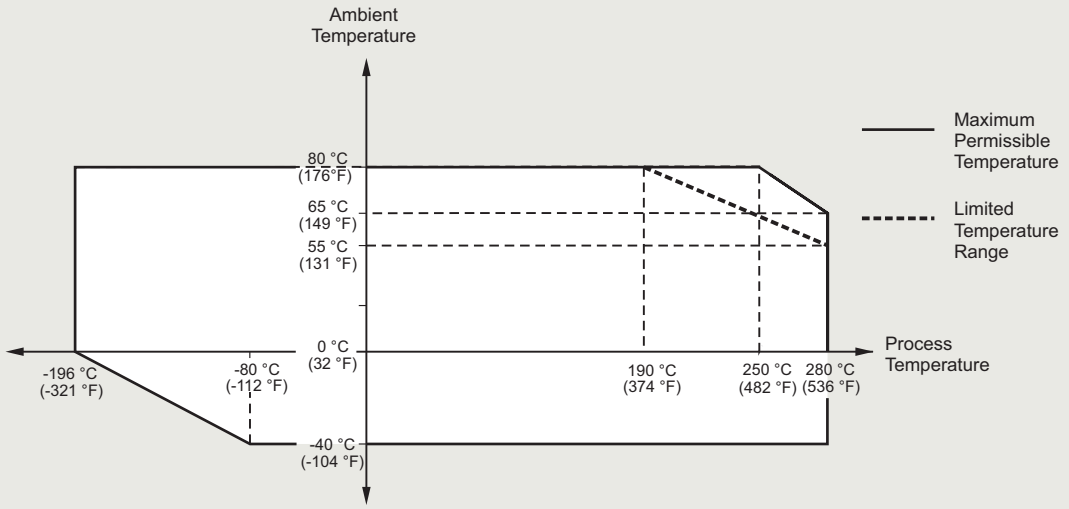


SITRANS LG260, ambient temperature/process temperature curves

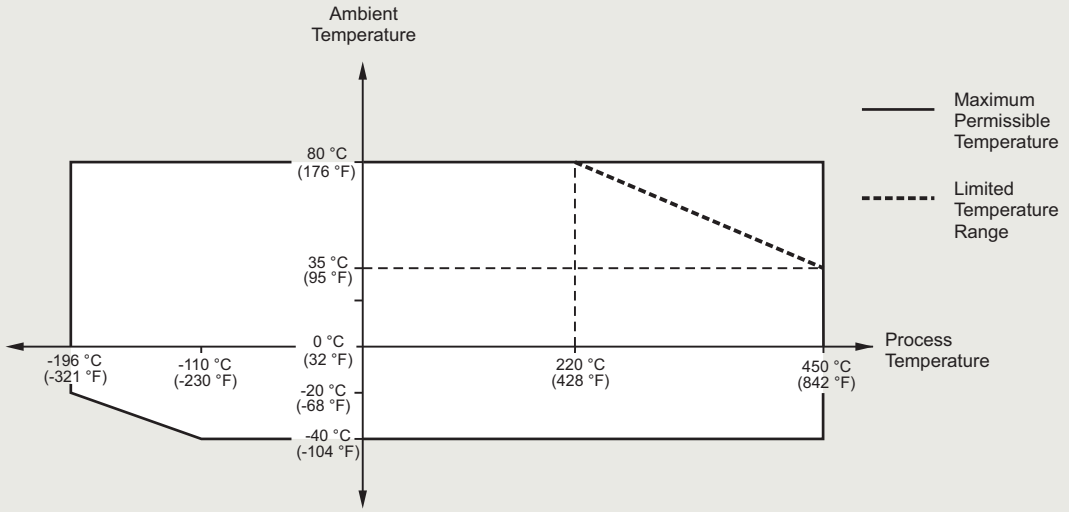
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Characteristic curves (continued)

SITRANS LG270, Ambient temperature/process temperature (-196 … +280 °C/-321 … +536 °F version)



SITRANS LG270, Ambient temperature/process temperature (-196 … +450 °C/-321 … +842 °F version)

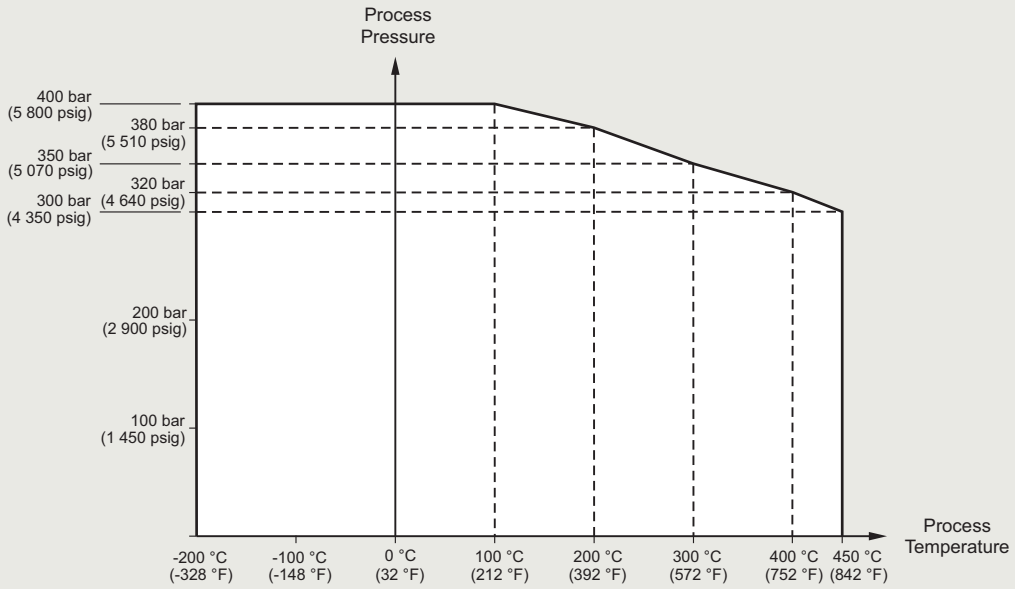


SITRANS LG270, ambient temperature/process temperature curves

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Characteristic curves (continued)

SITRANS LG270, Process pressure/process temperature (-196 … +450 °C/-321 … +842 °F version)

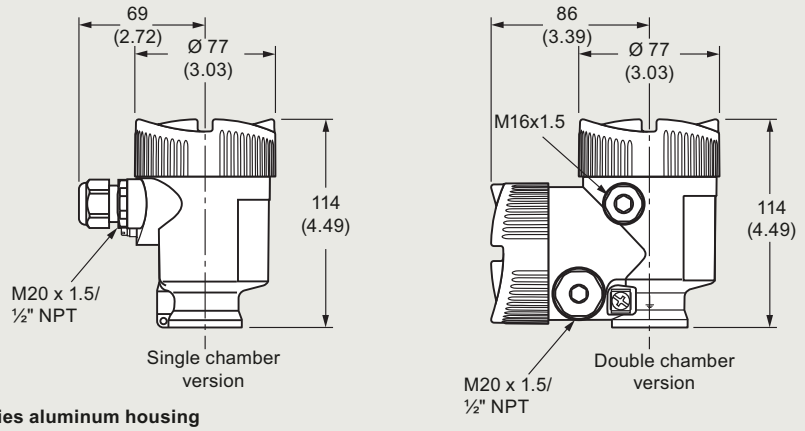


SITRANS LG270, process pressure/process temperature curve

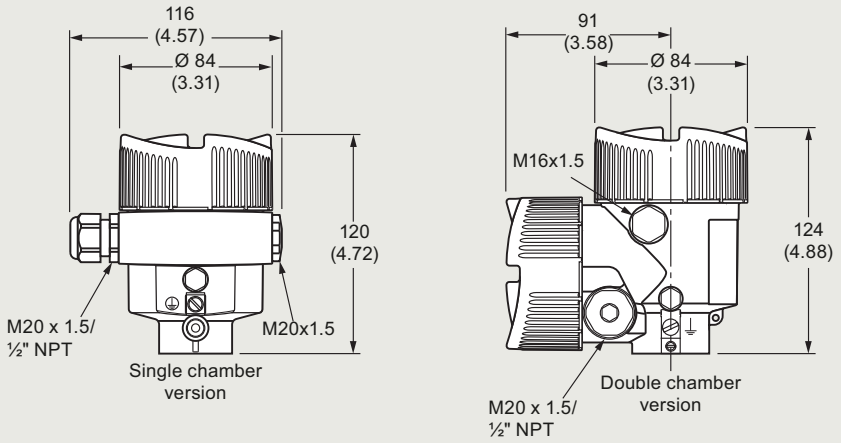
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Dimensional drawings

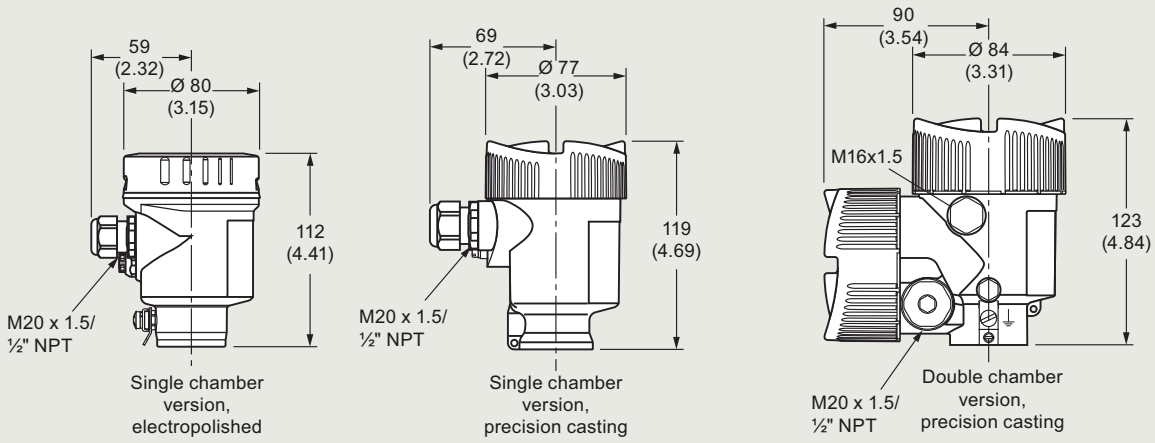
SITRANS LG Series plastic housing



SITRANS LG Series aluminum housing



SITRANS LG Series stainless steel housing



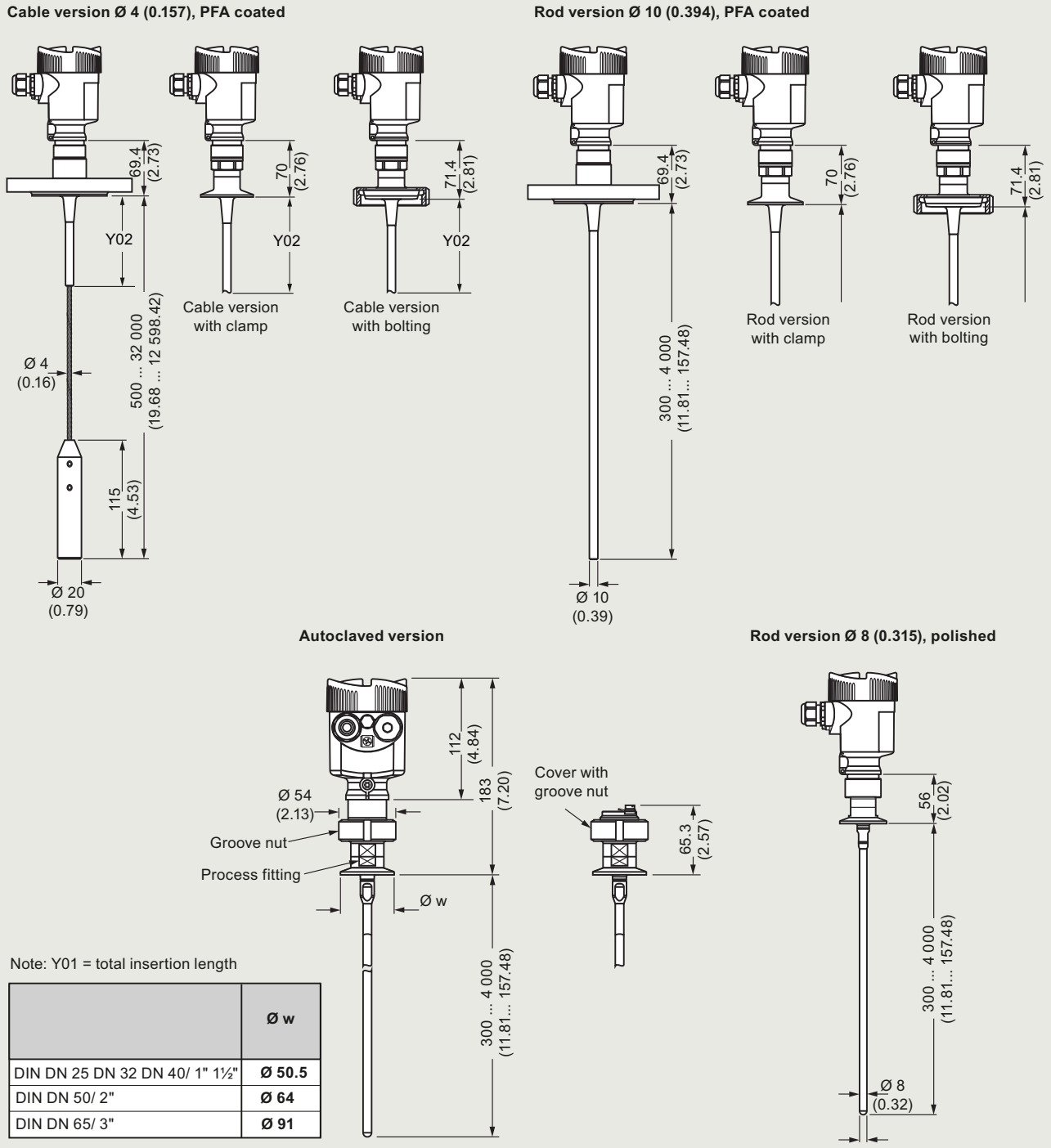
Note: For integrated display and adjustment module the housing is 9 (0.35) higher for all housing options

SITRANS LG series, dimensions in mm (inch)

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Dimensional drawings (continued)

SITRANS LG240



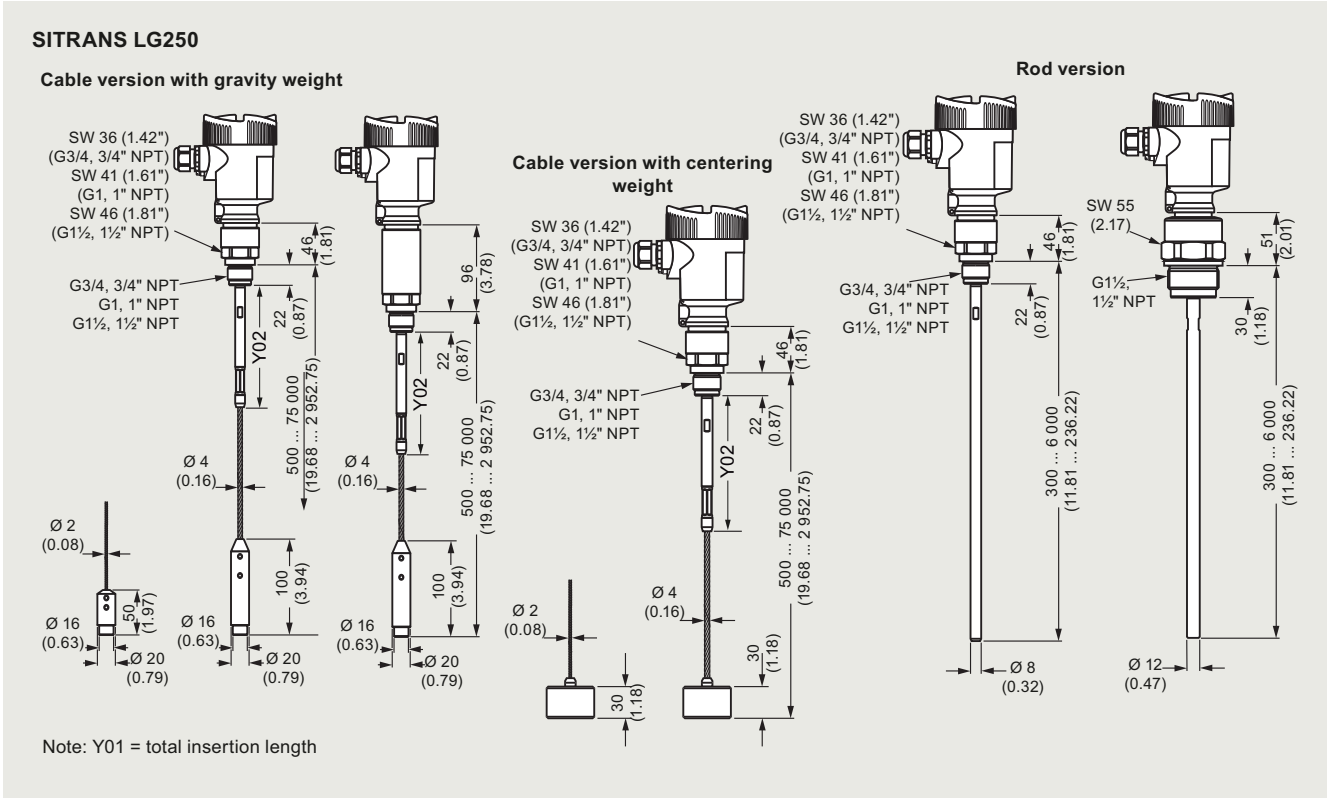
Note: Y01 = total insertion length

	Ø w
DIN DN 25 DN 32 DN 40/ 1" 1½"	**Ø 50.5**
DIN DN 50/ 2"	**Ø 64**
DIN DN 65/ 3"	**Ø 91**

SITRANS LG240, dimensions in mm (inch)

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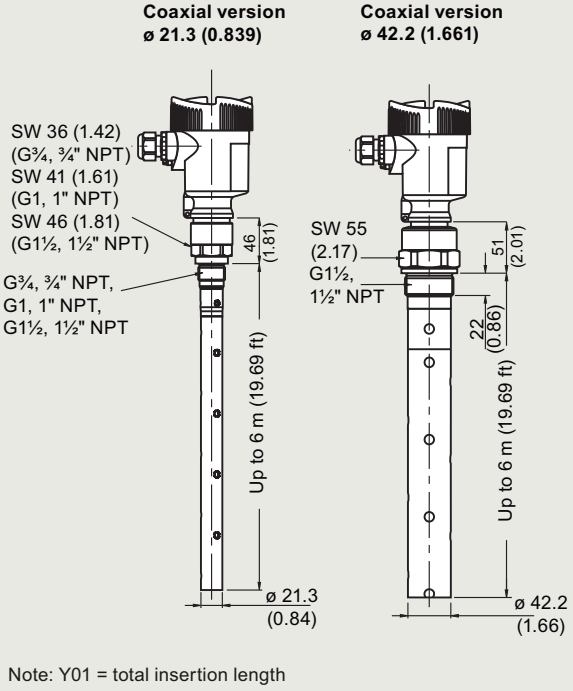
Dimensional drawings (continued)



SITRANS LG250, dimensions in mm (inch)

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Dimensional drawings (continued)

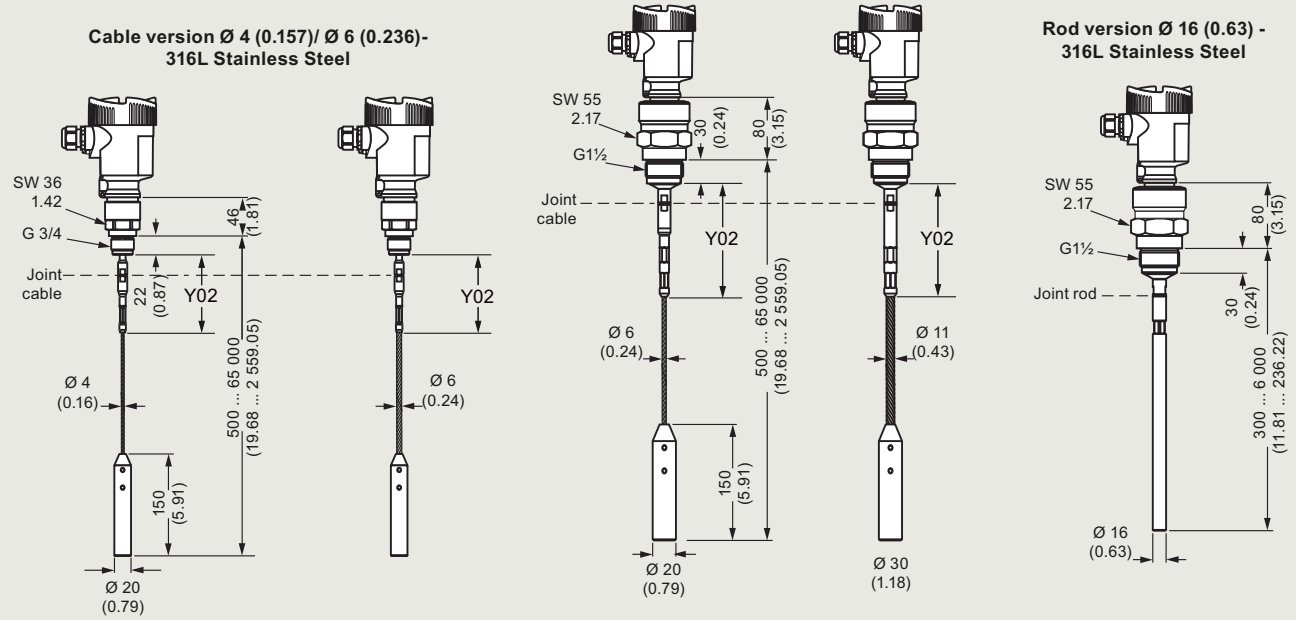


SITRANS LG250, dimensions in mm (inch)

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Dimensional drawings (continued)

SITRANS LG260

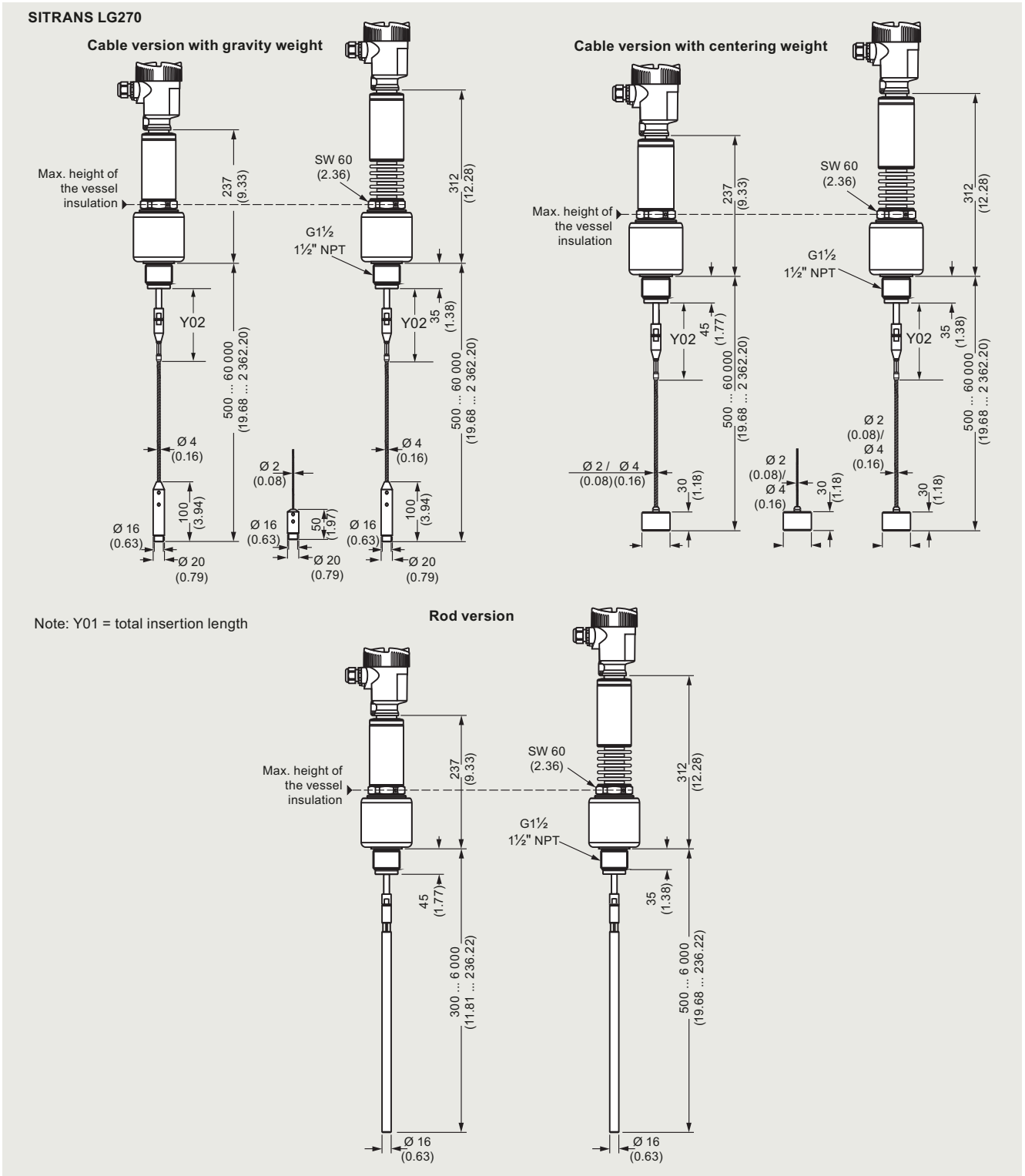


Note: Y01 = total insertion length

SITRANS LG260, dimensions in mm (inch)

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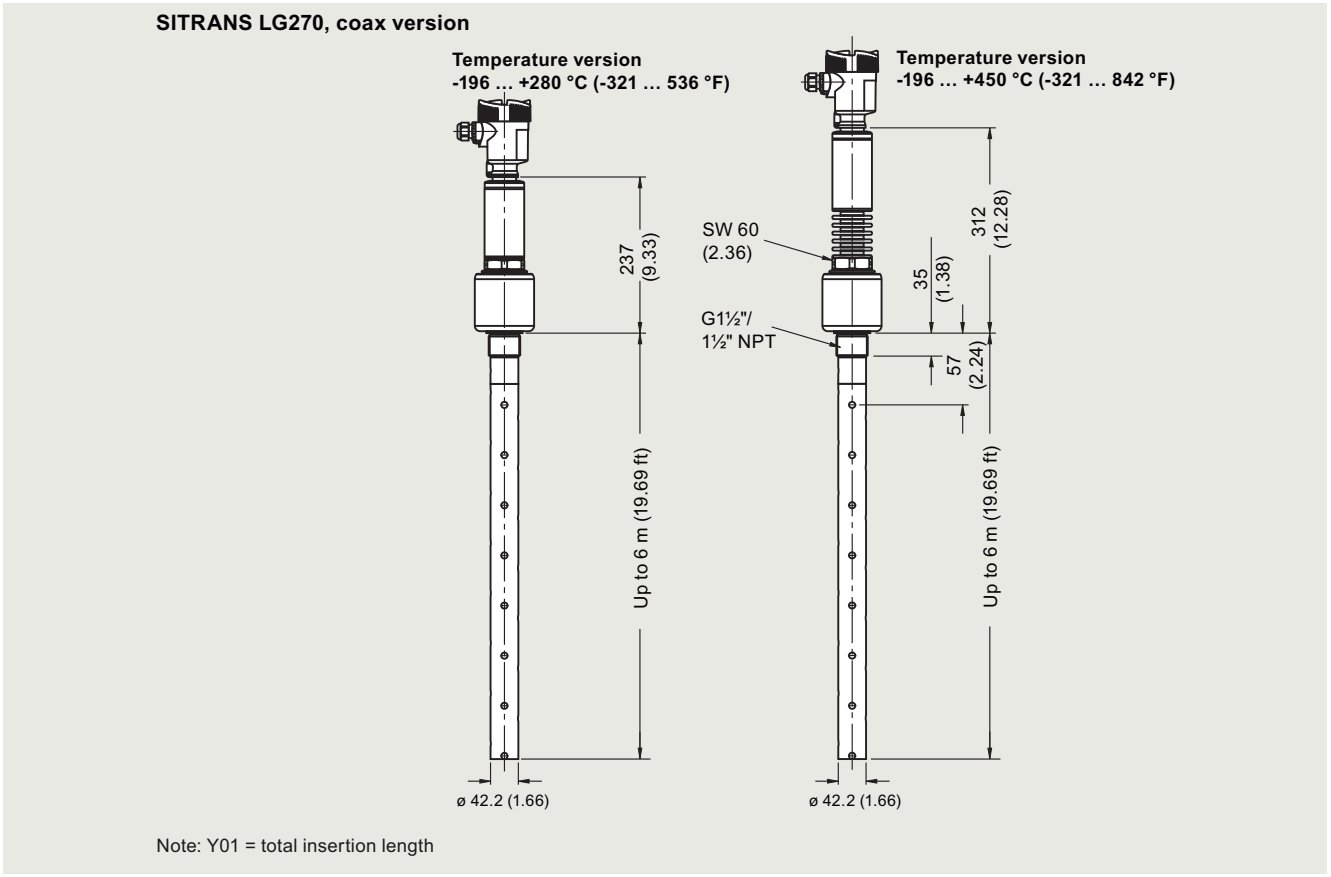
Dimensional drawings (continued)



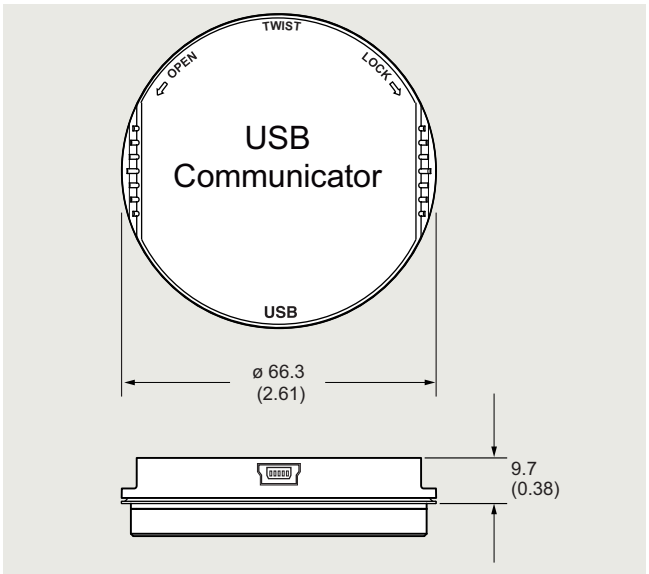
SITRANS LG270, dimensions in mm (inch)

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Dimensional drawings (continued)



SITRANS LG270, dimensions in mm (inch)

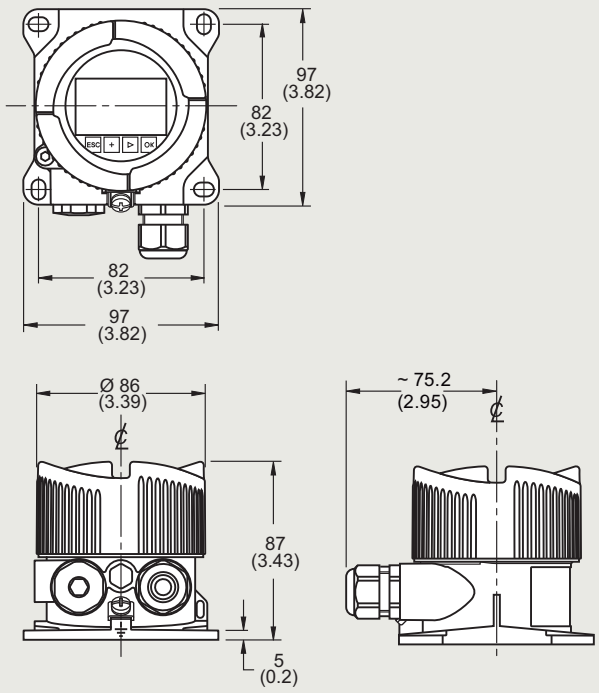


SITRANS LG USB Communicator, dimensions in mm (inch)

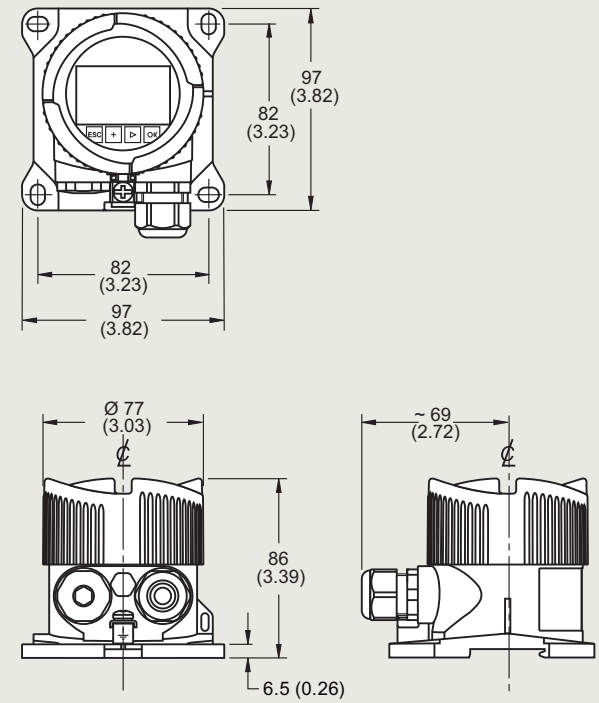
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Dimensional drawings (continued)

SITRANS LG remote interface, aluminum housing



SITRANS LG remote interface, plastic housing

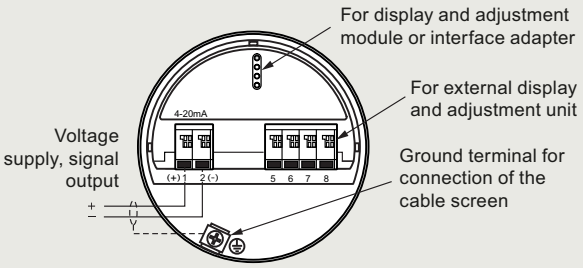


SITRANS LG remote interface, dimensions in mm (inch)

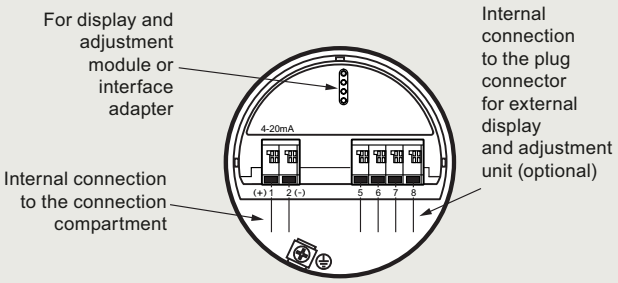
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Circuit diagrams

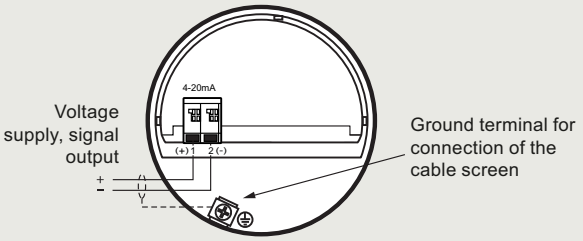
2-wire HART electronic option, electronics and connection compartment, single chamber housing



2-wire HART electronic option, electronics compartment, double chamber housing



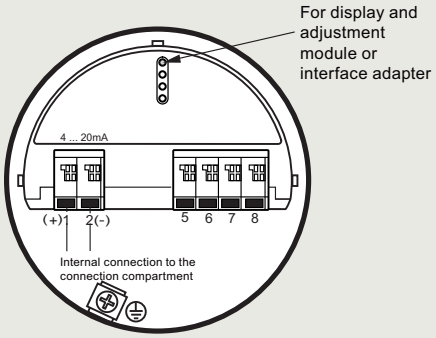
2-wire HART electronic option, connection compartment, Ex-d-ia double chamber housing



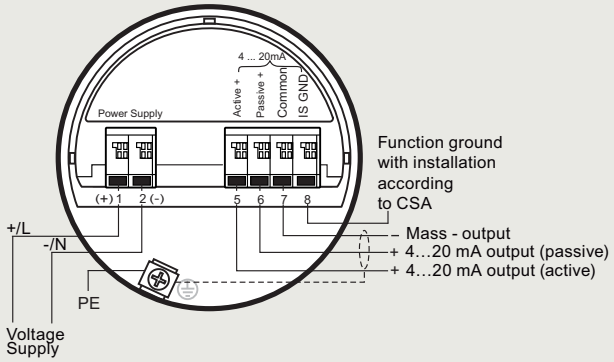
Note: All 2-wire HART connections and electronics are also available with SIL qualification.

SITRANS LG series connections

4-wire HART electronic option, electronics compartment, double chamber housing



4-wire electronic option, connection compartment, double chamber housing with mains voltage

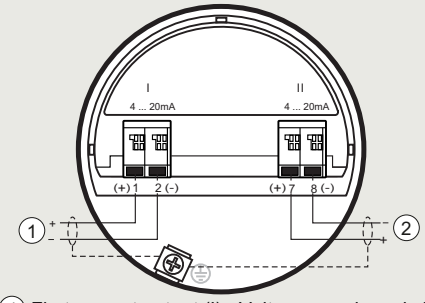


SITRANS LG series connections

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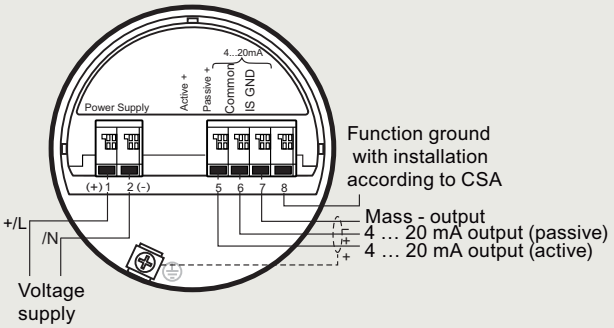
Circuit diagrams (continued)

Supplementary electronics



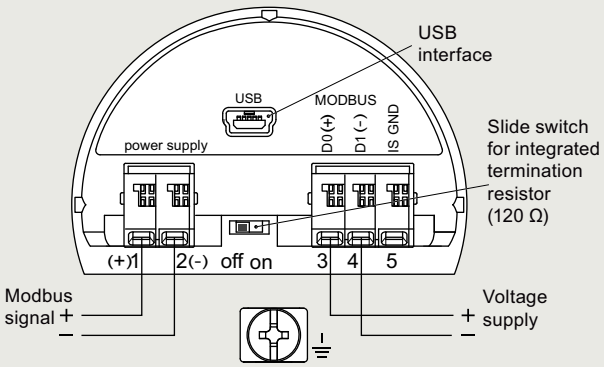
(1) First current output (I) - Voltage supply and signal output (HART)
(2) Second current output (II) - Voltage supply and signal output (without HART)

Connection compartment with low voltage

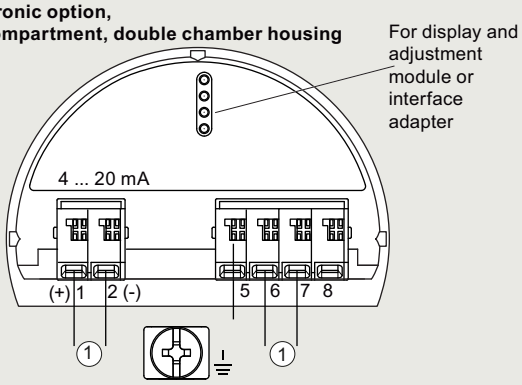


SITRANS LG series connections

Modbus electronic option, connection compartment



Modbus electronic option, electronics compartment, double chamber housing



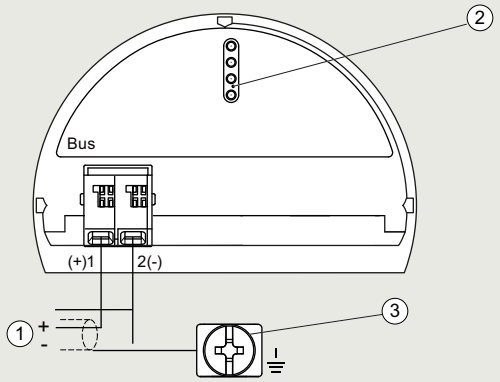
(1) Internal connection to the connection compartment

SITRANS LG series connections

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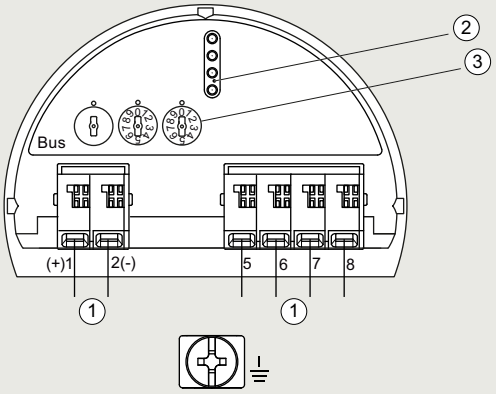
Circuit diagrams (continued)

PROFIBUS electronic option, connection compartment, double chamber housing



1 Voltage supply, signal output
2 For display and adjustment module or interface adapter
3 Ground terminal for connection of the cable screen

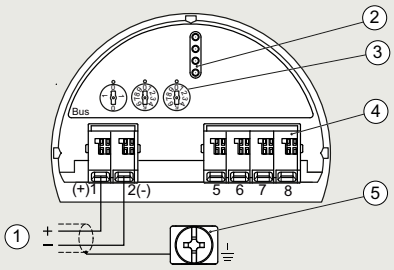
PROFIBUS electronic option, electronics compartment, double chamber housing



1 Internal connection to the connection compartment
2 Contact pins for the display and adjustment module or interface adapter
3 Selection switch for bus address

LG series connections

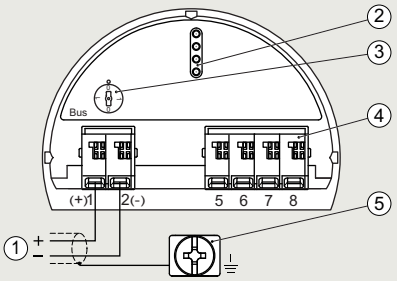
PROFIBUS electronic option, electronics and connection compartment, single chamber housing



1 Voltage supply, signal output
2 For display and adjustment module or interface adapter
3 Selection switch for bus address
4 For external display and adjustment unit
5 Ground terminal for connection of the cable screen

LG series connections

LG series, FOUNDATION Fieldbus electronic option, electronic and terminal compartment, single chamber housing



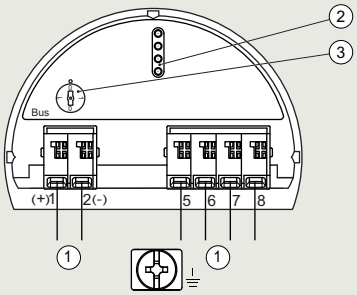
1 Voltage supply, signal output
2 Contact pins for the display and adjustment module or interface adapter
3 Simulation switch ("1" = mode for simulation release)
4 For external display and adjustment unit
5 Ground terminal for connection of the cable screen

LG series connections

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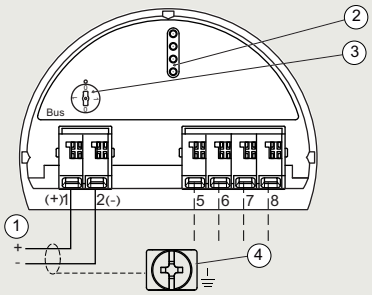
Circuit diagrams (continued)

LG series, FOUNDATION Fieldbus electronic option, electronic compartment, double chamber housing



1. Internal connection to the connection compartment
2. Contact pins for the display and adjustment module or interface adapter
3. Simulation switch ("on" = simulation mode)

LG series, FOUNDATION Fieldbus electronic option, terminal compartment, double chamber housing



1. Voltage supply, signal output
2. For display and adjustment module or interface adapter
3. For external display and adjustment unit
4. Ground terminal for connection of the cable screen

LG series connections

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Overview

SITRANS LC300

- Application
  - For liquids and solids applications, ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage and mining, aggregate, and cement industries
- Device description
  - Sophisticated, but easy-to-adjust microprocessor combined with field-proven probes
  - Active shield technology ensures measurements are unaffected by vapors, product deposits, dust, and condensation

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Overview



SITRANS LC300 is an inverse frequency shift capacitance continuous level transmitter for liquid, interface, and solid applications. It is ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage, water, wastewater, mining, aggregate, and cement industries.

Benefits

- Active-Shield technology so measurement is unaffected by material buildup in active shield section
- Highly accurate and reliable PFA-lined probes
- Integrated local LCD display
- 2-wire (4 to 20 mA) current loop design
- Current signaling according to NAMUR NE 43
- Push-button calibration and programming
- Stilling well (ground tube) version for low dielectric media, agitated materials, and non-metallic vessels

Application

SITRANS LC300 is a 2-wire level measurement instrument combining a sophisticated, yet easy-to-adjust microprocessor with field-proven probes. It is available in four versions: rod, rod with stilling well, cable with PFA insulation, and cable without PFA insulation.

Materials with low or high dielectric properties are accurately measured and Active-Shield technology helps in ignoring the effects of buildup or condensation near vessel nozzle.

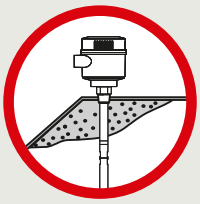
- Key Applications: conductive (dK ≥ 20) and non-conductive (dK < 20) media including: liquids and solids in standard industrial processes, bulk solids applications involving dust, and chemical processes involving vapor

Probe Applications	
Rod version	Conductive liquids, slurries or solids
Rod version with stilling well	• Conductive liquids or slurries in non-conductive tanks • Non-conductive liquids in non-conductive tanks • Tanks with agitation or turbulent liquids • Liquids with a dielectric constant below 2 • Non-linear tanks, such as parabolic or spherical tanks • Interface measurements
Cable version	Non-conductive solids or liquids
PFA coated cable version	Conductive or sticky liquids, slurries or solids

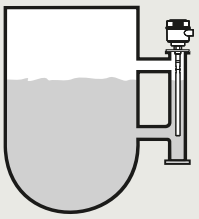
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Configuration

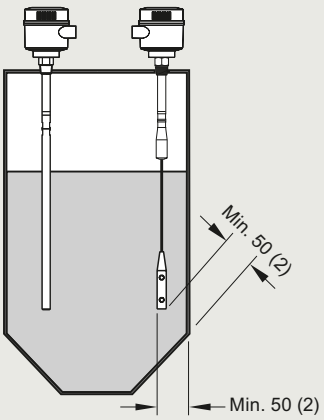
Installation



Build up of material in active shield area does not affect switch operation.



Mounting on a bypass



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

SITRANS LC300 installation, dimensions in mm (inch)

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Selection and ordering data

SITRANS LC300 Capacitance level transmitter, rod design Continuous, contact, monitors level or interface in liquids or solids. Extension options up to 5 m (16.40 ft).	Article No. 7ML560-	● ● ● ● ● - ● ● ● 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process connection		
Threaded, 316L stainless steel		
¾" NPT [(Taper), ASME B1.20.1]		0 A
1" NPT [(Taper), ASME B1.20.1]		0 B
1¼" NPT [(Taper), ASME B1.20.1]		0 C
1½" NPT [(Taper), ASME B1.20.1]		0 D
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1 A
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1 B
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1 D
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3 A
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3 B
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3 D
Welded flange, 316L stainless steel, raised face [1]		
1" ASME, 150 lb		5 A
1" ASME, 300 lb		5 B
1" ASME, 600 lb		5 C
1½" ASME, 150 lb		5 D
1½" ASME, 300 lb		5 E
1½" ASME, 600 lb		5 F
2" ASME, 150 lb		5 G
2" ASME, 300 lb		5 H
2" ASME, 600 lb		5 J
3" ASME, 150 lb		5 K
3" ASME, 300 lb		5 L
3" ASME, 600 lb		5 M
4" ASME, 150 lb		5 N
4" ASME, 300 lb		5 P
4" ASME, 600 lb		5 Q
Welded flange, 316L stainless steel, Type A flat faced [1]		
DN 25, PN 16		6 A
DN 25, PN 40		6 B
DN 40, PN 16		6 C
DN 40, PN 40		6 D
DN 50, PN 16		6 E
DN 50, PN 40		6 F
DN 80, PN 16		6 G
DN 80, PN 40		6 H
DN 100, PN 16		6 J
DN 100, PN 40		6 K
Sanitary, hastelloy, duplex or other custom process connections available. Please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		
Probe Length **(from flange face or including process thread)**		
Add Order code Y01 and plain text: "Insertion length ... mm"		
300 ... 1 000 mm (11.81 ... 39.37 inch)		A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)		C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)		D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)		E
Bent probes also available. Please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		

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Selection and ordering data (continued)

SITRANS LC300 Capacitance level transmitter, rod design Continuous, contact, monitors level or interface in liquids or solids. Extension options up to 5 m (16.40 ft).	Article No. 7ML560-	● ● ● ● ● - ● ● ● 0
Thermal isolator		
Without thermal isolator		0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]		1
Wetted seals		
FKM		0
FFKM [for process temperatures above -20 °C (-4 °F)[2]]		1
Probe material		
19 mm (0.75 inch) diameter 316L stainless steel, PFA lined rod		0
Approvals		
General Safety CSA, FM, CE, UKCA, RCM		A
Dust Ignition Proof with IS Probe CE, UKCA, RCM, ATEX, UKEX II 1/2D Ex ia/tb		B
Flameproof Enclosure with IS Probe CE, UKCA, RCM, ATEX, UKEX II 1/2G Ex ia/db; ATEX, UKEX II 1/2D Ex ia/tb		C
Dust Ignition Proof with IS Probe CSA/ FM Class II, III Div. 1Gr. E, F, G T4		D
Explosion Proof Enclosure with IS Probe CSA/ FM Class I, II, III Div. 1 Gr. A, B, C, D, E, F, G T4		E
Enclosure		
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65		A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65		B
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68		C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68		D
Stainless steel, contact local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		

[1] Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.
[2] Not available with FM approvals.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1]	**E24**
INMETRO[2]	**E34**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	**7ML1830-1KN**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

[1] Available only with Approvals options B and C; specific EAC Ex-marking.
[2] Available only with Approvals options A and B.

SITRANS LC300 Capacitance level transmitter, stilling well design Continuous, contact, monitors level or interface in liquids. Extension options up to 5 m (16.40 ft).	Article No. 7ML5671-	● ● ● ● ● - ● ● ● 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process connection		
Threaded, 316L stainless steel		
1½" NPT [(Taper), ASME B1.20.1]		0 D
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1 D
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3 D
Welded flange, 316L stainless steel, raised face [1]		
1½" ASME, 150 lb		5 D

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Selection and ordering data (continued)

SITRANS LC300 Capacitance level transmitter, stilling well design Continuous, contact, monitors level or interface in liquids. Extension options up to 5 m (16.40 ft).	Article No. 7ML5671-	● ● ● ● ● - ● ● ● 0
1½" ASME, 300 lb		5 E
1½" ASME, 600 lb		5 F
2" ASME, 150 lb		5 G
2" ASME, 300 lb		5 H
2" ASME, 600 lb		5 J
3" ASME, 150 lb		5 K
3" ASME, 300 lb		5 L
3" ASME, 600 lb		5 M
4" ASME, 150 lb		5 N
4" ASME, 300 lb		5 P
4" ASME, 600 lb		5 Q
Welded flange, 316L stainless steel, Type A flat faced [1]		
DN 40, PN 16		6 C
DN 40, PN 40		6 D
DN 50, PN 16		6 E
DN 50, PN 40		6 F
DN 80, PN 16		6 G
DN 80, PN 40		6 H
DN 100, PN 16		6 J
DN 100, PN 40		6 K
Sanitary, hastelloy, duplex or other custom process connections available. Please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		
Probe Length **(from flange face or including process thread)**		
Add Order code Y01 and plain text: "Insertion length ... mm"		
300 ... 1 000 mm (11.81 ... 39.37 inch)		A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)		C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)		D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)		E
Thermal isolator		
Without thermal isolator		0
With thermal isolator [for process connection tem-peratures over 85 °C (185 °F)]		1
Wetted seals		
FKM		0
FFKM [for process temperatures above -20 °C (-4 °F)] [2]		1
Probe material		
35 mm (1.38 inch) diameter stilling well, with 19 mm (0.75 inch) diameter 316L stainless steel, PFA lined rod with PTFE spacers		1
Approvals		
General Safety (CSA, FM, CE, RCM)		A
Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C		B
Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C		C
Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4		D
Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4		E
Enclosure		
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65		A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65		B

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Selection and ordering data (continued)

SITRANS LC300 Capacitance level transmitter, stilling well design Continuous, contact, monitors level or interface in liquids. Extension options up to 5 m (16.40 ft).	Article No. 7ML5671-	● ● ● ● ● - ● ● ● 0
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68		C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68		D
Stainless steel, please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		

[1] Flange bolting patterns and facings dimensionally correspond to the -applicable ASME B16.5 or EN 1092-1 standard.
[2] Not available with FM approvals.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1]	**E24**
INMMETRO[2]	**E34**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	**7ML1830-1KN**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

[1] Available only with Approvals options B and C; specific EAC Ex-marking.
[2] Available only with Approvals options A and B.

SITRANS LC300 Capacitance level transmitter, cable design Continuous, contact, monitors level or interface in liquids or solids. Extension options up to 25 m (82.02 ft).	Article No. 7ML5672-	● ● ● ● ● - ● ● ● 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process connection		
Threaded, 316L stainless steel		
1½" NPT [(Taper), ASME B1.20.1]		0 D
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		1 D
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		3 D
Welded flange, 316L stainless steel, raised face [1]		
1½" ASME, 150 lb		5 D
1½" ASME, 300 lb		5 E
1½" ASME, 600 lb		5 F
2" ASME, 150 lb		5 G
2" ASME, 300 lb		5 H
2" ASME, 600 lb		5 J
3" ASME, 150 lb		5 K
3" ASME, 300 lb		5 L
3" ASME, 600 lb		5 M
4" ASME, 150 lb		5 N
4" ASME, 300 lb		5 P
4" ASME, 600 lb		5 Q
Welded flange, 316L stainless steel, Type A flat faced [1]		
DN 40, PN 16		6 C
DN 40, PN 40		6 D
DN 50, PN 16		6 E
DN 50, PN 40		6 F
DN 80, PN 16		6 G

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Selection and ordering data (continued)

SITRANS LC300 Capacitance level transmitter, cable design Continuous, contact, monitors level or interface in liquids or solids. Extension options up to 25 m (82.02 ft).	Article No. 7ML5672-	● ● ● ● ● - ● ● ● 0
DN 80, PN 40		6 H
DN 100, PN 16		6 J
DN 100, PN 40		6 K
Sanitary, hastelloy, duplex or other custom process connections available. Please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		
Probe Length **(from flange face or including process thread)**		
Add Order code Y01 and plain text: "Insertion length ... mm"		
1 000 ... 2 000 mm (39.37 ... 78.74 inch)		A
2 001 ... 4 000 mm (78.78 ... 157.48 inch)		B
4 001 ... 6 000 mm (157.52 ... 236.22 inch)		C
6 001 ... 8 000 mm (236.26 ... 314.96 inch)		D
8 001 ... 10 000 mm (315.00 ... 393.70 inch)		E
8 001 ... 10 000 mm (315.00 ... 393.70 inch)		F
12 001 ... 14 000 mm (472.48 ... 551.18 inch)		G
14 001 ... 16 000 mm (551.22 ... 629.92 inch)[2]		H
16 001 ... 18 000 mm (629.96 ... 708.66 inch)[2]		J
18 001 ... 20 000 mm (708.70 ... 787.40 inch)[2]		K
20 001 ... 22 000 mm (787.44 ... 866.14 inch)[2]		L
22 001 ... 24 000 mm (866.18 ... 944.88 inch)[2]		M
24 001 ... 25 000 mm (944.92 ... 984.25 inch)[2]		N
Thermal isolator		
Without thermal isolator		0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]		1
Wetted seals		
FKM		0
FFKM [for process temperatures above -20 °C (-4 °F)][3]		1
Probe material		
Bare 316L stainless steel cable and 316L stainless steel cable weight, tinned copper crimp, PTFE backing ring, PEEK isolator and PFA lined active shield		0
Approvals		
General Safety (CSA, FM, CE, RCM)		A
Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C		B
Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C		C
Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4		D
Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4		E
Enclosure		
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65		A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65		B
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68		C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68		D
Stainless steel, please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		

1) Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.
2) Cable lengths from 15 000 mm (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.
3) Not available with FM approvals.

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Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**
EAC Ex-Approval[1)]	**E24**
INMETRO[2)]	**E34**

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	**7ML1830-1KN**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

1) Available only with Approvals options B and C; specific EAC Ex-marking.
2) Available only with Approvals options A and B.

SITRANS LC300 Capacitance level transmitter, PFA coated cable design Continuous, contact, monitors level or interface in liquids or solids. Extension options up to 25 m (82.02 ft).	**Article No. 7ML5673-** ● ● ● ● ● - ● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection	
Threaded, 316L stainless steel	
1½" NPT [(Taper), ASME B1.20.1]	**0 D**
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	**1 D**
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	**3 D**
Welded flange, 316L stainless steel, raised face [1)]	
1½" ASME, 150 lb	**5 D**
1½" ASME, 300 lb	**5 E**
1½" ASME, 600 lb	**5 F**
2" ASME, 150 lb	**5 G**
2" ASME, 300 lb	**5 H**
2" ASME, 600 lb	**5 J**
3" ASME, 150 lb	**5 K**
3" ASME, 300 lb	**5 L**
3" ASME, 600 lb	**5 M**
4" ASME, 150 lb	**5 N**
4" ASME, 300 lb	**5 P**
4" ASME, 600 lb	**5 Q**
Welded flange, 316L stainless steel, Type A flat faced [1)]	
DN 40, PN 16	**6 C**
DN 40, PN 40	**6 D**
DN 50, PN 16	**6 E**
DN 50, PN 40	**6 F**
DN 80, PN 16	**6 G**
DN 80, PN 40	**6 H**
DN 100, PN 16	**6 J**
DN 100, PN 40	**6 K**
Sanitary, hastelloy, duplex or other custom process connections available. Please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.	
Probe Length (from flange face or including process thread)	
Add Order code Y01 and plain text: "Insertion length ... mm"	
1 000 ... 2 000 mm (39.37 ... 78.74 inch)	**A**
2 001 ... 4 000 mm (78.78 ... 157.48 inch)	**B**

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Selection and ordering data (continued)

SITRANS LC300 Capacitance level transmitter, PFA coated cable design Continuous, contact, monitors level or interface in liquids or solids. Extension options up to 25 m (82.02 ft).	Article No. 7ML5673-	● ● ● ● ● - ● ● ● ●
4 001 ... 6 000 mm (157.52 ... 236.22 inch)		C
6 001 ... 8 000 mm (236.26 ... 314.96 inch)		D
8 001 ... 10 000 mm (315.00 ... 393.70 inch)		E
10 001 ... 12 000 mm (393.74 ... 472.44 inch)		F
12 001 ... 14 000 mm (472.48 ... 551.18 inch)		G
14 001 ... 16 000 mm (551.22 ... 629.92 inch)[2]		H
16 001 ... 18 000 mm (629.96 ... 708.66 inch)[2]		J
18 001 ... 20 000 mm (708.70 ... 787.40 inch)[2]		K
20 001 ... 22 000 mm (787.44 ... 866.14 inch)[2]		L
22 001 ... 24 000 mm (866.18 ... 944.88 inch)[2]		M
24 001 ... 25 000 mm (944.92 ... 984.25 inch)[2]		N
Thermal isolator		
Without thermal isolator		0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]		1
Wetted seals		
FKM		0
FFKM [for process temperatures above -20 °C (-4 °F)][3]		1
Probe material		
PFA coated cable and 316L stainless steel cable weight, PEEK isolator and PFA lined active shield		1
Approvals		
General Safety (CSA, FM, CE, RCM)		A
Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C		B
Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C		C
Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4		D
Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4		E
Enclosure		
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65		A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65		B
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68		C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68		D
Stainless steel, please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app.		
Mounting eye		
Without Mounting eye		0
With mounting eye		1

[1] Flange bolting patterns and facings dimensionally correspond to the -applicable ASME B16.5 or EN 1092-1 standard.
[2] Cable lengths from 15 000 mm (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.
[3] Not available with FM approvals.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Material inspection Certificate Type 3.1 per EN 10204	**C12**

Selection and Ordering data	Order code
EAC Ex-Approval[1]	**E24**
INMETRO[2]	**E34**

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Selection and ordering data (continued)

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	**7ML1830-1KN**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-.....-..**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-.....-..**
For applicable back up point level switch - see point level measurement section	

1) Available only with Approvals options B and C; specific EAC Ex-marking.
2) Available only with Approvals options A and B.

LC300 Specials[1]	
LC300 Cable Extensions, 316L stainless steel	
Kit, Stainless steel cable extension, 1 m, adjustable by customer	**A5E01163688**
Kit, Stainless steel cable extension, 3 m, adjustable by customer	**A5E01163689**
Kit, Stainless steel cable extension, 5 m, adjustable by customer	**A5E01163690**
Kit, Stainless steel cable extension, 10 m, adjustable by customer	**A5E01163691**
Kit, Stainless steel cable extension, 15 m, adjustable by customer	**A5E01163693**

LC300 Specials[1]	
Kit, Stainless steel cable extension, 20 m, adjustable by customer	**A5E01163695**
LC300 Cable Extensions, 316 stainless steel with PFA coating	
Kit, PFA cable extension, 1 m	**A5E01163709**
Kit, PFA cable extension, 3 m	**A5E01163710**
Kit, PFA cable extension, 5 m	**A5E01163711**
Kit, PFA cable extension, 10 m	**A5E01163712**
Kit, PFA cable extension, 15 m	**A5E01163713**
Kit, PFA cable extension, 20 m	**A5E01163714**
LC300 Mounting Eye	
Spare mounting eye (LC300 PFA versions only)	**A5E01163717**
LC300 Weight Kit, 316L stainless steel	
Kit, Spare stainless steel weight. To be used in any cable version of CLS300, or stainless steel cable version of LC300	**A5E01163727**

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

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Technical specifications

SITRANS LC300	
Input	
Measuring range	1.66 ... 3 300 pF
Span	Min. 3.3 pF
Output	
Loop current	Continuous signal 4 ... 20 mA/20 ... 4 mA according to NAMUR 43
Accuracy (transmitter)	
Temperature stability	0.25 % of actual capacitance value
Non-linearity and repeatability	< 0.4 % of full scale and actual measurement value
Accuracy	Deviation < 0.5 % of actual measurement value
Rated operating conditions[1]	
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)[2][3]
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
• Installation category	I
• Pollution degree	4
• Ingress protection	Type 4/NEMA 4/IP65 (optional IP68)
Installation conditions	
• Location	Indoor/outdoor
• Process pressure	-1 ... +35 bar g (-14.6 ... +511 psi g)
• Process temperature	-40 ... +200 °C (-40 ... +392 °F)[4]
• Min. dielectric constant ϵ_r	1.5
• Min. difference in dielectric constant for interface measurement	5
Design	
Material	
• Enclosure	Aluminum, epoxy-coated
Probe diameter	
• Rod version	19 mm (0.75 inch) with PFA jacket
• Cable version	9 mm (0.35 inch) with PFA jacket, 6 mm (0.24 inch) without PFA jacket
Active shield length	
• Rod version	Threaded: 120 mm (4.72 inch) Flanged: 100 mm (3.94 inch)
• Cable version	Threaded: 125 mm (4.92 inch) Flanged: 105 mm (4.13 inch)
Process connection of probe	
• Threaded rod mounting	¾",1",1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] R ¾",1", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
• Threaded cable mounting	1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
• Flange mounting	1 ... 4" ASME, DN 25 ... 100
Enclosure cable inlet	2 x ½" NPT or 2 x M20 x 1.5
Power supply	12 ... 30 V DC any polarity, 2-wire current loop circuit
User Interface	
Display	Local LCD, 4 digit, each 0 ... 9 and limited alpha characters
Safety	
Measurement current signaling	According to NAMUR NE 43, signal 3.8 ... 20.5 mA, fault ≤ 3.6 or ≥ 21 mA (22 mA)
Certificates and approvals	
General	CE, $CSA_{US/C}$, FM, RCM, KCC, EAC

SITRANS LC300	
Dust Ignition Proof (Intrinsically Safe probe circuit)	
• Canada/USA	FM/CSA: Class II, Div. 1, Groups E, F, G Class III T4
• Europe	ATEX ½ D T100 °C
Flame Proof (Intrinsically Safe probe circuit)	
• Europe	ATEX II ½ G EEx d [ia] IIC T6 ... T1 ATEX II ½ D T100 °C
• Brazil	Ex d [ia Ga] IIC T6 ... T4 Gb Ex tb IIIC T85 °C ... T100 °C Db IP65/IP68
• Russia/Kazakhstan	EAC Ex
Explosion Proof (Intrinsically Safe probe circuit)	
• Canada/USA	Class I, Div. 1, Groups A, B, C, D Class II, Div. 1, Groups E, F, G Class III T4
Marine	ABS Type Approval, Lloyds Register
Overfill Protection	VLAREM II
Other	Pattern Approval (AQSIQ, China), CRN, PED

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also LC300 Pressure/Temperature curves.
2) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)
3) Minimum voltage of 15 V DC is required for use at -40 °C (-40 °F)
4) Not suitable for steam environments

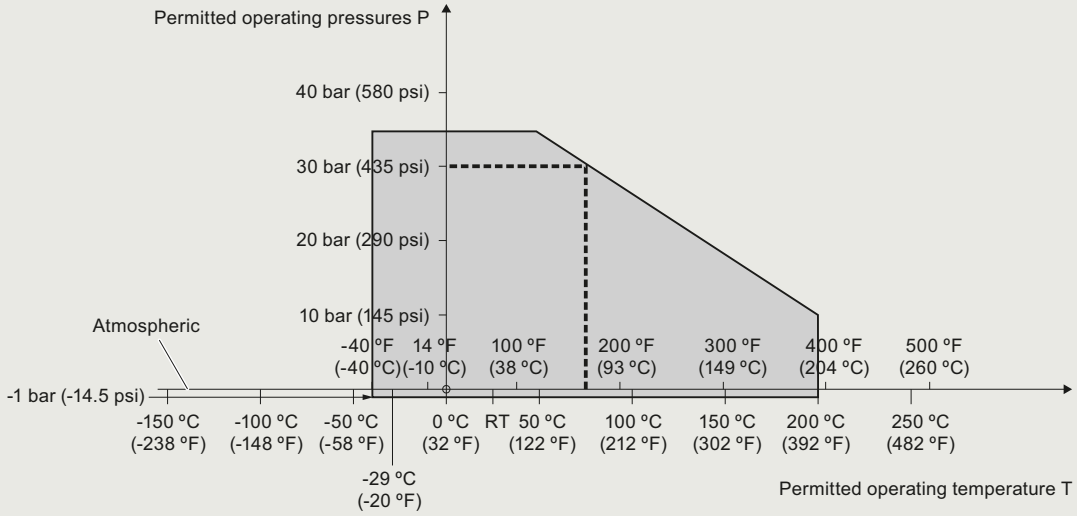
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Technical specifications (continued)

Design: Probe	Rod version	Stilling well version	Cable version
Length	Min. 300 mm (12 inch), max. 5 000 mm (197 inch)	Min. 300 mm (12 inch), max. 5 000 mm (197 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA, 316L stainless steel	PFA, 316L stainless steel	316L stainless steel or 316L stainless steel with PFA insulation
O-ring seal material	FKM or FFKM	FKM or FFKM	FKM or FFKM
Thermal isolator	Optional	Optional	Optional
Options	N/A	N/A	Mounting eye for PFA insulated cable version

Characteristic curves

Pressure/temperature curve
LC300 standard, extended rod and cable probes
Threaded process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)

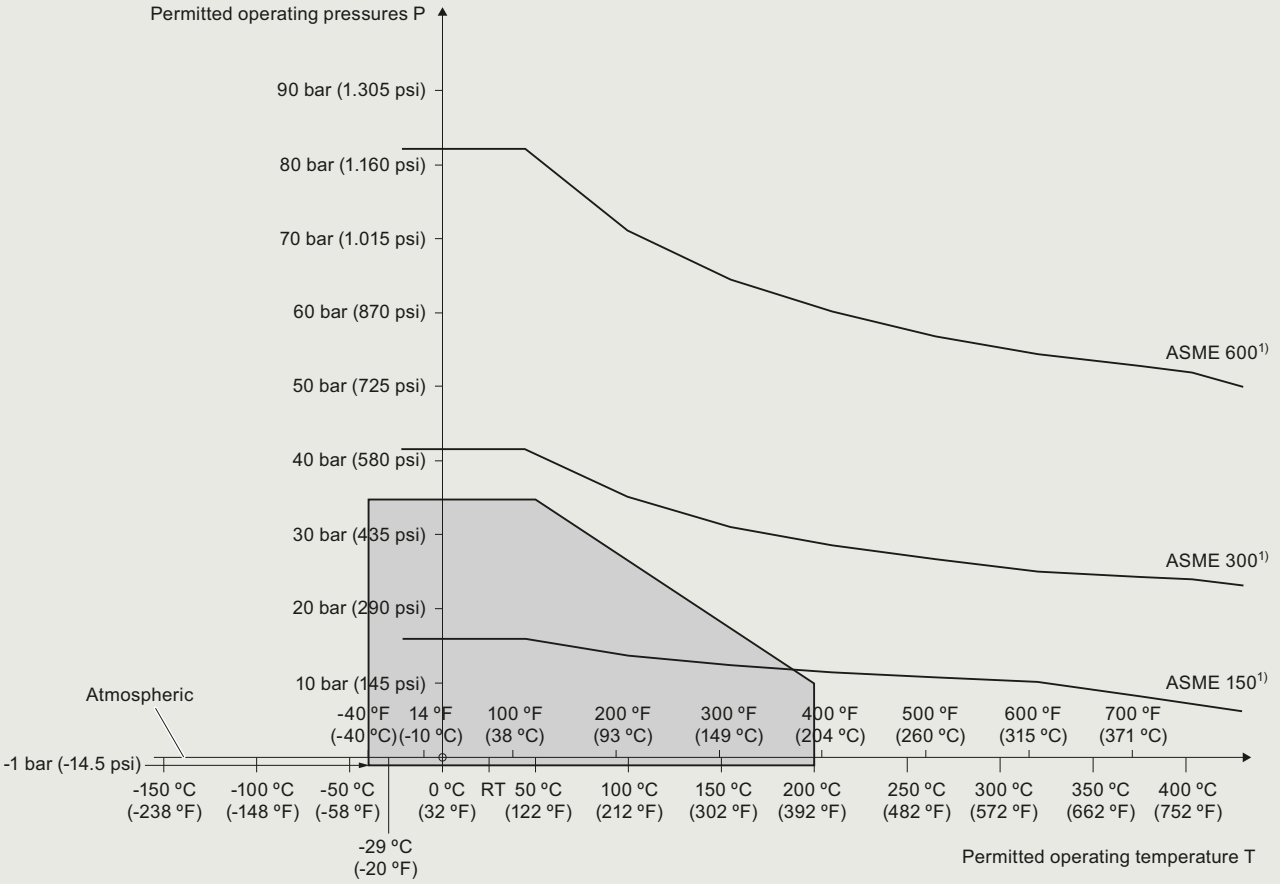


SITRANS LC300 process pressure/temperature derating curves (7ML5670, 7ML5671, 7ML5672, and 7ML5673))

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Characteristic curves (continued)

Pressure/temperature curve
LC300 standard, extended rod and cable probes
ASME flanged process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)



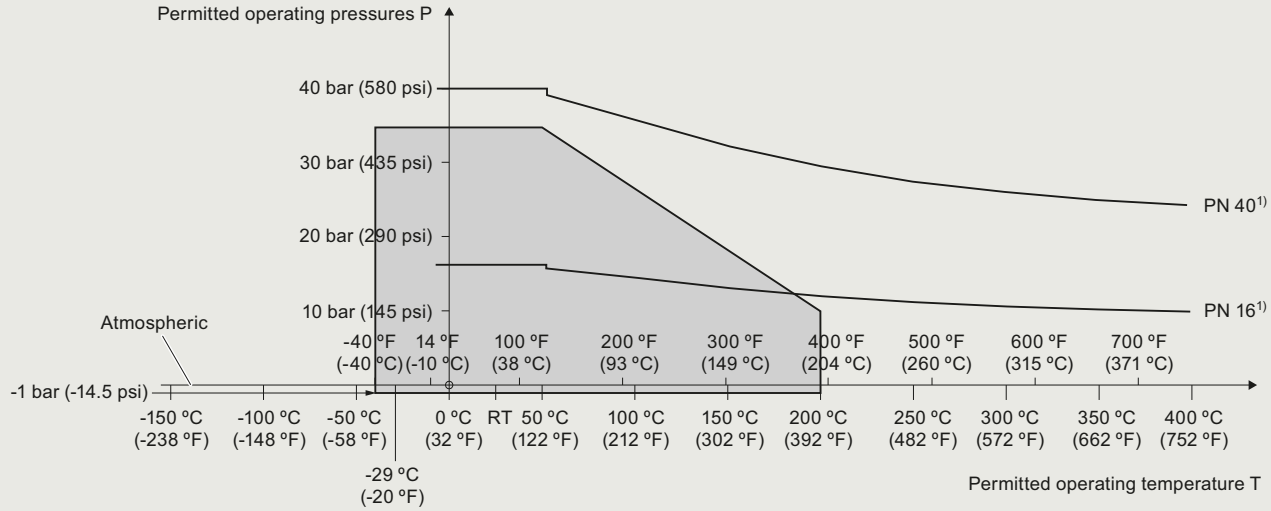
1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC300 process pressure/temperature derating curves (7ML5670, 7ML5671, 7ML5672, and 7ML5673)

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Characteristic curves (continued)

Pressure/temperature curve
LC300 standard, extended rod and cable probes
EN flanged process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)



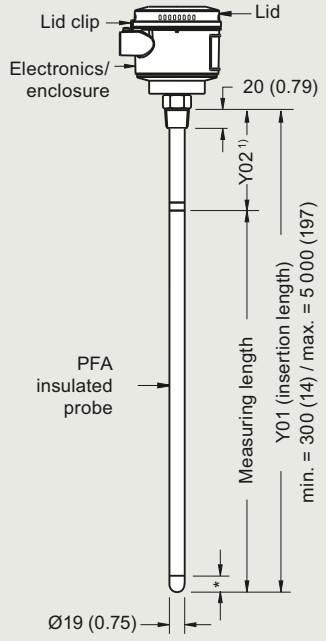
1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC300 process pressure/temperature derating curves (7ML5670, 7ML5671, 7ML5672, and 7ML5673)

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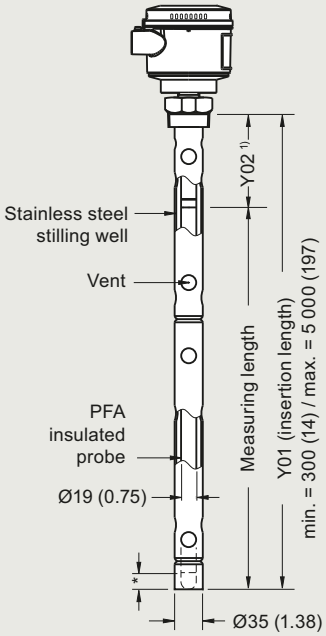
Dimensional drawings

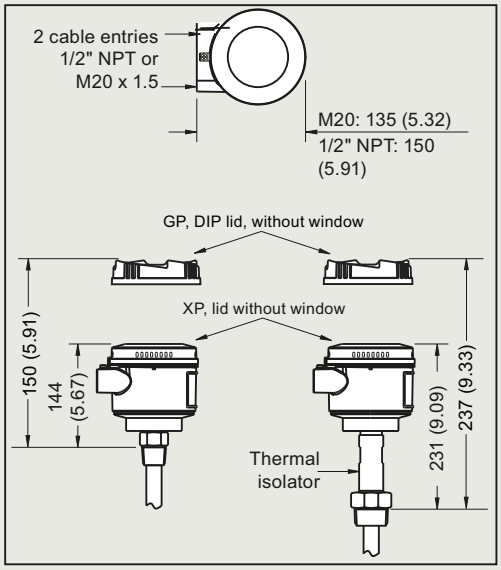
Threaded (7ML5670)



* = 30 (1.18) Inactive tip

Threaded (7ML5671)

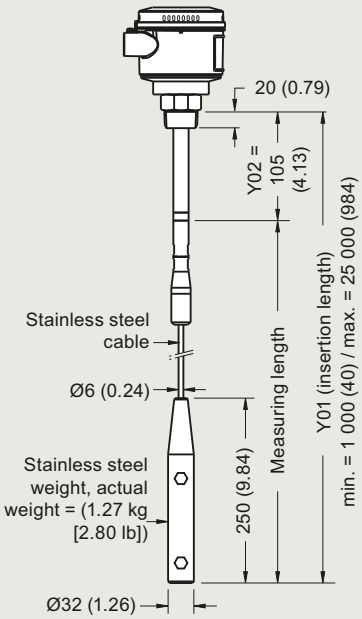




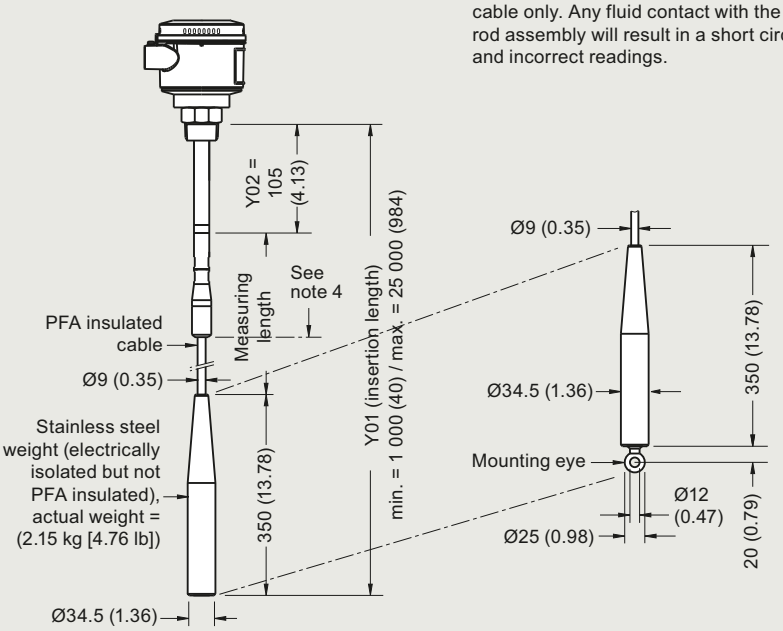
Note:

1) Rod version, threaded Y02 (including process connection): shield length = 120 (4.7).
2) For non-conductive applications only. Non-insulated cable can be shortened on site. Weight is included in measuring length.
3) For liquid and solid applications. Insulated cable cannot be shortened. Weight is **not** included in measuring length.
4) For conductive materials, the measuring length includes the exposed PFA insulated cable only. Any fluid contact with the upper rod assembly will result in a short circuit and incorrect readings.

Cable version, non-insulated[2)]
Threaded (7ML5672)



Cable version, insulated[3)]
Threaded (7ML5673)

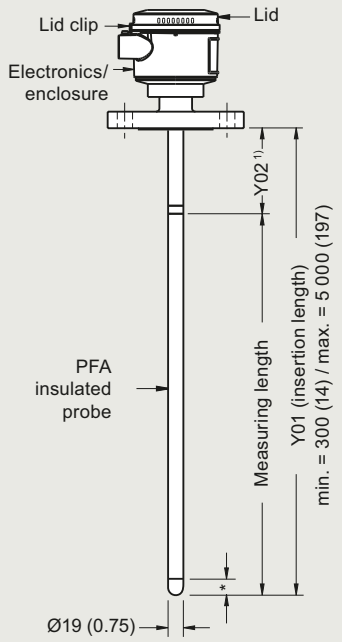


SITRANS LC300 threaded process connections, dimensions in mm (inch)

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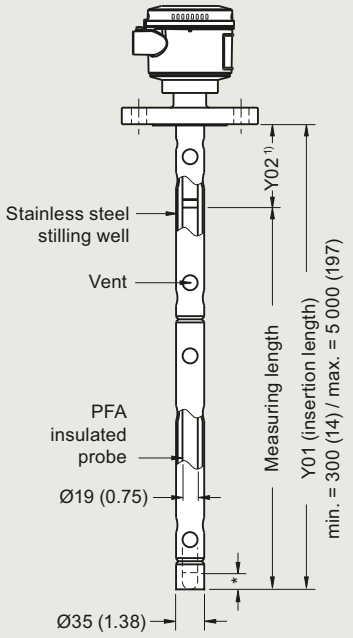
Dimensional drawings (continued)

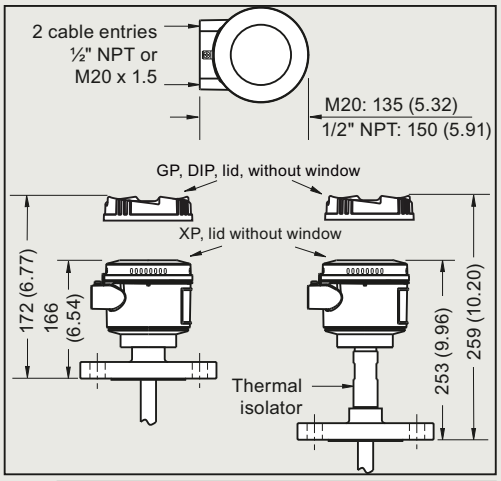
Welded Flange (7ML5670)



* = 30 (1.18) inactive tip

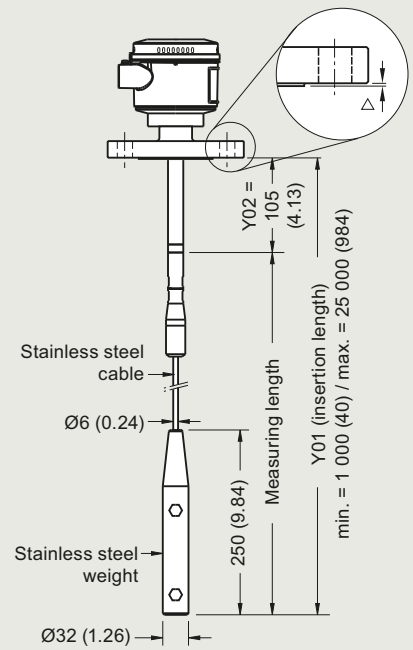
Welded Flange (7ML5671)



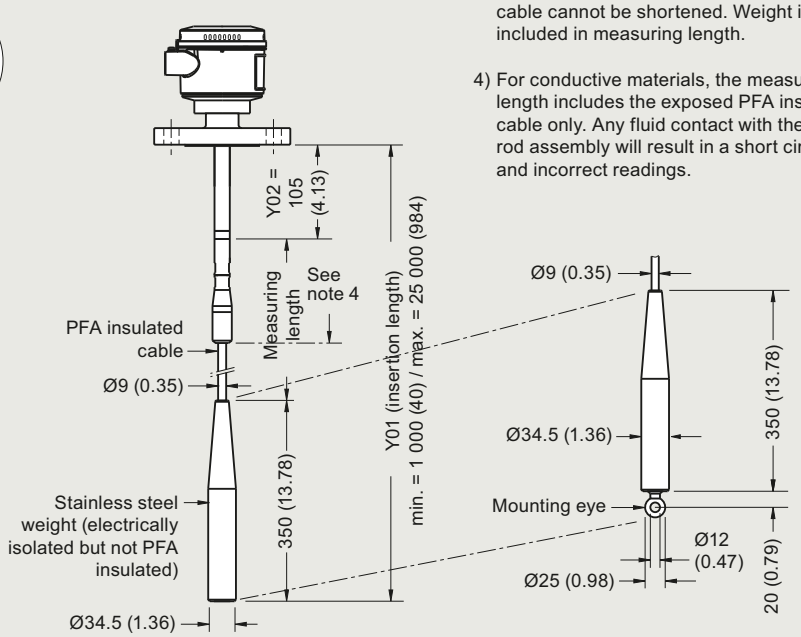


Flange Facing (raised face)	
Flange Class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

Cable version, non-insulated [2]
Welded Flange (7ML5672)



Cable version, insulated [3]
Welded Flange (7ML5673)



Notes:

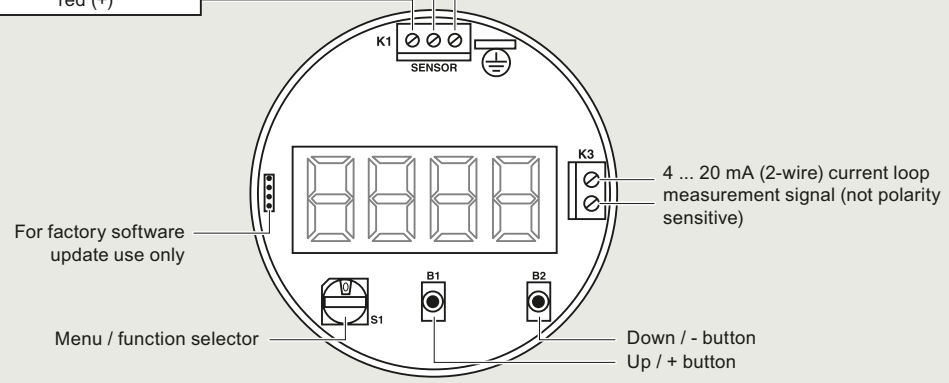
1) Rod version, welded flange Y02: shield length = 100 (3.9).
2) For non-conductive applications only. Non-insulated cable can be shortened on site. Weight is included in measuring length.
3) For liquid and solid applications. Insulated cable cannot be shortened. Weight is **not** included in measuring length.
4) For conductive materials, the measuring length includes the exposed PFA insulated cable only. Any fluid contact with the upper rod assembly will result in a short circuit and incorrect readings.

SITRANS LC300 flanged process connections, dimensions in mm (inch)

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Circuit diagrams

With safety barrier	Without safety barrier
white (S)	orange (S)
black (O)	black (O)
red (+)	red (+)



SITRANS LC300 connections

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Overview

SmartLinx modules, Dolphin Plus software

• Description

- Optional communication modules, SmartLinx, provide direct digital connection to popular industrial fieldbus systems
- Dolphin Plus for quick and easy configuring, monitoring, tuning and diagnostics of Siemens devices

SITRANS RD100

• Application

- 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation and for hazardous locations

• Description

- Versatile loop-powered meter that displays process variables in level, flow, pressure, temperature and weighing applications
- FM, CSA, and CE approved device that can be installed in a range of environments, including hazardous areas
- Large, easy-to-read display
- Easy to install and set up using quick two-step process

SITRANS RD150

• Application

- Remote display for 4 to 20 mA and HART devices.

• Description

- Ease of use through 4 button menu driven display
- Backlit display
- HART communications
- Flexible mounting options
- Plastic, stainless steel or aluminum housings up to IP68

SITRANS RD200

• Application

- Universal input, panel mount remote digital display for process instrumentation. Supports RTD, TC, current and voltage inputs, and supporting software allows for remote configuration and data logging.

• Description

- Universal remote display that accepts various inputs, making it an ideal fit for use with most field instruments
- Standard panel mount display with optional enclosures
- Two optional relays for alarm indication or process control applications
- Meter Copy feature to reduce setup time, cost and errors
- RD Software supporting remote configuration, monitoring and logging for up to 100 displays

Overview (continued)

SITRANS RD300

• Application

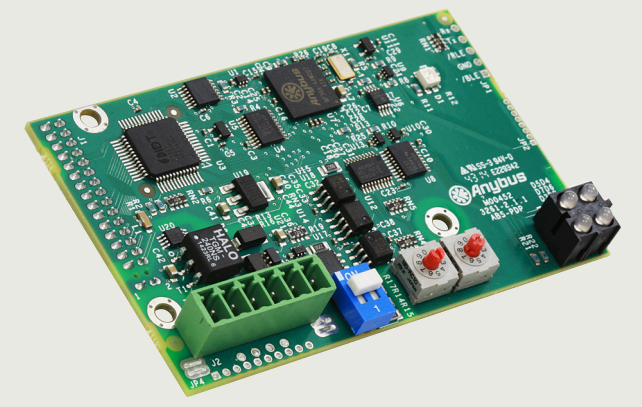
- A panel mount remote digital display for process instrumentation and acts as a multi-purpose, easy to use, rate/totalizer ideal for flow rate, total, and control applications

• Description

- A remote display for level, flow, pressure, weighing, and other process instruments
- Acts as a multi-purpose, easy to use, rate/totalizer ideal for flow rate, total, and control applications
- Data can be remotely collected, logged and presented on your local computer using the free downloadable RD Software
- Accepts a single or dual input of current and voltage and supports math functions such as averaging.

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Overview



SmartLinx modules provide direct digital connection to popular industrial communications buses with true plug-and-play compatibility with products manufactured by Siemens.

Benefits

- Fast, easy installation
- Direct connection: no additional installation required
- Scaleable application layer allows for optimized network bandwidth and memory requirements (for PROFIBUS DP-V0 and DeviceNet only)
- Modules available for PROFIBUS DP-V0, PROFIBUS DP-V1, PROFINET, DeviceNet, Modbus TCP/IP, and EtherNet/IP

Application

With the addition of a SmartLinx module, Siemens instruments can be connected to a variety of industrial communications networks.

They're fast and easy to install, and can be added at any time. The module simply plugs into the socket on any SmartLinx enabled product. They require no secondary private buses or gateways and no separate wiring. There are no extra boxes to connect to your network so there's a minimum load on engineering and maintenance staff.

SmartLinx provides all data from the instrument, including measurement and status, and allows changes to operation parameters to be done over the bus or telemetry link. The user can select which data in the application layer to transfer over the bus. This selection saves bandwidth and memory and optimizes data throughput and speeds up the network, enabling you to connect more instruments to your network.

Selecting a communications module: PROFIBUS DP-V0 versus PROFIBUS DP-V1

The PROFIBUS DP-V1 card was added to MultiRanger 200 HMI and HydroRanger 200 HMI to provide acyclic communication and SIMATIC PDM support over PROFIBUS and PROFINET. For backward compatibility, the PROFIBUS DP-V0 card can also be used with MultiRanger 200 HMI and HydroRanger 200 HMI.

MultiRanger 100/200, HydroRanger 200, BW500/L, and SF500 are compatible only with the PROFIBUS DP-V0 module.

Selection and ordering data

Selection and Ordering data	Article No.
SmartLinx modules provide direct digital connection to popular industrial communications buses with true plug-and-play compatibility with products manufactured by Siemens.	
SmartLinx PROFIBUS DP-V0 module	**7ML1830-1HR**
SmartLinx PROFIBUS DP-V1 module	**A5E35778741**
SmartLinx DeviceNet module	**7ML1830-1HT**
Smartlinx PROFINET IO module[1)]	**7ML1830-1PM**
SmartLinx Modbus TCP/IP, EtherNet/IP module	**7ML1830-1PN**
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

[1)] SmartLinx PROFINET module is certified per standard V2.2.4.

Technical specifications

Module type	PROFIBUS DP-V0
Interface	RS 485 (PROFIBUS standard)
Transmission rate	All valid PROFIBUS DP rates from 9 600 Kbps ... 12 Mbps
Slave address	0 ... 99
Connection	Slave
SmartLinx module compatibility	• MultiRanger 200 HMI • MultiRanger 100/200 • HydroRanger 200 HMI • HydroRanger 200 • Milltronics BW500, BW500/L • Milltronics SF500

Module type	PROFIBUS DP-V1
Interface	RS 485 (PROFIBUS standard)
Transmission rate	All valid PROFIBUS DP rates from 9 600 Kbps ... 12 Mbps
Slave address	0 ... 99
Connection	Slave
SmartLinx module compatibility	• MultiRanger 200 HMI • HydroRanger 200 HMI

Module type	PROFINET IO module
Interface	RJ 45 female
Transmission rate	10/100 Mbits/s
Address	IP address though dip switches or via DCP or DHCP
Connection	Slave/server
SmartLinx module compatibility	• MultiRanger 200 HMI • HydroRanger 200 HMI • Milltronics BW500, BW500/L • Milltronics SF500

Module type	Modbus TCP/IP, EtherNet/IP
Interface	RJ 45 female
Transmission rate	10/100 Mbits/s
Address	IP address though dip switches or via DCP or DHCP
Connection	Slave/server
SmartLinx module compatibility	• MultiRanger 200 HMI • HydroRanger 200 HMI • Milltronics BW500, BW500/L • Milltronics SF500

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Technical specifications (continued)

Module type	DeviceNet
Interface	DeviceNet physical layer
Transmission rate	125, 250, 500
MAC address	0 ... 63
Connection	Slave (group 2)
SmartLinx module compatibility	• MultiRanger 200 HMI • MultiRanger 100/200 • HydroRanger 200 HMI • HydroRanger 200 • Milltronics BW500, BW500/L • Milltronics SF500

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Overview



SITRANS DTM provides an easy way for Field Device Tool (FDT)/ Device Type Manager (DTM) users to parameterize Siemens Instruments using international standards.

Benefits

- Same look and feel for all Siemens field instruments
- Support for Quick start wizards and other dialog boxes
- Quick overview using table and tree views
- Online and offline configuration
- Conformity to IEC profiles for HART and PROFIBUS

Application

Electronic Device Description (EDD) is a proven way to describe the behavior and functionality of field instruments and other automation components.

For many years, EDD-based tools such as SIMATIC PDM from Siemens or handheld communicator have been used successfully in the process industry. Some years ago, an additional technology called FDT / DTM with the same approach was introduced to the market. To support the FDT DTM Technology for Siemens devices, the software SITRANS DTM has been developed which combines both technologies, EDD and FDT.

SITRANS DTM uses EDDs as the device description and provides the DTM interface to allow the integration of our field instruments into FDT-frame applications.

The following field instruments are currently available in SITRANS DTM:

- SITRANS TH300 HART
- SITRANS TH400 PA
- SITRANS P300 HART
- SITRANS DSIII HART
- SITRANS FM MAGFLO MAG6000 DP/PA
- SITRANS FC MASSFLO MASS6000 PA/PA
- SITRANS LT500 Service channel
- SITRANS Probe LU240 HART
- SITRANS LR110/120 HART
- SITRANS LR150 HART
- SITRANS LR510/530/550/580 HART
- SIPART PS2 HART, PA

Additionally, the SIPART PS2 FF has a DTM.

Technical specifications

SITRANS DTM	
Current Version	3.1
Compatible with PACTware versions	3.6, 4.0, 4.1
Compatible with Windows	XP, 7
Certified by FDT group	Yes

Free DTM software can be downloaded here:

- SITRANS DTM V3.1:
  https://support.industry.siemens.com/cs/document/53754140/software%3A-sitrans-dtm-v3-1?dti=0&lc=de-WW
- SITRANS DTM V4.1:
  https://support.industry.siemens.com/cs/document/109484287/sitrans-dtm-v4-1?dti=0&lc=de-WW

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Overview



The SITRANS RD100 is a 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation.

Benefits

- Easy setup
- Approved for hazardous locations
- NEMA 4X, IP67 impact-resistant enclosure
- Simple two-step calibration
- Two modes of input allow for easy servicing, with no interruption of loop required

Application

The RD100 is designed for maximum versatility, allowing seamless installation both indoors and outdoors, in a wide range of environments. Whether in heat or cold, the RD100 performs reliably in non-hazardous areas. Operating efficiently from -40 to +85 °C (-40 to +185 °F), it adds only 1 V to the loop.

Calibration consists of a quick two-step process involving the adjustment of only two non-interacting potentiometers.

- Key Applications: remotely displays process variables in level, flow, pressure, temperature, and weighing applications, in a 4 to 20 mA loop.

Selection and ordering data

SITRANS RD100 Display Remote digital display for process instruments. 2-wire, loop powered, NEMA 4X enclosure.	Article No. 7ML5741-	●	●	A	0	0	-	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.								
Conduit hole location (½ inch)								
None		1						
Bottom		2						
Rear		3						
Top		4						
Approvals								
CE			B					

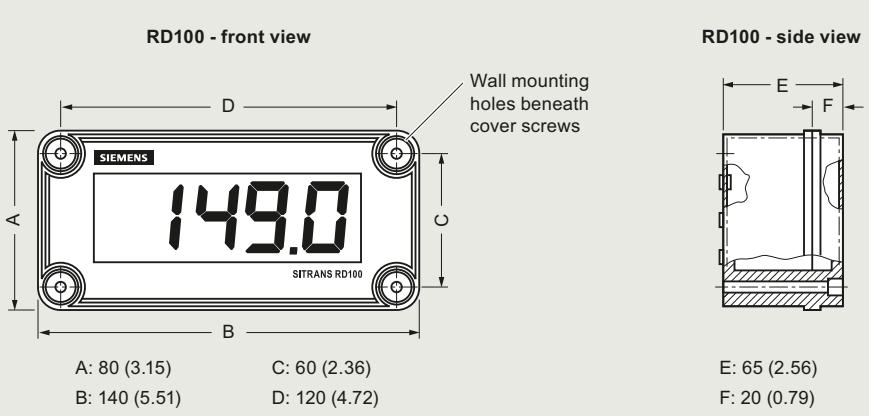
Selection and Ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301)	**7ML1930-1BQ**

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Technical specifications

SITRANS RD100	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring range	4 ... 20 mA
Measuring points	1 instrument only
Accuracy	± 0.1 % of span ± 1 count
Rated operating conditions	
Ambient conditions	
• Operating temperature range	-40 ... +85 °C (-40 ... +185 °F)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Design	
Weight	340 g (12 oz)
Material (enclosure)	Impact-resistant glass filled polycarbonate body and clear polycarbonate cover
Degree of protection	NEMA 4X, IP67
Power supply	
External loop power supply	30 V DC max.
Display	• 1.0 inch (2.54 cm) high LCD • Numeric range from -1 000 ... +1 999
Certificates and approvals	
Non-hazardous	CE
Options	
Mounting	• 2 inch (5.08 cm) pipe mounting kit (zinc plated or stainless steel) • Panel mounting kit

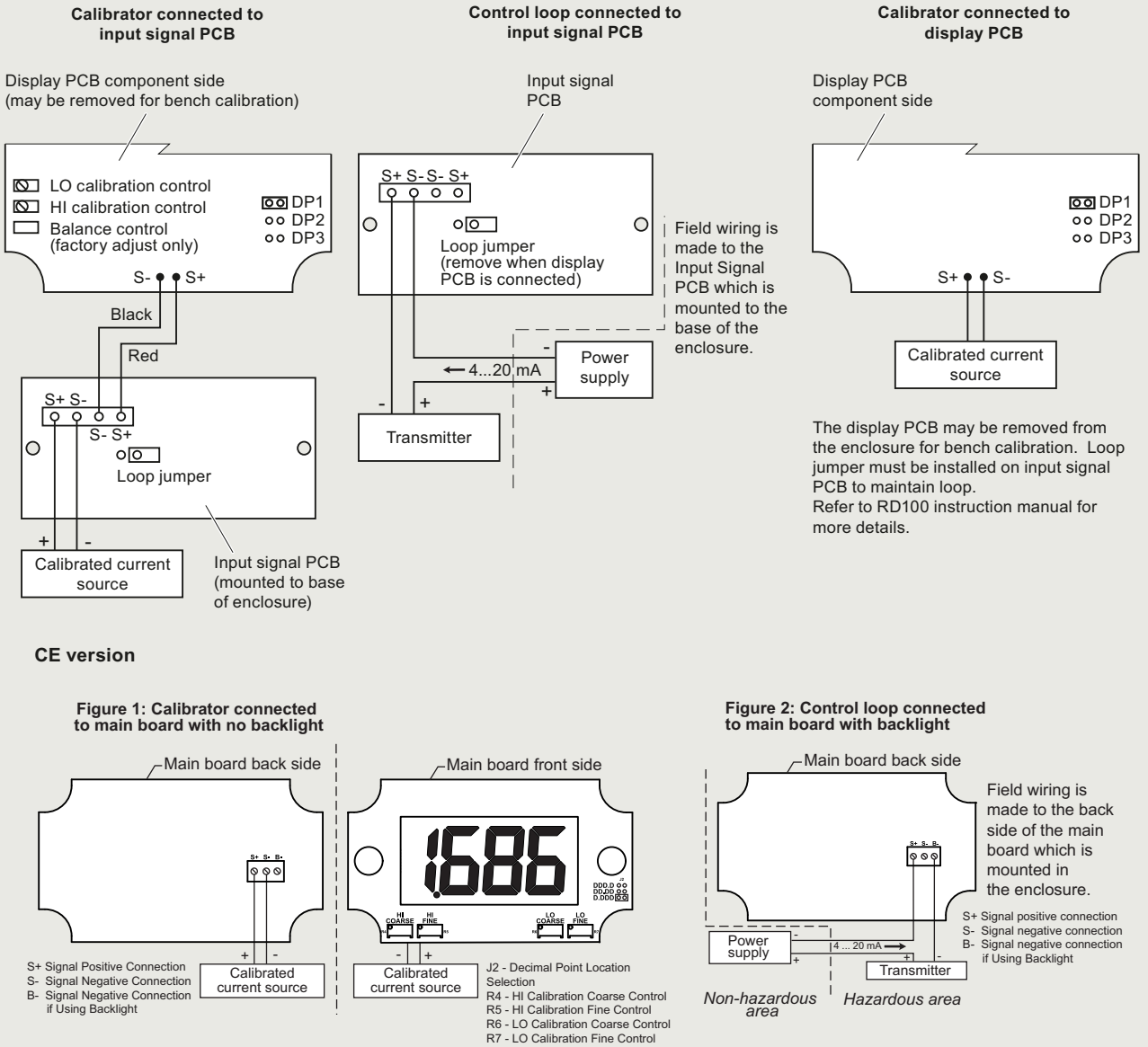
Dimensional drawings



SITRANS RD100, dimensions in mm (inch)

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Circuit diagrams



SITRANS RD100 connections

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Overview



The SITRANS RD150 is a remote display for 4 to 20 mA and HART devices.

Benefits

- Ease of use through 4 button menu driven display
- Backlit display
- HART communications
- Flexible mounting options
- Plastic, stainless steel or aluminum housings up to IP68

Application

The versatile SITRANS RD150 can be installed remotely from your instrument, providing 4/20 mA or multiple HART variable readings in a safe and convenient location.

Easy to use, 4 button, menu driven, display for monitoring of HART instruments via HART communication or 4/20 mA.

- Key Applications: remotely displays process variables in level, flow, pressure, temperature, and weighing applications, in a 4 to 20 mA HART loop.

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Selection and ordering data

SITRANS RD150 display Remote digital display, HART or 4 to 20 mA loop display, metal and plastic field mount enclosures.	Article No. 7ML574- ● ● ● ● ● - ● ● ● ●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Approvals	
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA	2- **0 A**
ATEX II 1G, Ex ia IIC T6...T1 Ga[4] UKEX II 1G, Ex ia IIC T6...T1 Ga[4]	**0 C**
ATEX II 2G Ex db IIC T6 Gb[9)10)] UKEX II 2G Ex db IIC T6 Gb[9)10)]	**0 F**
IECEx Ex ia IIC T6...T1 Ga, Gb[4]	**0 J**
IECEx Ex db IIC T6 Gb[9)10)]	**0 M**
$_{C}CSA_{US}$(IS) Class I, Div. 1, Groups A, B,C, D[12)]	**0 N**
$_{C}CSA_{US}$(XP) Class I, Div. 1, Groups A, B, C, D[9)11)]	**0 R**
Electronics	
Two-wire 4 ... 20 mA/HART	**A**
Two-wire 4 ... 20 mA without HART	**B**
Housing	
Plastic[1)4)6)]	**0**
Aluminum[2)4)7)]	**1**
Stainless steel (precision casting)[2)4)7)]	**2**
For panel mounting (72 x 72 mm)[3)5)8)]	**3**
Housing protection	
IP66/IP67 NEMA 4X	**0**
IP66/IP68 NEMA 6P (0.2 bar)	**1**
IP40 NEMA 2	**2**
IP40 Type 1	**3**
Cable entry	
M20 x 1.5/Cable gland PA black (ø5 ... 9 mm), standard	**0**
M20 x 1.5/Cable gland brass nickel plated (ø6 ... 12 mm)	**1**
M20 x 1.5/Blind plug	**2**
M20 x 1.5/Threaded fitting brass nickel-plated; for shielded cable (ø9 ... 13 mm)	**3**
½" NPT/Blind plug	**4**
½" NPT/Cable gland PA black (ø5 ... 9 mm)	**5**
½" NPT/Threaded fitting brass nickel plated (ø6 ... 12 mm)	**6**
½" NPT/Threaded fitting brass nickel plated; for shielded cable (ø9 ... 13 mm)	**7**
Without	**8**
Display	
Without	**A**
Mounted	**B**
Mounting	
For wall mounting with aluminum or stainless steel housing	**A**
For carrier rail and wall mounting with plastic housing	**B**
For carrier rail with aluminum or stainless steel housing	**C**
For tube mounting (29 ... 60 mm) incl. mounting material	**D**
For panel mounting	**E**
Certificates	
None	**0**
3.1 Certificate/Instrument with test data	**1**
Quality and Test plan	**2**

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Selection and ordering data (continued)

Selection and ordering data	Order code
Further designs	
Please add "-**Z**" to Article No. and specify Order code(s).	
Identification Label (measurement loop) stainless steel: max. 40 characters add in plain text. To add more than one line use a comma"," for Line break.	**Y17**
Identification Label (measurement loop) foil: max. 40 characters add in plain text. To add more than one line, use a coma "," for line break.	**Y18**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
USB communicator	**A5E35192015**
SITRANS LG/SITRANS RD150 sensor display module	**A5E34143449**

[1] Available only with Housing protection option 0.
[2] Available only with Housing protection option 1.
[3] Available only with Housing protection option 2.
[4] Available only with Cable entry options 0, 2, 4, and 5.
[5] Available only without Cable entry option 8.
[6] Available only with Carrier rail and Tube mount Mounting options.
[7] Available only with Wall mount, Carrier rail with aluminum or stainless steel housing, and Tube mount Mounting options.
[8] Available only with Panel mounting option.
[9] Available only with Housing options 1 and 2.
[10] Available only with Cable entry options 2, 3, 4, and 7.
[11] Available only with Cable entry options 2, 3, 4, 6, and 7.
[12] Not available with Cable entry option 1.

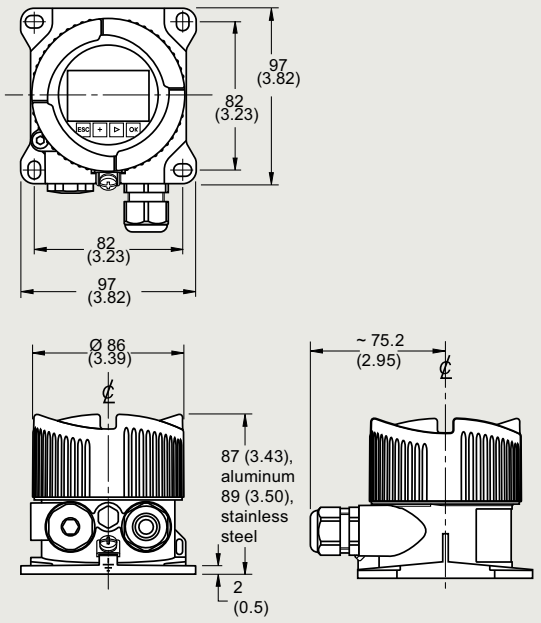
Technical specifications

SITRANS RD150	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring range	3.5 ... 22.5 mA
Measuring points	HART multi-drop support
Accuracy	± 0.1 % of 20 mA
Rated operating conditions	
Without display and adjustment module	-40 ... +80 °C (-40 ... +176 °F)
With display and adjustment module	-20 ... +70 °C (-4 ... +158 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Design	
Weight	
• Plastic housing	0.35 kg (0.772 lb)
• Aluminum housing	0.7 kg (1.543 lb)
• Stainless steel housing	2.0 kg (4.409 lb)
Material (enclosure)	
• Plastic housing	Plastic PBT (Polyester)
• Aluminum housing	Aluminum die-casting AlSi10Mg, powder-coated (basis: Polyester)
• Stainless steel housing	316L precision casting, blasted
Degree of protection	
• Plastic housing	IEC 60529 IP66/IP 67, NEMA Type 4X
• Housing for panel mounting (mounted)	IEC 60529 IP40, NEMA Type 1
• Aluminum/stainless steel housing	IEC 60529 IP66/IP68 (0.2 bar), NEMA Type 6P
Power supply	
External loop power supply	35 V DC max.
Display	
Number of digits	5
Digit size	7 x 13 mm (0.28 x 0.51 inch)
Certificates and approvals	See the online PIA configuration tool for details.
Options	
Mounting	• Panel Mounting • Carrier rail mounting • Pipe mounting

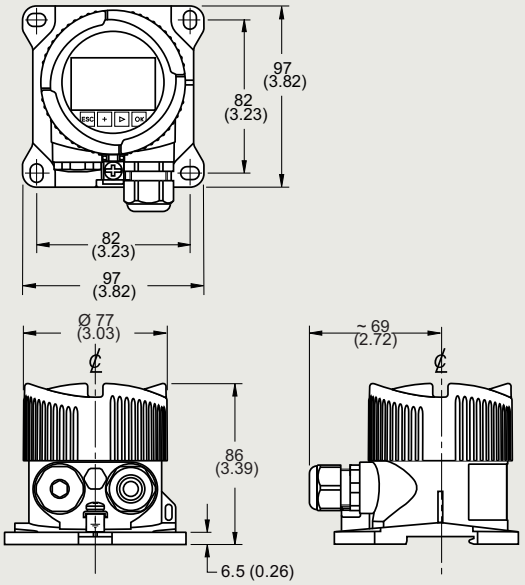
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Dimensional drawings

SITRANS RD150, aluminum/stainless steel housing

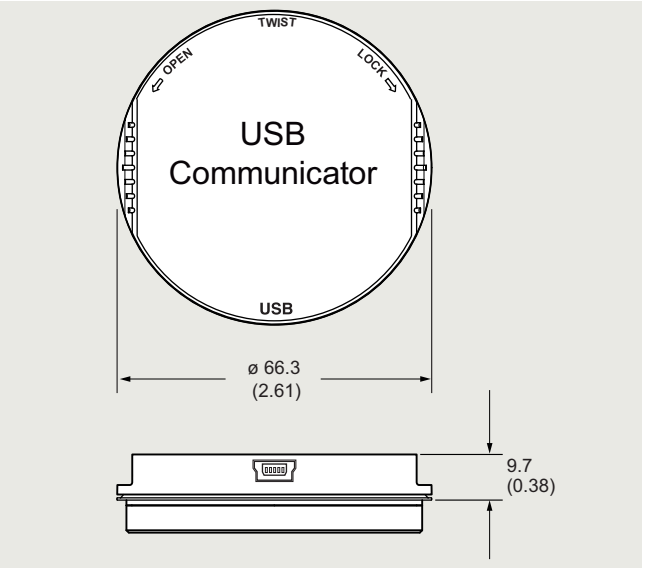


SITRANS RD150, plastic housing



SITRANS RD150, dimensions in mm (inch)

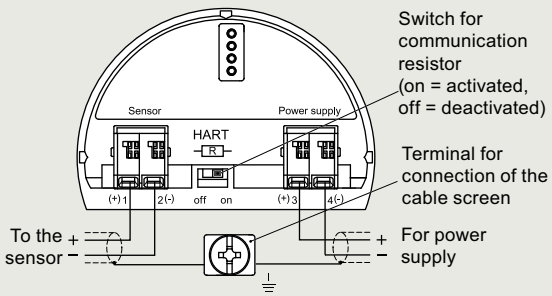
Dimensional drawings (continued)



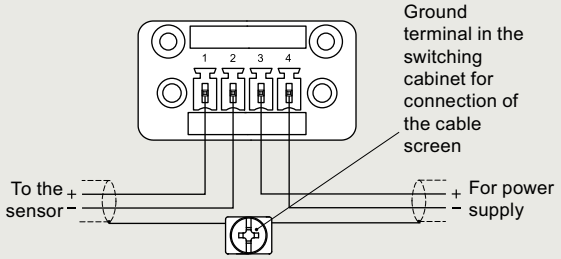
USB Communicator, dimensions in mm (inch)

Circuit diagrams

Standard housing with 2 wire device



Panel mount



SITRANS RD150 connections

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Overview



The SITRANS RD200 is a universal input, panel mount remote digital display for process instrumentation.

Benefits

- Easy setup and programming via front panel buttons or remotely using RD software
- Display readable in sunlight
- Universal input: accepts current, voltage, thermocouple, and RTD signals
- Single or dual 24 V DC transmitter power supply
- Serial communication using built in protocol or Modbus RTU
- Two optional relays for alarm indication or process control applications
- Linear or square root function supported
- Meter Copy feature to reduce setup time, cost, and errors
- RD software supports remote configuration, monitoring, and logging for up to 100 displays
- Other features include: 4 to 20 mA analog output option, pump alternation control, and optional NEMA 4 and 4X field enclosures
- 2X option for 30.5 mm (1.2 inch) high, red LED display

Application

The RD200 is a universal remote display for level, flow, pressure, temperature, weighing, and other process instruments.

Data can be remotely collected, logged and presented from as many as 100 displays on your local computer using the free downloadable RD Software.

The display accepts a single input of current, voltage, thermocouple, and RTD. This makes the RD200 an ideal fit for use with most field instruments.

The RD200 can be set up as a standard panel mount, or combined with optional enclosures to allow it to house up to 6 displays.

- Key Applications: tank farms, pump alternation control, local or remote display of level, temperature, flow, pressure and weighing instrument values, PC monitoring, and data logging with RD Software.

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Selection and ordering data

SITRANS RD200 Display Remote digital display for process instruments. With 4 to 20 mA, 0 to 10 V, RTD, and TC inputs and pump control. Panel mount with field mount enclosure options.	Article No. 7ML57-40-	●	●	●	●	●	-	●	A
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Input voltage									
85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.		1							
12 ... 36 V DC; 12 ... 24 V AC, 6 W max.		2							
Transmitter supply									
None			A						
Single 24 V DC transmitter supply[1]			B						
Dual 24 V DC transmitter supply[1][2]			C						
Output									
None				A					
2 relays				B					
4 ... 20 mA output				C					
Communication									
Modbus RTU					0				
Approvals									
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA, UL, cUL						1			
Display Size									
Standard								0	
2X option for 30.5 mm (1.2 inch) high, red LED								1	

[1] Available with input voltage option 1 only.
[2] Available with output option C only.

Selection and Ordering data	Article No
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
SITRANS RD200 copy cable 2.1 m (7 ft)	**7ML1930-1BR**
SITRANS RD200 RS 232 serial adapter (copy cable included)	**7ML1930-1BS**
SITRANS RD200 RS 422/485 serial adapter (copy cable included)	**7ML1930-1BT**
RS 232 to RS 422/485 isolated converter	**7ML1930-1BU**
USB to RS 422/485 isolated converter	**7ML1930-1BX**
RD200 USB serial adapter	**7ML1930-6AH**
USB to RS 232 converter	**7ML1930-6AK**
Low cost polycarbonate plastic enclosure for 1 display	**7ML1930-1CF**
2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301) only available with 7ML1930-1CF	**7ML1930-1BQ**
Thermoplastic enclosure	
For use with 1 display	**7ML1930-1CG**
For use with 2 displays	**7ML1930-1CH**
For use with 3 displays	**7ML1930-1CJ**

Selection and Ordering data	Article No
For use with 4 displays	**7ML1930-1CK**
For use with 5 displays	**7ML1930-1CL**
For use with 6 displays	**7ML1930-1CM**
Stainless steel enclosure (Type 304, EN 1.4301)	
For use with 1 display	**7ML1930-1CN**
For use with 2 displays	**7ML1930-1CP**
For use with 3 displays	**7ML1930-1CQ**
For use with 4 displays	**7ML1930-1CR**
For use with 5 displays	**7ML1930-1CS**
For use with 6 displays	**7ML1930-1CT**
Steel enclosure	
For use with 1 display	**7ML1930-1CU**
For use with 2 displays	**7ML1930-1CV**
For use with 3 displays	**7ML1930-1CW**
For use with 4 displays	**7ML1930-1CX**
For use with 5 displays	**7ML1930-1CY**
For use with 6 displays	**7ML1930-1DA**

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Technical specifications

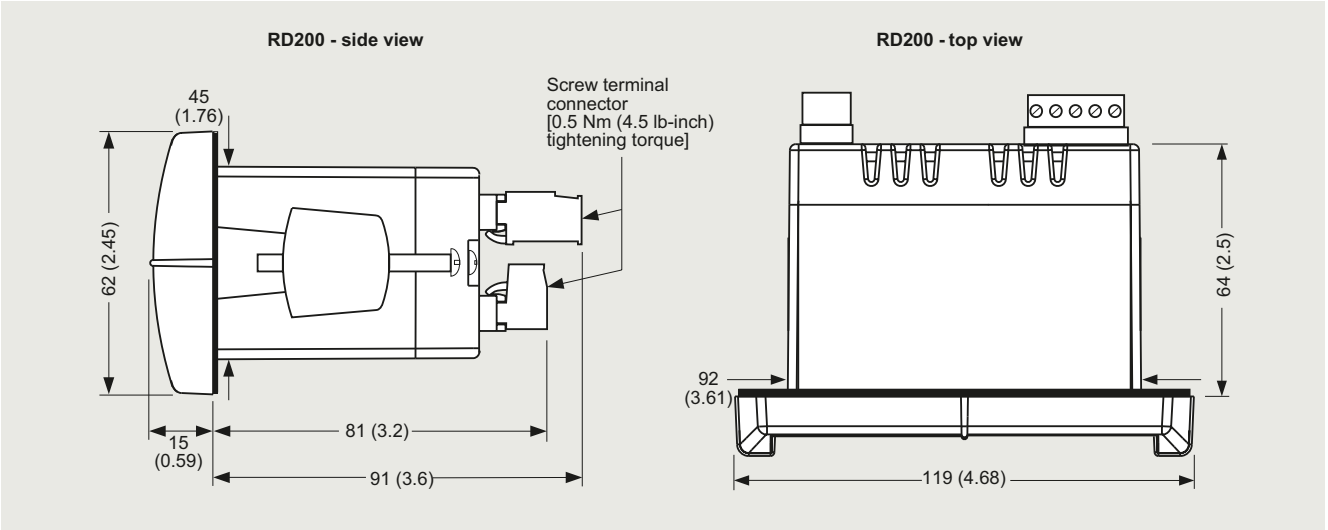
SITRANS RD200	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring points	• 1 instrument • Remote monitoring of 100 instruments with PC and RD software
Input	
Measuring range	
• Current	• 4 ... 20 mA, 0 ... 20 mA
• Voltage	• 0 V DC ... 10 V DC, 1 ... 5 V, 0 ... 5 V
• Thermocouple temperature	• Type J: -50 ... +750 °C (-58 ... +1 382 °F) • Type K: -50 ... +1 260 °C (-58 ... +2 300 °F) • Type E: -50 ... +870 °C (-58 ... +1 578 °F) • Type T: -180 ... +371 °C (-292 ... +700 °F) • Type T, 0.1° resolution: -180.0 ... +371 °C (-199.9 ... +700 °F)
• RTD temperature	• 100 Ω RTD: -200 ... +750 °C (-328 ... +1 382 °F)
Output signal	
Output	• 4 ... 20 mA (optional) • Modbus RTU
Relays	2 SPDT Form C relays, rated 3 A at 30 V DC or 3 A at 250 V AC, non-inductive, auto-initializing (optional)
Communications	• RS 232 with PDC or Modbus RTU • RS 422/485 with PDC or Modbus RTU
Accuracy	
4 ... 20 mA optional output	± 0.1 % FS ± 0.004 mA
Process input	± 0.05 % of span ± 1 count, square root: 10 ... 100 % FS
Thermocouple temperature input	• Type J: ± 1 °C (± 2 °F) • Type K: ± 1 °C (± 2 °F) • Type E: ± 1 °C (± 2 °F) • Type T: ± 1 °C (± 2 °F) • Type T, 0.1° resolution: ± 1 °C (± 1.8 °F)
RTD temperature input	• 100 Ω RTD: ± 1 °C (± 1 °F)
Rated operating conditions	
Ambient conditions	
• Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)
• Operating temperature range	-40 ... +65 °C (-40 ... +149 °F)
Design	
Weight	269 g (9.5 oz) (including options)
Material (enclosure)	• 1/8 DIN, high impact plastic, UL94V-0, color: gray • Optional plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 enclosures
Degree of protection	Type 4X, NEMA 4X, IP65 (front cover); panel gasket provided
Electrical connection	
mA output signal	2-core copper conductor, twisted, shielded, 0.82 ... 3.30 mm² (18 ... 12 AWG), Belden 8 760 or equivalent is acceptable
Electrical connection and relay connection	Copper conductor according to local requirements, rated 3 A at 250 V AC
Power supply	
Input voltage option 1	85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.
Input voltage option 2	12 ... 36 V DC; 12 ... 24 V AC, 6 W max.
Transmitter power supply	One or two isolated transmitter power supplies (optional)
• Single power supply	One 24 V DC ± 10 % at 200 mA max.
• Dual power supplies	Two 24 V DC ± 10 % at 200 mA and 40 mA max.
External loop power supply	35 V DC max.
Output loop resistance	• 24 V DC, 10 ... 700 Ω max. • 35 V DC (external), 100 ... 1 200 Ω max.

Technical specifications (continued)

SITRANS RD200	
Displays and controls	
Display	• 14 mm (0.56 inch) high LED • 2X option for 30.5 mm (1.2 inch) high, red LED • Numeric range from -1 999 ... +9 999 • Four digits, automatic lead zero blanking • Eight intensity levels
Memory	• Non-volatile • Stores settings for minimum of 10 years if power is lost
Programming	• Primary: front panel • Secondary: meter copy or PC with SITRANS RD software
Certificates and approvals	CE, UKCA, UL, cUL
Options	
Enclosures	Plastic, steel, and stainless steel (Type 304, EN 1.4301) NEMA 4 and 4X enclosures
Mounting	• 2 inch (5.08 cm) pipe mounting kit (zinc plated seal) • 2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301)

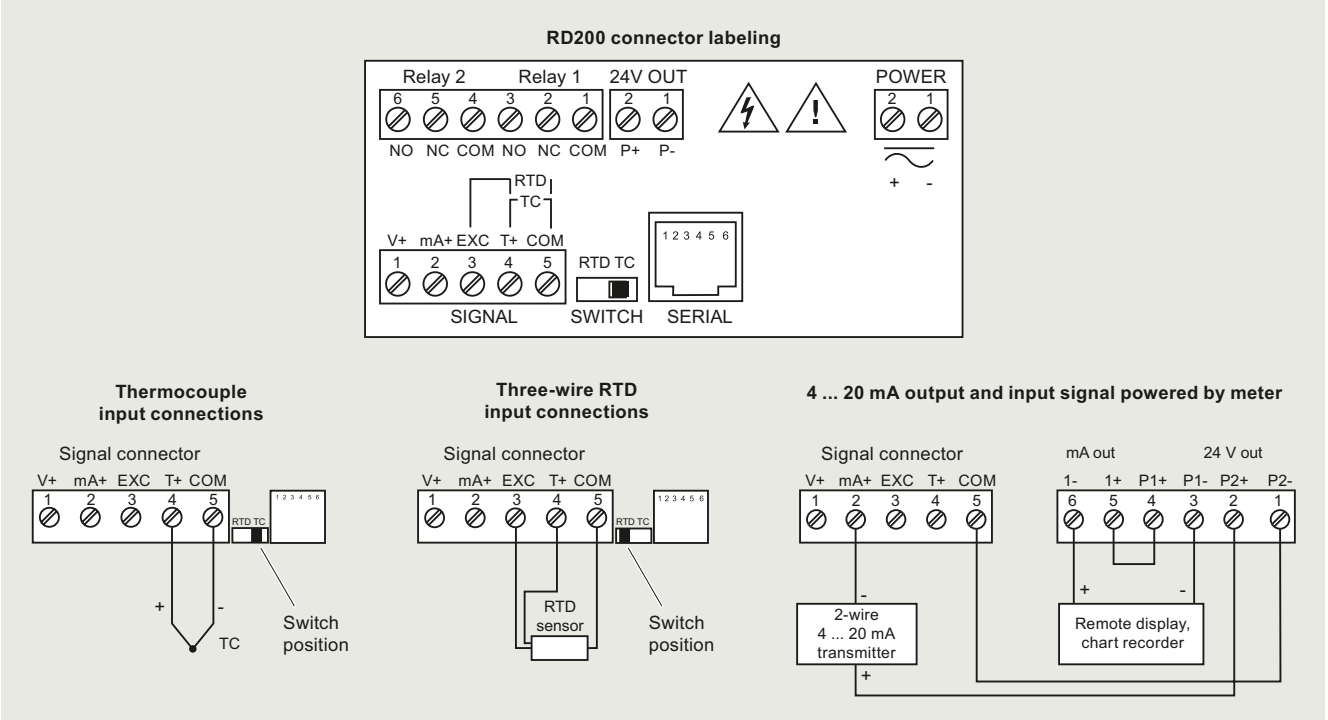
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Dimensional drawings



SITRANS RD200, dimensions in mm (inch)

Circuit diagrams



SITRANS RD200 connections

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Overview



The SITRANS RD300 is a panel mount remote digital display for process instrumentation and acts as a multi-purpose, easy to use, rate/totalizer ideal for flow rate, total, and control applications.

Benefits

- Easy setup and programming via front panel buttons or using free RD software available via USB drive
- Display readable in sunlight
- Input: accepts current and voltage
- Single or dual 24 V DC transmitter power supply
- Serial communication using built in protocol or Modbus RTU
- Supports up to 8 relays and 8 digital I/O for process control and alarming
- 32-Point linearization, square root or exponential linearization
- Multi-pump alternation control
- Supports total, grand total or non-resettable grand total
- 9-digit totalizer with total overflow feature
- Large dual-line, 6-digit display
- Configure, monitor, and datalog from a PC
- Dual-input option with math functions: addition, difference, average, multiplication, division, minimum, maximum, weighted average, ratio, concentration

Application

The RD300 is a remote display for level, flow, pressure, weighing, and other process instruments. This display also acts as a multi-purpose, easy to use rate/totalizer ideal for flow rate, total, and control applications.

Data can be remotely collected, logged and presented on your local computer using the free RD software available via USB drive.

The display accepts a single or dual input of current and voltage. This makes the RD300 an ideal fit for use with most field instruments.

The RD300 can be set up as a standard panel mount, or combined with optional enclosures to allow it to house up to 6 displays.

- Key Applications: tank farms, pump alternation control, local or remote display of level, flow, pressure and weighing instrument values, PC monitoring and data logging with RD Software.

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Selection and ordering data

SITRANS RD300 Display Remote digital panel mount process display with current or voltage inputs. Two input, multi-line display, totalizer and pump control.	Article No. 7ML574- 4-	●	●	●	●	●	-	0	A
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Input voltage									
85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.		1							
12 ... 36 V DC; 12 ... 24 V AC, 6 W max.		2							
Output									
None			A						
2 Relays			B						
4 Relays			C						
4 ... 20 mA output			D						
2 Relays and 4 ... 20 mA output			E						
4 Relays and 4 ... 20 mA output			F						
Type									
Single input process and flow rate/totalizer Mtr				A					
Dual input process Mtr				B					
Display									
Standard					0				
SunBright					1				
Approvals									
UL, $_{c}$UL, and CE						0			

Selection and Ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
DIN-Rail Mounting Kit	**7ML1930-6AB**
4 Relays Expansion Module	**7ML1930-6AC**
4 Digital I/O Module	**7ML1930-6AD**
Dual output 4 ... 20 mA expansion module for dual input meter	**7ML1930-6AP**
RD300 RS 232 Serial Adapter	**7ML1930-6AF**
RD300 RS 422/485 Serial Adapter	**7ML1930-6AG**
RD300 USB Serial Adapter	**7ML1930-6AJ**

Selection and Ordering data	Article No.
USB to RS 232 Converter	**7ML1930-6AK**
RS 232 to RS 422/485 isolated converter	**7ML1930-1BU**
USB to RS 422/485 isolated converter	**7ML1930-1BX**
Snubber	**7ML1930-6AL**
Plastic enclosure	
For 1 meter	**7ML1930-6AM**
For 2 meters	**7ML1930-6AN**
For 4 meters	**7ML1930-1CK**
For 5 meters	**7ML1930-1CL**
For 6 meters	**7ML1930-1CM**

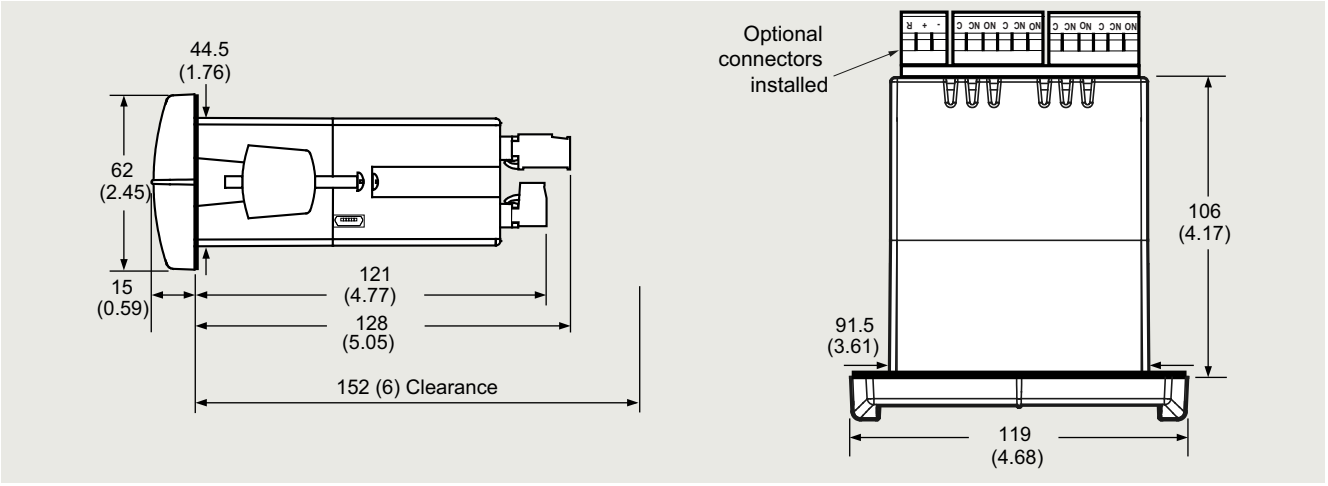
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Technical specifications

SITRANS RD300	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring points	1 or 2 instruments
Input	
Measuring range	
• Current	4 ... 20 mA, 0 ... 20 mA
• Voltage	0 V DC ... +10 V DC, 1 ... 5 V, 0 ... 5 V
Output signal	
Output	• 4 ... 20 mA (optional) • Modbus RTU
Relays	2 or 4 SPDT (Form C) internal and/or 4 SPST (Form A) external; rated 3 A at 30 V DC and 125/250 V AC resistive load; 1/14 HP (50 W) at 125/250 V AC for inductive loads (optional)
Communications	• RS 232 with Modbus RTU • RS 422/485 with Modbus RTU • USB configuration and monitoring port
Accuracy	
4 ... 20 mA optional output	± 0.1 % FS ± 0.004 mA
Process input	± 0.05 % of span ± 1 count, square root: 10 ... 100 % FS
Rated operating conditions	
Ambient conditions	
• Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)
• Operating temperature range	-40 ... +65 °C (-40 ... +149 °F)
Design	
Weight	269 g (9.5 oz) (including options)
Material (enclosure)	• 1/8 DIN, high impact plastic, UL94V-0, color: gray • Optional plastic, steel and stainless steel (Type 304, EN 1.4301)NEMA 4 enclosures
Degree of protection	Type 4X, NEMA 4X, IP65 (front cover); panel gasket provided
Electrical connection	
mA output signal	2-core copper conductor, twisted, shielded, 0.82 ... 3.30 mm² (18 ... 12 AWG), Belden 8 760 or equivalent is acceptable
Electrical connection and relay connection	Copper conductor according to local requirements, rated 3 A at 250 V AC
Power supply	
Input voltage option	85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max. or jumper selectable 12/24 V DC ± 10 %, 15 W max.
Transmitter power supply	Terminals P+ & P-: 24 V DC ± 10 %, 12/24 V DC powered models selectable for 24, 10, or 5 V DC supply (internal jumper J4), 85 ... 265 V AC models rated at 200 mA max, 12/24 V DC powered models rated at 100 mA max., at 50 mA max. for 5 or 10 V DC supply.
External loop power supply	35 V DC max.
Output loop resistance	• 24 V DC, 10 ... 700 Ω max. • 35 V DC (external), 100 ... 1 200 Ω max.
Displays and controls	
Main display	0.6 inch (15 mm) high, red LEDs
Second display	0.46 inch (12 mm) high, red LEDs, 6-digits: each (-99 999 ... 999 999)
Memory	• Non-volatile • Stores settings for minimum of 10 years if power is lost
Programming	• Primary: front panel • Secondary: Meter Copy or PC with SITRANS RD Software
Certificates and approvals	CE, UL, ¿UL
Options	
Enclosures	Plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 and 4X enclosures

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Dimensional drawings

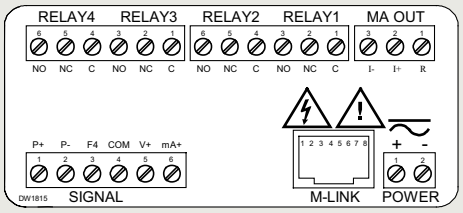


SITRANS RD300, dimensions in mm (inch)

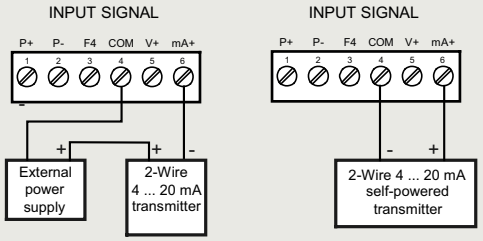
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Circuit diagrams

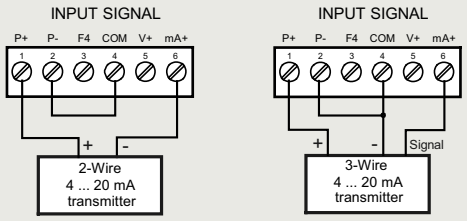
Connector labeling for fully loaded single input meter



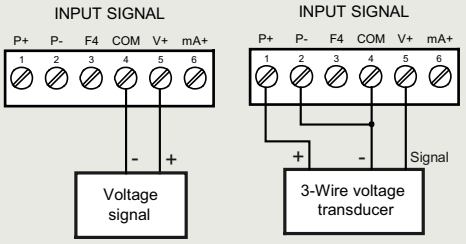
Transmitter powered by external supply or self-powered



Transmitter powered by internal supply



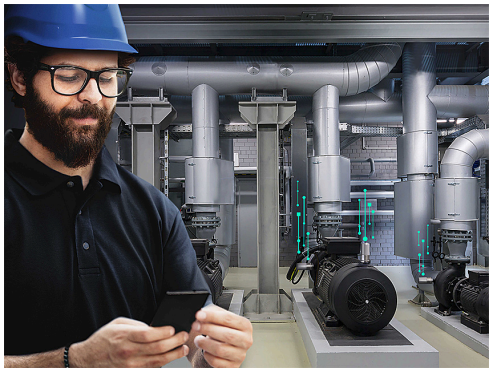
Voltage Input Connections



SITRANS RD300 connections

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5/2	**Connectivity**
5/2	SITRANS CC220
5/4	**Sensors**
5/4	SITRANS MS200

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Overview



SITRANS CC220 is an industrial IIOT gateway that collects measurement and status data from up to 50 SITRANS MS200 multisensors. It then forwards the data via MQTT protocol to any kind of analysis tool or platform.

Benefits

- Collects vibration, temperature and magnetic field data from SITRANS MS200 multisensor
- Built-in web server for configuration and device management
- Allows for more efficient maintenance planning through valuable information
- Helps to reduce plant downtime
- Efficient configuration of measurement settings for connected sensors to perfectly fit analysis tools
- Easy commissioning, minimal training required, and long maintenance cycles

Design

SITRANS CC220 is an IP20 device and is typically mounted inside a cabinet.

Function

SITRANS CC220, IIOT gateway

- Cyclically polls data from SITRANS MS200 multisensors
- Securely uploads data via MQTT
- Can handle up to 50 SITRANS MS200 multisensors

Selection and ordering data

Selection and ordering data	Article No.
SITRANS CC220 A gateway that collects measurement and status data from up to 50 SITRANS MS200 multisensors. With the integrated webserver device management of both SITRANS CC220 and SITRANS MS200 multisensor is handled. Data can be transferred via MQTT to any kind of analysis tool or platform.	**7MP2200-2CB05-2AA1**
Accessories	
SITRANS CC220 Ex-antenna with 10 m (32.8 ft) extension cable	**7MP2200-8DB00-0LC2**
SITRANS CC220 Ex-antenna with 30 m (98.4 ft) extension cable	**7MP2200-8DB00-0LG2**

Operating Instructions

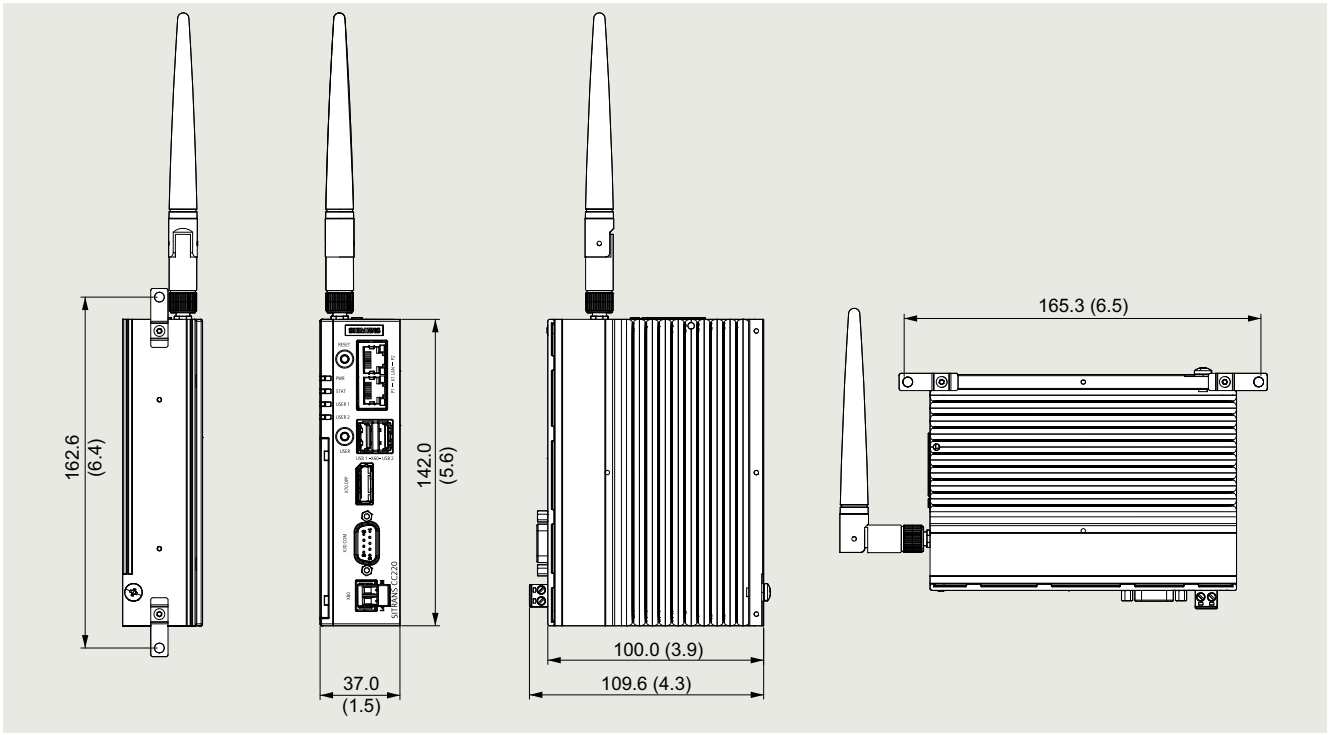
All literature is available to download for free, in a range of languages, at
http://www.siemens.com/processinstrumentation/documentation

Technical specifications

SITRANS CC220	
Functions	
Connecting	Connects 50 SITRANS MS200 and forwards data to analysis tools and platforms.
Management	Integrated web server to configure SITRANS CC220 and SITRANS MS200 multisensor
Polling	Cyclic polling of SITRANS MS200
Voltage supply	
Voltage	24 V nominal
Fuse	Replaceable
Fan	Passive cooling
Communication	
To sensor	Bluetooth Low Energy (BLE)
To cloud	MQTT
Environment	
Storage temperature	-20 ... +70 °C (-4 ... +158 °F)
Ambient temperature	0 ... +50 °C (-32 ... +122 °F)
Altitude	• Operation: -1 000 ... 2 000 m (3 280 ... 6 561.68 ft) • Pressure: 795 ... 1 080 hPa
Rating	IP20, according to IEC 60529
Certificates and approvals	
General purpose	CE, UL, CSA
Radio approvals	ACMA RCM (Australia, New Zealand), TRA (Bahrain, Oman), ATT (Bolivia), ANATEL (Brazil), FCC/IC (Canada, USA), SUBTEL (Chile), CRC / ANE (Colombia), ARCOTEL (Ecuador), RED (EU, UK, Switzerland, Norway), OFCA (Hongkong), WPC (India), MoC (Israel), ANRT (Morocco), NYCE/IFT (Mexico), MTC (Peru), NTC (Philippines), CRA (Qatar), IMDA (Singapore), (Thailand), BTK (Turkey), TDRA (UAE), MITC (Uzbekistan)

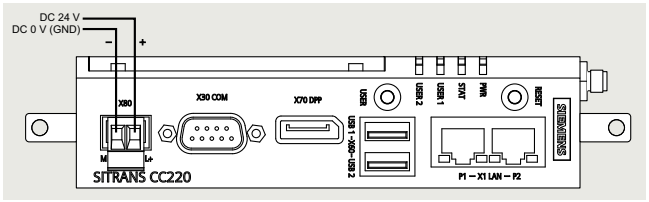
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Dimensional drawings



SITRANS CC220, dimensions in mm (inch)

Circuit diagrams



SITRANS CC220, connections

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Overview



SITRANS MS200 is a battery-powered, wireless multisensor that provides process data that is not normally available for typical process control functions. SITRANS MS200 can monitor conditions such as vibration states, temperature, and dynamic and static magnetic field strength.

Benefits

- Measures vibration, temperature and magnetic field data of assets where no information is available
- Calculates KPIs for a quick analysis
- Allows for more efficient maintenance planning through valuable information
- Sustainable sensor design with replaceable battery
- Helps to reduce plant downtime
- Configurable data measurements to perfectly fit analysis tools
- Easy commissioning, minimal training required, and long maintenance cycles

Application

SITRANS MS200 multisensors are suitable for use with a wide range of rotating equipment, within all industries that require rugged IIoT sensors. The sensors are suitable for measurement within any industrial environment and in hazardous areas. They can be used indoors and outdoors.

SITRANS MS200 sensors can be used in process industries such as food and beverage, water/wastewater, power generation, utilities, and chemical. Typical applications include filling stations, agitating vessels, and many types of pumps, gears, compressors, fans or bearings.

Design

SITRANS MS200 is contained within a rugged, IP68 and IP69 enclosure for use with rotating equipment.

Function

SITRANS MS200, Battery powered clamp-on sensor

- Monitors vibration, temperature, and magnetic field strength of rotating equipment

Selection and ordering data

Selection and ordering data	Article No.
SITRANS MS200 A battery-powered, wireless multisensor that provides process condition data that is collected in addition to the core process control data.	
• For general purpose (non-hazardous)	**7MP2210-2BB22-2AB1**
• For hazardous areas (instrinsically safe)	**7MP2210-2BB22-2LB1**

Selection and ordering data	Article No.
Spare Parts	
SITRANS MS200 replacement battery pack with plug, 3.6 V/2.6 Ah	**7MP2210-2AB22-2AB8**

Operating Instructions

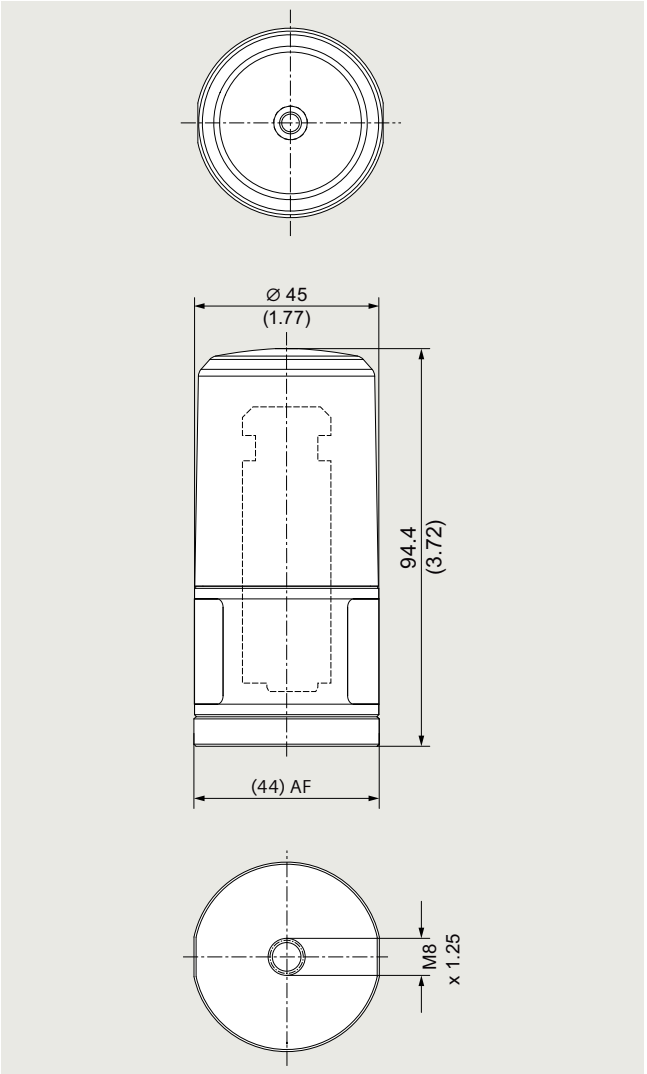
All literature is available to download for free, in a range of languages, at
http://www.siemens.com/processinstrumentation/documentation

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Technical specifications

SITRANS MS200	
Scope of measurement	Vibration, temperature, and magnetic field strength
Data transmission	
Polling	Cyclic, via SITRANS CC220
Vibration sensor	3-axis accelerometer
Sensitivity (range)	up to ±16 g
Repeatability	±10 mg
Accuracy	±10 % of measurement range
Data format	16 bits
Frequency range	1 ... 3 300 Hz
Resolution	0.488 mg
Sampling rate	Configurable, 12 ... 6 600 Hz
Number of samples	Configurable, 128 ... 32 768
Vibration KPIs (calculated on SITRANS MS200)	Velocity RMS, Acceleration RMS, Peak to Peak, Kurtosis, Crest factor, Skewness
Magnetic field strength sensor	
Sampling rate	Configurable, min. 10 Hz; max. 400 Hz
Sensitivity (range)	Configurable, ±300 µT, ± 600 µT, 1200 µT
Number of samples	Configurable, 128 ... 1 024
Magnetic field KPIs (calculated on SITRANS MS200)	Main stator frequency, slip frequency, rotational speed
Temperature sensor	
Resolution	0.01 °C (0.018 °F)
Temperature range	• For general purpose (non-hazardous): -30 ... +80 °C (-22 ... +176 °F) • For hazardous areas: -30 ... +50 °C (-22 ... +122 °F)
Accuracy	± 2 °C (3.6 °F)
Repeatability	0.15 °C (0.27 °F)
Voltage supply	
Voltage	3.6 V
Capacity	2.6 Ah
Lithium content	0.65 g (0.023 oz)
Weight of battery	18 g (0.63 oz)
Battery life at 25 °C (77 °F)	2 ... 5 years
Replacement	Replacement batteries are offered by Siemens. Please see spare parts for more details.
Communication	
Bluetooth	Bluetooth Low Energy (BLE)
Data transmission cycle	Configurable, min. 1 per 100 s; max. 1 per 24 hours
Environment	
Storage temperature (with disconnected battery)	-40 ... +85 °C (-40 ... +185 °F)
Ambient temperature (at the fixation point in operation)	• For general purpose (non-hazardous): -30 ... +80 °C (-22 ... +176 °F) • For hazardous areas: -30 ... +50 °C (-22 ... +122 °F)
Altitude	• Operation: -1 000 ... 2 000 m (3 280 ... 6 561.68 ft) • Pressure: 795 ... 1 080 hPa
Rating	IP68 2 m/24 h and IP69, according to IEC 60529
Certificates and approvals	
General purpose	CE, UL, CSA
Radio approvals	ACMA RCM (Australia, New Zealand), TRA (Bahrain, Oman), ATT (Bolivia), ANATEL (Brazil), FCC/IC (Canada, USA), SUBTEL (Chile), CRC / ANE (Colombia), ARCOTEL (Ecuador), RED (EU, UK, Switzerland, Norway), OFCA (Hongkong), WPC (India), MoC (Israel), ANRT (Morocco), NYCE/IFT (Mexico), MTC (Peru), NTC (Philippines), CRA (Qatar), IMDA (Singapore), (Thailand), BTK (Turkey), TDRA (UAE), MITC (Uzbekistan)
Intrinsically safe	ATEX/IECEx: II 2G Ex ib IIC T4 Gb -30 °C < = Ta < = +50 °C

Dimensional drawings



SITRANS MS200, dimensions in mm (inch)

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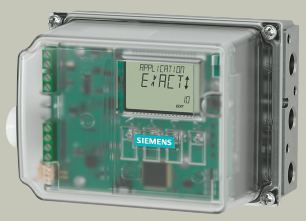
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6/2	Product overview
6/3	SIPART PS2
6/27	SIPART PS100

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Overview

Positioners		
Type	**Application**	**Device description**
SIPART PS2 	Position control of pneumatic linear or part-turn actuators	In polycarbonate, aluminum or stainless steel enclosure • Connection: 4 ... 20 mA • HART, PROFIBUS PA, FOUNDATION Fieldbus • No explosion protection or intrinsically safe Ex i, Ex e, Ex t • Modularly extensible with limit switches, sensors, etc. • Digital inputs and outputs • Automatic commissioning • Diagnostic functions • Manual operation on the device
SIPART PS2 	Position control of pneumatic linear or part-turn actuators	Same as above, but here in flameproof aluminum or stainless steel enclosure, available as: • Not Ex • Flameproof Ex d, Ex t • Intrinsically safe Ex i, Ex e, Ex t • Flameproof and intrinsically safe Ex d + Ex i
SIPART PS100 	Position control of pneumatic linear or part-turn actuators	In polycarbonate or aluminum enclosure • Connection: 4 ... 20 mA • HART • Intrinsically safe Ex i, Ex e, Ex t • Digital inputs and outputs • Automatic commissioning at the push of a button • Manual operation on the device

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Overview



SIPART PS2 in polycarbonate enclosure with gauge block (optional)



SIPART PS2 in aluminum enclosure



SIPART PS2 in stainless steel enclosure with gauge block (optional)

Overview (continued)



SIPART PS2 in flameproof aluminum enclosure (Ex d) with gauge block (optional)



SIPART PS2 in flameproof stainless steel enclosure 316L with gauge block (optional)

SIPART PS2 positioners control the valve position according to setpoint value specification on pneumatic valves. The valve can be verified with various intelligent online (during operation) and offline (e.g. between batch processes) diagnostic functions. Diagnostic functions can be optionally expanded by pressure sensors.

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Benefits

SIPART PS2 positioners excel in their:

- Easy installation
- Automatic commissioning
- Simple operation and on-device configuration with local display or via SIMATIC PDM
- Very high control performance
- Minimal air consumption in stationary operation
- "Close tight" function for maximum torque on the process valve seat
- "Fast Open/Fast Close" function for defined approach of the end position and fast reaction from the end positions
- "Fail Safe" function: Secure depressurization SIL 2 in case of failure of electrical auxiliary power
- "Fail in Place" function: Maintain current position on failure of electrical and/or pneumatic auxiliary power
- "Fail to Open" function: Pressurizing of the actuator in case of failure of electrical auxiliary power
- Numerous functions can be activated by simple configuring (e.g. characteristic curves and limits)
- One device variant for all applications: Linear actuators, part-turn actuators and cylinders
- Optional with internal or external contactless position feedback for external ambient conditions
- "Intelligent solenoid valve": Solenoid valve function and diagnostics in one device
- Extensive diagnostic functions:
  - Full Stroke Test
  - Multi Step Response Test
  - Valve Performance Test
  - Valve Signature, pressure sensor-aided
  - Partial Stroke Test, optionally pressure sensor-supported for performance and maintenance assessment of the valve
  - Leakage monitoring
- Can be operated with natural gas, carbon dioxide, nitrogen or noble gases

Custom designs for SIPART PS2

Custom and special functionalities are available after consultation.

Application

The SIPART PS2 is used in the following industry sectors:

- Valve manufacturing
- Chemical industry
- Petrochemical industry
- Oil and gas
- Paper
- Water and wastewater
- Power supply
- Pharmaceuticals
- Food and beverages

The devices are available in variants for:

- 4 to 20 mA
- HART communication
- PROFIBUS PA communication
- FOUNDATION Fieldbus communication
- Single-and double-acting valves in various enclosure designs and various materials (polycarbonate, aluminum and stainless steel)
- Applications without explosion protection requirements
- Hazardous applications in the versions:
  - Device protection with intrinsic safety (Ex i) for use in Zone 1, 2, 21, 22 or Class I, II, III/Division 1/Groups A-G
  - Device dust ignition protection by enclosure (Ex t) for use in Zone 21, 22 or Class II, III/Division 1/Groups E-G
  - Device protection with increased security (Ex e) for use in Zone 2 or Class I, Division 2, Groups A-D
  - Device protection with flameproof enclosure (Ex d) for use in Zone 1 or Class I, Division 1, Groups A-D

Stainless steel enclosure for extreme ambient conditions

The SIPART PS2 is available in a stainless steel enclosure for use in particularly aggressive environments (e.g. offshore operation, chlorine plants). The device functionality is not different due to the enclosure variants.

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Design

The SIPART PS2 digital positioner comprises the following components:

- Base plate with lid with/without inspection window, depending on the variant
- Electronics with screw-type terminals:
  - 4 to 20 mA
  - 4 to 20 mA with HART
  - PROFIBUS PA according to IEC 61158-2, bus-supplied
  - FOUNDATION Fieldbus (FF) according to IEC 61158-2, bus-supplied
- Position feedback via potentiometer or non-contacting sensor (NCS)
- Pneumatic block

The pneumatic connections for supply air and actuating pressure are located on the right side of the enclosure. A gauge block, venting gauge block, booster, VDI3847 interface or a safety solenoid valve can be connected there as options. The SIPART PS2 positioner is fitted to the linear or part-turn actuator using an appropriate mounting kit.

Optional expansion with modules and functions

Optionally, SIPART PS2 can be expanded with the following modules and functions:

Analog Output Module (AOM)

Analog position feedback 4 to 20 mA.

Digital I/O Module (DIO) with 3 digital outputs and 1 digital input

- Signaling of two limits of the travel or angle. The two limits can be assigned parameters independently as maximum or minimum values.
- Output of an alarm if the setpoint position of the final control element is not reached in automatic mode or if a device/valve fault occurs.
- 2nd digital input for alarm signals or for triggering safety reactions, e.g. hold position or approach safety position.

Inductive Limit Switches (ILS)

Via the inductive switches, 2 independent limits can be set and monitored as NAMUR signal (EN 60947-5-6). The module also contains an integrated fault indicator (see "Digital I/O Module (DIO)").

Mechanic Limit Switches (MLS)

2 independent limits can be monitored via the mechanical switches. The module also contains an integrated fault indicator (see "Digital I/O Module (DIO)").

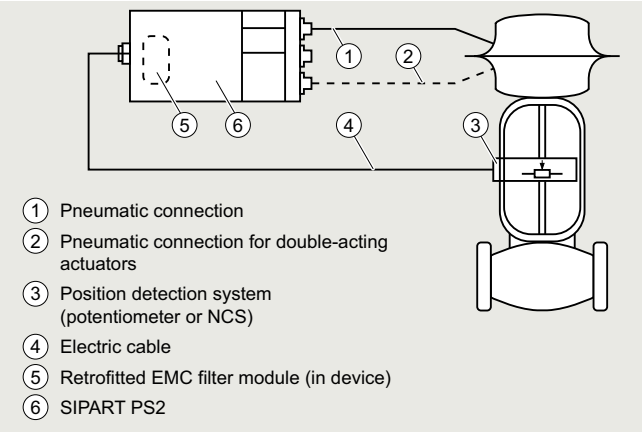
Valid for all modules described above:

- All signals are electrically isolated from one another and from the basic unit. The outputs indicate self-signaling faults. The modules are easy to retrofit.

Separate mounting of positioner and position detection

Separate mounting of the positioner and position detection can be implemented with SIPART PS2. Only measurement of the stroke or angle, for example, is carried out directly on the actuator. This means that the positioner can be installed at a distance in a protected area. Components are connected electrically via a cable and pneumatically via tubes or pipes. The system is often advantageous if the ambient conditions at the valve exceed the specified values for the positioner (e.g. strong vibrations, radiation, magnetism).

Design (continued)



Separate installation of the position detection and positioner SIPART PS2

Use for position detection

The following can be used for position detection:



SIPART PS2, NCS for strokes > 14 mm

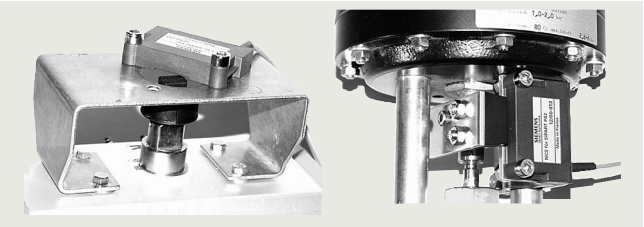
- Non-contacting sensor (NCS)
- Position transmitter
- Linear potentiometers
- Commercial sensors

Non-contacting sensor (NCS)

For SIPART PS2

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Design (continued)



Left: NCS for part-turn actuator (6DR4004-.N.10) mounted on mounting console 6DR4004-1D to 4D
Right: NCS for linear actuator (6DR4004-.N.20) mounted with actuator-specific/customer-specific mounting solution

Position transmitter

With potentiometer, with NCS, with NCS and ILS or with NCS and MLS for SIPART PS2.
Mounting takes place like with SIPART PS2.



Linear potentiometers

With 3K, 5K or 10 to 20 kΩ (e.g. pneumatic cylinder).

Commercial sensors

With 4 to 20 mA or 0 to 10 V (only with non-Ex applications).

Function

Monitoring functions

The SIPART PS2 has comprehensive monitoring functions with which changes on the actuator and process valve can be detected and signaled depending on the set limit. This information provides important indications on the status of the valve.
Determined/monitored measuring data:

- Travel integral
- Number of changes in direction
- Alarm counter
- Self-adjusting dead zone
- Process valve end position (e.g. for detection of process valve seat wear or deposits)
- Operating hours (also according to temperature and position ranges) as well as min./max. temperature
- Operating cycles of piezoelectric valves in pneumatic block
- Process valve travel time
- Actuator leakages

At a glance with the Diagnostics Cockpit

With the Diagnostics Cockpit, the HART variants of the SIPART PS2 provide a straightforward way of getting started with the world of diagnostic capabilities. All relevant information on the valve, such as setpoint, actual value, control deviation, status of the diagnostic system, etc., is available at a glance. Additional facts and details are just a few mouse clicks away from the Diagnostics Cockpit.

Status monitoring with 3-stage alarm concept

The intelligent electropneumatic SIPART PS2 positioner is equipped with additional monitoring functions. The status alarms derived from these monitoring functions signal active faults of the valve with grading in the form of "traffic light signaling". The status alarms are symbolized by a wrench in the colors green, yellow and red (in SIMATIC PDM and Maintenance Station):

- Maintenance required (green wrench)
- Urgent maintenance demanded (yellow wrench)
- Imminent danger of valve failure or general failure (red wrench)

This allows users to put early measures into action before an acute process valve or actuator fault occurs which could result in a system shutdown. Early alarms indicate, for example, the onset of a diaphragm break in the actuator or progressive sluggishness of a valve. In this way, users can guarantee plant safety and availability with suitable maintenance strategies.

This 3-stage alarm hierarchy also allows early detection and signaling of static friction of a stuffing box, wear of a process valve plug/seat, or deposits or coatings on the fittings.

These fault indications can be output either line-conducted over the alarm outputs of the positioner (maximum 3), or via communication over the HART or fieldbus interfaces. In this case, the HART, PROFIBUS and FOUNDATION Fieldbus variants of SIPART PS2 allow for differentiation of the various fault indications, as well as a trend representation and histogram function of all key process variables with regard to the valve.

The device's local display also displays the graded maintenance requirements, complete with identification of the source of the fault.

Maintenance required of control valves

The Full Stroke Test, Step Response Test, Multi Step Response Test and Valve Performance Test provide detailed information about the maintenance required of the valve. With the help of the HART communication system, you receive comprehensive test results and

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Function (continued)

can identify the extent of the maintenance measures. In order to quantify the performance capability of valves, characteristic values such as step response times (T63, T86 or Txx), dead times, overshoot, hysteresis, measurement deviations and non-linearity are determined.

Functional Safety according to SIL 2

In the variants 6DR5.1.-0....-....-Z C20, the positioner is suitable for use on single-acting valves with spring return that satisfy the special requirements in terms of functional safety up to SIL 2 according to IEC 61508 or IEC 61511. The positioner depressurizes the process valve actuator on demand/in the event of a fault (safe depressurizing) and puts the process valve in the preset safety position.

Valve Signature

With pressure sensor-aided Valve Signature, the characteristic curve of the valve can be recorded, saved in the device (max. 10 characteristic curves) and displayed in Asset Management systems, e.g. in PDM. Based on the exportable data, friction values, spring characteristics, hysteresis, breakout pressures can be determined. If the test is regularly repeated, characteristic curves can be compared with one another and changes over time can be displayed as the basis for a predictive maintenance approach.

Partial Stroke Test

With the pressure sensor-aided Partial Stroke Test, the function of safety (open/close) valves can be checked reliably during operation. Up to 10 characteristic curves and important parameters are saved in the device. They can be displayed in Asset Management systems, e.g. in PDM. Recording of the reference characteristic curve takes place during operation and in settled state. Based on the exportable data, friction values, spring characteristics, hysteresis, breakout pressures can be determined. If the test is regularly repeated, characteristic curves can be compared with one another and changes over time can be displayed as the basis for a predictive maintenance approach.

Intelligent solenoid valve

The SIPART PS2 can (parameterizable) take on the function of a solenoid valve for open/close valves and also offers intelligent diagnostics for valves with the pressure sensor-aided Partial Stroke Test, for example. SIPART PS2 takes on the function as "Intelligent solenoid valve" with additional pressure sensor-aided diagnostics and handles multiple tasks in one device:

- The positioner opens and closes the valve quickly and without control.
- In a safety scenario, during power failure, the SIPART PS2 drives the valve into the safety position "Functional Safety according to SIL 2".
- A pressure sensor-aided Partial Stroke Test can be performed automatically at regular intervals. This test keeps the valve in regular movement and prevents rusting of the valve due to corrosion or incrustation.

Solenoid valves on control valves normally cannot be tested during operation. They are therefore not necessary when using SIPART PS2 as the depressurizing is carried out on demand by SIPART PS2. This means that, on control valves, both the control function and the shut-off function can be carried out by a single device.

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Selection and ordering data

SIPART PS2 electropneumatic positioner	Article No. 6DR5 ● ● ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
 Click the article number for online configuration in the PIA Life Cycle Portal.		
Version		
4 ... 20 mA	0	
4 ... 20 mA, HART	1	
PROFIBUS PA	5	
FOUNDATION Fieldbus	6	
Without electronics (for 19-inch remote variant)	9	
Actuator		
Single-acting	1	
Double-acting	2	
Enclosure		
Polycarbonate, glass-fiber reinforced[1]	0	
Stainless steel, without inspection window, 1.4581	2	
Aluminum, AlSi12	3	
Version		
Standard	0	
Advanced safety functions	1	
Type of protection (Ex)		
Without explosion protection	N	
Increased safety (Ex e)[2], dust ignition protection by enclosure (Ex t)[2]	D	
Intrinsic safety (Ex i) SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00)	E	
Intrinsic safety (Ex i), increased safety (Ex e)[2] SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00)	F	
Increased safety (Ex e)[2]	G	
Intrinsic safety (Ex i), increased safety (Ex e)[2], dust ignition protection by enclosure (Ex t)[2] SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00)	K	
Connection thread electric/pneumatic		
M20×1.5 / G¼	G	
½-14 NPT / ¼-18 NPT	N	
M20×1.5 / ¼-18 NPT	M	
½-14 NPT / G¼	P	
M12 device plug (A coding) for electronics[3] / G¼ The M12 cable socket can be ordered separately with 6DR4004-5A.	R	
M12 device plug (A coding) for electronics[3] / ¼-18 NPT The M12 cable socket can be ordered separately with 6DR4004-5A.	S	
Limit monitor Including 2nd cable gland		
None	0	
Digital I/O Module (DIO), 1 digital input, 3 digital outputs (2 limits min. or max., 1 fault indicator). Device plug M12 optionally orderable with -Z D55.	1	
Inductive Limit Switches (ILS), 2 inductive limit switches and 1 digital output (DO) Device plug M12 optionally orderable with -Z D56.	2	
Mechanic Limit Switches (MLS), 2 mechanical limit switches and 1 digital output (DO). Not applicable for natural gas applications. Device plug M12 optionally orderable with -Z D57.	3	
Internal NCS module for non-contacting position detection. The internal position detection via a potentiometer is not applied but can be ordered in addition with -Z K11. Note: Only for 6DR55.. and 6DR56..	9	L 1 A
Option modules Including 2nd cable gland		
None	0	

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Selection and ordering data (continued)

SIPART PS2 electropneumatic positioner	Article No. 6DR5 ● ● ● - ● ● ● ● ● - 0 ● ● ●	Order code ● ● ●
Analog Output Module (AOM), analog position feedback 4 ... 20 mA. Device plug M12 optionally orderable with -Z D53. SITRANS I100 isolating power supply sold separately (7NG4124-1AA00)	1	
Analog Input Module (AIM) to connect external position detection systems, e.g. NCS sensor, position transmitter 6DR4004-1ES/2ES/3ES/4ES, and other sensors. The internal position detection is not applied but can be ordered in addition with -Z K11 and/or K12. Device plug M12 optionally orderable with -Z D54.	2	
Analog Output Module (AOM) and Analog Input Module (AIM). The internal position detection is not applied but can be ordered in addition with -Z K11 and/or K12. Device plug M12 is not available. SITRANS I100 isolating power supply sold separately (7NG4124-1AA00).	3	
Brief instructions		
English/German/Chinese	A	
French/Italian/Spanish	B	
Version		
Standard / Fail Safe • Depressurizing the actuator in case of failure of electrical auxiliary power	A	
Fail in Place • Maintain position in case of failure of electrical and/or pneumatical auxiliary power	F	
Fail to Open • Pressurizing of the actuator in case of failure of electrical auxiliary power	G	
Gauge block		
None	0	
With pressure gauges made of plastic IP31 (MPa, bar)		
• Block made of aluminum, single-acting, G¼	1	
• Block made of aluminum, double-acting, G¼	2	
With pressure gauges made of plastic IP31 (MPa / psi)		
• Block made of aluminum, single-acting, ¼-18 NPT	3	
• Block made of aluminum, double-acting, ¼-18 NPT	4	
With pressure gauges made of metal IP44 (MPa, bar, psi)		
• Block made of aluminum, single-acting, G¼	9	R 1 A
• Block made of aluminum, double-acting, G¼	9	R 2 A
• Block made of aluminum, single-acting, ¼-18 NPT	9	R 1 B
• Block made of aluminum, double-acting, ¼-18 NPT	9	R 2 B
With pressure gauges made of stainless steel IP54 (MPa, bar, psi)		
• Block made of stainless steel 316, single-acting, G¼	9	R 1 C
• Block made of stainless steel 316, double-acting, G¼	9	R 2 C
• Block made of stainless steel 316, single-acting, ¼-18 NPT	9	R 1 D
• Block made of stainless steel 316, double-acting, ¼-18 NPT	9	R 2 D
Venting gauge block		
Depressurizing of Y2 on compressed air failure with pressure gauges made of metal IP44 (MPa, bar, psi). The double-acting actuator with springs moves into the safety position.		
• Block made of aluminum, double-acting, G¼	9	R 2 E
• Block made of aluminum, double-acting, ¼-18 NPT	9	R 2 F
Booster (Cv = 2)		
Aluminum with pressure gauges made of metal IP44 (MPa, bar, psi)		
• Single-acting, G½	9	R 1 J
• Double-acting, G½	9	R 2 J
• Single-acting, ½-14 NPT	9	R 1 K
• Double-acting, ½-14 NPT	9	R 2 K

1) Only for type of protection Ex i
2) Impact energy on inspection window max. 2 joule for aluminum enclosure 6DR5..3.
3) Device plug M12 mounted and electrically connected in versions 6DR50.., 6DR51.., 6DR55.. and 6DR56..

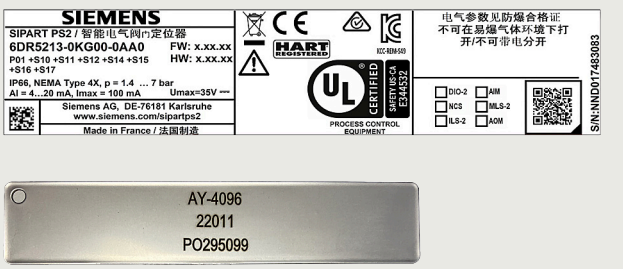
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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and plain text	Order code
SIEMENS Positioner Lifecycle Support Platform (WeChat applet, China only)	**A30**
Stainless steel sound absorber Standard with stainless steel enclosures	**A40**
Functional safety (SIL 2) for 6DR5.1. only (single-acting positioner) Device suitable for use according to IEC 61508 and IEC 61511	**C20**
M12 device plug (D coding) The M12 cable socket can be ordered separately with 6DR4004-5D.	
Connected with Analog Output Module (AOM)	**D53**
Connected with Analog Input Module (AIM)	**D54**
Connected with Digital I/O Module (DIO)	**D55**
Connected with Inductive Limit Switches (ILS)	**D56**
Connected with Mechanic Limit Switches (MLS)	**D57**
SITRANS AW050 Bluetooth adapter for wireless communication and data transfer	**F50**
Optimized control behavior for small actuators (< 200 cm³)	**K10**
Additional internal position detection by means of a potentiometer	**K11**
Additional, device-internal position detection via a magnetic sensor (NCS)	**K12**
Pneumatic terminal strip made of stainless steel 316	**K18**
Interface according to VDI/VDE 3847 For single and double-acting, with CATS (Clean Air To Spring) only for single-acting. Not for flameproof enclosure.	**K20**
Operation with natural gas Device is optimized for natural gas operation and contains corrosion-protected, painted electronics and high-quality FVMQ elastomers. Exhaust air (natural gas) cannot be dissipated collectively.	**K50**
Pneumatic block cord seal from FVMQ (higher oil resistance)	**K55**
Permissible ambient temperature during operation -40 ... 80 °C (-40 ... +176 °F) For 6DR5..1., 6DR5..2., 6DR5..3.: Lid without inspection window	**M40**
Pressure sensor supported monitoring / diagnostics	
Monitoring of the device/custom min./max. supply pressure PZ. Hold position on demand. Messages according to NAMUR NE107.	**P01**
Monitoring of the device/custom min./max. supply pressure PZ. Hold position on demand. Valve Signature, Partial Stroke Test, monitoring of leakage and actuating pressure (triggered), actuating pressure limitation for single-acting actuators. Messages according to NAMUR NE107.	**P02**
Certificates	
EN 10204 certificate type 2.1	**C35**
DNV (Det Norske Veritas)	**S10**
LR (Lloyds Register)	**S11**
BV (Bureau Veritas)	**S12**
ABS (American Bureau of Shipping)	**S14**
KR (Korean Register of Shipping)	**S15**
CCS (China Classification Society)	**S16**
RINA (Registro Italiano Navale)	**S17**
TAG plate made of stainless steel, 3-line Text line 1: plain text from Y17 Text line 2: plain text from Y15 Text line 3: plain text from Y16	**A20**
Measuring point description Input field: Max. 16 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA; specify in plain text	**Y15**

Options Add "-Z" to article number, specify order code and plain text	Order code
Measuring point text Input field: Max. 32 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus, and 4 ... 20 mA; specify in plain text	**Y16**
Measuring point number (TAG no.) Input field: Max. 32 characters; specify in plain text	**Y17**
Preset bus address Input field: Specify in plain text (for 6DR55.. and 6DR56.. only)	**Y25**
Customer-specific parameter setting Input field: Specify in plain text	**Y30**
Special design / Product Variant Request (PVR) Input field: Specify order number from PVR clarification in plain text	**Y99**
Creation of a "Product Variant Request" is a prerequisite	
Examples:	
• Conformal coating / Tropicalization	**VP001**
• Gauge block with IP65 gauge	**VP002**
• SIPART PS2 for part-turn applications up to 180°	**VP003**

Nameplate on SIPART PS2, tag plate made of stainless steel



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Selection and ordering data (continued)

SIPART PS2 electropneumatic positioner, in flameproof enclosure	Article No. 6DR5 ● ● ● - 0 ● ● ● ● - 0 ● ● ●	Order code ● ● ●
  Click the article number for online configuration in the PIA Life Cycle Portal.		
Version		
4 ... 20 mA	0	
4 ... 20 mA, HART	1	
PROFIBUS PA	5	
FOUNDATION Fieldbus	6	
Actuator		
Single-acting	1	
Double-acting	2	
Enclosure		
Aluminum, flameproof, AlSi12	5	
Stainless steel, 316L, flameproof, 1.4409	6	
Type of protection (Ex)		
Without explosion protection	N	
Flameproof enclosure (Ex d), Dust ignition protection by enclosure (Ex t)	E	
Intrinsic safety (Ex i), increased safety (Ex e) SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00)	F	
Increased safety (Ex e)	G	
Intrinsic safety (Ex i), increased safety (Ex e), dust ignition protection by enclosure (Ex t) SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00)	K	
Flameproof enclosure (Ex d), intrinsic safety (Ex i), dust ignition protection by enclosure (Ex t) SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00)	P	
Connection thread electrical/pneumatic		
M20×1.5 / G¼	G	
½-14 NPT / ¼-18 NPT	N	
M20×1.5 / ¼-18 NPT	M	
½-14 NPT / G¼	P	
M25×1.5 / G¼	Q	
Limit monitor		
None	0	
Digital I/O Module (DIO), 1 digital input, 3 digital outputs (2 limits min. or max., 1 fault indicator).	1	
Inductive Limit Switches (ILS), 2 inductive limit switches and 1 digital output (DO).	2	
Mechanic Limit Switches (MLS), 2 mechanical limit switches and 1 digital output (DO). Not applicable for natural gas applications.	3	
Internal NCS module for non-contacting position detection. The internal position detection via a potentiometer is not applied but can be ordered in addition with -Z K11. Note: Only for 6DR55.. and 6DR56..	9	L 1 A
Option modules		
None	0	
Analog Output Module (AOM), 4 ... 20 mA current module SITRANS I100 isolating power supply sold separately (7NG4124-1AA00)	1	

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Selection and ordering data (continued)

SIPART PS2 electropneumatic positioner, in flameproof enclosure	Article No. 6DR5 ● ● ● - 0 ● ● ● ● - 0 ● ● ●	Order code ● ● ●
Analog Input Module (AIM) to connect external position detection systems, e.g. NCS sensor, position transmitter 6DR4004-1ES/2ES/3ES/4ES, and other sensors. The internal position detection is not applied but can be ordered in addition with -Z K11 and/or K12.	2	
Analog Output Module (AOM) and Analog Input Module (AIM). The internal position detection is not applied but can be ordered in addition with -Z K11 and/or K12. SITRANS I100 isolating power supply sold separately (7NG4124-1AA00)	3	
Brief instructions		
English/German/Chinese	A	
French/Italian/Spanish	B	
Version		
Standard / Fail Safe • Depressurizing the actuator in case of failure of electrical auxiliary power	A	
Fail in Place • Maintain position in case of failure of electrical and/or pneumatical auxiliary power	F	
Fail to Open • Pressurizing of the actuator in case of failure of electrical auxiliary power	G	
Gauge block		
None	0	
With pressure gauges made of plastic IP31 (MPa, bar)		
• Block made of aluminum, single-acting, G¼	1	
• Block made of aluminum, double-acting, G¼	2	
With pressure gauges made of plastic IP31 (MPa / psi)		
• Block made of aluminum, single-acting, ¼-18 NPT	3	
• Block made of aluminum, double-acting, ¼-18 NPT	4	
With pressure gauges made of metal IP44 (MPa, bar, psi)		
• Block made of aluminum, single-acting, G¼	9	R 1 A
• Block made of aluminum, double-acting, G¼	9	R 2 A
• Block made of aluminum, single-acting, ¼-18 NPT	9	R 1 B
• Block made of aluminum, double-acting, ¼-18 NPT	9	R 2 B
With pressure gauges made of stainless steel IP54 (MPa, bar, psi)		
• Block made of stainless steel 316, single-acting, G¼	9	R 1 C
• Block made of stainless steel 316, double-acting, G¼	9	R 2 C
• Block made of stainless steel 316, single-acting, ¼-18 NPT	9	R 1 D
• Block made of stainless steel 316, double-acting, ¼-18 NPT	9	R 2 D
Venting gauge block		
Depressurizing of Y2 on compressed air failure with pressure gauges made of metal IP44 (MPa, bar, psi). The double-acting actuator with springs moves into the safety position.		
• Block made of aluminum, double-acting, G¼	9	R 2 E
• Block made of aluminum, double-acting, ¼-18 NPT	9	R 2 F
Booster (Cv = 2)		
Aluminum with pressure gauges made of metal IP44 (MPa, bar, psi)		
• Single-acting, G½	9	R 1 P
• Double-acting, G½	9	R 2 P
• Single-acting, ½-14 NPT	9	R 1 Q
• Double-acting, ½-14 NPT	9	R 2 Q

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Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and plain text	Order code
Functional safety (SIL 2) only for 6DR5.1* (single-acting positioner) Device suitable for use according to IEC 61508 and IEC 61511.	**C20**
SITRANS AW050 Bluetooth adapter for wireless communication and data transfer	**F50**
Optimized control behavior for small actuators (< 200 cm^3)	**K10**
Additional internal position detection by means of a potentiometer	**K11**
Additional, device-internal position detection via a magnetic sensor (NCS)	**K12**
Pneumatic terminal strip made of stainless steel 316	**K18**
Operation with natural gas Device is optimized for natural gas operation and contains corrosion-protected, painted electronics and high-quality FVMQ elastomers. Exhaust air (natural gas) can be dissipated collectively with the 6DR5..5*.	**K50**
Pneumatic block cord seal from FVMQ (higher oil resistance)	**K55**
Permissible ambient temperature during operation -40 ... 80 °C (-40 ... +176 °F) For 6DR5..1*, 6DR5..2*, 6DR5..3*: Lid without inspection window	**M40**
Pressure sensor supported monitoring/diagnostics	
Monitoring of the device/custom min./max. supply pressure PZ. Hold position on demand. Messages according to NAMUR NE107.	**P01**
Monitoring of the device/custom min./max. supply pressure PZ. Hold position on demand. Valve Signature, Partial Stroke Test, monitoring of leakage and actuating pressure (triggered), actuating pressure limitation for single-acting actuators. Messages according to NAMUR NE107.	**P02**
Certificates	
EN 10204 certificate type 2.1	**C35**
DNV (Det Norske Veritas)	**S10**
LR (Lloyds Register)	**S11**
BV (Bureau Veritas)	**S12**
ABS (American Bureau of Shipping)	**S14**
KR (Korean Register of Shipping)	**S15**
CCS (China Classification Society)	**S16**
RINA (Registro Italiano Navale)	**S17**
TAG plate made of stainless steel, 3-line Text line 1: plain text from Y17 Text line 2: plain text from Y15 Text line 3: plain text from Y16	**A20**
SIEMENS Positioner Lifecycle Support Platform (WeChat applet, China only)	**A30**
Measuring point description Input field: Max. 16 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA; specify in plain text	**Y15**
Measuring point text Input field: Max. 32 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus, and 4 ... 20 mA; specify in plain text	**Y16**
Measuring point number (TAG no.) Input field: Max. 32 characters; specify in plain text	**Y17**
Preset bus address Input field: Specify in plain text (for 6DR55.. and 6DR56.. only)	**Y25**
Customer-specific parameter setting Input field: Specify in plain text	**Y30**
Special design / Product Variant Request (PVR) Input field: Specify order number from PVR clarification in plain text	**Y99**
Creation of a "Product Variant Request" is a prerequisite	
Examples:	
• Conformal coating / Tropicalization	**VP001**
• Gauge block with IP65 gauge	**VP002**

Options Add "-Z" to article number, specify order code and plain text	Order code
• SIPART PS2 for part-turn applications up to 180°	**VP003**

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Selection and ordering data (continued)

Sensors and modules

NCS sensor

NCS sensor For contact-free position detection (not for Ex d version)	Article No. 6DR4004-	●	N	●	●	0
Click the article number for online configuration in the PIA Life Cycle Portal.						
Explosion protection						
Non-explosion-proof		8				
In type of protection (Ex) • Intrinsic safety • Non-sparking		6				
Cable length						
6 m (19.68 ft)				N		
20 m (65.67 ft)				P		
40 m (131.23 ft)				R		
Actuator type						
Linear actuator for stroke ≤ 14 mm (0.55 inches) Mounting is actuator-specific and is not included in the scope of delivery as a mounting kit. Mounting kit 6DR4004-8V can be used on NAMUR actuators for this purpose.					2	
Linear actuator for strokes > 14 mm This version is suitable for linear drives with a stroke greater than 14 mm and is made from stainless steel. The matching NAMUR mounting kit 6DR4004-8V / -8L can be ordered separately.					3	
Part-turn actuator, magnet holder made of anodized aluminum A NAMUR mount is not included in the scope of delivery but can be ordered separately with 6DR4004-1D/-2D/-3D/-4D.					4	
Linear actuator for strokes > 14 mm This version is suitable for linear drives with a stroke greater than 14 mm and is made from aluminum. The matching NAMUR mounting kit 6DR4004-8V / -8L can be ordered separately.					5	

Position transmitter

- See technical specifications for explosion protection (ATEX / IECEx / FM / CSA / not Ex d).
- SIPART PS2 externally mounted in protected area.
- Requirement: SIPART PS2 with integrated Analog Input Module (AIM) as order option or retrofit with 6DR4004-6F/-8F.
- Variant with cable and cable socket M12 stainless steel 6DR4004-5D on request

	Article No.
Position transmitter (potentiometer) In aluminum enclosure with potentiometer, without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-1ES
Position transmitter (NCS) Aluminum enclosure with non-contacting position detection (NCS), without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-2ES
Position transmitter (NCS, ILS) In aluminum enclosure with non-contacting position detection (NCS) and inductive limit switches (ILS), without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-3ES
Position transmitter (NCS, MLS) In aluminum enclosure with non-contacting position detection (NCS) and mechanic limit switches (MLS), without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-4ES

SIPART PS2 remote 19" variant

	Article No.
Control unit for 3× SIPART PS2 4 ... 20 mA 19-inch control unit with 3× electronics, 2-wire, 4 ... 20 mA, for remote installation of the electronics for the SIPART PS2 6DR59* in a protected area (e.g. against radiation, dirt, temperature, etc.)	A5E00151560
Control unit for 5× SIPART PS2 PA 19-inch control unit including 5× PROFIBUS PA module, for remote installation of the electronics of the SIPART PS2 6DR59* in a protected area (e.g. against radiation, dirt, temperature, etc.), order 1× plug panel A5E00252845 or A5E00252830 separately.	A5E00250501
Control unit for 10× SIPART PS2×PA 19-inch control unit including 10× PROFIBUS PA module, for remote installation of the electronics of the SIPART PS2 6DR59* in a protected area (e.g. against radiation, dirt, temperature, etc.), order 2× plug panels A5E00252845 or A5E00252830 separately.	A5E00250502
Control unit for 15× SIPART PS2 PA 19-inch control unit including 15× PROFIBUS PA module, for remote installation of the electronics of the SIPART PS2 6DR59* in a protected area (e.g. against radiation, dirt, temperature, etc.), order 3× plug panels A5E00252845 or A5E00252830 separately.	A5E00250503
Plug panel for control unit (50) Connection panel (rear panel) for 19-inch PROFIBUS PA control unit with Burndy 50 plug (50 pins) to connect a max. of 5 units of SIPART PS2 w/o electronics module (6DR59*). The Burndy 50 cable socket is already included in the scope of delivery. Order in addition: 1× for A5E00250501, 2× for A5E00250502 and 3× for A5E00250503.	A5E00252845
Plug panel for control unit (50 + 8) Connection panel (rear panel) for 19-inch PROFIBUS PA control unit with Burndy 50 plug (50 pins) to connect a max. of 5 units of SIPART PS2 w/o electronics (6DR59*). Additional Burndy 8 plug (8 pins) to link communication between control units. The Burndy 50 cable socket is already included in the scope of delivery. Order in addition: 1× for A5E00250501, 2× for A5E00250502 and 3× for A5E00250503	A5E00252830

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Selection and ordering data (continued)

Other accessories

Analog Input Module (AIM) For connecting external position detection systems to the SIPART PS2, for example position transmitter 6DR4004-1ES/2ES/3ES/4ES, NCS sensor or others.	
• With explosion protection	**6DR4004-6F**
• Without explosion protection	**6DR4004-8F**
Digital I/O Module (DIO) 1 digital input, 3 digital outputs (2 limits min. or max., 1 fault indicator)	
• With explosion protection	**6DR4004-6A**
• Without explosion protection	**6DR4004-8A**
Inductive Limit Switches (ILS) 2 inductive limit switches and 1 digital output (DO)	
• With explosion protection	**6DR4004-6G**
• Without explosion protection	**6DR4004-8G**
Mechanic Limit Switches (MLS) 2 mechanical limit switches and 1 digital output (DO). Not applicable for natural gas applications!	
• With explosion protection	**6DR4004-6K**
• Without explosion protection	**6DR4004-8K**
Analog Output Module (AOM) For analog position feedback 4 ... 20 mA	
• With explosion protection	**6DR4004-6J**
• Without explosion protection	**6DR4004-8J**
Internal NCS module For non-contacting position detection, for installation in the SIPART PS2	
• Without explosion protection	**6DR4004-5L**
• With explosion protection	**6DR4004-5LE**
SITRANS AW050 Bluetooth adapter kit for wireless communication and data transfer for SIPART PS2, as of FW 5.05.00.	**6DR4004-2BT**
Overvoltage protection	
Overvoltage protection up to 6 kV for 2-wire, M20 × 1.5	**6DR4004-1LP**
Overvoltage protection up to 6 kV for 3-wire, M20 × 1.5	**6DR4004-2LP**
Overvoltage protection up to 6 kV for 4-wire, M20 × 1.5	**6DR4004-3LP**
Overvoltage protection up to 6 kV for PA/FF, M20 × 1.5	**6DR4004-4LP**
Cable socket M12 stainless steel	
A-coding, for cable mounting (0.25 ... 0.5 mm²). The cable socket can be connected to SIPART PS2 with M12 device plug.	**6DR4004-5A**
D-coding, for cable mounting (0.25 ... 0.5 mm²). The cable socket can be connected to SIPART PS2 with M12 device plug.	**6DR4004-5D**
Gauge block	
With pressure gauges made of plastic IP31 (MPa, bar)	
• Block made of aluminum, single-acting, G¼	**6DR4004-1M**
• Block made of aluminum, double-acting, G¼	**6DR4004-2M**
With pressure gauges made of plastic IP31 (MPa, psi)	
• Block made of aluminum, single-acting, ¼-18 NPT	**6DR4004-1MN**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2MN**
With pressure gauges made of metal IP44 (MPa, bar, psi)	
• Block made of aluminum, single-acting, G¼	**6DR4004-1P**
• Block made of aluminum, double-acting, G¼	**6DR4004-2P**
• Block made of aluminum, single-acting, ¼-18 NPT	**6DR4004-1PN**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2PN**
With pressure gauges made of stainless steel IP54 (MPa, bar, psi)	
• Block made of stainless steel 316, single-acting, G¼	**6DR4004-1Q**
• Block made of stainless steel 316, double-acting, G¼	**6DR4004-2Q**
• Block made of stainless steel 316, single-acting, ¼-18 NPT	**6DR4004-1QN**
• Block made of stainless steel 316, double-acting, ¼-18 NPT	**6DR4004-2QN**
Venting gauge block Depressurizing of Y2 on compressed air failure with pressure gauges made of metal IP44 (MPa, bar, psi). The double-acting actuator with springs moves into the safety position.	
• Block made of aluminum, double-acting, G¼	**6DR4004-2RE**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2RF**
Booster (Cv = 2) Aluminum with pressure gauges made of metal IP44 (MPa, bar, psi)	
For SIPART PS2 enclosure variants 6DR5..0/2/3. (non-flameproof enclosure)	
• Single-acting, G½	**6DR4004-1RJ**
• Double-acting, G½	**6DR4004-2RJ**
• Single-acting, ½-14 NPT	**6DR4004-1RK**
• Double-acting, ½-14 NPT	**6DR4004-2RK**
For SIPART PS2 enclosure variants 6DR5..5/6. (flameproof enclosure)	
• Single-acting, G½	**6DR4004-1RP**
• Double-acting, G½	**6DR4004-2RP**
• Single-acting, ½-14 NPT	**6DR4004-1RQ**
• Double-acting, ½-14 NPT	**6DR4004-2RQ**
Interface according to VDI/VDE 3847 For single- and double-acting, with CATS (Clean Air To Spring) only for single-acting, not for flameproof enclosures	**6DR4004-5PB**
Mounting kit for NAMUR part-turn actuators	
VDI/VDE 3845, with plastic coupling wheel, without mounting console	**6DR4004-8D**
VDI/VDE 3845, with stainless steel coupling, without mounting console	**TGX:16300-1556**
Console for mounting the SIPART PS2, NCS sensor or position transmitter on NAMUR part-turn actuators VDI/VDE 3845	
• 80 × 30 × 20 mm (3.15 × 1.18 × 0.79 inches)	**6DR4004-1D**
• 80 × 30 × 30 mm (3.15 × 1.18 × 1.18 inches)	**6DR4004-2D**
• 130 × 30 × 30 mm (5.12 × 1.18 × 1.18 inches)	**6DR4004-3D**
• 130 × 30 × 50 mm (5.12 × 1.18 × 1.97 inches)	**6DR4004-4D**
Mounting kit for other part-turn actuators The following mounting consoles can be used together with the NAMUR part-turn actuator mounting kit 6DR4004-8D.	
SPX (DEZURIK) Power Rac, sizes R1, R1A, R2 and R2A	**TGX:16152-328**
Masoneilan Camflex II	**TGX:16152-350**
Fisher 1051/1052/1061, sizes 30, 40, 60 to 70	**TGX:16152-364**
Fisher 1051/1052, size 33	**TGX:16152-348**
Mounting kit for NAMUR linear actuators	
NAMUR-linear actuator with short lever (2 ... 35 mm (0.08 ... 1.38 inches))	**6DR4004-8V**
Lever arm for strokes of 35 ... 130 mm (1.38 ... 5.12 inches) without NAMUR mounting bracket	**6DR4004-8L**
Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with short lever with up to 35 mm (1.38 inches) stroke	**6DR4004-8VK**
Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with long lever > 35 mm (1.38 inches) stroke	**6DR4004-8VL**
Mounting console, stainless steel 316L Robust design to support extended loads like SIPART PS2 in a flameproof 316L stainless steel enclosure or as a variant with the booster. The console gets mounted and therefore supported by both stands of the actuator.	**6DR4004-8R**
Tapered roller made of stainless steel 316 for replacing the tapered roller made of plastic in the mounting kits 6DR4004-8V, -8VK, -8VL	**6DR4004-3N**
Terminal blocks made of stainless steel 316 for replacement of the aluminum terminal blocks in the 6DR4004-8V, -8VK and -8VL mounting kits	**6DR4004-3M**

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Selection and ordering data (continued)

Mounting kit for other linear actuators	
MASONEILAN type 87/88	**TGX:16152-1210**
MASONEILAN type 37/38, all sizes	**TGX:16152-1215**
Fisher type 657/667, sizes 30 ... 80	**TGX:16152-900**
Samson actuator type 3277 Yoke dimension = 101 mm (integrated connection without pipe), not for Ex d	**6DR4004-8S**
Pneumatic terminal strip made of stainless steel 316 As spare part or to replace the pneumatic terminal strip made of aluminum	
• Single-acting, G¼	**6DR4004-1R**
• Double-acting, G¼	**6DR4004-2R**
• Single-acting, ¼-18 NPT	**6DR4004-1RN**
• Double-acting, ¼-18 NPT	**6DR4004-2RN**
Connection block For safety solenoid valve with extended mounting flange according to NAMUR	
• For mounting according to IEC 534-6	**6DR4004-1B**
• For SAMSON actuator (integrated mounting) see above	**6DR4004-1C**
HART modem with USB interface	**7MF4997-1DC**
SIPART PS2 / PS100 demo case	**6DR4004-5DE**

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Technical specifications

SIPART PS2 (all device designs)	
Operating conditions	
Ambient conditions	For indoor and outdoor use
Ambient temperature	In hazardous areas, observe the maximum permissible ambient temperature according to the temperature class.
• Permissible ambient temperature for operation[1)]	-30 ... +80 °C (-22 ... +176 °F) Optional -40 ... +80 °C (-40 ... +176 °F) With NCS external, -40 ... +90 °C
• Height	≤ 2 000 m above the German Mean Height Reference System (DHHN). At altitudes greater than 2 000 m above the German Mean Height Reference System, use a suitable power supply.
• Relative humidity	0 ... 100%
Degree of protection[2)]	IP66/Type NEMA 4X
Corrosion protection according to EN ISO 9227:2022 and EN ISO 12944:2017	
• 6DR5..0 Polycarbonate enclosure	C5-M medium durability
• 6DR5..3 Aluminum enclosure and 6DR5..5 Aluminum enclosure, flameproof	C5-M medium durability
• 6DR5..2 Stainless steel enclosure and 6DR5..6 Stainless steel enclosure, flameproof	C5-M high durability
Mounting position	Any. Electrical connections and exhaust opening not facing up in wet environment (outdoor/rain).
Vibration resistance	
• Harmonic oscillations (sine) according to EN 60068-2-6/10.2008	3.5 mm (0.14"), 2 ... 27 Hz, 3 cycles/axis 98.1 m/s² (321.84 ft/s²), 27 ... 300 Hz, 3 cycles/axis
• Bumping (half-sine) according to EN 60068-2-27/02.2010	150 m/s² (492 ft/s²), 6 ms, 1 000 shocks/axis
• Noise (digitally controlled) according to EN 60068-2-64/04.2009	10 ... 200 Hz; 1 $(m/s^2)^2$/Hz (3.28 $(ft/s^2)^2$/Hz) 200 ... 500 Hz; 0.3 $(m/s^2)^2$/Hz (0.98 $(ft/s^2)^2$/Hz) 4 hours/axis
• Recommended continuous duty range of the complete valve	≤ 30 m/s² (98.4 ft/s²) without resonance sharpness
Climatic class	According to IEC EN 60721-3
• Storage	1K23, -40 ... +80 °C (-40 ... +176 °F)
• Transport	2K12, -40 ... +80 °C (-40 ... +176 °F)
Pneumatic data	
Auxiliary power (inlet air)	Compressed air, carbon dioxide (CO_2), nitrogen (N_2), noble gasses or natural gas
• Pressure[3)]	1.4 ... 7 bar (20.3 ... 101.5 psi)
Air quality according to ISO 8573-1	
• Solid particulate size and density	Class 3
• Pressure dew point	Class 3 (min. 20 K (36 °F) below ambient temperature)
• Oil content	Class 3
Unrestricted flow (DIN 1945)	
• Inlet air (pressurize actuator)[4)]	
- 2 bar; 0.1 KV (29 psi; 0.116 CV)	4.1 Nm³/h (18.1 USgpm)
- 4 bar; 0.1 KV (58 psi; 0.116 CV)	7.1 Nm³/h (31.3 USgpm)
- 6 bar; 0.1 KV (87 psi; 0.116 CV)	9.8 Nm³/h (43.1 USgpm)
• Exhaust air (depressurize actuator for all versions except fail in place)[4)]	
- 2 bar; 0.2 KV (29 psi; 0.232 CV)	8.2 Nm³/h (36.1 USgpm)
- 4 bar; 0.2 KV (58 psi; 0.232 CV)	13.7 Nm³/h (60.3 USgpm)
- 6 bar; 0.2 KV (87 psi; 0.232 CV)	19.2 Nm³/h (84.5 USgpm)
• Exhaust air (depressurize actuator for fail in place version)	
- 2 bar; 0.1 KV (29 psi; 0.116 CV)	4.3 Nm³/h (19.0 USgpm)
- 4 bar; 0.1 KV (58 psi; 0.116 CV)	7.3 Nm³/h (32.2 USgpm)
- 6 bar; 0.1 KV (87 psi; 0.116 CV)	9.8 Nm³/h (43.1 USgpm)
Restrictor ratio	Adjustable
Typical auxiliary power consumption in the controlled state	0.01 Nm³/h (0.044 US gpm)

Technical specifications (continued)

SIPART PS2 (all device designs)	
Sound pressure	L_{Aeq} < 75 dB L_{Amax} < 80 dB
Sound pressure with installed Siemens booster	L_{Aeq} < 95 dB L_{Amax} < 98 dB
Structural design	
Mode of operation	
• Range of stroke (linear actuators)	3 ... 130 mm (0.12 ... 5.12 inches); higher range of stroke on request
• Angle of rotation range (part-turn actuators)	30° ... 160° for 6DR50.. and 6DR51.. 30° ... 100° for 6DR55.. and 6DR56.. (up to 180° on request)
Mounting type	
• On linear actuators	Using mounting kit 6DR4004-8V and where necessary with an additional lever arm 6DR4004-8L on actuators according to IEC 60534-6-1 (NAMUR) with ribs, bars or flat face.
• On part-turn actuators	Using mounting kit 6DR4004-8D or TGX:16300-1556 on actuators with mounting plane according to VDI/VDE 3845 and IEC 60534-6-2. The actuator-specific mounting console 6DR4004-1D ... 4D must be ordered separately, see the Selection and ordering data.
Weight, positioner without option modules or accessories	
• 6DR5..0 Glass-fiber reinforced polycarbonate enclosure	Approx. 0.9 kg (1.98 lbs)
• 6DR5.11 Aluminum enclosure, only single-acting	Approx. 1.3 kg (2.86 lbs)
• 6DR5..2 Stainless steel enclosure	Approx. 3.9 kg (8.6 lbs)
• 6DR5..3 Aluminum enclosure	Approx. 1.6 kg (3.53 lbs)
• 6DR5..5 Aluminum, flameproof	Approx. 5.2 kg (11.46 lbs)
• 6DR5..6 Stainless steel enclosure, flameproof	Approx. 8.4 kg (18.5 lbs)
Material	
Dimensions	See "Dimensional drawings"
Device designs	
• In polycarbonate enclosure 6DR5..0	Single-acting and double-acting
• In aluminum enclosure 6DR5..1	Single-acting
• In aluminum enclosures 6DR5..3 and 6DR5..5	Single-acting and double-acting
• In stainless steel enclosures 6DR5..2 and 6DR5..6	Single-acting and double-acting
Gauge block	
• Degree of protection with:	
- Pressure gauge made of plastic	IP31
- Gauge made of metal	IP44
- Pressure gauge made of stainless steel 316	IP54
• Vibration resistance	According to EN 837-1
Connections, electrical	
• Screw terminals	2.5 mm² AWG30-14
• Cable bushing	
- Without explosion protection as well as with Ex i	M20x1.5 or ½-14 NPT
- With explosion protection Ex d	Ex d-certified M20x1.5; ½-14 NPT or M25x1.5
Connections, pneumatic	Internal thread G¼ or ¼-18 NPT
Controller	
Controller unit	
• Five point controller	Adaptive
• Deadband	
- dEbA = Auto	Adaptive
- dEbA = 0.1 ... 10%	Can be set as fixed value
Analog-to-digital converter	
• Scan time	10 ms

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Technical specifications (continued)

SIPART PS2 (all device designs)	
• Resolution	≤ 0.05%
• Transmission error	≤ 0.2%
• Temperature influence effect	≤ 0.1%/10 K (≤ 0.1%/18 °F)
Certificates and approvals	
DoC compliance	The applicable directives and applied standards with their revision levels can be found in the Declaration of Conformity on the internet.
UL conformity	The SIPART PS2 has documented compliance with the safety requirements in the USA and Canada. These are UL classified, recognized and listed.
Explosion protection	You can find details on explosion protection in the compact operating instructions and the explosion protection certificates.

1) At ≤ -10 °C (≤ 14 °F), the refresh rate of the local display is limited. When using Analog Output Module (AOM), only T4 is permissible.
2) Max. impact energy 1 joule for enclosure with inspection window 6DR5..0 and 6DR5..1 or max. 2 joules for 6DR5..3.
3) The following applies to fail in place double-acting: 3 ... 7 bar (43.5 ... 101.5 psi)
4) When using Ex d versions (6DR5..5-... and 6DR5..6-...), values are reduced by approximately 20%.

SIPART PS2 with 4 ... 20 mA / HART	Electronics without explosion protection
Electrical specifications	
Current input I_W	
• Nominal signal range	4 ... 20 mA
• Test voltage	840 V DC, 1 s
• Digital input DI1 (terminals 9/10; electrically connected to the basic device)	Suitable only for floating contact; max. contact load < 5 µA at 3 V
Minimum current to maintain operation	≥ 3.8 mA
Required load voltage U_B (corresponds to Ω at 20 mA)	
• 4 ... 20 mA (6DR50..)	
- Typical	8.25 V (= 413 Ω)
- Max.	8.8 V (= 440 Ω)
• HART (6DR51..)	
- Typical	8.75 V (= 438 Ω)
- Max.	9.3 V (= 465 Ω)
• Static destruction limit	± 40 mA
HART communication	
HART version	7
PC parameterization software	SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.

Pressure sensor module 6DR51.. -Z P01/ -Z P02	Electronics without explosion protection
Required load voltage U_B (corresponds to Ω at 20 mA)	• typ. 8.6 V (= 430 Ω) • max. 9.4 V (= 470 Ω)
Static destruction limit	± 30 V

Technical specifications (continued)

SIPART PS2 with PROFIBUS PA/with FOUNDATION Fieldbus	Electronics without explosion protection
Electrical specifications	
Auxiliary power supply, bus circuit	Bus-powered
Bus voltage	9 ... 32 V
For connecting to circuits with the following peak values	
• Bus connection with FISCO supply unit	
• Bus connection with barrier	
Effective internal capacitance C_i	-
Effective internal inductance L_i	-
Current consumption	11.5 mA ± 10%
Additional fault current	0 mA
Safety shutdown can be activated with "jumper" (terminals 81/82)	Galvanically isolated from bus circuit and digital input
• Input resistance	> 20 kΩ
• Signal state "0" (shutdown active)	0 ... 4.5 V or unconnected
• Signal state "1" (shutdown not active)	13 ... 30 V
For connecting to power supply with the following peak values	
Effective internal capacitance and inductance	-
Digital input DI1 for PROFIBUS (terminals 9/10); electrically connected to the bus circuit)	Jumpered or connection to switching contact. Suitable only for floating contact; max. contact load < 5 µA at 3 V
Galvanic isolation	
• For basic device without explosion protection	Galvanic isolation between basic device and the input for safety shutdown, as well as the outputs of the option modules
Test voltage	840 V DC, 1 s
PROFIBUS PA communication	
Communication	Layers 1 and 2 according to PROFIBUS PA, transmission technology according to IEC 61158-2; slave function; layer 7 (protocol layer) according to PROFIBUS DP, EN 50170 standard with the extended PROFIBUS functions (all data acyclic, manipulated variable, feedbacks and status also cyclic)
C2 connections	Four connections to master class 2 are supported; automatic connection setup 60 s after break in communication
Device profile	PROFIBUS PA profile B, version 3.02, more than 150 objects
Response time to master message	Typically 10 ms
Device address	126 (when delivered)
PC parameterization software	SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.
FOUNDATION Fieldbus communication	
Communications group and class	According to technical specification of the FOUNDATION Fieldbus for H1 communication
Function blocks/functions	Group 3, Class 31PS (Publisher Subscriber), 1 Resource Block (RB2), 1 Analog Output Function Block (AO), 1 PID Function Block (PID), 1 Transducer Block (Standard Advanced Positioner Valve), Link Active Scheduler (LAS) function
Execution times of the blocks	AO: 30 ms PID: 40 ms
Physical layer profile	123, 511
FF registration	Tested with ITK 6.x
Device address	22 (when delivered)

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Technical specifications (continued)

Option modules

Digital I/O Module (DIO)	Without explosion protection, suitable for Ex d 6DR4004-8A
3 digital output current circuits	• Alarm output A1: Terminals 41 and 42 • Alarm output A2: Terminals 51 and 52 • Alarm output: Terminals 31 and 32
• Auxiliary power U_{Aux}	≤ 35 V and the current consumption is to be limited to < 25 mA
• Signal state	
- High (not addressed)	Conductive, R = 1 kΩ[1]
- Low[2] (addressed)	Blocked, I_R < 60 µA
• For connecting to circuits with the following peak values	-
1 circuit	Digital input DI2: Terminals 11 and 12, terminals 21 and 22 (jumper)
• Electrically connected to the basic device	
- Signal state 0	Floating contact, open
- Signal state 1	Floating contact, closed
- Contact load	3 V, 5 µA
• Galvanically isolated from the basic device	
- Signal state 0	≤ 4.5 V or open
- Signal state 1	≥ 13 V
- Natural resistance	≥ 25 kΩ
• Static destruction limit	± 35 V
Galvanic isolation	The three outputs, the DI2 input and the basic device are galvanically isolated from each other.

1) When using in the flameproof encapsulated enclosure, the current consumption must be restricted to 10 mA per output.
2) The status is also Low if the basic device is faulty or without auxiliary power.

Analog Output Module (AOM)	Without explosion protection, suitable for Ex d 6DR4004-8J
DC output for position feedback	
1 current output: Terminals 61 and 62	2-wire connection
Nominal signal range	4 ... 20 mA, short-circuit-proof
Total operating range	3.6 ... 20.5 mA
Auxiliary power U_{Aux}	+12 ... +35 V
External load R_B [kΩ]	≤ (U_{Aux} [V] – 12 V)/I [mA]
Transmission error	≤ 0.3%
Temperature influence effect	≤ 0.1%/10 K (≤ 0.1%/18 °F)
Resolution	≤ 0.1%
Residual ripple	≤ 1%
For connecting to circuits with the following peak values	-
Galvanic isolation	Galvanically isolated from the alarm option and safely isolated from the basic device

Technical specifications (continued)

Inductive Limit Switches (ILS)	Without explosion protection, suitable for Ex d 6DR4004-8G
Limit transmitter with Inductive Limit Switches (ILS) and fault indicator	
2 Inductive Limit Switches (ILS)	• Digital output (limit transmitter) A1: Terminals 41 and 42 • Digital output (limit transmitter) A2: Terminals 51 and 52
• Connection	2-wire system acc. to EN 60947-5-6 (NAMUR), for switching amplifier to be connected on load side
• Signal state High (not addressed)	> 2.1 mA
• Signal state Low (addressed)	< 1.2 mA
• 2 Inductive Limit Switches (ILS)	Type SJ2-SN
• Function	NC (normally closed) contact
• Connecting to circuits with the following peak values	Rated voltage 8 V current consumption: ≥ 3 mA (limit not addressed) ≤ 1 mA (limit addressed)
1 alarm output	Digital output: Terminals 31 and 32
• Connection	On switching amplifier according to EN 60947-5-6: (NAMUR), U_{Aux} = 8.2 V, R_i = 1 kΩ.
• Signal state High (not addressed)	R = 1.1 kΩ
• Signal state Low (addressed)	R = 10 kΩ
• Auxiliary power U_{Aux}	U_{Aux} ≤ DC 35 V I ≤ 20 mA
• Connecting to circuits with the following peak values	-
Galvanic isolation	The 3 outputs are galvanically isolated from the basic device.

Mechanic Limit Switches (MLS)	With explosion protection Ex i 6DR4004-6K
Limit transmitter with mechanical switching contacts	
2 limit value contacts	• Digital output A1: Terminals 41 and 42 • Digital output A2: Terminals 51 and 52
For connecting to circuits with the following peak values:	
• Max. switching voltage AC/DC	U_i = 30 V
• Max. switching current AC/DC	I_i = 100 mA
• Max. switching capacity	P_i = 750 mW
1 alarm output	Digital output: Terminals 31 and 32
• Connection	On switching amplifier according to EN 60947-5-6: (NAMUR), U_{Aux} = 8.2 V, R_i = 1 kΩ
• Signal state High (not addressed)	R = 991 kΩ
• Signal state Low (addressed)	R = 10 kΩ
• Auxiliary power	U_{Aux} ≤ DC 35 V I ≤ 20 mA
Galvanic isolation	The 3 outputs are galvanically isolated from the basic device

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Technical specifications (continued)

Analog Input Module (AIM)	Without explosion protection 6DR4004-8F
	The Analog Input Module (AIM) 6DR4004-6F and -8F is required for connecting a Non Contacting Sensor (NCS) or Position Transmitter 6DR4004-1ES through -4ES. Potentiometers of a different design with resistance values between 3 and 20 kΩ and 4 ... 20 mA and 0 ... 10 V signals can also be connected.
R-potentiometer	
• Peak values when powered by the basic unit with PA (6DR55) or with FF communication (6DR56)	U_{max} = 5 V
• Peak values when supplied by other basic units (6DR50/1/2/3/9)	U_{max} = 5 V
Signal 20 mA	
• Nominal signal range	0 ... 20 mA
• Internal load R_B	200 Ω
• Static destruction limit	40 mA
Signal 10 V	
• Nominal signal range	0 ... 10 V
• Internal resistance R_i	25 kΩ
• Static destruction limit	20 V
Supply and signal circuits	Electrically connected to the basic device

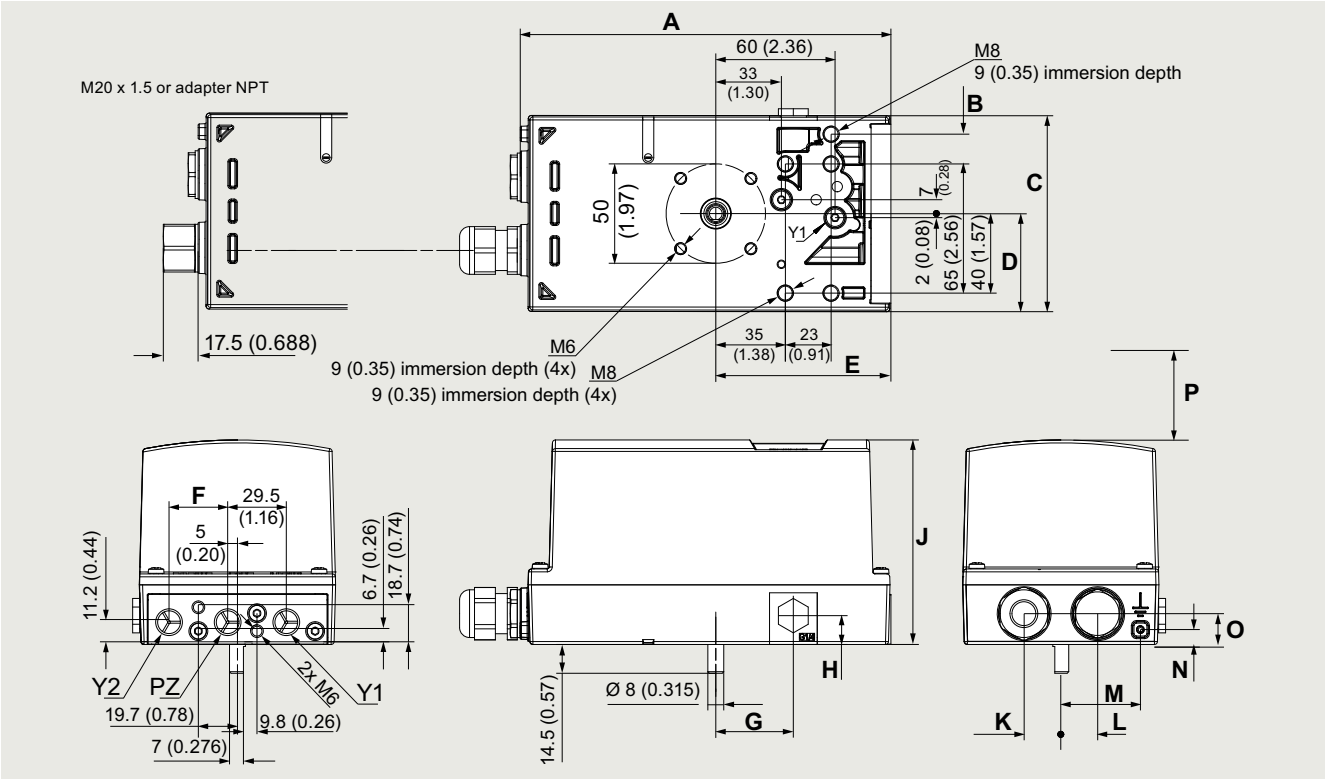
NCS sensor	Without explosion protection 6DR4004-8N*
Position range	
• Linear actuator 6DR4004-.N.20	3 ... 14 mm (0.12 ... 0.55")
• Linear actuator 6DR4004-.N.30	10 ... 130 mm (0.39 ... 5.12"); up to 200 mm (7.87") on request
• Part-turn actuator	30° ... 100°
Linearity for NCS sensor and internal NCS module 6DR4004-5L/-5LE (after correction by means of positioner)	± 1 %
Hysteresis for NCS sensor and NCS module 6DR4004-5L/-5LE	± 0.2 %
Temperature influence (range: Rotation angle 120° or stroke 14 mm)	≤ 0.1%/10 K (≤ 0.1%/18 °F) for -20 ... +90 °C (-4 ... +194 °F) ≤ 0.2%/10 K (≤ 0.2%/18 °F) for -40 ... -20 °C (-40 ... -4 °F)
Climatic class	According to IEC EN 60721-3
• Storage	1K23, -40 ... +90 °C (-40 ... +194 °F)
• Transport	2K12, -40 ... +90 °C (-40 ... +194 °F)
Continuous working temperature	-40 °C ... +90 °C (-40 °F ... +194 °F)
Vibration resistance	
• Harmonic oscillations (sine) according to IEC 60068-2-6	3.5 mm (0.14"), 2 ... 27 Hz, 3 cycles/axis 98.1 m/s² (321.84 ft/s²), 27 ... 300 Hz, 3 cycles/axis
• Bumping according to IEC 60068-2-29	300 m/s² (984 ft/s²), 6 ms, 4000 shocks/axis
Degree of protection	IP68 according to IEC/EN 60529; Type 4X according to NEMA 250

Technical specifications (continued)

Booster	
Operating conditions	
Permissible ambient temperature for operation	-30 ... +80 °C (-22 ... +176 °F)
Climatic class	According to IEC EN 60721-3
• Storage	1K23, -40 ... +80 °C (-40 ... +176 °F)
• Transport	2K12, -40 ... +80 °C (-40 ... +176 °F)
Vibration resistance	
• Harmonic oscillations	According to ISA-S75.13
• Bumping (half-sine) according to EN 60068-2-27/02.2010	150 m/s² (492 ft/s²), 6 ms, 1 000 shocks/axis
Structural design	
Booster weight	
• Single-acting	
- Optional module for standard enclosure	2.9 kg (6.5 lb)
- Installed with polycarbonate enclosure	4.0 kg (8.8 lbs)
- Optional module for flameproof aluminum enclosure	3.3 kg (7.3 lbs)
- Installed with flameproof aluminum enclosure	7.9 kg (17.4 lbs)
• Double-acting	
- Optional module for standard enclosure	4.3 kg (9.4 lbs)
- Installed with polycarbonate enclosure	5.3 kg (11.7 lbs)
- Optional module for flameproof aluminum enclosure	4.7 kg (10.4 lbs)
- Installed with flameproof aluminum enclosure	9.3 kg (20.5 lbs)
Connections	
• Pneumatic	¼-14 NPT or G¼
Pneumatic data	
Auxiliary power (inlet air)	Compressed air, carbon dioxide (CO_2), nitrogen (N_2), noble gasses or natural gas
• Pressure	1.4 ... 7 bar (20.3 ... 101.5 psi)
• Inlet air	According to ISO 8573-1
• Air consumption	1.2×10^{-2} Nm³/h (0.007SCFM)
Pressure gauge	Stainless steel enclosure MPa, bar, psi Degree of protection IP54
Flow capacity	Cv = 2.0

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Dimensional drawings



SIPART PS2, non-flameproof enclosure, dimensions in mm (inch)

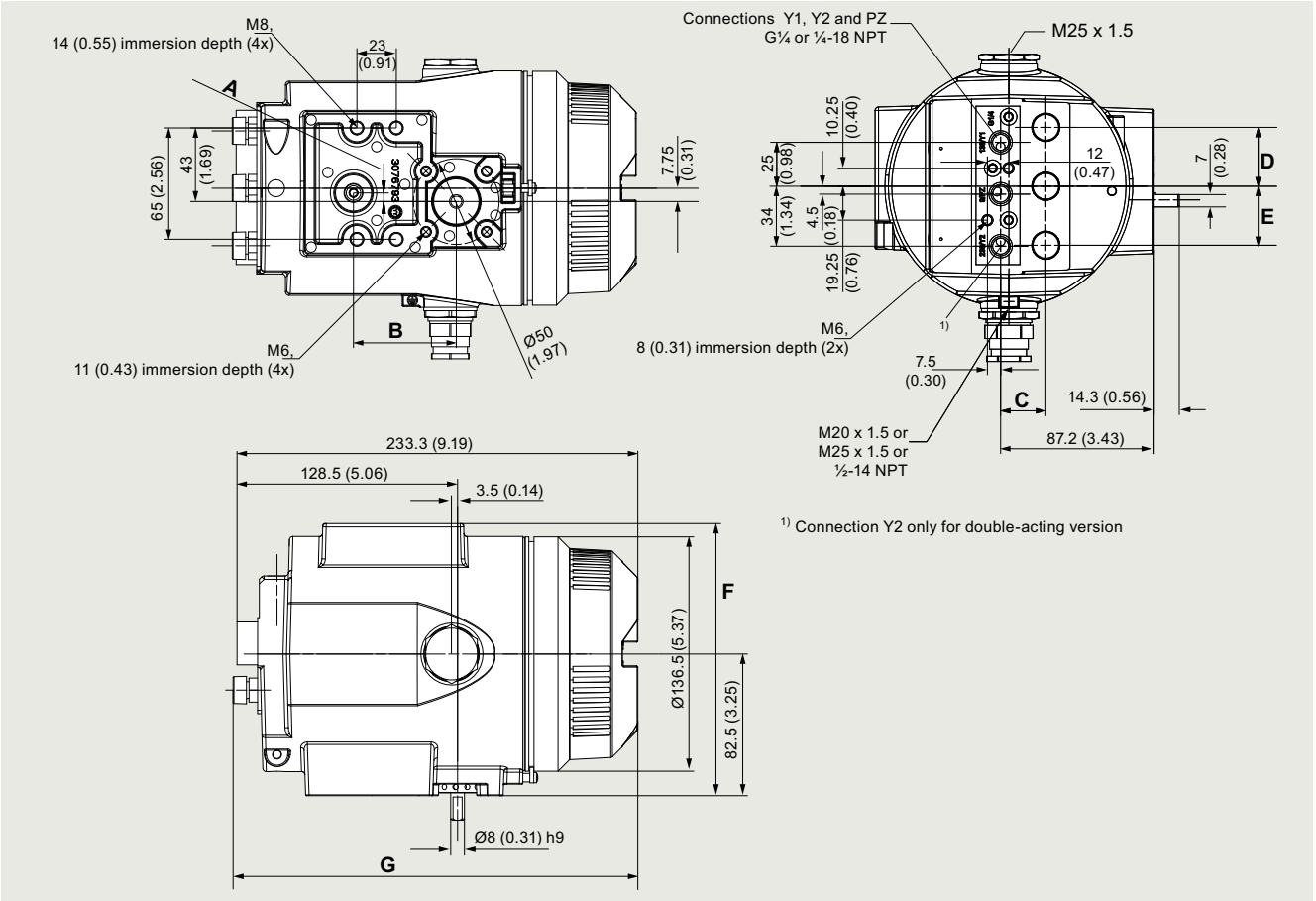
Value	6DR5..0 G¼	6DR5..0 ¼-18 NPT	6DR5..2 G¼, ⅛ NPT	6DR5..3 G¼	6DR5..3 ¼-18 NPT
A	184.5 (7.26)	186.5 (7.34)	186.5 (7.34)	186.5 (7.34)	188.5 (7.42)
B	-	-	15 (0.59)	-	-
C	95 (3.74)	95 (3.74)	99 (3.90)	98.6 (3.88)	98.6 (3.88)
D	48 (1.89)	48 (1.89)	49.5 (1.95)	48.6 (1.91)	48.6 (1.91)
E	88.5 (3.48)	90.5 (3.56)	88.5 (3.48)	88.8 (3.50)	90.8 (3.57)
F[1]	29.5 (1.16)	29.5 (1.16)	29.5 (1.16)	29.5 (1.16)	29.5 (1.16)
G	39 (1.54)	39 (1.54)	39 (1.54)	39 (1.54)	39 (1.54)
H	14.5 (0.57)	14.5 (0.57)	16 (0.63)	14.5 (0.57)	14.5 (0.57)
J	96.6 (3.80)	96.6 (3.80)	98.5 (3.88)	103 (4.06)	103 (4.06)
K	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)
L	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)
M	-	-	41.5	40	40
N	-	-	7.5	7.5	7.5
O	14.5 (0.57)	14.5 (0.57)	14.5 (0.57)	15.5 (0.61)	15.5 (0.61)
P	> 150 (5.91)[2]	> 150 (5.91)[2]	> 150 (5.91)[2]	> 150 (5.91)[2]	> 150 (5.91)[2]

[1] Dimension applies only to double-acting actuators.
[2] Adhere to this minimum clearance P for service and maintenance above the lid.

SIPART PS2, non-flameproof enclosure	
6DR5..0	Polycarbonate enclosure; dimensions with pneumatic interface G¼ or ¼-18 NPT
6DR5..2	Stainless steel enclosure, without inspection window
6DR5..3	Aluminum enclosure; dimensions with pneumatic connection G¼ or ¼-18 NPT

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Dimensional drawings (continued)



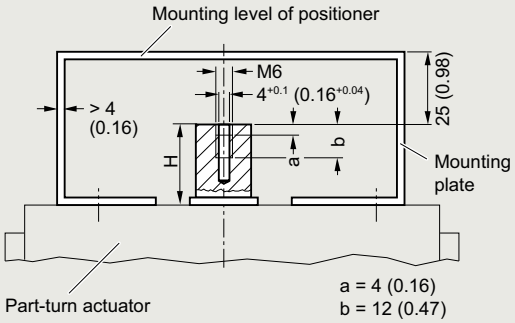
SIPART PS2, flameproof enclosure, dimensions in mm (inch)

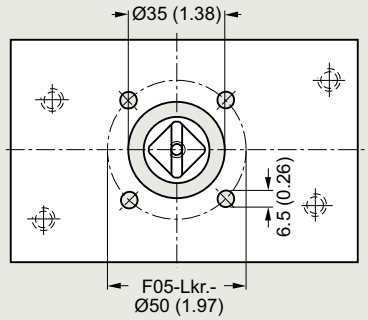
Value	6DR5..5	6DR5..6
A	5 (0.2)	-
B	60 (2.36)	-
C	25.7 (1.01)	21.7 (0.85)
D	33.5 (1.32)	25 (0.99)
E	33.5 (1.32)	-
F	158.5 (6.24)	160 (6.3)
G	235.3 (9.26)	227.6 (8.96)

SIPART PS2, flameproof enclosure	
6DR5..5	Aluminum enclosure, flameproof; dimensions with pneumatic interface G¼ or ¼-18 NPT
6DR5..6	Stainless steel enclosure, flameproof

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Dimensional drawings (continued)

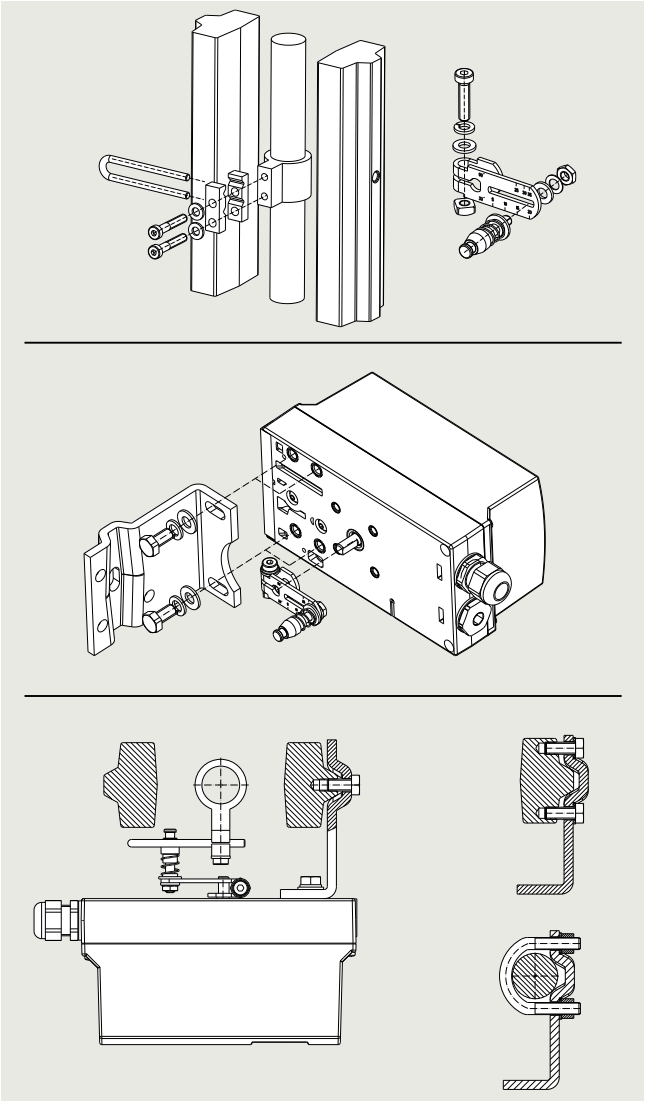




Mounting onto part-turn actuators; mounting console can be ordered via 6DR4004-1D/-2D/-3D/-4D, extract from VDI/VDE 3845, dimensions in mm (inch)

Mounting kit for NAMUR linear actuators 6DR4004-8V

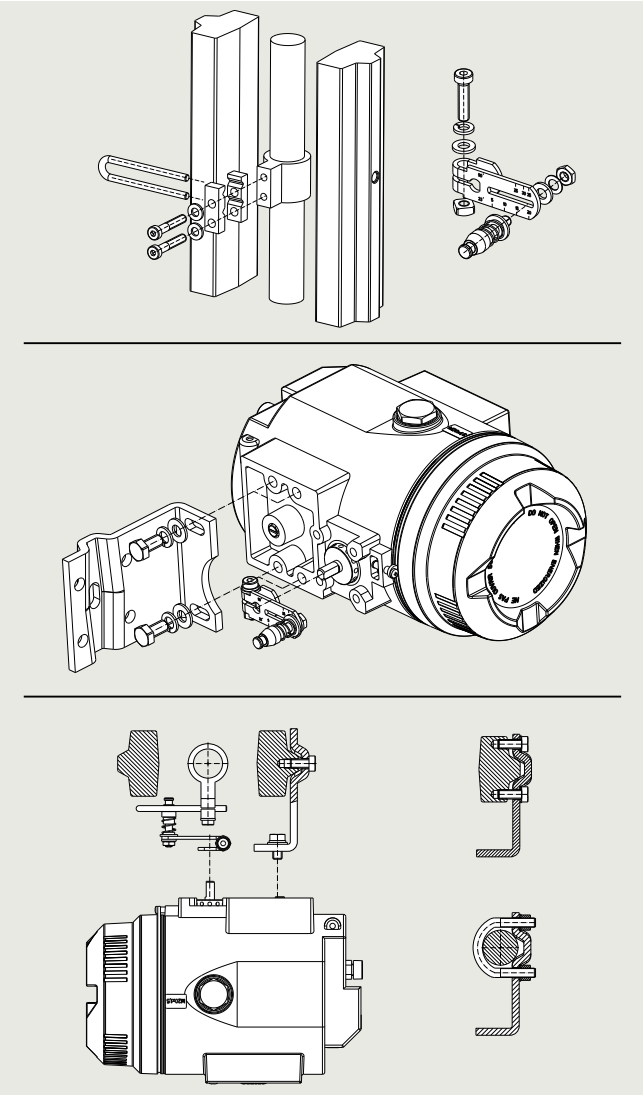
- 1 mounting bracket
- 2 clamps
- 1 U-bracket
- 1 lever arm with adjustable tapered roller
- 2 U-bolts
- Various screws and lock washers



Mounting of SIPART PS2 on linear actuators

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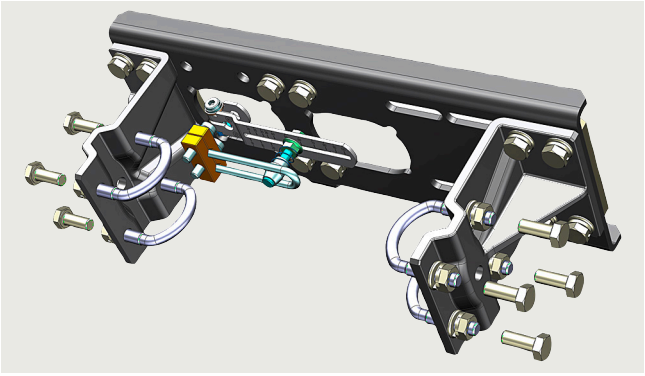
Dimensional drawings (continued)



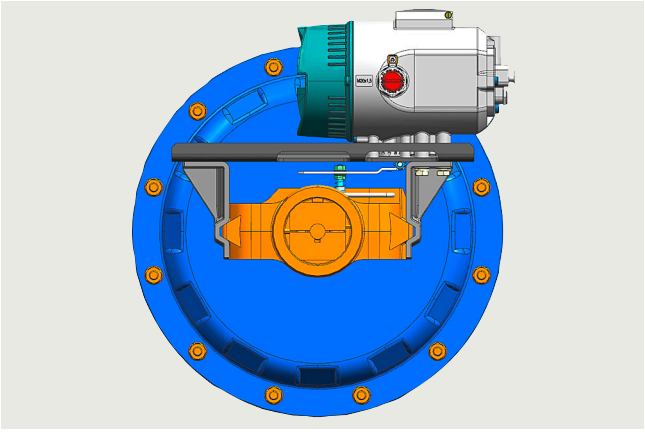
Mounting of SIPART PS2 in flameproof aluminum enclosure on linear actuators

Mounting console made of stainless steel 316L for linear actuators 6DR4004-8R

- Console with 2 adjustable mounting brackets
- 4 U-brackets for pillar mounting
- 1 lever arm with adjustable tapered roller
- 2 clamps with U-bracket
- Screws and lock washers



Mounting console made of stainless steel 316L 6DR4004-8R



Mounting console stainless steel 316L mounted on SIPART PS2 in flameproof stainless steel enclosure 316L

Mounting kit for NAMUR part-turn actuators 6DR4004-8D

- 1 coupling wheel
- 1 driver pin
- 8 scales
- 1 pointer
- Various screws and lock washers

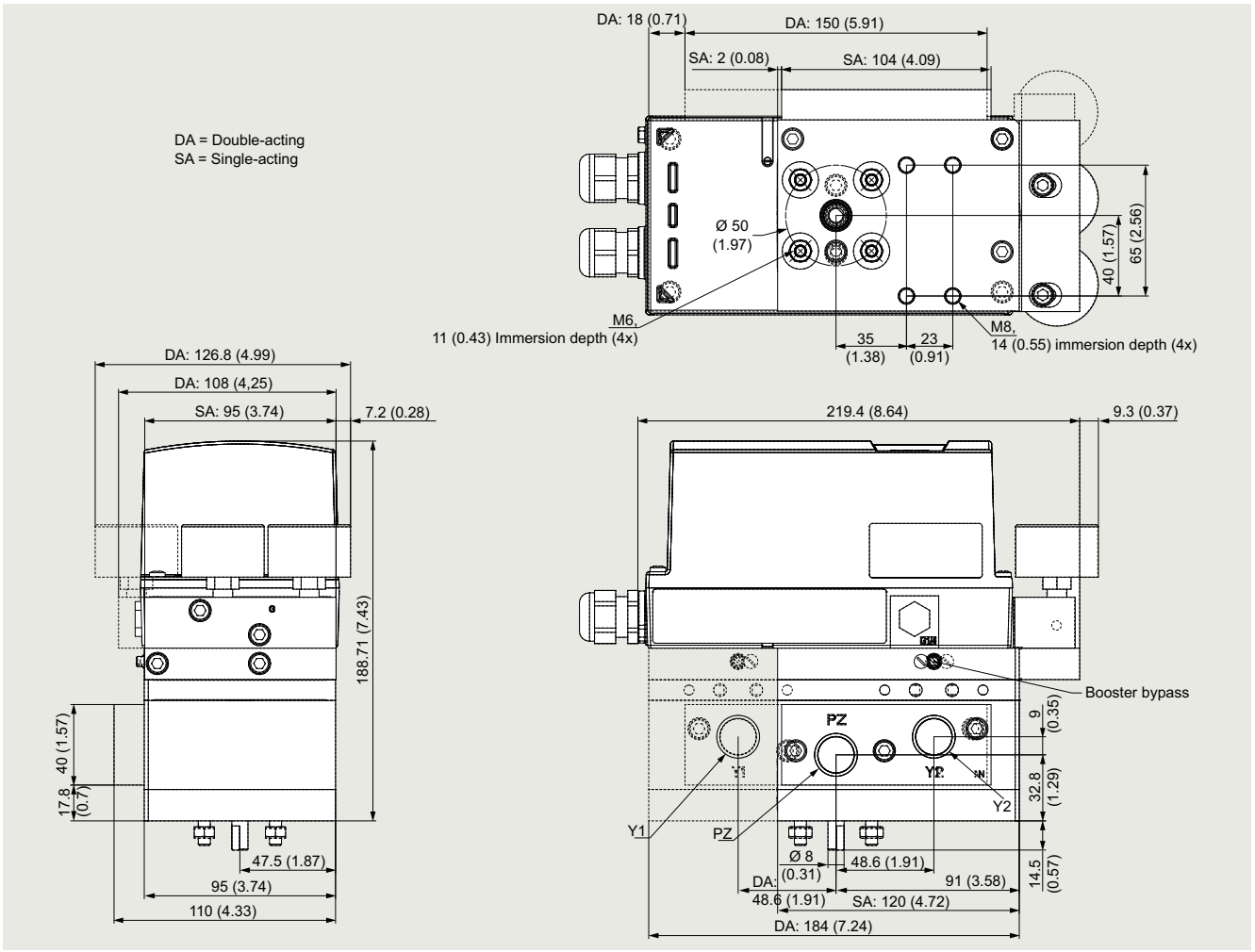
Notice

The mounting console for mounting on the part-turn actuators is not included in the scope of delivery, but can be ordered separately via 6DR4004-1D/-2D/-3D/-4D. Fixing screws are not included in the scope of delivery (see "Technical specifications")

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Dimensional drawings (continued)

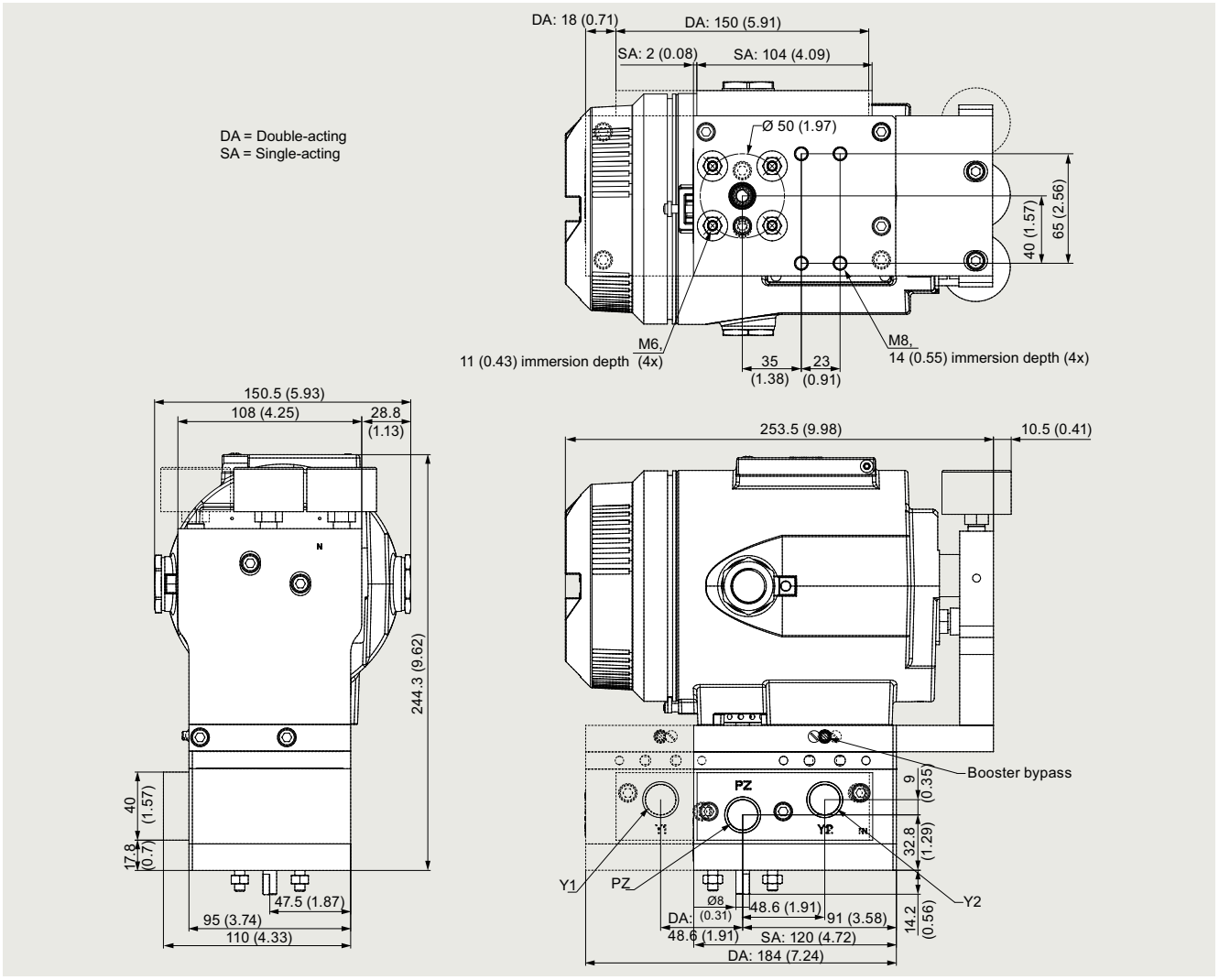
Booster mounted on positioner



Booster mounted on positioner, dimensions in mm (inch)

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Dimensional drawings (continued)



Booster mounted on positioner in a flameproof enclosure, dimensions in mm (inch)

More information

Documentation and certificates

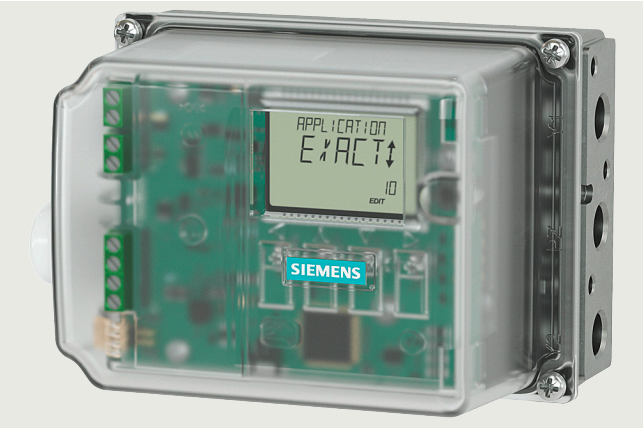
All documentation and all available certificates are available free of charge in multiple languages through the QR code below:

Special designs

On request

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Overview



SIPART PS100 with polycarbonate lid



SIPART PS100 in aluminum enclosure

The SIPART PS100 electropneumatic positioner is used to control the process valve or damper position of pneumatic linear or part-turn actuators. The SIPART PS100 regulates the process valve according to the setpoint.

Benefits

The SIPART PS100 positioners offer the following advantages:

- Fast commissioning at the push of a button
- Simple operation via the local display and four buttons
- Local display symbols according to NAMUR NE 107
- Negligible air consumption in stationary operation
- Setting the application profile based on predefined selection options, e.g. close tight valve, open/close valve, small valve
- Rapid response in end positions means short travel times and a close tight valve.
- Insensitive to oscillations (vibrations) and steam hammer
- Leakage compensation ensures a constant actual value and protects the actuator
- Only one device version for linear and part-turn actuators
- Consistent parameter assignment with HART communication
- Safe use in hazardous areas

Application

The SIPART PS100 is used in the following industry sectors:

- Valve manufacturing
- Chemical industry
- Power supply
- Paper
- Water and wastewater
- Food and beverages
- Pharmaceuticals

The SIPART PS100 can be utilized in applications with pneumatic actuators and a setpoint signal of 4 ... 20 mA.

Custom designs

Adaptation of your SIPART PS100 positioner to your own brand with standardized features:

- Individual aluminum enclosure color
- Customized company logo on the enclosure
- A combination of the above features
- Further adjustments on request

The technical functions of the PS100 are therefore not limited. All features and the standard delivery times remain the same.

In addition to three functions, which have been prepared for the adjustment, additional special functions are available on request. Please contact your sales representative for more information.

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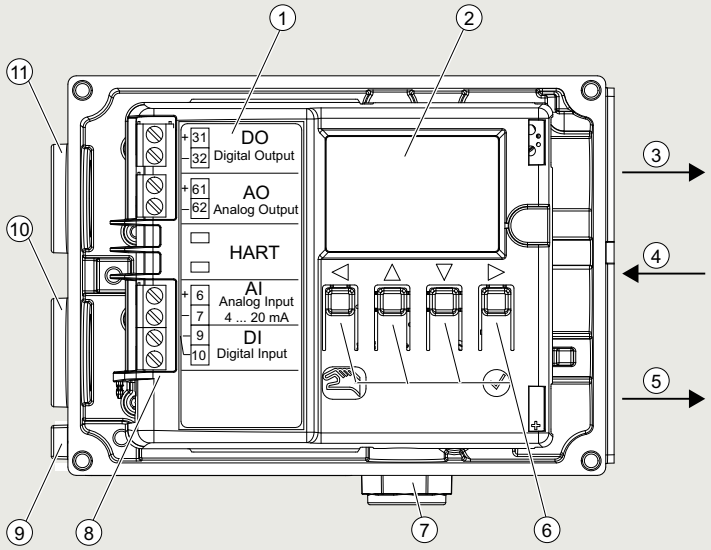
Design

The SIPART PS100 positioner comprises the following components:

- Enclosure (base plate with lid)
- Electronics
- Wear-free, contact-free position detection
- Pneumatic block

The pneumatic block is located in the enclosure, the pneumatic connections for the inlet air and the actuating pressure on the right-hand side of the enclosure. The electrical connections are located on the left-hand side of the enclosure.
The SIPART PS100 positioner is fitted to the relevant pneumatic linear or part-turn actuator using an appropriate mounting kit. The positioner shaft is located on the underside of the base plate. The positioner shaft is connected to the spindle of the linear actuator or the actuator shaft of the part-turn actuator using the mounting kit.
The electronics are available with the following options:

- Analog output (AO) 4 to 20 mA
  The current position of the valve is converted into a 4 to 20 mA signal.
- Digital input and digital output (DI and DQ)
  - Position limit monitoring.
  - Output of an alarm in the event of a control deviation or a device fault.
  - Approach of a defined process valve position, disabling of keys, blocking of valve process valve by means of digital input.
- HART communication on parameter assignment and information on the device status



1. Wiring diagram on module cover
2. Display
3. Output: actuating pressure Y1
4. Input: supply air pressure PZ
5. Output: actuating pressure Y2 for double-acting actuators
6. Buttons
7. Exhaust air outlet with a sound absorber
8. Connecting terminals
9. Grounding, thread M4
10. Lower cable gland, thread M20x1.5
11. Upper cable gland, thread M20x1.5

SIPART PS100, enclosure with open lid

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Function

Local operation is performed using the built-in local display and the four buttons. It enables, for example:

- Starting automatic commissioning with the press of a button
- Configuring the device
- Switching between the operation modes:
  - AUTO: The positioner controls the valve according to the analog input (AI) 4 to 20 mA
  - MANUAL: Valve movement with the middle keys

A hallmark of the SIPART PS100 is its own extremely low consumption of air. Compressed air is only required to move the valve. In the controlled state, consumption of air is negligible.

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Selection and ordering data

SIPART PS100 electropneumatic positioner without explosion protection	Article No. 6DR71	●	●	-	0	●	●	●	●	-	●	●	●	0
Click the article number for online configuration in the PIA Life Cycle Portal.														
Enclosure material														
Polycarbonate, lid with inspection window		0												
Aluminum, lid without inspection window		1												
Actuator type														
For single-acting actuators			1											
For double-acting actuators			2											
Communication														
4 ... 20 mA						N								
4 ... 20 mA, HART						A	N							
Device option 1														
Without device option 1							N							
With digital input (DI) and digital output (DQ)							A							
Device option 2														
Without device option 2								0						
With analog output (AQ) 4 ... 20 mA								1						
Thread of the lower cable entry/cable gland														
M20 × 1.5/without cable gland									0					
M20 × 1.5/with plastic cable gland									1					
M20 × 1.5/with metal cable gland									2					
½-14 NPT/without cable gland									4					
Thread of the upper cable entry/cable gland														
M20 × 1.5/with blanking plug											0			
M20 × 1.5/with plastic cable gland											1			
M20 × 1.5/with metal cable gland											2			
½-14 NPT/without cable gland											4			
Pneumatic thread														
G¼												A		
¼-18 NPT												B		
Pneumatic accessories														
Without gauge block													A	
Pressure gauge made of plastic, block made of aluminum													C	
Pressure gauge made of metal, block made of aluminum													D	
Gauge made of stainless steel, block made of stainless steel													E	

SIPART PS100 electropneumatic positioner with explosion protection	Article No. 6DR71	●	●	-	●	●	N	●	●	-	●	●	●	0
Click the article number for online configuration in the PIA Life Cycle Portal.														
Enclosure material														
Polycarbonate, lid with inspection window		0			1									
Aluminum, lid without inspection window		1												
Actuator type														
For single-acting actuators			1											
For double-acting actuators			2											
Degree of protection														
Ex i (ATEX, IECEx,...) SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00).					1									
Ex i; Ex e (ATEX, IECEx,...) SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00).					2									
Ex i; Ex e; Ex t (ATEX, IECEx,...) SITRANS I200 output isolation amplifier sold separately (7NG4131-1AA00).					3									
Communication														
4 ... 20 mA						N								
4 ... 20 mA, HART						A								

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Selection and ordering data (continued)

SIPART PS100 electropneumatic positioner with explosion protection	Article No. 6DR71	●	●	-	●	●	N	●	●	-	●	●	●	0
Device option 2														
Without device option 2								0						
With analog output (AQ) 4 ... 20 mA SITRANS I100 isolating power supply sold separately (7NG4124-1AA00).								1						
Thread of the lower cable entry/cable gland														
M20 × 1.5/without cable gland									0					
M20 × 1.5/with plastic cable gland									1					
M20 × 1.5/with metal cable gland									2					
½-14 NPT/without cable gland									4					
Thread of the upper cable entry/cable gland														
M20 × 1.5/with blanking plug											0			
M20 × 1.5/with plastic cable gland											1			
M20 × 1.5/with metal cable gland											2			
½-14 NPT/without cable gland											4			
Pneumatic thread														
G¼												A		
¼-18 NPT												B		
Pneumatic accessories														
Without gauge block													A	
Pressure gauge made of plastic, block made of aluminum													C	
Pressure gauge made of metal, block made of aluminum													D	
Gauge made of stainless steel, block made of stainless steel													E	

Options Add "-Z" to article number, specify order code and plain text	Order code
TAG plate made of stainless steel, 3-line Input fields Text line 1: plain text from Y15 Text line 2: plain text from Y16 Text line 3: plain text from Y17	**A20**
Version with stainless steel sound absorbers	**A40**
Explosion protection (Japan)	**E29**
EN 10204 certificate type 2.1	**C35**
DNV (Det Norske Veritas)	**S10**
SITRANS AW050 Bluetooth adapter for wireless communication and data transfer	**F50**
Measuring point description Input field: Max. 32 characters; specify in plain text	**Y15**
Measuring point text Input field: Max. 32 characters; specify in plain text	**Y16**
Measuring point number (TAG no.) Input field: Max. 8 characters; specify in plain text	**Y17**

Accessories	Article No.
SITRANS AW050 Bluetooth adapter kit for wireless communication and data transfer for SIPART PS100	**6DR4004-1BT**
Gauge block	
With pressure gauges made of plastic IP31 (MPa, bar)	
• Block made of aluminum, single-acting, G¼	**6DR4004-1M**
• Block made of aluminum, double-acting, G¼	**6DR4004-2M**
With pressure gauges made of plastic IP31 (MPa, psi)	
• Block made of aluminum, single-acting, ¼-18 NPT	**6DR4004-1MN**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2MN**
With gauges made of metal IP44 (MPa, bar, psi)	
• Block made of aluminum, single-acting, G¼	**6DR4004-1P**
• Block made of aluminum, double-acting, G¼	**6DR4004-2P**
• Block made of aluminum, single-acting, ¼-18 NPT	**6DR4004-1PN**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2PN**
With pressure gauges made of stainless steel 316 IP54 (MPa, bar, psi)	
• Block made of stainless steel 316, single-acting, G¼	**6DR4004-1Q**
• Block made of stainless steel 316, double-acting, G¼	**6DR4004-2Q**
• Block made of stainless steel 316, single-acting, ¼-18 NPT	**6DR4004-1QN**
• Block made of stainless steel 316, double-acting, ¼-18 NPT	**6DR4004-2QN**
Venting gauge block Depressurizing of Y2 on compressed air failure with pressure gauges made of metal IP44 (MPa, bar, psi). The double-acting actuator with springs moves into the safety position.	
• Block made of aluminum, double-acting, G¼	**6DR4004-2RE**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2RF**
Booster (Cv = 2) Aluminum with pressure gauges made of metal IP44 (MPa, bar, psi)	
• Single-acting, G½	**6DR4004-1RJ**

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Selection and ordering data (continued)

Accessories	Article No.
• Double-acting, G½	**6DR4004-2RJ**
• Single-acting, ½-14 NPT	**6DR4004-1RK**
• Double-acting, ½-14 NPT	**6DR4004-2RK**
Mounting kit for NAMUR part-turn actuators	
VDI/VDE 3845, with plastic coupling wheel, without mounting console	**6DR4004-8D**
VDI/VDE 3845, with stainless steel coupling, without mounting console	**TGX:16300-1556**
Console for mounting on NAMUR part-turn actuators VDI/VDE 3845	
• 80 × 30 × 20 mm (3.15 × 1.18 × 0.79 inches)	**6DR4004-1D**
• 80 × 30 × 30 mm (3.15 × 1.18 × 1.18 inches)	**6DR4004-2D**
• 130 × 30 × 30 mm (5.12 × 1.18 × 1.18 inches)	**6DR4004-3D**
• 130 × 30 × 50 mm (5.12 × 1.18 × 1.97 inches)	**6DR4004-4D**
Mounting kit for other part-turn actuators The following mounting consoles can be used together with the NAMUR part-turn actuator mounting kit 6DR4004-8D.	
SPX (DEZURIK) Power Rac, sizes R1, R1A, R2 and R2A	**TGX:16152-328**
Masoneilan Camflex II	**TGX:16152-350**
Fisher 1051/1052/1061, to 30, 40, 60 to 70	**TGX:16152-364**
Fisher 1051/1052, size 33	**TGX:16152-348**
Mounting kit for NAMUR linear actuators	
NAMUR-linear actuator with short lever (2 ... 35 mm (0.08 ... 1.38 inches))	**6DR4004-8V**
Lever arm for strokes of 35 ... 130 mm (1.38 ... 5.12 inches) without NAMUR mounting bracket	**6DR4004-8L**

Accessories	Article No.
Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with short lever with up to 35 mm (1.38 inches) stroke	**6DR4004-8VK**
Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with long lever > 35 mm (1.38 inches) stroke	**6DR4004-8VL**
Tapered roller made of stainless steel 316 for replacing the tapered roller made of plastic in the mounting kits 6DR4004-8V, -8VK, -8VL	**6DR4004-3N**
Terminal blocks made of stainless steel 316 for replacement of the aluminum terminal blocks in the 6DR4004-8V, -8VK and -8VL mounting kits	**6DR4004-3M**
Mounting kit for other linear actuators	
MASONEILAN type 87/88	**TGX:16152-1210**
MASONEILAN type 37/38, all sizes	**TGX:16152-1215**
Fisher type 657/667, size 30 ... 80	**TGX:16152-900**
Interface according to VDI/VDE 3847	
Interface according to VDI/VDE 3847 for single and double-acting, CATS-equipped (Clean Air To Spring) on single-acting, not for flameproof enclosure	**6DR4004-5PB**
HART modem with USB interface	**7MF4997-1DC**

Scope of delivery for positioner

1 SIPART PS100 positioner as ordered

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Technical specifications

SIPART PS100	
Input	
Analog input (AI), terminals 6 and 7	
• Nominal signal range	4 ... 20 mA
• Minimum current to maintain operation	3.8 mA
• Maximum load voltage	6.5 V (corresponds to 325 Ω at 20 mA)
• Static destruction limit	± 40 mA
• Type of communication	HART 7
Digital input (DI), terminals 9 and 10	
• Galvanic isolation	Electrically connected to analog input Galvanically isolated from the outputs
• Signal state 0, floating contact open	> 300 kΩ
• Signal state 1, floating contact closed	< 3 kΩ
• Contact load	Suitable only for floating contact; max. contact load < 20 µA, 3 V
Output	
Analog output (AO), terminals 61 and 62	
• Connection type	2-wire connection
• Nominal signal range	4 ... 20 mA
• Fault current	< 3.6 mA
• Supply voltage U_H	12 ... 30 V
• External load R_B [kΩ]	≤ (U_H [V] - 12 V)/I_O [mA]
• Resolution in relation to the nominal signal range	0.05%
• Transmission error in relation to the nominal signal range	± 0.3%
• Effect of ambient temperature	± 0.1%/10K
• Maximum residual ripple	± 0.5%
• Galvanic isolation	Galvanically isolated from the other electrical inputs and outputs
Digital output (DQ), terminals 31 and 32	
• Maximum supply voltage U_H	35 V
• External current consumption	To be limited to 50 mA
• "Conductive" state	• Permissible rated current 50 mA • Maximum terminal voltage 3 V • Overload-proof
• "Locked" state "Locked" is also the state if the device is faulty or analog input (AI) is = 0 mA.	I < 60 µA
Operating conditions	
Ambient conditions for operation according to IEC 60068-2	For indoor and outdoor use
Ambient temperature	
• Ambient temperature	-20 ... +80 °C (-4 ... +176 °F)
• Relative humidity	0 ... 100%
Pollution degree according to IEC 61010-1	2
Overvoltage category according to IEC 61010-1	II
Degree of protection of enclosure	
• According to IEC 60529	IP66
• According to NEMA 250	Type 4X
Corrosion protection according to EN ISO 9227:2022 and EN ISO 12944:2017	
• 6DR710 polycarbonate enclosure	C5-M medium durability
• 6DR711 aluminum enclosure	C5-M medium durability
Vibration resistance	
• Harmonic oscillations (sine) according to IEC 60068-2-6	3.5 mm (0.14"), 2 ... 27 Hz, 3 cycles/axis, 98.1 m/s² (321.84 ft/s²), 27 ... 300 Hz, 3 cycles/axis
• Bumping (half-sine) according to IEC 60068-2-27	150 m/s² (492 ft/s²), 6 ms, 1 000 shocks/axis
• Noise (controlled digitally) according to IEC 60068-2-64	10 ... 200 Hz; 1 (m/s²)²/Hz (3.28 (ft/s²)²/Hz) 200 ... 500 Hz; 0.3 (m/s²)²/Hz (0.98 (ft/s²)²/Hz), 4 hours/axis
Climatic class	According to IEC EN 60721-3
• Storage	1K23, -40 ... +80 °C (-40 ... +176 °F)

Technical specifications (continued)

SIPART PS100	
• Transport	2K13, -40 ... +80 °C (-40 ... +176 °F)
Pneumatic data	
Pneumatic operating medium	Compressed air, carbon dioxide (CO_2), nitrogen (N_2), noble gasses
• Operating pressure	1.4 ... 7 bar (20.3 ... 101.5 psi)
Air quality according to ISO 8573-1	
• Solid particulate size and density	Class 3
• Pressure dew point	Class 3 (min. 20 K (36 °F) below ambient temperature)
• Oil content	Class 3
Flow rate	
• Aerate process drive	
- Supply pressure 4 bar (58 psi)	7.1 Nm³/h (31.3 USgpm)
- Supply pressure 6 bar (87 psi)	9.8 Nm³/h (43.1 USgpm)
• Depressurize process drive	
- Actuating pressure 4 bar (58 psi)	13.7 Nm³/h (60.3 USgpm)
- Actuating pressure 6 bar (87 psi)	19.2 Nm³/h (84.5 USgpm)
Leakage actuator chamber (positioner portion)	< 6 · 10^{-4} Nm³/h (0.0026 USgpm)
Typical auxiliary power consumption in the controlled state	0.01 Nm³/h (0.044 US gpm)
Sound pressure	• $L_{A\,eq}$ < 75 dB • $L_{A\,max}$ < 80 dB
Structural design	
Supported actuator types	
• Linear actuator, range of stroke	10 ... 130 mm (0.39 ... 5.12")
• Part-turn actuator, angle-of-rotation range	10 ... 100°
Weight, positioner without accessories	Approx. 1.0 kg (2.20 lbs)
Material	
• Lid	• Aluminum • Polycarbonate
• Base plate	Aluminum
• Gauge block	Aluminum, anodized or stainless steel 316
• Pressure gauge	• Plastic, mechanics brass • Stainless steel, mechanics brass nickel-plated • Stainless steel, mechanics stainless steel 316
Torques	
• Lid fixing screws	1.5 Nm (1.1 ft lb)
• Part-turn actuator fixing screws DIN 933 M6x12-A2	5 Nm (3.7 ft lb)
• Linear actuator fixing screws DIN 933 M8x16-A2	12 Nm (8.9 ft lb)
• Gland pneumatic G¼	15 Nm (11.1 ft lb)
• Gland pneumatic ¼-18 NPT	
- Without sealant	12 Nm (8.9 ft lb)
- With sealant	6 Nm (4.4 ft lb)
• M20 cable gland, plastic	4 Nm (3 ft lb)
• M20 cable gland, metal	6 Nm (4.4 ft lb)
• ½-14 NPT cable gland, metal	15 Nm (11.1 ft lb)
• ½-14 NPT cable gland, metal in the NPT adapter **IMPORTANT:** To avoid damage to the device, the NPT adapter must be held in place while the NPT gland is screwed into the NPT adapter.	68 Nm (50 ft lb)
• Union nut made of plastic	2.5 Nm (1.8 ft lb)
• Union nut made of metal	4 Nm (3 ft lb)
• Gauge block fixing screws	6 Nm (4.4 ft lb)
Pressure gauge	
• Degree of protection	
- Plastic pressure gauge, mechanics brass	IP31

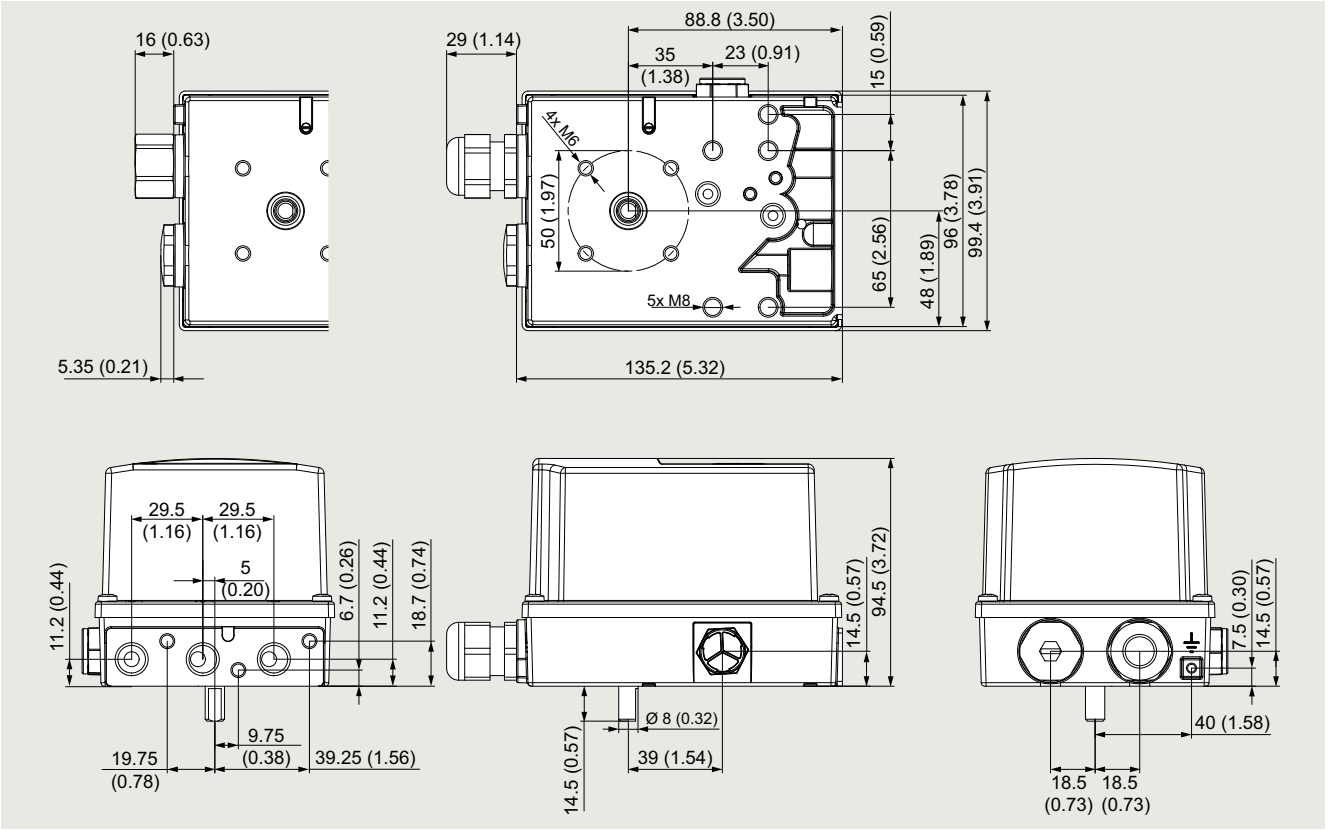
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Technical specifications (continued)

SIPART PS100	
- Metal pressure gauge, mechanics brass nickel-plated	IP44
- Stainless steel pressure gauge, mechanics stainless stee 316L	IP54
Connections, electrical	
• Screw terminals	2.5 mm^2 AWG30-14
• Cable bushing	M20x1.5 or ½-14 NPT with NPT adapter
Connections, pneumatic	G¼ or ¼-18 NPT
Controller	
Controller unit	
• Five-point switch	Adaptive
• Deadband	
- Adjustable maximum value	± 0.1 ... 3%, plus hysteresis (half of the deadband, but at least 0.2%)
- Minimization of the maximum value	Always active
Analog input (AI), terminals 6 and 7	
• Sampling interval	50 ms
• Resolution	0.05%
Position detection	
• Sampling interval	10 ms
• Resolution at 10 mm stroke	0.1%
• Temperature influence effect	0.1%/10 K (0.1%/18 °F)
Certificates and approvals	
DoC compliance	You can find the appropriate directives and standards, including the relevant versions, in the Declaration of Conformity on the internet.
UL conformity	The SIPART PS100 has documented compliance with the safety requirements in the USA and Canada. These are UL classified, recognized and listed.
Explosion protection	You can find details on explosion protection in the compact operating instructions and the explosion protection certificates.

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Dimensional drawings



Non-flameproof enclosure, dimensions in mm (inch)

More information

Documentation and certificates

All documentation and all available certificates are available free of charge in multiple languages through the QR code below:

Special designs

On request

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7/2	**Product overview**
7/4	**Acoustic and motion sensing**
7/4	Introduction
7/6	**Acoustic sensors**
7/6	SITRANS DA400 Acoustic diagnostic unit
7/12	SITRANS AS100 Acoustic sensor
7/17	SITRANS CU02 Control Unit
7/21	**Motion sensors**
7/21	SITRANS MFA 4p Motion failure alarm controller
7/29	SITRANS MSP-7 Motion sensor
7/32	SITRANS WM100 Motion sensor

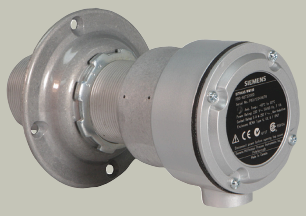
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Overview

	Application	Device description
Acoustic sensor for pump monitoring 	Acoustic diagnostics unit for flow valve leakage monitoring in oscillating displacement pumps or for material flow monitoring of bulk solids in pipes, conveyors or raceways.	**SITRANS DA400** • 4 inputs for structure-born noise sensors • 4 universal inputs • 6 digital outputs • With PROFIBUS DP or PROFIBUS PA • Sensor degree of protection IP66/IP68
Acoustic sensors for material flow monitoring 	Acoustic sensor for solids flow detection.	**SITRANS AS100** • Non-invasive • Screw in, bolt on, weld, or bond in place • Analog output • High and low sensitivity range of operation
	Alarm control unit for use with SITRANS AS100 acoustic sensor to provide reliable continuous protection for bulk solid flow. It processes signals from the sensor, providing relay and analog outputs for interface into a process.	**SITRANS CU02** • 3 digit LCD display • 4 ... 20 mA output • Two programmable relays • Adjustable independent time delay for each relay • DIN rail mounting provides easy installation

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Overview (continued)

Motions sensors	Application	Device description
	Highly sensitive single set point motion sensor alarm unit, used with MSP probes.	**Milltronics MFA 4p** • Probe/target separation up to 100 mm (4 inch) • Minimum velocity of moving ferrous target: 1 cm/sec. (2 fpm)
	Highly sensitive dual setpoint motion sensor system, used with Milltronics MSP probes.	**SITRANS WM300 MFA** • Up to 100 mm (4 inch) gap between target and probe. • Setpoint adjustment range 2 to 5 000 Hz (120 to 300 000 ppm
	Heavy duty 3-wire motion sensor that provides an NPN open collector output to PLCs.	**Milltronics MSP-7** • Up to 100 mm (4 inch) gap between target and probe • Corrosion resistant construction
	Heavy-duty zero speed alarm switch.	**SITRANS WM100** • Detects the absence or presence of motion of rotating or reciprocating or conveying equipment

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Overview

Process protection devices act as early warning systems to avoid costly process interruptions and breakdowns of equipment. Non-contacting motion sensors detect changes in motion and speed of conveying, reciprocating and rotating machinery.

Non-invasive acoustic sensors detect inaudible, high frequency acoustic emissions generated by friction and impact, caused by materials in motion. They can detect conditions of flow/no flow or high/low flow, to warn of blockages, product absence or equipment failure. They are located outside of the process, accurately detecting conditions without wear on the sensor.

Motion sensors can warn in case of equipment malfunction and shut down machinery in case of a slowdown or failure. They are rugged and perform even in harsh industrial conditions. Most of the MFA 4p motion sensing probes, as well as the SITRANS WM100, can be mounted up to 100 mm (4 inch) from the ferrous target, reducing the chance of damage to the probe and the equipment. The probes are not affected by moisture or dust build-up.

Mode of operation

Acoustic Sensing

Acoustic sensors monitor high frequency emissions generated by friction and the impact of flowing material or mechanical parts. The sensors can also sense the turbulence of gases or liquids leaking through valves and flanges. When matter vibrates between 0 Hz and 200 kHz, it creates acoustic energy. Sound energy between 20 Hz and 20 kHz can be detected by humans. Acoustic sensors detect high-frequency acoustic energy between 75 kHz and 175 kHz. Acoustic energy travels quickly through dense materials (metal) and poorly through less dense materials (air). Because the acoustic sensors are mounted directly to the external wall of the chute work, other plant noises are well below 75 kHz and effectively ignored by the sensors.

The acoustic sensors contain a specialized piezocrystal and filter circuit that responds effectively to the high-frequency band between 75 kHz and 175 kHz. As the crystal is excited by the acoustic energy, it produces a continuous electrical signal in direct proportion to the level of acoustic energy received. The SITRANS AS100 sensor output of 0 to 10 V DC can be applied to a PLC or to an optional control unit for a programmable alarm relay or 4 to 20 mA signal output.

Motion sensing

Siemens Milltronics probes work on the principle of Faraday's Laws of Electromagnetic Induction. When a ferromagnetic object enters the probe's permanent magnetic field, it distorts the flux, causing its coil windings to generate a voltage. This voltage is proportional to the strength of the magnet and the number of wire turns in the coil (constant in the probes) and the speed at which the ferrous target passes through the flux. The generated voltage is also inversely proportional to the square of the distance between the target and the probe.

The robust motion sensors provide the contacts to shut down machinery whenever under-speed, over-speed or plant equipment failure occurs. On belt, drag and screw conveyors, or on bucket elevators, fans and pumps, the speed alarm option can warn instantly of equipment malfunction. Some probes may be linked to a programmable logic controller to monitor equipment.

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Technical specifications

Process Protection Selection Guide

Criteria	SITRANS DA400	SITRANS AS100	Milltronics MFA 4p	SITRANS WM300 MFA	Milltronics MSP-7	SITRANS WM100
Typical industries	Mining, water/wastewater, chemicals/petrochemicals and oil & gas industry	Aggregates, grain, cement, food processing, power generation, steel processing	Aggregates, cement, mining, wastewater, grain	Mining aggregate, cement, and other primary and secondary industries.	General industrial applications	Aggregates, cement, mining
Typical Applications	Oscillating displacement pumps such as diaphragm piston pumps, piston pumps and hose-type diaphragm piston pumps. Monitoring of flowing materials in pipes, conveyors or channels.	Pipes, pneumatic conveyors, aerated gravity flow systems, burst filter bag detection	Tail pulleys, driven pulleys, motor shaft sensing, screw conveyor flights, bucket elevators	Tail pulleys, motor shaft sensing, screw conveyor flights, bucket elevators	Tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps	Tail pulleys, driven pulleys, motor shaft sensing, screw conveyor flights, bucket elevators
Operation	Acoustic detection of cavitation, optionally acoustic detection of impact noises of high frequency	Acoustic sensing	Motion sensing	Motion sensing	Motion sensing	Motion sensing
Enclosure	Electronics housing, Makrolon IP65, sensor, stainless steel material number 1.4571 (316Ti SST)	Compact 304 or 303 stainless steel, IP68	Type 4X/NEMA 4X/IP65 polycarbonate	Polycarbonate	Type 4X/NEMA 4X/IP67 aluminum	Type 4X/NEMA 4X/IP67 aluminum
Sensor mounting	Screw to outside of pump housing. For material flow monitoring on the outside of pipes, channels, chutes or raceways	Sensor non-invasive: glue or weld-on disc, bolt or weld-on tab, drill and tap	Non-contacting probes secured with supplied flange	Non-contacting probes secured with supplied flange	Non-contacting probe secured with supplied flange	Non-contacting, secured with supplied flange
Operating temperature	Electronics: -20 ... +60 °C (-4 ... +140 °F) Sensor: -20 ... +110 °C (-4 ... +230 °F)	-20 ... +80 °C (-4 ... +176 °F)[1]	-20 ... +50 °C (-4 ... +122 °F)[2]	-20 ... +50 °C (-4 ... +122 °F)	-40 ... +60 °C (-40 ... +140 °F)	-40 ... +60 °C (-40 ... +140 °F)
Power requirements	19 V ... 36 V DC, < 100 mA	20 ... 30 V DC, 18 mA	100/115/200/230 V AC ± 10 % 50/60 Hz, 15 VA	100 ... 240 V AC, 50/60 Hz, 0.7 ... 0.35 A per LOGO! power module	21 ... 28 V DC, 40 mA max.	115 or 230 V AC ± 10 % 50/60 Hz, 7 VA
Approvals	CE, PROFIBUS DP, and PROFIBUS PA conform, Ex protection to ATEX 1G or 1D	CE, RCM, CSA/FM Class II, Div. 1, Groups E, F, G optional, ATEX II, 2GD, 3D optional, EAC	$CSA_{US/C}$, CE, RCM	CE, CSA/$UL_{C/US}$, FM, EAC, RCM, KCC	CE, RCM	$CSA_{US/C}$, CE, RCM

[1] Extended temperature model -40 ... +125 °C (-40 ... +257 °F) available (CE version)
[2] Probes available for -40 ... +260 °C (-40 ... +500 °F)

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Overview



The SITRANS DA400 acoustic diagnostic unit acoustically measures the structure-borne noise

- In the version for pump monitoring; on oscillating displacement pumps
- In the version for material flow monitoring; on pipes, conveying equipment or channels.

It comprises an electric diagnostic unit and up to four acoustic sensors.

Benefits

Benefits when pump monitoring

- Increased availability of the system through:
  - Advanced maintenance planning thanks to early recognition of defective components
  - Reduced downtimes (no fault locating necessary)
  - Increased maintenance intervals
  - Greater pump reliability
- Prevention of expensive consequential damage
- Increased safety of critical applications
- Early recognition of a reduction in power
- Increased productivity

Benefits when material flow monitoring

- Detection of insufficient or excessive inflow of material in a liquid or gas flow
- Detection of blockages or clogging
- Reduction of down times
- Increased product quality
- Increased availability
- Guaranteed operational safety
- Increased productivity

Application

In the version for pump monitoring, the SITRANS DA400 allows continuous, simultaneous and independent monitoring of up to four flow control valves in a pump for leaks. In addition, another four inputs are available for monitoring standard signals (e.g. diaphragm and temperature monitoring). This means that the condition of an oscillating displacement pump is monitored in every phase of its operation.

The SITRANS DA400 is used in all industries where an oscillating displacement pump is used.

The version for material flow monitoring monitors the material flow in liquids or gases that is usually as a result of impact or friction, e.g. against the pipe or channel wall.

Function

Product features

Continuous and independent status monitoring:

- Of the flow control valves, for leaks
- Of the membranes, for material fatigue
- Of the temperature loading of the hydraulic oil
- Of flowing bulk solids in pipes, conveying equipment or channels

Communication of the status to superordinate control systems:

- Via digital outputs
- Digitally, via PROFIBUS DP

Simple to operate and parameterize:

- Locally, via digital display and keys
- PROFIBUS DP

Mode of operation

Principle of measurement

Leaks in the flow control valves of oscillating displacement pumps are flows in which cavitation occurs. This results in sound waves that are transmitted to the valve housing, where they are recorded by the structure-borne sound sensor in the SITRANS DA400 on the outside.

The SITRANS DA400 utilizes the fact that with both an open valve and a closed intact valve, no cavitation occurs and the measured sound level thus corresponds to the operating noise of the pump. By contrast, with a closed defective valve cavitation does occur, which can be identified by a period increase in the sound level (see figures). The measured value from the SITRANS DA400 corresponds exactly to this increase in the sound level.

In the version for material flow monitoring, SITRANS DA400 continuously detects high-frequency acoustic oscillations by means of structure-born noise sensors.

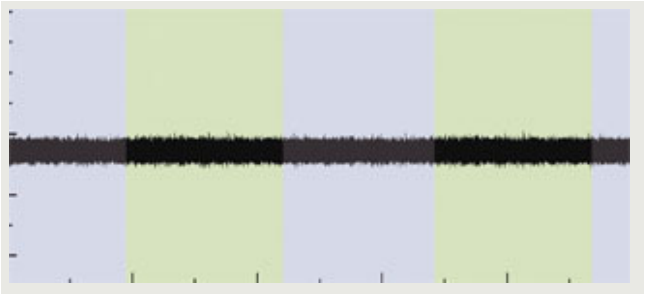
These oscillations are created by:

- Friction and impact of bulk solids in:
  - pipes, raceways or channels
  - chutes
  - conveyors
- Friction and impact of mechanical parts
- Bursting of bubbles
- Cavitation
- Turbulence in gas and liquid flows

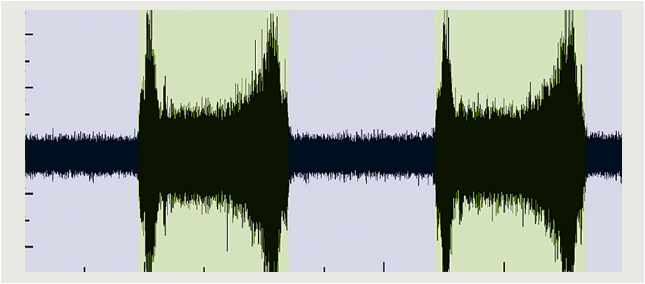
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Function (continued)

The following shows an example of signal levels at an oscillating displacement pump



Signal from structure-borne sound sensor with intact valve



Signal from structure-borne sound sensor with defective valve

Sensor operation

The structure-borne sound sensor works on the piezoelectric principle. The structure-borne sound is injected into the sensor via the sensor base (mounting surface) and inside it is converted into an electrical voltage by a piezo-ceramic element. This is amplified in the sensor and transmitted via the cable.

The sensor frequency range lies in the ultrasonic range (> 20 kHz). The sensor is non-directional, i.e. the angle at which the sound wave impacts on the sensor base is not important.

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Selection and ordering data

SITRANS DA400 Acoustic diagnostic unit Monitors material flow in pipes, leakage in valves or oscillating pumps with up to 4 independent acoustic sensors.	Article No. 7MJ240- ●	A	A	0	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Communication					
• PROFIBUS DP	1				
Application software					
For continuous condition monitoring of positive displacement pumps					1
For material flow monitoring in pipes, raceways and conveyors					2

SITRANS DA400 Acoustic diagnostic unit Monitors material flow in pipes, leakage in valves or oscillating pumps with up to 4 independent acoustic sensors.	Article No. 7MJ200- 1	A	●	0	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Cable **(incl. pin and allen screw M6)**					
20 m			B		
40 m			C		
100 m			F		

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Technical specifications

SITRANS DA400	
Input	
Acoustic channels	4
• Cycle time	10 ms
Universal inputs	4
• Cycle time	80 ms
• Low pass filter time	1 s
Universal analog current input	
• Load	< 105 Ω
• Resolution	0.1 %
• Accuracy	0.5 %
• Fault signal	> 21 mA or < 3.6 mA (at 4 ... 20 mA)
• Alarm monitoring hysteresis	0.5 %
• Static destruction limit	40 mA, 4 V
Universal input 24 V digital signal	
• Input resistance	> 19 kΩ
• Signal level Low	< 4.5 V or open
• Signal level High	> 7 V
• Hysteresis	> 1 V
• Static destruction limit	± 40 V
8.2 V source for NAMUR signal (DIN EN 60947-5-6)	
• Open circuit voltage	8.2 V ± 0.3 V, short-circuit proof
• Input resistance	< 950 Ω
• Static destruction limit for incorrect wiring	+20 V/-10 V
Output	
Digital outputs	6
• Semiconductor relay	Individually isolated, short circuit-proof
• Switching voltage	24 V AC/36 V DC, any polarity
• Destruction limit	35 V AC, 50 V DC
• Max. switching current	100 mA
Conditions of use	
Installation conditions	Vertical wall mounting, cables fed in from below
Climatic class	Class 4K4 according to EN 60721-3-4
Permissible ambient temperature	-20 ... +60 °C (-4 ... +140 °F)
Storage temperature	-20 ... +60 °C (-4 ... 140 °F)
Mechanical load	Class 4M3 according to EN 60721-3-4
Degree of protection to EN 60529	IP65
Electromagnetic Compatibility	
• Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21
Usage limits for water	
• Delivery side	≥ 10 bar a
• Number of strokes	Min. 4 min^{-1}, max. 10 ... 500 min^{-1}
Design	
Weight (without options)	Approx. 2.5 kg
Dimensions (W x H x D) in mm (inch)	172 x 320 x 80 (6.8 x 12.6 x 3.2)
Enclosure material	Polycarbonate
Electrical connection via screw terminals	• Rigid 2.5 mm (0.984 inch) • Flexible 1.5 mm (0.59 inch) • Flexible with connector sleeves 1.5 mm (0.59 inch)
Cable inlet via plastic cable joints	• 2 x Pg 13.5 • 5 x Pg 11
Power supply	
Rated voltage	24 V DC
Operating range	19 ... 36 V DC

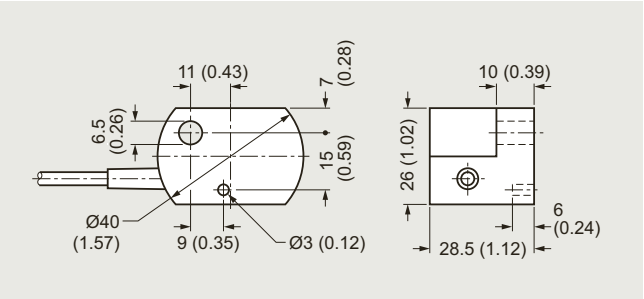
Technical specifications (continued)

SITRANS DA400	
Current consumption	< 100 mA
Communication	
PROFIBUS DP	RS 485, switchable terminating resistor
Protocol	Cyclic with Master C1 and acyclic with Master C2
PC parameterization software	SIMATIC PDM (not included in the scope of delivery)

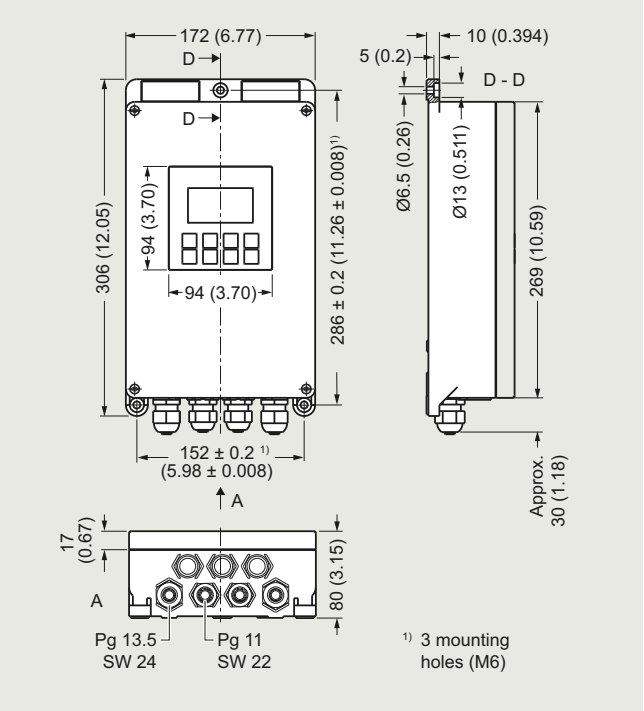
Sensor for SITRANS DA400	
Setup	• Piezoceramic sensor with pre-amplifier • Encapsulated electronics • 4-wire cable with anti-kink sleeve
Conditions of use	
Permissible ambient temperature	-40 ... +110 °C (-40 ... +230 °F)
Degree of protection to EN 60529	P66/IP68
Mechanical load	Class 4M7 according to EN 60721-3-4
Climatic class	Class 4K4 according to EN 60721-3-4
Design	
Housing material	Stainless steel 1.4571 (316Ti SST)
Cable	Ends with wire protectors and cable shoe for connection to the SITRANS DA400
Weight	125 g (0.276 lb)
Dimensions (W x H x D) in mm (inch)	26 x 29 x 40 (1.02 x 1.14 x 1.57)
Power Supply	Power fed from device

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Dimensional drawings



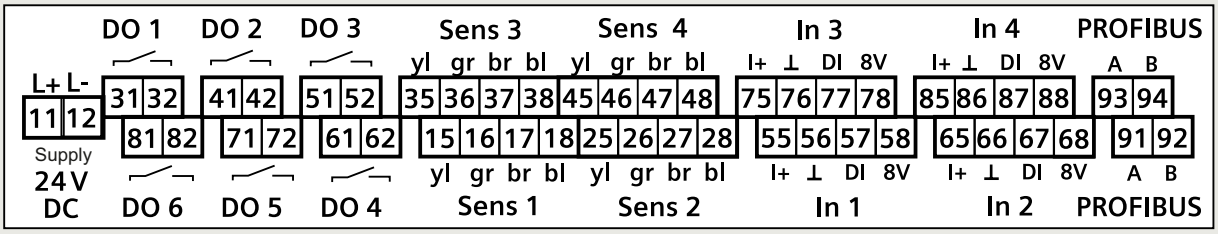
Sensor for SITRANS DA400, dimensions in mm (inch)



SITRANS DA400, dimensions in mm (inch)

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Circuit diagrams



L+/L-	Power supply	In	Input	⊥	Ground
DO	Digital output	yl	Yellow	DI	Digital input
Sens	Sensor	gr	Green	A	Signal A (green) with PROFIBUS DP
		br	Brown	B	Signal B (red) with PROFIBUS DP
		bl	Black		
		I+	Analog current input +		

SITRANS DA400, terminal assignment

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Overview



SITRANS AS100 is an acoustic sensor used for solids flow detection.

Benefits

- Non-invasive
- Screw in, bolt on, weld, or bond in place
- Analog output
- High and low sensitivity range of operation

Application

SITRANS AS100 detects changes in high frequency sound waves from equipment and materials in motion. It detects and reacts instantly to changes in solids flow to warn of blockages, product absence, or equipment failure such as burst filter bags. This allows an operator to take early preventative action and avoid costly damage.

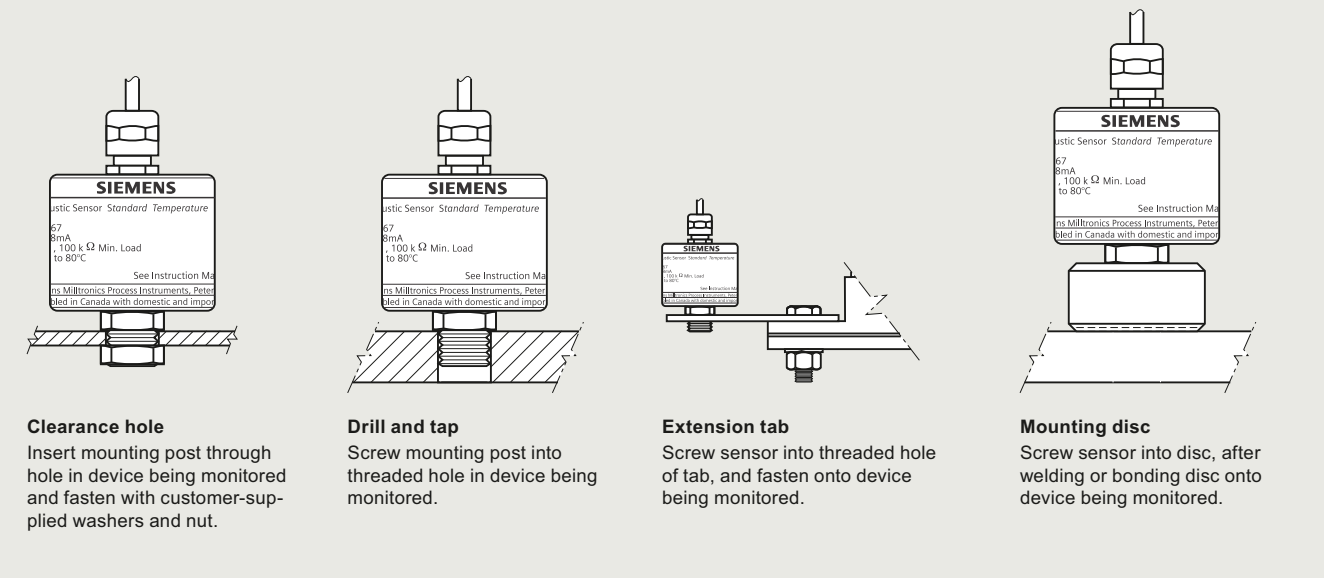
Common applications include pellets, powders and most bulk solids in pipes, chutes, vibratory feeders, pneumatic conveyors or aerated gravity flow systems.

Operating with a SITRANS CU02 control unit, the system detects conditions of high flow, low flow or no flow. It can be added to a control loop via a 4 to 20 mA output. Two relays are fully programmable and independent of each other and can be used to operate an alarm or control device.

With no moving parts and a type 304 or 303 stainless steel enclosure sealed against dust and moisture, this non-invasive unit requires little or no maintenance. With a dual operating range, the sensor offers an exceptionally wide range of application capabilities.

- Key applications: pipes, chutes, vibratory feeders, aerated gravity flow systems, burst filter bag detection

Design



SITRANS AS100 mounting

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Selection and ordering data

SITRANS AS100 Acoustic sensor Non-invasive, for detection of solids flow.	Article No. 7MH75-60-	●	●	●	0	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Sensor						
Standard temperature range [-20 ... +80 °C (-4 ... +176 °F)][1]		1				
Extended temperature range [-40 ... +125 °C (-40 ... +257 °F)][2]		3				
Extended temperature range [-30 ... +120 °C (-22 ... +248 °F)][3]		4				
Cable Length						
4 m (13.12 ft)			A			
Sensor Mounting						
None				A		
Mounting disk				B		
Mounting tab				C		
Approvals						
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA, RCM, EAC, KC						1
CSA/FM Class II, Div. 1, Group E, F, and G (includes ½" NPT female fitting)						3
CSA Class II, Div. 1, Group E, F, and G (includes ½" NPT female fitting)						4
FM/CSA Class II, Div. 1, Groups E, F, & G; ATEX II 3D, Ex tc IIIC T100°C Dc, Ta 0= -20°C to +80°C, IP68 (includes M20 female fitting); UKEX II 3D, Ex tc IIIC T100°C Dc, Ta = -20°C to +80°C, IP68 (includes M20 female fitting); EAC Ex Ex tc IIIC T100°C Dc; CE, UKCA, RCM						5
ATEX II 2 G Ex d IIC T4 Gb, c/w cable gland; ATEX II 2 D Ex tb IIIC T100°C Db, c/w cable gland; EAC Ex 1Ex db IIC T4 Gb; EAC Ex Ex tb IIIC T100°C Db[4]						6

[1] Available with approval options 1, 3, 5, and 6 only.
[2] Available with approval option 1 only.
[3] Available with approval option 4 only.
[4] Available with sensor option 1 only and sensor mounting option A only.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Manufacturer's test certificate: According to EN 10204-2.2	**C11**
Acrylic coated, stainless steel tag [12 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	**Y17**

Spare Parts	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Mounting tab	**7MH7723-1AA**
Mounting disk	**7MH7723-1AB**
½" NPT adapter kit for standard temperature range sensor, not Class II approved	**7MH7723-1BW**
M20 adapter kit for standard temperature range sensor, not Class II or ATEX and UKEX approved	**7MH7723-1BV**
½" NPT adapter kit for extended temperature range sensor, not Class II approved Note: Adapter kits are not CSA Class II approved	**7MH7723-1BX**

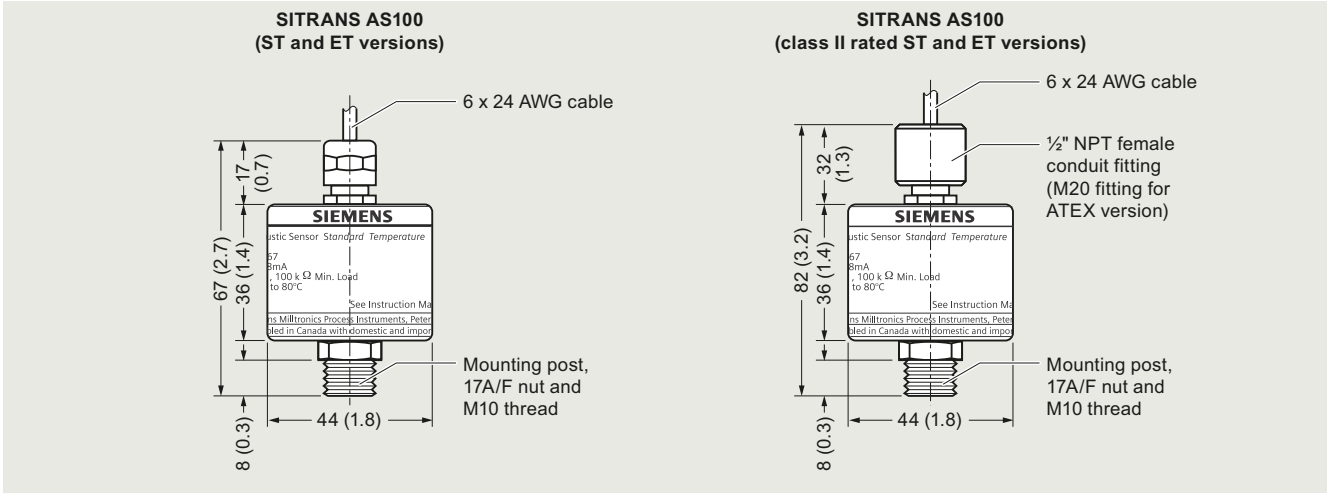
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Technical specifications

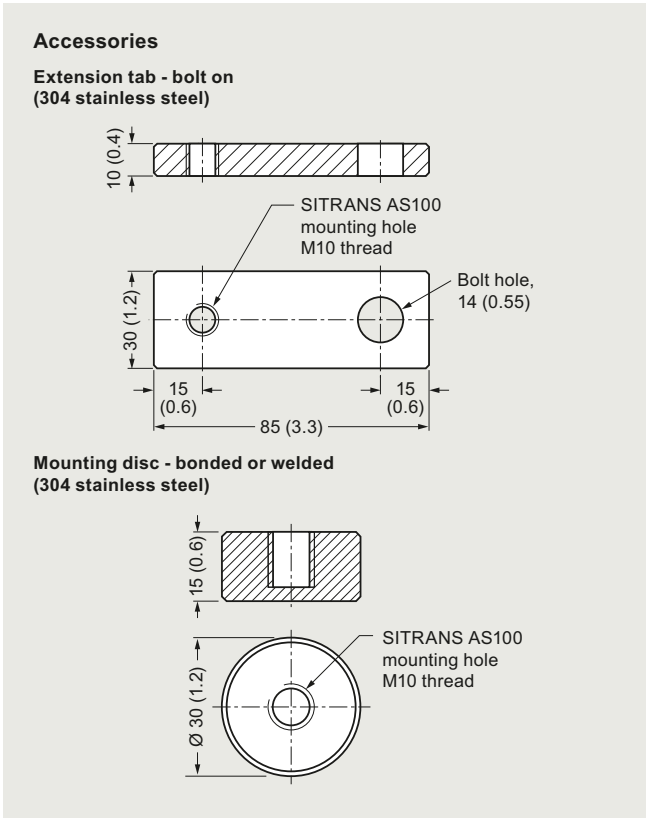
SITRANS AS100 Acoustic sensor	
Mode of Operation	
Operating principle	Acoustic sensing of high frequency emissions caused by impact or friction
Typical application	• Detects burst filter bags in dust collection systems • Detects material being conveyed in pneumatic conveyor lines • Route confirmation in chute work
Model	
Standard	Standard operating temperature range
Extended	Extended operating temperature range
Operation	
Relative sensitivity	0.5 %/°C of reading, average over the operating range
Outputs	Analog, 0.08 ... 10 V DC nominal, 100 kΩ minimum load impedance
Rated operating conditions	
Amb. temperature for enclosure	
• Standard	-20 ... +80 °C (-4 ... +176 °F)
• Extended	• -40 ... +125 °C (-40 ... +257 °F) (CE and UKCA only) • -30 ... +120 °C (-22 ... +248 °F) option
Storage temperature	
• Standard	-20 ... +80 °C (-4 ... +176 °F)
• Extended	• -40 ... +125 °C (-40 ... +257 °F) (CE and UKCA only) • -30 ... +120 °C (-22 ... +248 °F) option
Design	
Weight	0.4 kg (1 lb)
Enclosure	Enclosure: 304 (1.4301) stainless steel [303 stainless steel (1.4305) on Class II version, aluminum 231 on 2GD version]
Degree of protection	IP68 (waterproof)
Cable	
• Standard	4 m (13 ft) cable, PVC jacketed, 3 twisted pairs, 24 AWG (0.25 mm^2), shielded
• Extended	4 m (13 ft) cable, thermoplastic elastomer jacketed, 6 conductor, 24 AWG (0.25 mm^2) conductor, shielded
Power supply	20 ... 30 V DC, 18 mA (typical)
Certificates and approvals	CE, UKCA, RCM, EAC, KC, CSA/FM, Class II, Div. 1, Groups E, F, G (optional), ATEX II 2GD (optional), ATEX II 3D (optional), UKEX II 3D (optional), EAC Ex

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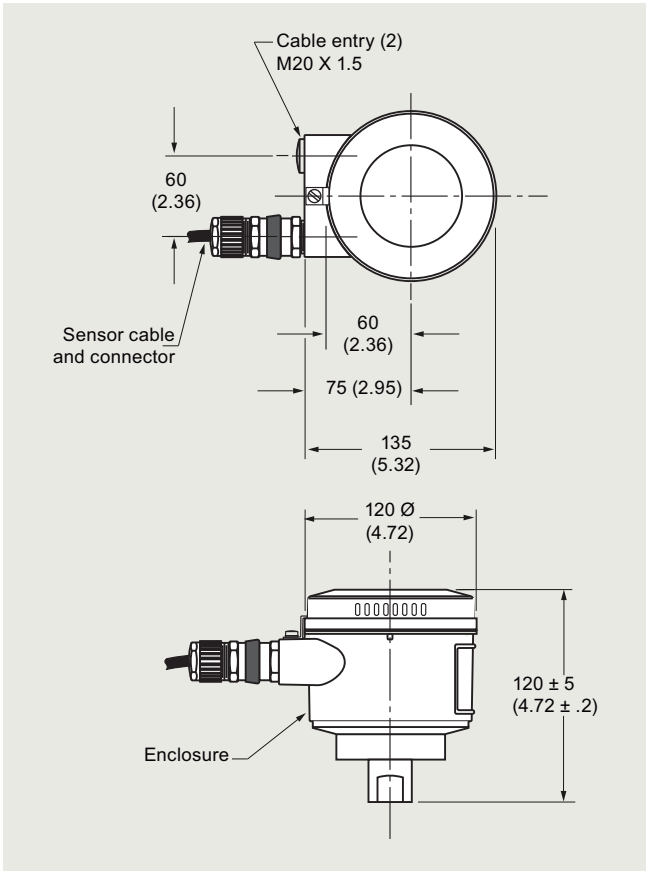
Dimensional drawings



SITRANS AS100, dimensions in mm (inch)



SITRANS AS100 accessories, dimensions in mm (inch)

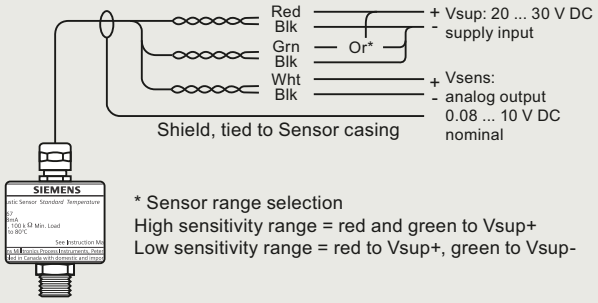


SITRANS AS100 (2D, 2G, XP version), dimensions in mm (inch)

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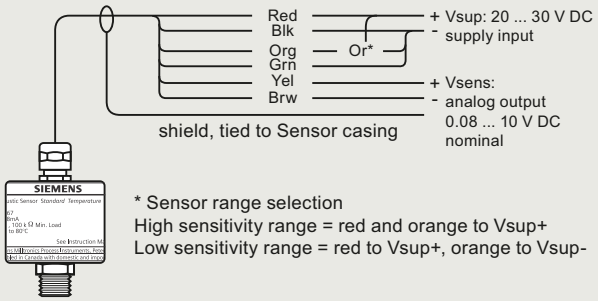
Circuit diagrams

Standard temperature range



* Sensor range selection
High sensitivity range = red and green to Vsup+
Low sensitivity range = red to Vsup+, green to Vsup-

Extended temperature range



* Sensor range selection
High sensitivity range = red and orange to Vsup+
Low sensitivity range = red to Vsup+, orange to Vsup-

Interconnection
The longer the cable, the more susceptible it is to noise and earth loops. It is therefore recommended to use cable with heavy gauge conductors and good RF/electrical shielding (copper braid rather than drain and foil). A proper junction box close to the sensor is an ideal location not only to extend the cable but also to configure the wiring for high or low sensitivity range operation.
The following table provides a guideline for suitable wire gauges where distances are considerable.

Max. distance between sensor and supply
(24 V or Control Unit).

	Wire size		Distance	
AWG	mm	mm^2	meters	feet
24	7 x 0.20	0.25	500	1 600
22	7 x 0.25	0.35	800	2 600
20	10 x 0.25	0.5	1 200	3 900

SITRANS AS100 connections

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Overview



SITRANS CU02 is an alarm control unit, for use with SITRANS AS100 acoustic sensor, that provides reliable continuous protection for bulk solids flow.

Benefits

- 4 to 20 mA output
- Two programmable relays
- Adjustable independent time delay for each relay
- Adjustable start-up time delay
- DIN rail mounting provides easy installation
- Built-in password protection to parameters

Application

SITRANS CU02 receives a 0 to 10 V DC input signal from the SITRANS AS100 sensor, providing relay and analog outputs for interface into a process.

- Key applications: with SITRANS AS100 for bulk solids flow

Function

The system can be readily configured for set points indicating such conditions as high flow, low flow or no flow. Alternatively, it can be added to a control loop via a 4 to 20 mA isolated output for trend monitoring proportional to the signal from the sensor.

Two relays are fully programmable and independent of each other and can be used to operate an alarm or control device. Alarming may be provided above or below a setpoint or within a band. Readings are also displayed locally by the SITRANS CU02 on its LCD.

The SITRANS CU02 may be mounted up to 500 m (1 500 ft) from the sensor.

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Selection and ordering data

SITRANS CU02 Control unit Set-point alarm controller, for use with AS100 acoustic sensor.	Article No. 7MH75-62-	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
Power Supply				
100 V AC		**1**		
115 V AC		**2**		
200 V AC		**3**		
230 V AC		**4**		
Enclosure				
Standard DIN Rail			**A**	
Approvals				
Ordinary Locations/General Purpose (Non-Ex), $_{C}CSA_{US}$, CE, UKCA, RCM, KC				**A**

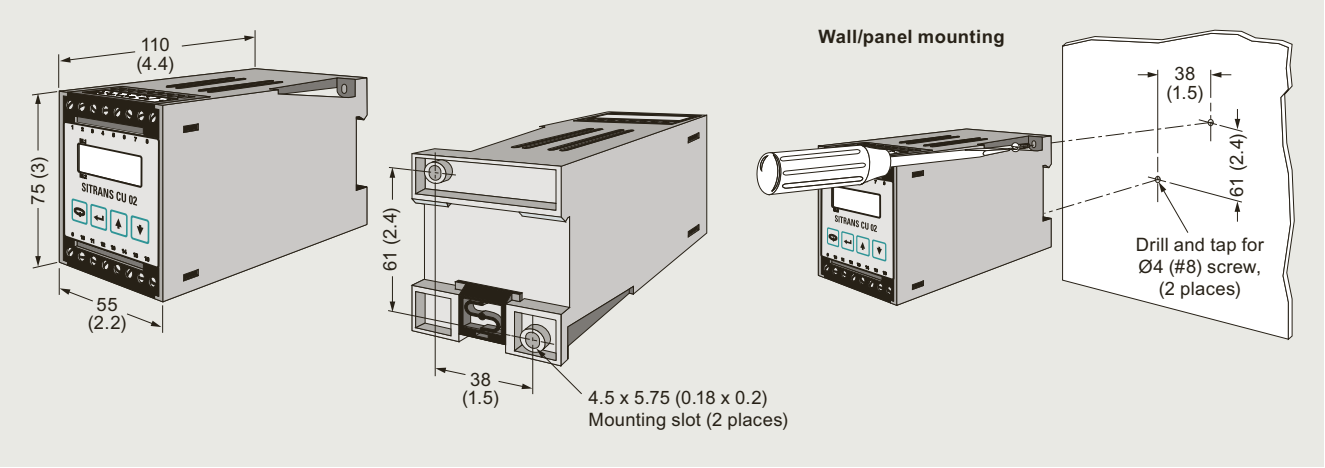
Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Manufacturer's test certificate: According to EN 10204-2.2	**C11**
Acrylic coated, stainless steel tag [38 x 51 mm (1.5 x 2 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	**Y18**
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

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Technical specifications

SITRANS CU02 Control unit	
Mode of operation	
Measuring principle	Controller for acoustic sensing (SITRANS AS100)
Typical application	Connects to SITRANS AS100 to detect burst filter bag
Input	0 ... 10 V DC, from sensor
Output	
Output signal	4 ... 20 mA isolated output, 2 Form C relays - latching or non-latching - 5 amp at 250 V AC non-inductive
Sensor excitation	26 V DC
Max. load	750 Ω
Rated operating conditions	
Installation conditions	
• Location	Indoor
Ambient conditions	
• Ambient temperature for enclosure	-20 ... +50 °C (-4 ... +122 °F)
• Storage temperature	-20 ... +50 °C (-4 ... +122 °F)
• Relative humidity	80 % for temperatures up to 50 °C (122 °F)
• Degree of protection	IP20
• Installation category	II
• Pollution degree	2
Design	
Weight	550 g (18 oz)
Dimensions (W x H x D)	55 x 75 x 110 mm (2.2 x 3 x 4.4 inch)
Material enclosure	Polycarbonate
Mounting	DIN Rail (DIN 46277 or DIN EN 50022), or wall mount, up to 500 m (1 500 ft) from sensor
Cable	2 twisted pair, 24 AWG (22 mm^2), shielded. Mount up to 500 m (1 500 ft) from sensor
Display	Liquid crystal, three digits, 9 mm (0.35 inch), high and multi-segment graphic symbols for operation status
Power supply	
Supply voltage	100, 115, 200, 230 V AC ± 15 %, 50/60 Hz, factory set
Power consumption	Max. 10 VA
Approvals	$_{c}CSA_{US}$, CE, UKCA, RCM, KC

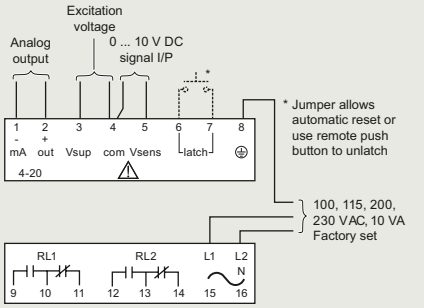
Dimensional drawings



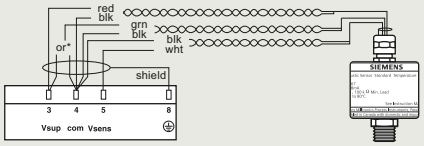
SITRANS CU02, dimensions in mm (inch)

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Circuit diagrams

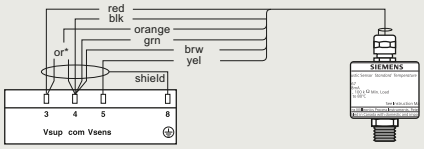


Standard temperature version



* Sensor range selection
High sensitivity range = green to 'Vsup'
Low sensitivity range = green to 'com'

Extended temperature version



* Sensor range selection
High sensitivity range = orange to 'Vsup'
Low sensitivity range = orange to 'com'

Mounting
Installation shall only be performed by qualified personnel and in accordance with local governing regulations.
This product is susceptible to electrostatic shock. Follow proper grounding procedures.

Interconnection
All field wiring must have insulation suitable for at least 250 V.
Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
The maximum allowable working voltage between adjacent relay contacts shall be 250 V. If sensor case is grounded, do not connect shield of cable to SITRANS CU02 ground terminal.

SITRANS CU02 connections

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Overview



MFA 4p motion failure alarm controller is a highly sensitive single setpoint motion sensor system, used with SITRANS MSP probes.

Benefits

- Up to 100 mm (4 inch) gap between target and probe
- Switch selectable overspeed or underspeed detection
- Setpoint adjustment 0.15 to 3 000 PPM (pulses/minute)
- Adjustable start-up time delay
- Visual indication of probe operation and relay status
- General purpose, suitable for majority of industrial applications; rugged probe designs provide unmatched reliability

Application

The MFA 4p detects changes in the motion and speed of rotating, reciprocating or conveying equipment. It warns of equipment malfunction and signals through contacts to shut down machinery in case of a slowdown or failure. Its reliability makes it a cost-effective way to protect valuable process equipment.

The single setpoint system suits most industrial applications. This versatile unit can be used on tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps.

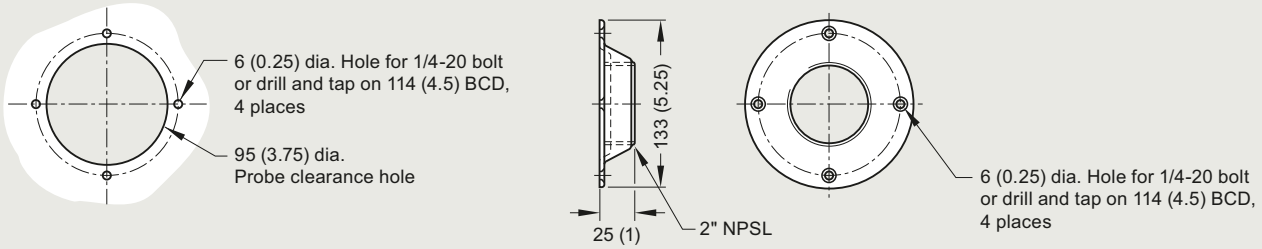
A special feature is the adjustable 0 to 60 second time delay, allowing the monitored device to accelerate to normal running speed before monitoring begins. A wide range of probes are available to suit specific needs, including high temperatures and corrosive installations. The CE and UKCA approval allows the MFA 4p to consistently meet the needs of the mining aggregate, cement and other primary and secondary industries.

- Key Applications: tail pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

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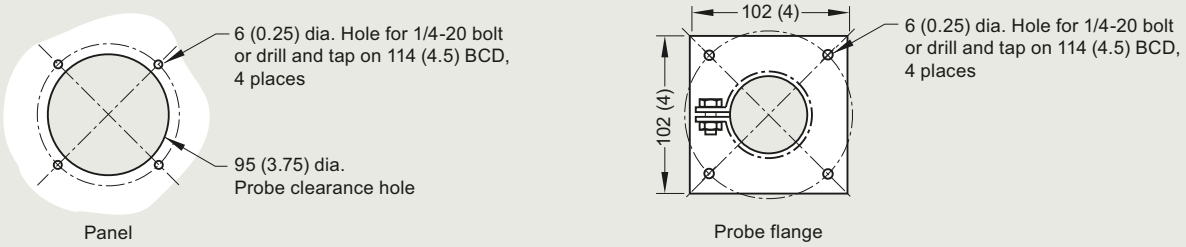
Design

Mounting for SITRANS MSP-12, MSP-3, XPP-5



Note: Mounting flange supplied with probe.

Mounting for SITRANS MSP-9



SITRANS MSP-12, MSP-3, MSP-9, XPP-5 mounting, dimensions in mm (inch)

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Design (continued)



Standard SITRANS MSP-12
- Heavy-duty general purpose motion probe
- Long lasting aluminum body with internal amplifier
- Convenient mounting flange and locknut for fast installation and setup
- Temperature rating: -40 ... +60 °C (-40 ... +140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67



SITRANS XPP-5
- CSA hazardous approval (Class I, Div. 1, Groups A, B, C, D; Class II Div. 1, Groups E, F, G; Class III)
- Aluminum body that is fully potted
- Convenient mounting flange and locknut
- 3/4" NPT male hub connection
- Operating temperature from -40 ... 60 °C (-40 ... 140 °F)
- Enclosure rating: Type/NEMA 4X,6, IP67



High temperature SITRANS MSP-3
- Heavy-duty, high temperature aluminum probe designed to withstand operating temperatures from -50 ... 260 °C (500 °F)
- Cast aluminum probe with convenient mounting flange and locknut
- 1.5 m (5 ft) of high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Amplifier remote mounted in enclosure 140 x 140 x 100 mm (5.5 x 5.5 x 4 inch), available in cast aluminum (½" NPT conduit entry), painted steel (Type/NEMA 4, IP65 rating), or stainless steel (Type/NEMA 4X, IP65 rating)
- Amplifier temperature rating -40 ... +60 °C (-40 ... +140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67



Stainless high temperature SITRANS MSP-9
- Heavy-duty, high temperature 304 stainless steel probe
- Special construction allows operation of probe in environment from -50 ... 260 °C (500 °F)
- 1.5 m (5 ft) special high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Amplifier remote mounted in enclosure 140 x 140 x 100 mm (5.5 x 5.5 x 4 inch), available in cast aluminum (½" NPT conduit entry), painted steel (Type/NEMA 4, IP65 rating), or stainless steel (Type/NEMA 4X, IP65 rating)
- Enclosure rating: Type/NEMA 4X, 6, IP67
- Amplifier temperature rating -40 ... +60 °C (-40 ... +140 °F)



SITRANS RMA (Remote Mounted Amplifier)
- Available for internal mounting within Probe, or in enclosure for remote mounting
- Enclosures available in cast aluminum (½" NPT entry), painted steel (Type/NEMA 4 rating) or stainless steel (Type/NEMA 4X, IP65 rating)
- Operating temp. from -40 ... +60 °C (-40 ... +140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67

SITRANS motion probes

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Selection and ordering data

SITRANS MFA 4p Motion failure alarm controller Set-point alarm controller, for use with MSP motion probes.	Article No. 7MH71- 44-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Enclosure					
NEMA 4X, polycarbonate enclosure		1			
NEMA 4, painted mild steel enclosure		2			
NEMA 4X, 304 (1.4301) stainless steel enclosure		3			
Input Voltage					
100 ... 240 V AC, ± 10 %, 50/60 Hz, 15 VA			A		
Speed detection version					
Standard, underspeed (U/S) or overspeed (O/S), switch selectable				A	
Slow speed (S/S), U/S or O/S detection, switch selectable (limit of 15 ppm)				B	
Approvals					
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA, RCM, KC, $_{C}CSA_{US}$, FM					2

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Manufacturer's test certificate: According to EN 10204-2.2	**C11**
Acrylic coated, stainless steel tag [69 x 50 mm (2.7 x 1.97 inch)]: Measuring-point number/id-entification (max. 27 characters), specify in plain text	**Y15**
Painted mild steel, heated enclosure with viewing window for use down to -50 °C (-58 °F) (finished unit is mounted inside enclosure) [483 x 584 x 203 mm (19 x 23 x 8 inch)]	**A35**
Stainless steel, sun/weather shield (finished unit is field mounted inside enclosure) [357 x 305 x 203 mm (14 x 12 x 8 inch)]	**S50**

Spare parts	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Circuit Card, standard	**7MH7723-1DU**
Circuit Card, Slow speed	**7MH7723-1DV**
Lid with overlay for MFA 4p	**7MH7723-1GY**

SITRANS RMA Remote mounted amplifier Remote mounted amplifier for SITRANS MSP-3 and MSP-9 motion sensing probes.	Article No. 7MH71- 45-	0	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Enclosure			
Aluminum enclosure, IP65, Type/NEMA 4X, ½" NPT entry			A
Painted steel, Type/NEMA 4, IP65 rating			C
304 (1.4301) stainless steel enclosure, Type/NEMA 4X, IP65 rating			D

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Manufacturer's test certificate: According to EN 10204-2.20	**C11**
Acrylic coated, stainless steel tag [38 x 51 mm (1.5 x 2 inch)]: Measuring-point number/id-entification (max. 16 characters), specify in plain text	**Y18**

Spare parts	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Card, RMA	**7MH7723-1DT**

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Selection and ordering data (continued)

SITRANS Motion sensing probes Heavy duty, 100 mm measuring range, for use with RMA, MFA 4p, WM300 MFA, or other control. Note: SITRANS MSP-3 and MSP-9 probes require the use of SITRANS RMA (amplifier)	Article No. 7MH71-46-	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
Cable Length				
Standard length (as described in Model options)[1]		**0**		
Add Order code Y01 and plain text: "Total cable length ... m"				
Extended cable length 2 000 ... 30 000 mm (79.2 ... 1 181 inch)[2]		**1**		
Extended cable length 30 001 ... 50 000 mm (1 181 ... 1 969 inch)[4]		**2**		
Extended cable length 50 001 ... 100 000 mm (1 969 ... 3 937 inch)[4]		**3**		
Model [standard cable length/type]				
MSP-3, ½" NPT cable inlet[3] [1.5 m (5 ft) high temperature cable]			**B**	
MSP-9 [1.5 m (5 ft) high temperature cable][3]			**D**	
MSP-12, ½" NPT cable inlet, no cable			**E**	
XPP-5 [1.5 m (5 ft) cable, (CSA Class I, Groups A, B, C and D; Class II Groups E, F, and G)]			**G**	
XPP-5 [10 m (32.8 ft) cable, (CSA Class I, Groups A, B, C, and D; Class II Groups E, F, and G)]			**H**	
XPP-5 [15 m (49.2 ft) cable, (CSA Class I, Groups A, B, C, and D; Class II Groups E, F, and G)]			**J**	
Approvals				
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA, RCM, KC				**A**

[1] No Y01 needed in Order code for standard length.
[2] Only available with model options B, D, G, H, J.
[3] MSP-3 and MSP-9 probes required the use of RMA (amplifier).
[4] Available with Model options G, H, and J only.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total cable length: enter the total cable length in plain text description	**Y01**
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	**Y17**
Cable gland kit	**A57**
Manufacturer's test certificate: According to EN 10204-2.2	**C11**

Spare parts	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Locknut, for MSP-3, MSP-7, MSP-12, XPP-5	**7MH7723-1CR**
Mounting flange, for MSP-3, MSP-7, MSP-12, XPP-5	**7MH7723-1CS**
Mounting bracket for MSP-9	**7MH7723-1CT**
Lid, 1/2" NPT cable inlet for MSP-3, MSP-7, MSP-12	**7MH7723-1CU**
Lid for MSP-9	**7MH7723-1CV**
Lid gasket, for MSP-3, MSP-9	**7MH7723-1CW**
Lid gasket, for MSP-7, MSP-12	**7MH7723-1CX**
Motion cable gland adaptor kit	**7MH7723-1JU**

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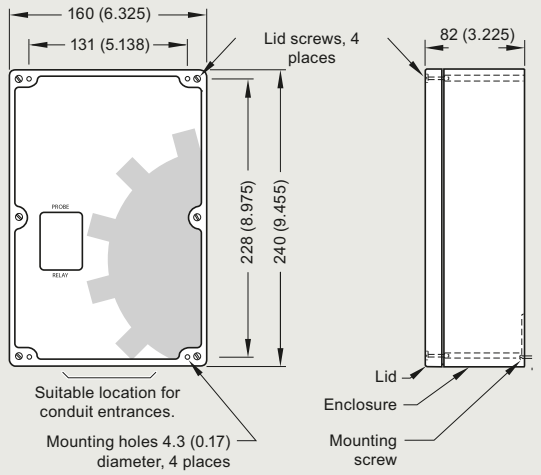
Technical specifications

SITRANS MFA 4p Motion failure alarm controller	
Mode of operation	
Measuring principle	Motion monitor and alarm
Typical application	Monitoring loss of motion in tail pulley, screw flights, bucket elevators
Features	• Switch selectable overspeed or underspeed detection • Setpoint adjustment: 0.15 ... 3 000 PPM • Adjustable start-up time delay: 0 ... 60 seconds • Visual indication of probe operation and relay status
Output	2 relays working in unison, each providing 1 SPDT Form C relay contact, rated 8 A at 250 V AC resistive
Performance	
Repeatability	± 1 %
Dead band	± 0.25 %
Dynamic Range	0 ... 7 200 PPM
Ambient Temperature Range	-20 ... +50 °C (-5 ... +122 °F)
Storage temperature	-20 ... +50 °C (-5 ... +122 °F)
Design	
Enclosure rating	Type 4X/NEMA 4X/IP65 (standard and optional stainless steel) Type 4/NEMA 4/IP65 (optional mild steel)
Enclosure dimensions	160 x 240 x 82 mm (6.3 x 9.5 x 3.2 inch) Optional: mild steel or 304 (1.4301) stainless steel 203 x 254 x 102 mm (8 x 10 x 4 inch)
Enclosure material	Polycarbonate Optional: mild steel or stainless steel
Power Supply	100 ... 240 V AC, 50/60 Hz, 15 VA, ± 10 % of rated voltage
Certificates and approvals	CE, UKCA, RCM, KC, $_{C}$CSA$_{US}$, FM

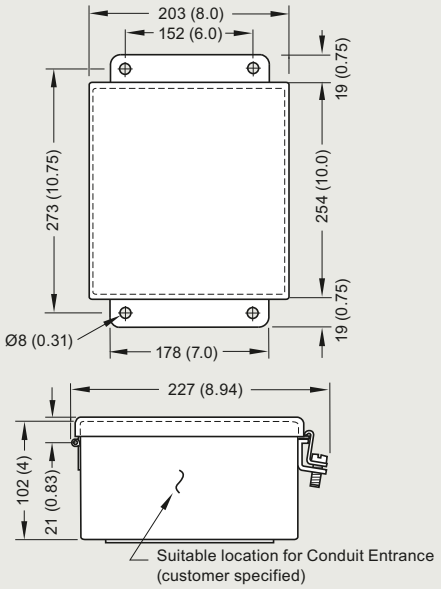
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Dimensional drawings

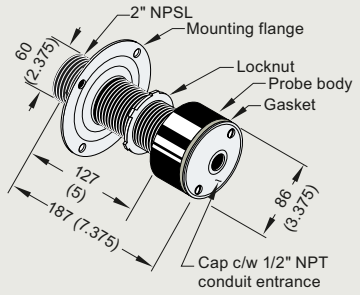
Type 4X/NEMA 4X/IP65 Polycarbonate Enclosure



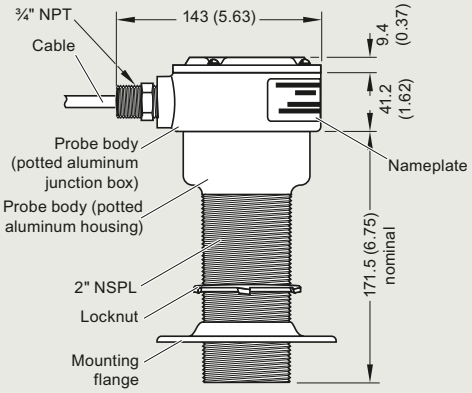
Type 4/NEMA 4/IP65 Painted Steel Enclosure & Type 4X/NEMA 4X/IP65 Stainless Steel Enclosure



Standard Probe MSP-12



Hazardous Locations XPP-5

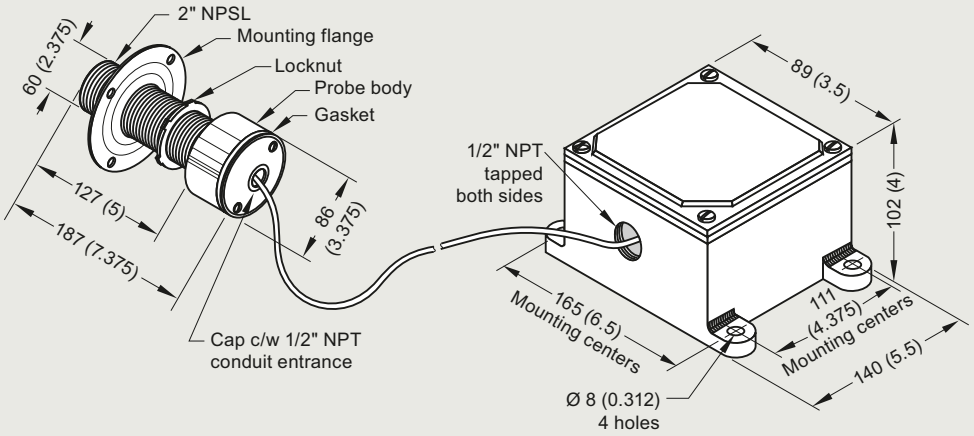


SITRANS MFA 4p and probe, dimensions in mm (inch)

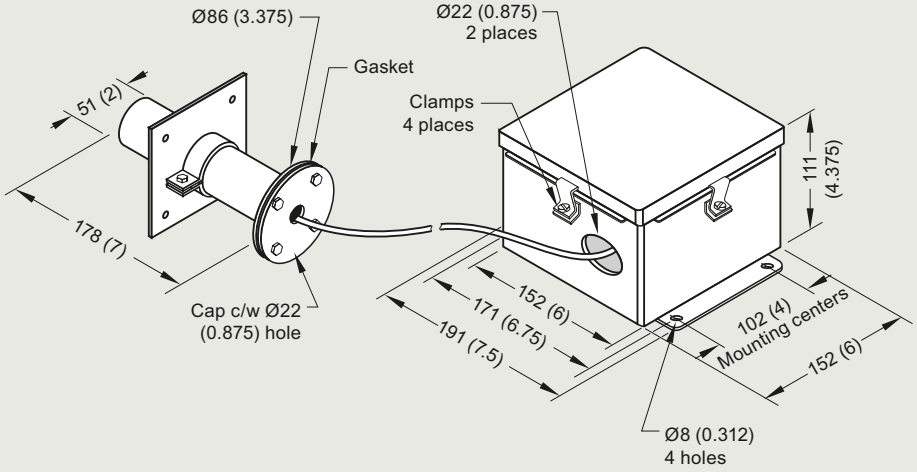
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Dimensional drawings (continued)

High temperature probe MSP-3



High temperature stainless steel probe MSP-9



SITRANS probes, dimensions in mm (inch)

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Overview



SITRANS MSP-7 is a heavy-duty 3-wire motion sensor that provides an NPN open collector output to PLCs.

Benefits

- Up to 100 mm (4 inch) gap between target and probe
- Corrosion resistant construction
- General purpose, suitable for majority of industrial applications; rugged probe designs provide unmatched reliability

Application

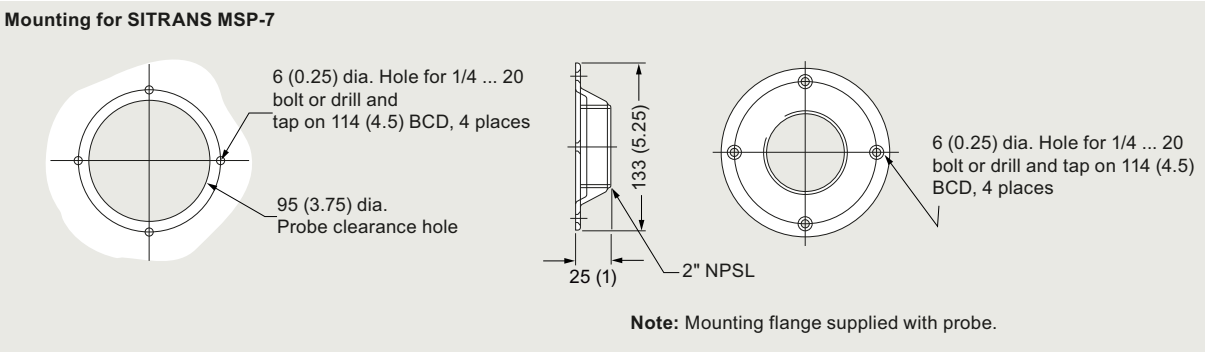
The MSP-7 motion sensing probe can detect changes in the rotation and movement of ferrous equipment. When connected to a PLC it can warn of malfunction and signals to stop or slow down equipment, preventing costly failure or downtime. Its reliability makes it a very cost effective sensor.

The single setpoint system suits most industrial applications. This versatile unit can be used on tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps.

An NPN open collector 3-wire output allows for versatile connection to most PLC models and a large dynamic range ensures that the MSP-7 can detect changes in target speed for a variety of applications.

- Key Applications: tail pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

Design



Mounting for SITRANS MSP-7, dimensions in mm (inch)

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Selection and ordering data

SITRANS Motion sensing probes Heavy duty, 100 mm measuring range, for use with WM300 MFA, or other control.	Article No. 7MH7146-	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
Cable Length				
Standard length (as described in Model options)[1]		0		
Add Order code Y01 and plain text: "Total cable length ... m"				
Extended cable length 2 ... 30 m (6.6 ... 98.4 ft)		1		
Model [standard cable length/type]				
MSP-7, ½" NPT cable inlet [1.5 m (5 ft) cable]			K	
Approvals				
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA, RCM, KC				A

[1] No Y01 needed in Order code for standard length.

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Total cable length: enter the total cable length in plain text description	**Y01**
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	**Y17**
Cable gland kit	**A57**
Manufacturer's test certificate: According to EN 10204-2.2	**C11**

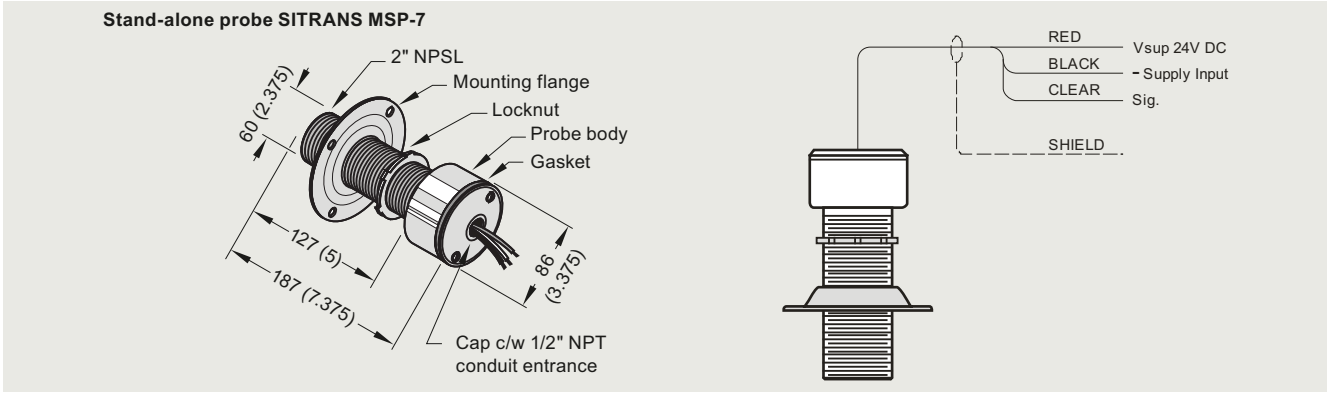
Spare parts	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare Parts	
Locknut, for MSP-3, MSP-7, MSP-12, XPP-5	**7MH7723-1CR**
Mounting flange, for MSP-3, MSP-7, MSP-12, XPP-5	**7MH7723-1CS**
Lid, 1/2" NPT cable inlet for MSP-3, MSP-7, MSP-12	**7MH7723-1CU**
Lid gasket, for MSP-7, MSP-12	**7MH7723-1CX**
Motion cable gland adaptor kit	**7MH7723-1JU**

Technical specifications

SITRANS MSP-7 Motion sensor	
Measuring principle	Magnetic
Typical application	Monitoring loss of motion in tail pulley, screw flights, bucket elevators
Features	• Rugged corrosion resistant aluminum body • Low voltage operation • Large dynamic range • Threaded body for finite adjustment
Output	NPN open collector, 2 kΩ pull up to input voltage, 330 Ω impedance, 40 mA max.
Performance	
Repeatability	± 1 %
Dead band	± 0.25 %
Dynamic Range	0 ... 7 200 PPM
Ambient Temperature Range	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Design	
Enclosure rating	Type 4X/NEMA 4X/IP67
Power Supply	21 ... 28 V DC, 40 mA max.
Certificates and approvals	CE, UKCA, RCM, KC

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Dimensional drawings



Stand-alone probe SITRANS MSP-7, dimensions in mm (inch)

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Overview



SITRANS WM100 is a heavy-duty zero-speed alarm switch. This non-contacting unit provides cost-effective equipment protection even in the harshest conditions.

Benefits

- Up to 100 mm (4 inch) gap between SITRANS WM100 and targets
- Rugged, low maintenance suitable for tough environments
- 1 SPDT Form C relay contact
- Provides cost-effective protection
- Visual indication of target triggered pulse

Application

This rugged unit is impervious to dust, dirt, build-up and moisture and is ideal for such primary industries as mining, aggregate, and cement. Operating where other systems are prone to failure, the non-contacting design eliminates the need for lubricating, cleaning and part replacement. Downtime and clean-up expenses associated with conveying equipment failure are reduced by the SITRANS WM100. It alarms to minimize spillage, prevent extensive damage or even fire caused by belt slippage at the head pulley, and warns against conveyor malfunction.

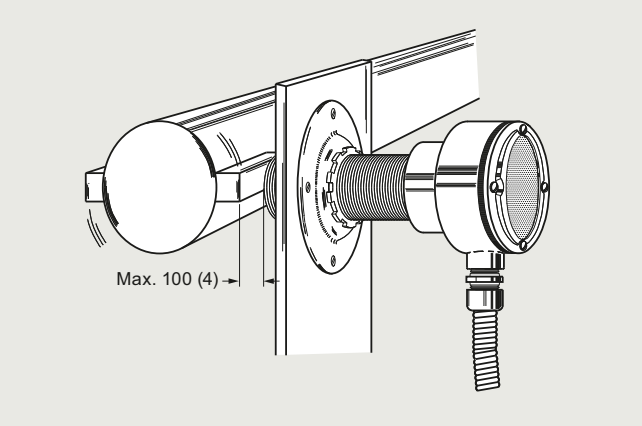
The SITRANS WM100 has built-in selectable start delays and 1 Form C relay contact. With an aluminum body, it operates from -40 to +60 °C (-40 to +140 °F).

- Key Applications: tail pulleys, driven pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

Design

Mounting

The WM100 probe should be mounted, using the supplied mounting flange, onto a vibration-free structure. The gap between the probe and the target should be sufficient such that there is no danger of the target damaging the probe. The maximum allowable gap is 100 mm (4 inch) from the face of the target to the face of the probe for 4.5 x 4.5 mm (3/16 x 3/16 inch) keyway. The WM100 is sensitive to lateral disturbances to its magnetic field. If the WM100 is responding to motion from an interfering target, move the WM100 or install a ferrous plate (steel) as a shield between the WM100 and the interfering target. Where possible, the probe should be mounted such that the cable inlet is pointing downward to avoid accumulation of condensation in the casing. Connection of the probe should be made via flexible conduit for easier removal or adjustment of the probe.



SITRANS WM100 mounting, dimensions in mm (inch)

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Selection and ordering data

SITRANS WM100 Motion sensor Heavy duty speed alarm switch with 100 mm measuring range.	Article No. 7MH71- 0 58 -	●	A	0	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Model					
115 V AC		A			
230 V AC		B			

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Manufacturer's Test Certificate: According to EN 10204-2.2	**C11**
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/i-dentification (max. 16 characters), specify in plain text	**Y17**

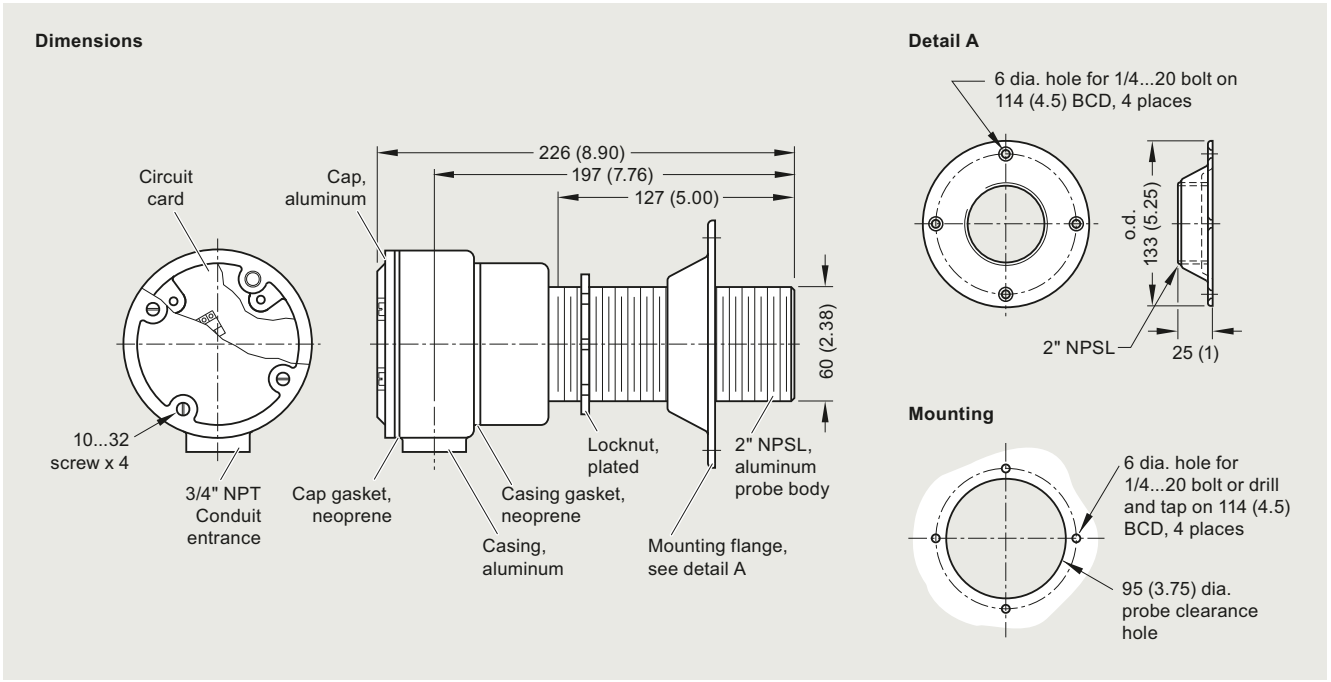
Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Locknut	**7MH7723-1CR**
Mounting flange	**7MH7723-1CS**
Motion cable gland adaptor kit	**7MH7723-1JU**

Technical specifications

Mode of operation	
Measuring principle	Disruption of magnetic field by ferrous target
Typical application	Monitors absence or presence of motion in harsh conditions
Output	
Contact	1 SPDT Form C dry relay contact, rated 5 A at 250 V AC, fail-safe operation
Time delay	Start up: 10 ... 14 seconds (5 ... 7 seconds with 12 ppm jumper installed)
Zero Speed (selected via a common jumper)	5 seconds ± 1 (minimum speed 10 ... 15 ppm) or 10 seconds ± 2 (minimum speed 5 ... 7.5 ppm)
Rated operating conditions	
Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Design	
Probe body	Aluminum
Process mounting	2" NPSL
Connection box	Aluminum, ¾" NPT conduit entrance, 5 screw terminals plus grounding terminal for electrical connection, max. 12 AWG (3.30 mm²) wire size
Gasketing	Neoprene
Display	Red LED for verification of pulses
Enclosure rating	Type NEMA 4x, 6, IP67
Dynamic range	Minimum 6 or 12 pulses per minute Maximum 3 000 pulses per minute
Shipping weight	2 kg (4.4 lb)
Power supply	• 115 V AC/50 ... 60 Hz, 7 VA • 230 V AC/50 ... 60 Hz, 7 VA • ± 10 % of rated voltage
Certificates and approvals	$_{C}$CSA$_{US}$, CE, UKCA RCM, KC

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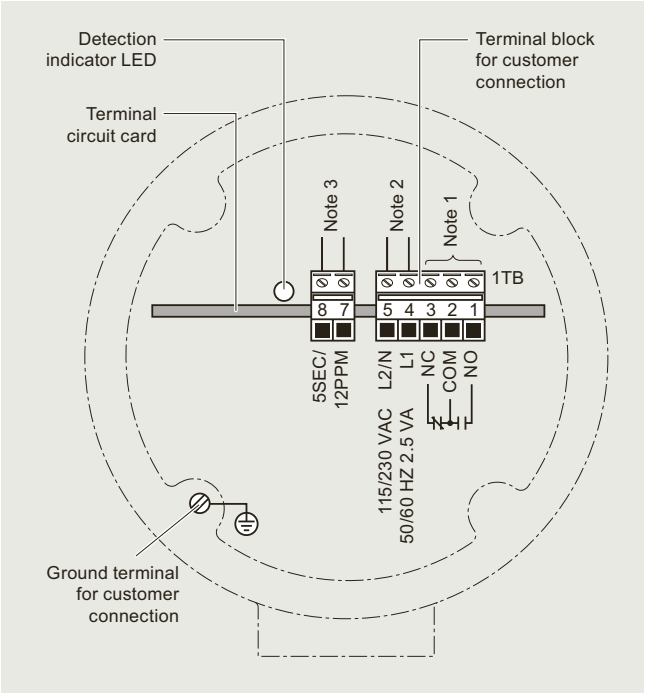
Dimensional drawings



SITRANS WM100 mounting, dimensions in mm (inch)

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Circuit diagrams



SITRANS WM100 wiring

Notes:

1. Dry contacts shown in de-energized (alarm or shelf) state.

2. SITRANS WM100 is manufactured for either 115 or 230 V AC operation. Check WM100 nameplate for applicable voltage. Correct voltage must be supplied. Voltages lower than specified will result in an inoperative condition. Voltages higher than specified will severely damage unit.

3. For 5 second time delay and a minimum 12 ppm range, connect jumper across terminals 7 and 8. Without a jumper, the default is a 10 second time delay and a minimum 6 ppm range.

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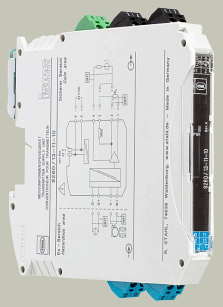
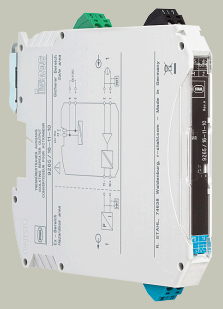
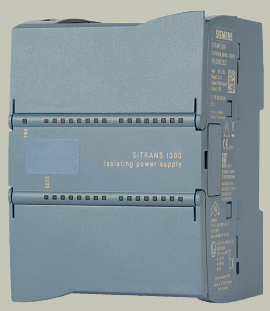
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8/6	**Supply units and isolation amplifiers**
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8/9	SITRANS I200
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8/23	SITRANS RD300
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8/54	SIMATIC CFU PA Edition
8/56	SIMATIC CFU DIQ Edition

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Overview

Power supply units and isolation amplifiers			
Type	**Area of application**	**Device description**	**Programming software**
SITRANS I100 	Isolating power supply for 2-wire transmitter, 4-wire transmitter with intrinsically safe input (mA sources) and analog output module (AOM) for SIPART PS2.	Single-channel version, output 0/4 ... 20 mA, intrinsically safe Ex i, approved to SIL 2 (IEC/EN 61508), width 12.5 mm, DIN rail-mounting.	–
SITRANS I200 	Compact single-channel output isolation amplifier for HART output signals 0/4 ... 20 mA. For the intrinsically safe operation of positioners such as SIPART PS2, I/P converters or indicators.	HART output isolation amplifier for DIN rail mounting, with intrinsically safe output. Approved up to SIL 2 (IEC/EN 61508), width 12.5 mm.	–
SITRANS I300 	Isolating power supply for 4-wire devices in hazardous areas	Isolating power supply with intrinsically safe EIA-485 interface for DIN rail mounting, for 4-wire devices.	–

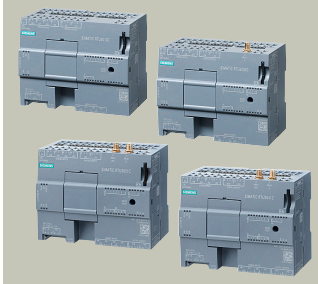
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Overview (continued)

Display devices			
Type	**Area of application**	**Device description**	**Programming software**
SITRANS RD100 	Remote digital display in 2-wire system, power supply via the current loop, NEMA 4X enclosure, for process measuring equipment	• Versatile 2-wire measuring instrument that displays process tags in level, flow, pressure, temperature and weighing applications • FM-approved, CSA-approved and CE-approved device that can be installed in a range of environments, including hazardous areas • Large, easy-to-read local display • Easy to install and set up using a quick 2-step process	–
SITRANS RD150 	Remote digital display for 4 to 20 mA and HART devices	• Easy operation via local display with 4-button menu control • Background illuminated local display • HART communication • Flexible mounting options • Plastic, stainless steel or aluminum enclosures up to IP68 • Complete configuration of the connected sensors with optional USB Communicator and PC • Supports multiple HART sensors with HART Multidrop	–
SITRANS RD200 	Remote digital display with universal input for control panel mounting for process measuring equipment. Supports RTD, thermocouple, current and voltage inputs. Supporting software enables remote configuration and data logging.	• Universal remote digital display for various inputs; ideal for use with most field devices • Standard local display for control panel mounting with optional enclosures • Two optional relays for alarm display or process control applications • Special copy function of the measuring instrument reduces setup time, costs and errors • RD software supports remote configuration, monitoring and logging for up to 100 displays	–
SITRANS RD300 	Universal, easy-to-operate, remote digital display for control panel mounting for process instruments. Delivers flow rate/total values in various applications (pumped flow rate, summation and control).	• Remote digital display for level, flow, pressure, weighing and other process instruments. • The universal, easy-to-operate display device for flow rate/total values is ideal for flow rate, summation and control applications. • Using the RD software, which is available for download free of charge, you can record and display the data on your PC. • It is designed for one or two current and voltage inputs and supports mathematical functions such as averaging.	–

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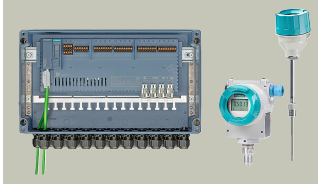
Overview (continued)

Remote Terminal Unit			
Type	**Area of application**	**Device description**	**Programming software**
SIMATIC RTU3000C 	The devices of the RTU3000C family are compact telecontrol stations (RTU: Remote Terminal Unit) for applications with their own power supply. They are particularly suited for monitoring and control of remote stations that are not connected to a power supply network. The RTUs can independently collect data from connected sensors with timestamps, pre-process the data, and transfer it to a control center. The RTU3000C is supplied with energy by a battery, rechargeable battery or solar panel or a 12 ... 24 V DC power supply unit.	• Flexible location of use - Energy-optimized operation and flexible power supply concept • Rugged hardware - Reliable operation, even in tough environments with increased temperature range (-40 °C to +70 °C) • Flexible connection to control centers - Thanks to swappable telecontrol protocols • Fast and flexible data communication • Simple and cost-effective engineering - Easy configuration with standard web browser without additional engineering tool. • Remote access - To HART or Modbus devices on the Extension Board HART/RS485 via SIMATIC PDM. • Fully automatic timestamp • Automatic temporary storage of process values • Secure data transfer - Use of OpenVPN VPN technology and encrypted email connections • Time of day is retained in case of power failure • Saves travel and maintenance costs - Thanks to web-based management	–

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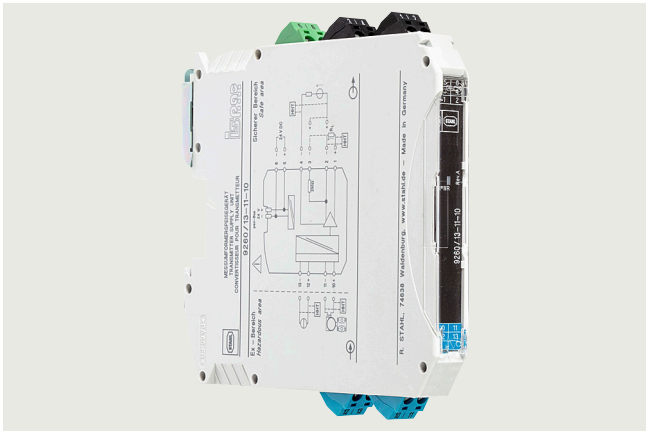
Overview (continued)

Network gateways

Type	Area of application	Device description	Programming software
IE/PB LINK 	IE/PB LINKs are gateways for connecting the two network types, Industrial Ethernet and PROFIBUS, i.e. they enable access to all PROFIBUS nodes connected to the lower-level PROFIBUS network. The variants IE/PB LINK HA and IE/PB LINK PN IO are offered as gateways from Industrial Ethernet and PROFIBUS. **IE/PB LINK IO** Gateway with PROFINET IO functionality, S7 routing and data record routing for standard ambient conditions **IE/PB LINK HA** Gateway optimized for use in the process industry through the possibility of deployment in harsh ambient conditions and the connection of PROFIBUS field devices to a redundant AS as PROFINET IO controllers	Both product variants can be used in 2 operation modes: Standard mode enables, for example, loading of programs and configuration data via PG/OP communication, data record routing for configuration and diagnostics of field devices with the SIMATIC PDM tool, S7 routing e.g. for cross-network loading of SIMATIC controllers on PROFIBUS. When operated as a PROFINET IO proxy, from the perspective of the PN IO controller, all PROFIBUS DP slaves connected after the IE/PB LINK are treated as PN IO devices according to the PROFINET standard. The IE/PB LINK is the proxy of the connected PROFIBUS DP slaves. Both IE/PB LINK variants offer the possibility to use different transmission media by employing BusAdapters.	–
SIMATIC Compact Field Unit (CFU) 	Smart field distributors installed at process level and directly connected to the automation system via PROFINET. Two versions are available: • SIMATIC CFU PA edition • SIMATIC CFU DIQ edition **SIMATIC CFU PA edition** • PROFIBUS PA already integrated into SIMATIC FCU • Robust and really easy to use • Automatic addressing of connected devices • Device integration via standardized communication profiles **SIMATIC CFU DIQ edition** • Individual, customized solutions • Flexible system expansion • 16 freely configurable, digital IO channels • Expansion functions can be configured if desired • "Counter" and "Frequency measurement" operation modes with a limit frequency of 1 kHz can be activated as additional operation modes.	• High overheads for device integration and replacement • Complicated, error-prone wiring and routing over several levels, making the hardware FAT very complex • Very long copper cables and numerous terminal points in the field • Multiple individual control cabinets • Large numbers of different components and protocols necessitate costly spare parts inventories and training sessions • High planning and documentation costs • Flexible connection options via PROFINET • Ready for Process Automation (PA Ready)	–

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Overview



Analog input 0/4 to 20 mA

The isolating power supplies are used for the intrinsically safe operation of transmitters or for connecting to intrinsically safe mA sources and the analog output module (AOM) for SIPART PS2.

The transmitters are supplied with auxiliary power from the isolating power supplies.

HART communication signals are transmitted bidirectionally by the isolating power supplies.

Benefits

- Active and passive output 0/4 to 20 mA
- Universally applicable for transmitters and mA sources (4-wire transmitters)
- Narrow design – 12.5 mm (0.49 inch) width – for one and two-channel version
- Intrinsically safe input [Ex ia] IIC
- Galvanic isolation between input, output and auxiliary power
- Installation permissible in Zones 2, 22 and Div. 2
- Can be used up to SIL 2 (IEC/EN 61508)

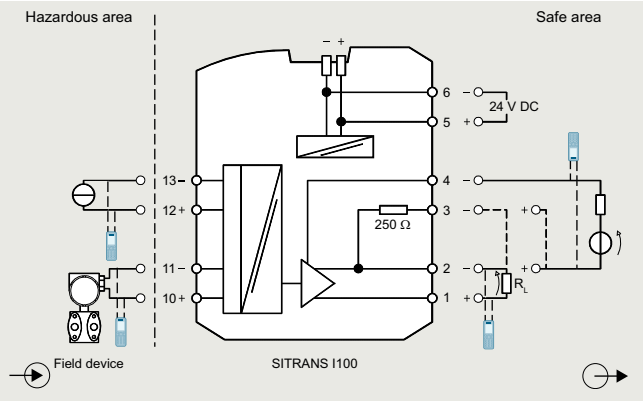
	Zones					
	0	1	2	20	21	22
Ex i interfaces	X	X	X	X	X	X
Installation in			X			X

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Design

The SITRANS I100 HART isolating power supply is comprised of a compact plastic enclosure (IP30) and is equipped with push-in screw terminals.

On the front are a green LED for indicating the power supply status and a red LED for signaling errors.



SITRANS I100 isolating power supply HART, function block diagram

Selection and ordering data

	Article No.
SITRANS I100 isolating power supply • DIN rail mounting • For 2-wire transmitters • For 4-wire transmitter with intrinsically safe input (mA sources) • For analog output module (AOM) for SIPART PS2 • Single-channel version with output 0/4 ... 20 mA, intrinsically safe Ex i • 12.5 mm wide • Approved up to SIL 2 (IEC/EN 61508)	**7NG4124-1AA00**

Technical specifications

SITRANS I100	
General	
Number of channels	1
Transmitter infeed operation	Yes
Isolation amplifier operation	Yes
Input	0/4 ... 20 mA
Output	0/4 ... 20 mA with HART
Output adjustment time	< 0.2 ms
Output A	0/4 ... 20 mA active (source)
Output B	0/4 ... 20 mA active (sink)
Ex i input	
Input signal	0/4 ... 20 mA with HART
Input functional range	0 ... 24 mA
Communication signal	HART
Transmitter supply voltage	≥ 16 V at 20 mA
Voltage drop	< 3.5 V
Short-circuit current	≥ 22.5 mA
Output	
Output signal	0/4 ... 20 mA with HART (active/passive)
Output functional range	0 ... 24 mA
Communication signal	HART
Output characteristics	= Input signal
Output current at $I_E = 0$	$I_A = 0$ mA
Max. load resistance R_L	1 000 Ω
Residual ripple	≤ 20 mV_{eff}
Settling time (10 ... 90%)	< 200 µs (isolating transformers: < 600 µs)
Galvanic isolation	
• Test voltage according to EN 60079-11	
- Ex i-input to output	375 V peak value
- Ex i-input to auxiliary power	375 V peak value
• Test voltage according to EN 61010/EN 50178	
- Output to auxiliary power	300 V_{eff}
- Output to output	300 V_{eff}
Measuring accuracy	
Error limits temperature influence	≤ 0.1%/10 K
Deviation	≤ 0.1%
Deviation typical	0.05%
Operating conditions	
Degree of protection	
• Enclosure	IP30
• Terminals	IP20
Ambient temperature	-20 ... +60 °C (-4 ... +140 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Relative humidity	≤ 95%, (no condensation)
Usage in height	< 2 000 m (6 562 ft)
Electromagnetic compatibility	Tested acc. to the following standards and regulations: • EN 61326-1 Use in the industrial environment • Interference immunity in accordance with EN 61000-6-2 • Noise radiation according to EN 61000-6-4
Structural design	
Weight	185 g (0.41 lb)
Enclosure material	Polyamide
Grid size	12.5 mm (0.49 inch)
Fire resistance (UL-94)	V0
Mounting type	DIN rail NS35/15; NS35/7.5
Mounting position	Vertical or horizontal
Connection type	Screw terminals
• One-wire core cross-section	
- Rigid	0.2 ... 2.5 mm^2(0.00031 ... 0.0039 $inch^2$)
- Flexible	0.2 ... 2.5 mm^2(0.00031 ... 0.0039 $inch^2$)

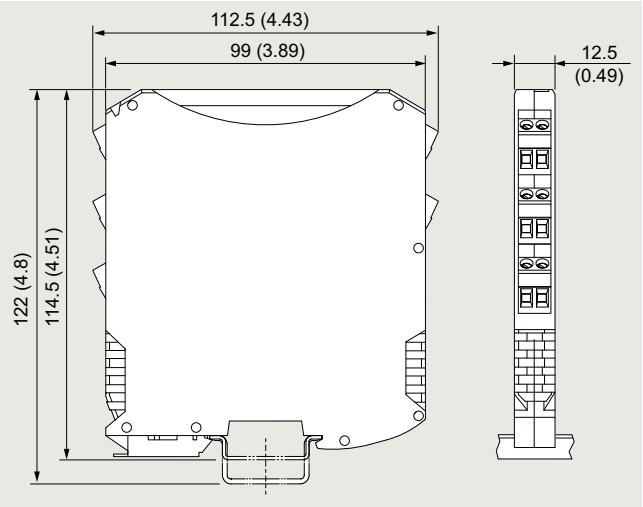
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Technical specifications (continued)

SITRANS I100	
Auxiliary power	
Nominal voltage U_N	24 V DC
Voltage range	19.2 ... 30 V
Residual ripple within voltage range	≤ 3.6 V_{SS}
Rated current	76 mA
Power consumption	1.8 W
Max. power loss:	1.2 W
Status indicator	Green "PWR" LED
Reverse polarity protection	Yes
Safety specifications	
• Max. voltage U_o	25.2 V
• Max. current I_o	93 mA
• Max. power P_o	587 mW
• Max. permissible external capacitance C_o for IIC/IIB	107 nF/820 nF
• Max. permissible external inductance L_o for IIC/IIB	2 mH/4 mH
• Internal capacitance C_i and inductance L_i	Negligible
• Max. safety-technical voltage	AC 253 V
• SIL	2
• Isolation amplifier, input:	
- Max. output voltage U_o	-[1]
- Max. connectable voltage U_i	30 V
- Max. connectable current I_i	150 mA
- Internal capacitance Ci and inductance L_i of the isolation amplifier	Negligible
Certificates and approvals	
ATEX/IECEx explosion protection	
Certificates	• BVS 17 ATEX E 087 X • IECEx BVS 17.0079X
Gas/dust explosion protection, firedamp protection for Zones 2 and 22	
• ATEX	• II 3 (1) G Ex nA [ia Ga] IIC T4 Gc • II (1) D [Ex ia Da] IIIC • I (M1) [Ex ia Ma] I
• IECEx	• Ex nA [ia Ga] IIC T4 Gc • [Ex ia Da] IIIC • [Ex ia Ma] I
Installation	In Zones 2 and 22, Div. 2 and in safe areas
Other approvals	• USA/Canada (UL): NEC certification (Class I, II, III) 1, 2 • DNV marine approval • Other approvals for India and Korea

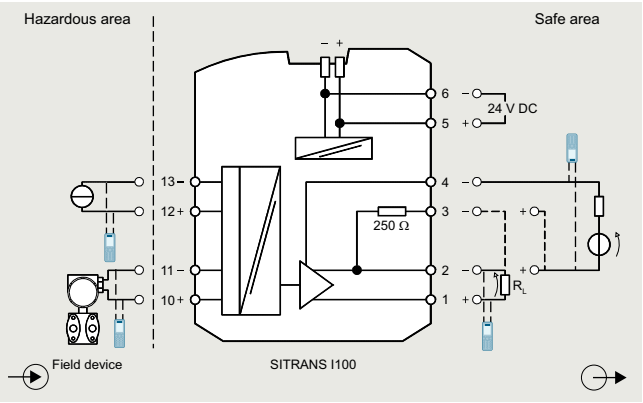
[1] U_o does not have to be taken into account in 4-wire operation.

Dimensional drawings

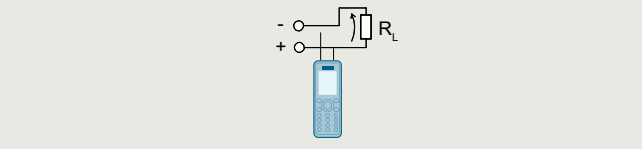


SITRANS I100 isolating power supply HART, dimensions in mm (inch)

Circuit diagrams



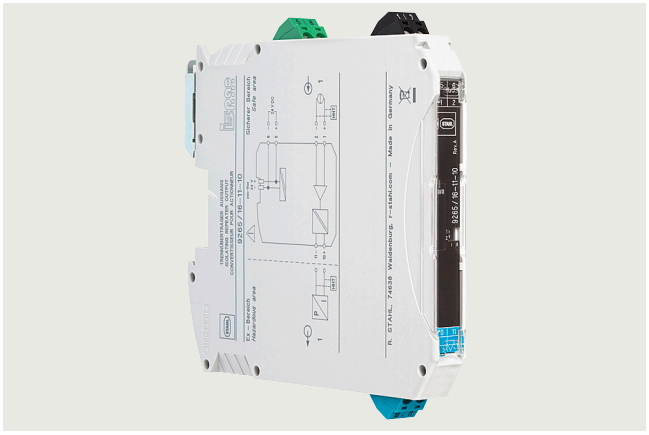
SITRANS I100 isolating power supply HART, connection diagram



SITRANS I100 isolating power supply HART, output configuration

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Overview



Analog output 0/4 to 20 mA for HART

The single-channel Ex i output isolation amplifiers are used for intrinsically safe operation of valve positioners, i/p converters or indicators.

Operation of intrinsically safe HART valve positioners (e.g. SIPART PS2) is also possible. The devices transfer a superimposed HART communication signal bidirectionally.

The SITRANS I200 is used for intrinsically safe operation of regulating valves, I/P converters or indicators.

- Superimposed HART communication signals are transmitted bidirectionally by the output isolator.
- Input, output and auxiliary power are electrically isolated from each other.

Benefits

- Compact single-channel Ex i output isolation amplifiers
- Narrow design – 12.5 mm (0.49 inch) width – for single-channel version
- For HART output signals 0/4 to 20 mA
- Output intrinsically safe [Ex ia] IIC
- Galvanic isolation between input, output and auxiliary power
- Wire break and short-circuit monitoring and messaging (can be switched off)
- Installation permissible in Zone 2 and Div. 2
- Can be used up to SIL 2 (IEC/EN 61508)

	Zones					
	0	1	2	20	21	22
Ex intrinsically safe interface	X	X	X	X	X	X
Installation in			X			X

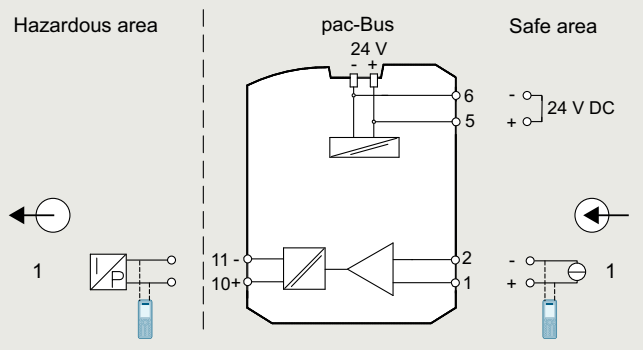
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Design

The SITRANS I200-Ex i output isolation amplifier is comprised of a compact plastic enclosure (IP30) and is equipped with push-in screw terminals.

On the front are a green LED for indicating the power supply status and a red LED for signaling errors.

The auxiliary power supply can be individually connected using push-in screw terminals.



SITRANS I200 output isolation amplifier, function block diagram

Selection and ordering data

	Article No.
SITRANS I200 Ex i output isolation amplifier, Ex • Single channel • DIN rail mounting • For HART output signals 0/4 ... 20 mA • Intrinsically safe operation of positioners, e.g. SIPART PS2, I/P converters or indicators • 12.5 mm wide • Approved up to SIL 2 (IEC/EN 61508)	**7NG4131-1AA00**

Technical specifications

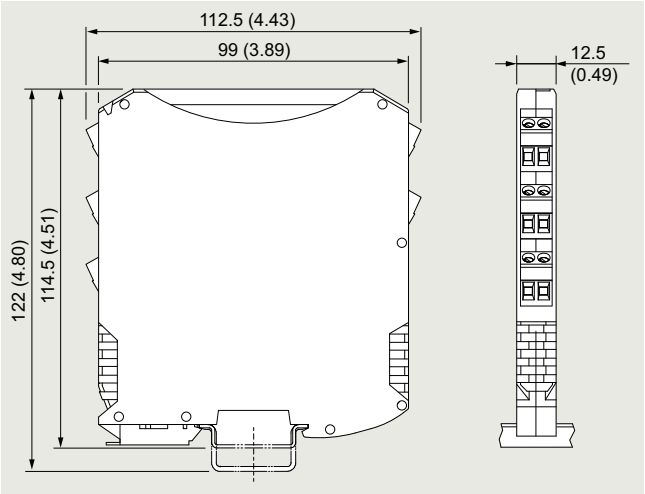
SITRANS I200	
General	
Number of channels	1
LFD relay (LFD = Line fault detection)	No
Electrical specifications	
Input	
Input signal	0/4 ... 20 mA with HART
Functional range	0 ... 24 mA
Response threshold line fault (L_F)	I_E > 3.6 mA
Response of the input to line fault (L_F)	R_E ≥ 1 MΩ
Output	
Output signal	0/4 ... 20 mA with HART
Functional range	0.0 ... 24.0 mA
Communication signal	HART
Max. load resistance R_L	700 Ω
Residual ripple	≤ 20 mV
Settling time (10 ... 90%) (valid for 4 ... 20 mA)	≤ 140 µs
No-load voltage U_a	27.00 V
Average measuring error	0.10%
Line fault	
• Setting switch	Enabled/disabled for short circuit
• Response threshold	I_E > 3.6 mA
• Display	Red "ERR" LED
Error detection	
• Wire break	R_L > 10 kΩ
• Short circuit	R_L < 50 Ω
Error limits temperature influence	≤ 0.1% / 10 K
Galvanic isolation	
Test voltage according to IEC EN 60079-11	
• Ex i output to auxiliary power	375 V AC peak value
• Ex i output to input	375 V AC peak value
Test voltage according to EN 61010/EN 50178	
• Input to auxiliary power	300 V_{eff}
Auxiliary power	
Nominal voltage U_N	24 V DC
Voltage range	19.2 ... 30 V
Rated current	45 mA
Power consumption	1.1 W
Max. power loss:	1.1 W
Status indicator	Green "PWR" LED
Reverse polarity protection	Yes
Safety specifications	
• Max. voltage U_o	25.2 V
• Max. current I_o	93 mA
• Max. power P_o	587 mW
• Max. permissible external capacitance C_o for IIC/IIB	0.107 µF/0.817 µF
• Max. permissible external inductance L_o for IIC/IIB	2 mH/4 mH
• Internal capacitance C_i / internal inductance L_i	Negligible
• Max. safety-technical voltage	253 V
• SIL	2
Operating conditions	
Degree of protection	
• Enclosure	IP30
• Terminals	IP20
Ambient temperature	-40 °C ... +70 °C (-40 °F ... +158 °F)
Storage temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)
Relative humidity	≤ 95%
Usage in height	< 2 000 m (6 562 ft)

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Technical specifications (continued)

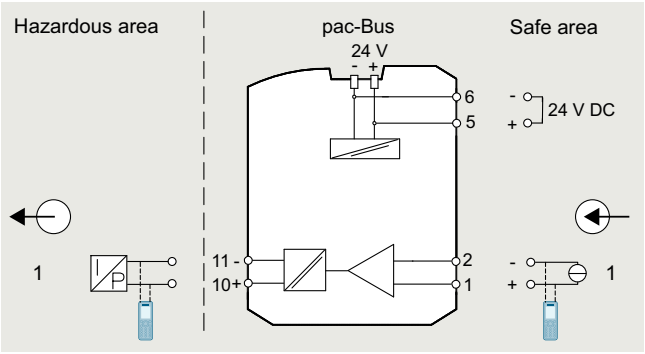
SITRANS I200	
Electromagnetic compatibility (EMC)	• EN 61326-1 Use in the industrial environment • Namur NE 21
Structural design	
Weight	0.170 kg (0.38 lb)
Enclosure material	Polyamide
Grid size	12.5 mm (0.49 inch)
Width	12.5 mm (0.49 inch)
Height	114.5 mm (4.51 inches)
Length	116 mm (4.57 inches)
Fire resistance (UL-94)	V0
Mounting type	DIN rail NS35/15. NS35/7.5
Mounting position	Any (vertical or horizontal)
Connection type	Screw terminal
Screw terminals	
Core cross-section	
• Rigid	0.2 mm² ... 2.5 mm² (0.00031 ... 0.0039 inch²)
• Flexible min.	0.2 mm² ... 2.5 mm² (0.00031 ... 0.0039 inch²)
Conductor cross-section AWG	16 ... 12
Certificates and approvals	
ATEX/IECEx explosion protection	
Operating range (zones)	2
Ex interface zone	0, 20
Gas/dust explosion protection, firedamp protection for Zones 2 and 22	
Certificates	• BVS 20 ATEX E 045 X • IECEx BVS 20.0035X
• ATEX	• Ex II 3 (1) G Ex ec [ia Ga] IIC T4 Gc • Ex II (1) D [Ex ia Da] IIIC • Ex I (M1) Ex [Ex ia Ma] I
• IECEx	• Ex ec [ia Ga] IIC T4 Gc • [Ex ia Da] IIIC • Ex [Ex ia Ma] I
Installation	In Zone 2, Div. 2 and in the safe area
Certificates	• ATEX (BVS), IECEx (BVS), SIL (BVS) • cULus • PESO • KTL
Marine approval	DNV

Dimensional drawings



SITRANS I200 output isolation amplifier HART, dimensions in mm (inch)

Circuit diagrams



SITRANS I200 output isolation amplifier HART, connection diagram

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Overview



The SITRANS RD100 is a 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation.

Benefits

- Easy setup
- Approved for hazardous locations
- NEMA 4X, IP67 impact-resistant enclosure
- Simple two-step calibration
- Two modes of input allow for easy servicing, with no interruption of loop required

Application

The RD100 is designed for maximum versatility, allowing seamless installation both indoors and outdoors, in a wide range of environments. Whether in heat or cold, the RD100 performs reliably in non-hazardous areas. Operating efficiently from -40 to +85 °C (-40 to +185 °F), it adds only 1 V to the loop.

Calibration consists of a quick two-step process involving the adjustment of only two non-interacting potentiometers.

- Key Applications: remotely displays process variables in level, flow, pressure, temperature, and weighing applications, in a 4 to 20 mA loop.

Selection and ordering data

SITRANS RD100 Display Remote digital display for process instruments. 2-wire, loop powered, NEMA 4X enclosure.	Article No. 7ML5741-	●	●	A	0	0	-	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.								
Conduit hole location (½ inch)								
None		1						
Bottom		2						
Rear		3						
Top		4						
Approvals								
CE			B					

Selection and Ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301)	**7ML1930-1BQ**

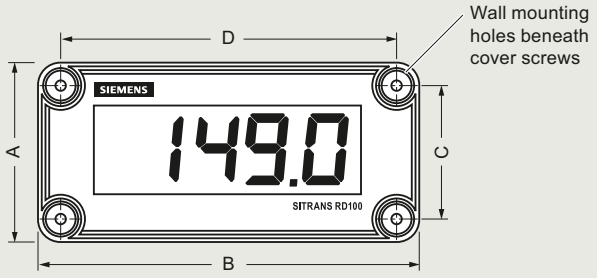
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Technical specifications

SITRANS RD100	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring range	4 ... 20 mA
Measuring points	1 instrument only
Accuracy	± 0.1 % of span ± 1 count
Rated operating conditions	
Ambient conditions	
• Operating temperature range	-40 ... +85 °C (-40 ... +185 °F)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Design	
Weight	340 g (12 oz)
Material (enclosure)	Impact-resistant glass filled polycarbonate body and clear polycarbonate cover
Degree of protection	NEMA 4X, IP67
Power supply	
External loop power supply	30 V DC max.
Display	• 1.0 inch (2.54 cm) high LCD • Numeric range from -1 000 ... +1 999
Certificates and approvals	
Non-hazardous	CE
Options	
Mounting	• 2 inch (5.08 cm) pipe mounting kit (zinc plated or stainless steel) • Panel mounting kit

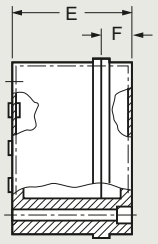
Dimensional drawings

RD100 - front view



A: 80 (3.15)
B: 140 (5.51)
C: 60 (2.36)
D: 120 (4.72)

RD100 - side view

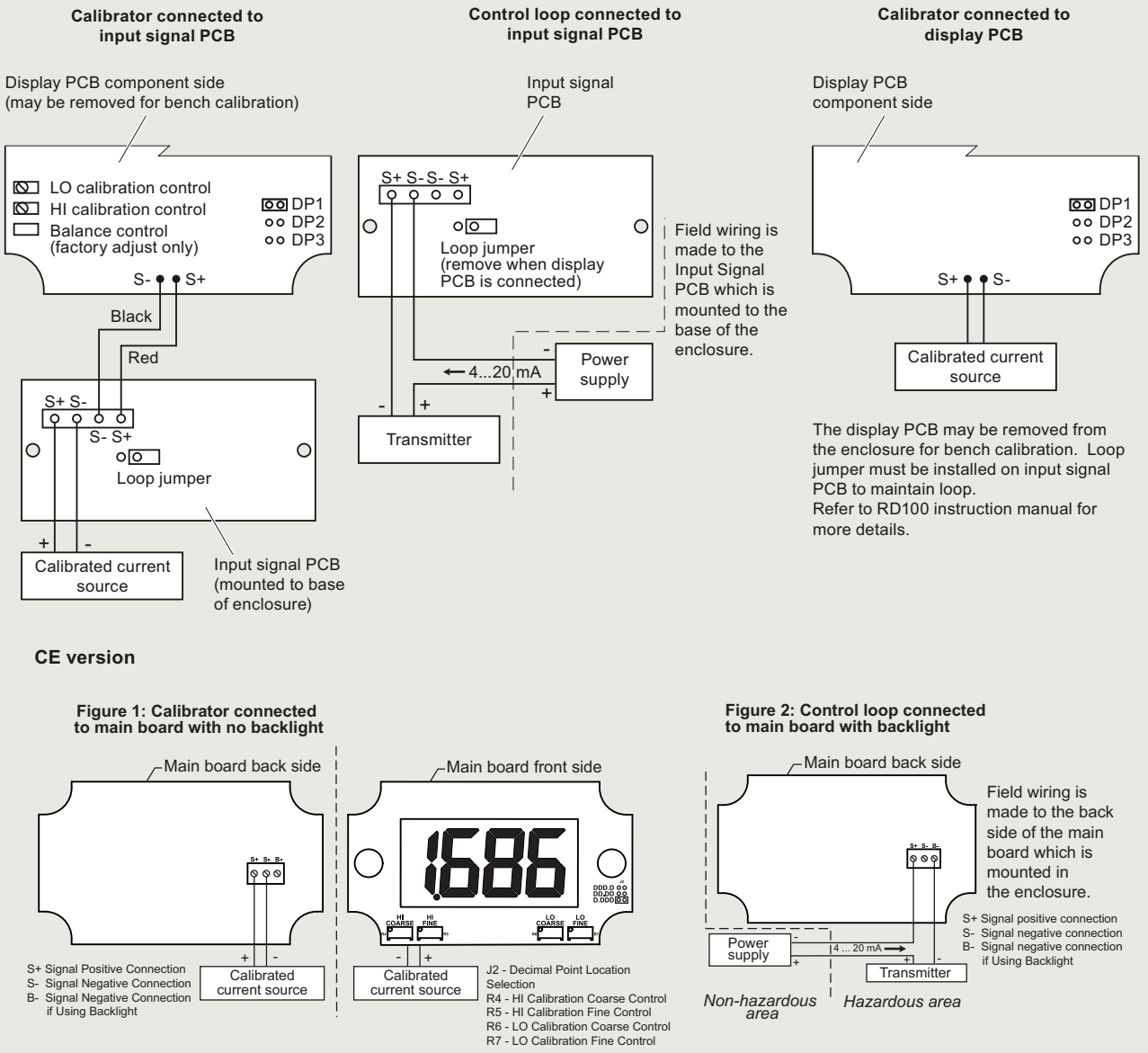


E: 65 (2.56)
F: 20 (0.79)

SITRANS RD100, dimensions in mm (inch)

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Circuit diagrams



SITRANS RD100 connections

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Overview



The SITRANS RD150 is a remote display for 4 to 20 mA and HART devices.

Benefits

- Ease of use through 4 button menu driven display
- Backlit display
- HART communications
- Flexible mounting options
- Plastic, stainless steel or aluminum housings up to IP68

Application

The versatile SITRANS RD150 can be installed remotely from your instrument, providing 4/20 mA or multiple HART variable readings in a safe and convenient location.

Easy to use, 4 button, menu driven, display for monitoring of HART instruments via HART communication or 4/20 mA.

- Key Applications: remotely displays process variables in level, flow, pressure, temperature, and weighing applications, in a 4 to 20 mA HART loop.

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Selection and ordering data

SITRANS RD150 display Remote digital display, HART or 4 to 20 mA loop display, metal and plastic field mount enclosures.	Article No. 7ML574-2-	●	●	●	●	●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Approvals											
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA		0	A								
ATEX II 1G, Ex ia IIC T6...T1 Ga[4)] UKEX II 1G, Ex ia IIC T6...T1 Ga[4)]		0	C								
ATEX II 2G Ex db IIC T6 Gb[9)10)] UKEX II 2G Ex db IIC T6 Gb[9)10)]		0	F								
IECEx Ex ia IIC T6...T1 Ga, Gb[4)]		0	J								
IECEx Ex db IIC T6 Gb[9)10)]		0	M								
$_{C}CSA_{US}$(IS) Class I, Div. 1, Groups A, B,C, D[12)]		0	N								
$_{C}CSA_{US}$(XP) Class I, Div. 1, Groups A, B, C, D[9)11)]		0	R								
Electronics											
Two-wire 4 ... 20 mA/HART				A							
Two-wire 4 ... 20 mA without HART				B							
Housing											
Plastic[1)4)6)]					0						
Aluminum[2)4)7)]					1						
Stainless steel (precision casting)[2)4)7)]					2						
For panel mounting (72 x 72 mm)[3)5)8)]					3						
Housing protection											
IP66/IP67 NEMA 4X						0					
IP66/IP68 NEMA 6P (0.2 bar)						1					
IP40 NEMA 2						2					
IP40 Type 1						3					
Cable entry											
M20 x 1.5/Cable gland PA black (ø5 ... 9 mm), standard								0			
M20 x 1.5/Cable gland brass nickel plated (ø6 ... 12 mm)								1			
M20 x 1.5/Blind plug								2			
M20 x 1.5/Threaded fitting brass nickel-plated; for shielded cable (ø9 ... 13 mm)								3			
½" NPT/Blind plug								4			
½" NPT/Cable gland PA black (ø5 ... 9 mm)								5			
½" NPT/Threaded fitting brass nickel plated (ø6 ... 12 mm)								6			
½" NPT/Threaded fitting brass nickel plated; for shielded cable (ø9 ... 13 mm)								7			
Without								8			
Display											
Without									A		
Mounted									B		
Mounting											
For wall mounting with aluminum or stainless steel housing										A	
For carrier rail and wall mounting with plastic housing										B	
For carrier rail with aluminum or stainless steel housing										C	
For tube mounting (29 ... 60 mm) incl. mounting material										D	
For panel mounting										E	
Certificates											
None											0
3.1 Certificate/Instrument with test data											1
Quality and Test plan											2

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Selection and ordering data (continued)

Selection and ordering data	Order code
Further designs	
Please add "-**Z**" to Article No. and specify Order code(s).	
Identification Label (measurement loop) stainless steel: max. 40 characters add in plain text. To add more than one line use a comma"," for Line break.	**Y17**
Identification Label (measurement loop) foil: max. 40 characters add in plain text. To add more than one line, use a coma "," for line break.	**Y18**

Selection and ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
USB communicator	**A5E35192015**
SITRANS LG/SITRANS RD150 sensor display module	**A5E34143449**

[1] Available only with Housing protection option 0.
[2] Available only with Housing protection option 1.
[3] Available only with Housing protection option 2.
[4] Available only with Cable entry options 0, 2, 4, and 5.
[5] Available only without Cable entry option 8.
[6] Available only with Carrier rail and Tube mount Mounting options.
[7] Available only with Wall mount, Carrier rail with aluminum or stainless steel housing, and Tube mount Mounting options.
[8] Available only with Panel mounting option.
[9] Available only with Housing options 1 and 2.
[10] Available only with Cable entry options 2, 3, 4, and 7.
[11] Available only with Cable entry options 2, 3, 4, 6, and 7.
[12] Not available with Cable entry option 1.

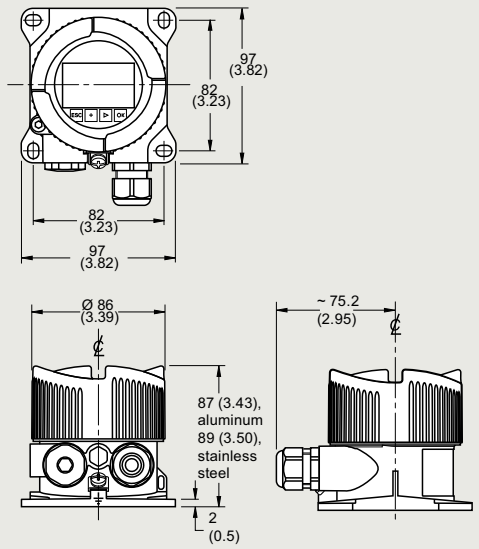
Technical specifications

SITRANS RD150	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring range	3.5 ... 22.5 mA
Measuring points	HART multi-drop support
Accuracy	± 0.1 % of 20 mA
Rated operating conditions	
Without display and adjustment module	-40 ... +80 °C (-40 ... +176 °F)
With display and adjustment module	-20 ... +70 °C (-4 ... +158 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Design	
Weight	
• Plastic housing	0.35 kg (0.772 lb)
• Aluminum housing	0.7 kg (1.543 lb)
• Stainless steel housing	2.0 kg (4.409 lb)
Material (enclosure)	
• Plastic housing	Plastic PBT (Polyester)
• Aluminum housing	Aluminum die-casting AlSi10Mg, powder-coated (basis: Polyester)
• Stainless steel housing	316L precision casting, blasted
Degree of protection	
• Plastic housing	IEC 60529 IP66/IP 67, NEMA Type 4X
• Housing for panel mounting (mounted)	IEC 60529 IP40, NEMA Type 1
• Aluminum/stainless steel housing	IEC 60529 IP66/IP68 (0.2 bar), NEMA Type 6P
Power supply	
External loop power supply	35 V DC max.
Display	
Number of digits	5
Digit size	7 x 13 mm (0.28 x 0.51 inch)
Certificates and approvals	See the online PIA configuration tool for details.
Options	
Mounting	• Panel Mounting • Carrier rail mounting • Pipe mounting

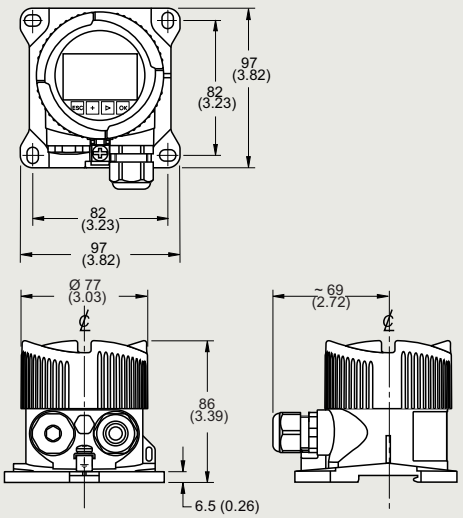
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Dimensional drawings

SITRANS RD150, aluminum/stainless steel housing

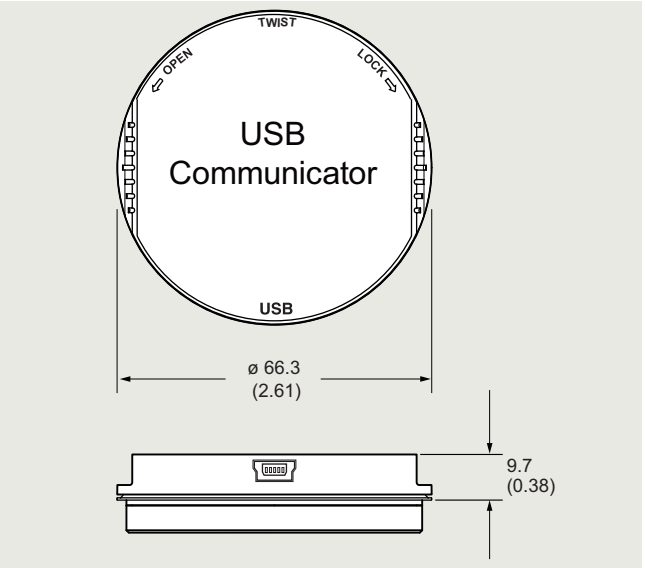


SITRANS RD150, plastic housing



SITRANS RD150, dimensions in mm (inch)

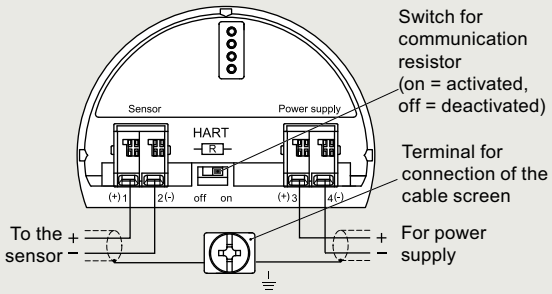
Dimensional drawings (continued)



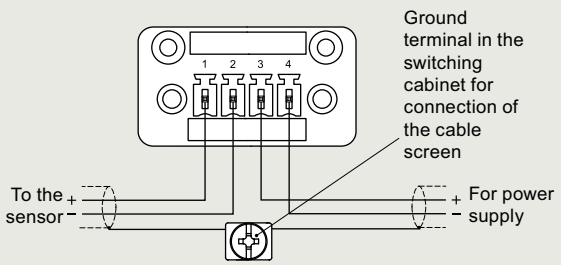
USB Communicator, dimensions in mm (inch)

Circuit diagrams

Standard housing with 2 wire device



Panel mount



SITRANS RD150 connections

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Overview



The SITRANS RD200 is a universal input, panel mount remote digital display for process instrumentation.

Benefits

- Easy setup and programming via front panel buttons or remotely using RD software
- Display readable in sunlight
- Universal input: accepts current, voltage, thermocouple, and RTD signals
- Single or dual 24 V DC transmitter power supply
- Serial communication using built in protocol or Modbus RTU
- Two optional relays for alarm indication or process control applications
- Linear or square root function supported
- Meter Copy feature to reduce setup time, cost, and errors
- RD software supports remote configuration, monitoring, and logging for up to 100 displays
- Other features include: 4 to 20 mA analog output option, pump alternation control, and optional NEMA 4 and 4X field enclosures
- 2X option for 30.5 mm (1.2 inch) high, red LED display

Application

The RD200 is a universal remote display for level, flow, pressure, temperature, weighing, and other process instruments.

Data can be remotely collected, logged and presented from as many as 100 displays on your local computer using the free downloadable RD Software.

The display accepts a single input of current, voltage, thermocouple, and RTD. This makes the RD200 an ideal fit for use with most field instruments.

The RD200 can be set up as a standard panel mount, or combined with optional enclosures to allow it to house up to 6 displays.

- Key Applications: tank farms, pump alternation control, local or remote display of level, temperature, flow, pressure and weighing instrument values, PC monitoring, and data logging with RD Software.

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Selection and ordering data

SITRANS RD200 Display Remote digital display for process instruments. With 4 to 20 mA, 0 to 10 V, RTD, and TC inputs and pump control. Panel mount with field mount enclosure options.	Article No. 7ML57-40-	●	●	●	●	●	-	●	A
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Input voltage									
85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.		1							
12 ... 36 V DC; 12 ... 24 V AC, 6 W max.		2							
Transmitter supply									
None			A						
Single 24 V DC transmitter supply[1]			B						
Dual 24 V DC transmitter supply[1][2]			C						
Output									
None				A					
2 relays				B					
4 ... 20 mA output				C					
Communication									
Modbus RTU					0				
Approvals									
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA, UL, cUL						1			
Display Size									
Standard								0	
2X option for 30.5 mm (1.2 inch) high, red LED								1	

[1] Available with input voltage option 1 only.
[2] Available with output option C only.

Selection and Ordering data	Article No
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
SITRANS RD200 copy cable 2.1 m (7 ft)	**7ML1930-1BR**
SITRANS RD200 RS 232 serial adapter (copy cable included)	**7ML1930-1BS**
SITRANS RD200 RS 422/485 serial adapter (copy cable included)	**7ML1930-1BT**
RS 232 to RS 422/485 isolated converter	**7ML1930-1BU**
USB to RS 422/485 isolated converter	**7ML1930-1BX**
RD200 USB serial adapter	**7ML1930-6AH**
USB to RS 232 converter	**7ML1930-6AK**
Low cost polycarbonate plastic enclosure for 1 display	**7ML1930-1CF**
2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301) only available with 7ML1930-1CF	**7ML1930-1BQ**
Thermoplastic enclosure	
For use with 1 display	**7ML1930-1CG**
For use with 2 displays	**7ML1930-1CH**
For use with 3 displays	**7ML1930-1CJ**

Selection and Ordering data	Article No
For use with 4 displays	**7ML1930-1CK**
For use with 5 displays	**7ML1930-1CL**
For use with 6 displays	**7ML1930-1CM**
Stainless steel enclosure (Type 304, EN 1.4301)	
For use with 1 display	**7ML1930-1CN**
For use with 2 displays	**7ML1930-1CP**
For use with 3 displays	**7ML1930-1CQ**
For use with 4 displays	**7ML1930-1CR**
For use with 5 displays	**7ML1930-1CS**
For use with 6 displays	**7ML1930-1CT**
Steel enclosure	
For use with 1 display	**7ML1930-1CU**
For use with 2 displays	**7ML1930-1CV**
For use with 3 displays	**7ML1930-1CW**
For use with 4 displays	**7ML1930-1CX**
For use with 5 displays	**7ML1930-1CY**
For use with 6 displays	**7ML1930-1DA**

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Technical specifications

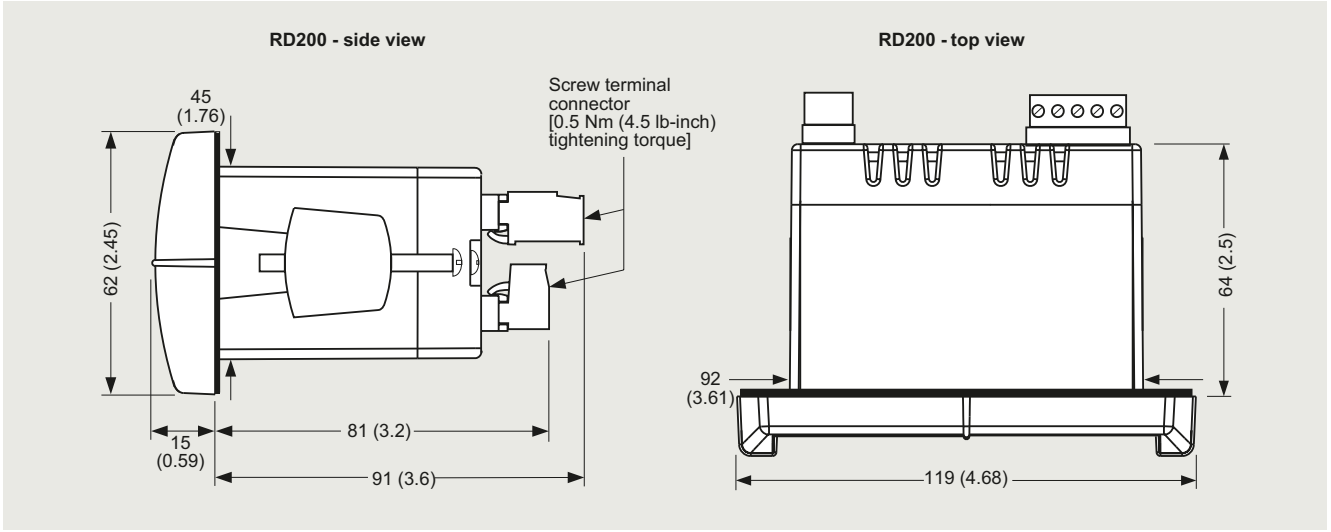
SITRANS RD200	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring points	• 1 instrument • Remote monitoring of 100 instruments with PC and RD software
Input	
Measuring range	
• Current	• 4 ... 20 mA, 0 ... 20 mA
• Voltage	• 0 V DC ... 10 V DC, 1 ... 5 V, 0 ... 5 V
• Thermocouple temperature	• Type J: -50 ... +750 °C (-58 ... +1 382 °F) • Type K: -50 ... +1 260 °C (-58 ... +2 300 °F) • Type E: -50 ... +870 °C (-58 ... +1 578 °F) • Type T: -180 ... +371 °C (-292 ... +700 °F) • Type T, 0.1° resolution: -180.0 ... +371 °C (-199.9 ... +700 °F)
• RTD temperature	• 100 Ω RTD: -200 ... +750 °C (-328 ... +1 382 °F)
Output signal	
Output	• 4 ... 20 mA (optional) • Modbus RTU
Relays	2 SPDT Form C relays, rated 3 A at 30 V DC or 3 A at 250 V AC, non-inductive, auto-initializing (optional)
Communications	• RS 232 with PDC or Modbus RTU • RS 422/485 with PDC or Modbus RTU
Accuracy	
4 ... 20 mA optional output	± 0.1 % FS ± 0.004 mA
Process input	± 0.05 % of span ± 1 count, square root: 10 ... 100 % FS
Thermocouple temperature input	• Type J: ± 1 °C (± 2 °F) • Type K: ± 1 °C (± 2 °F) • Type E: ± 1 °C (± 2 °F) • Type T: ± 1 °C (± 2 °F) • Type T, 0.1° resolution: ± 1 °C (± 1.8 °F)
RTD temperature input	• 100 Ω RTD: ± 1 °C (± 1 °F)
Rated operating conditions	
Ambient conditions	
• Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)
• Operating temperature range	-40 ... +65 °C (-40 ... +149 °F)
Design	
Weight	269 g (9.5 oz) (including options)
Material (enclosure)	• 1/8 DIN, high impact plastic, UL94V-0, color: gray • Optional plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 enclosures
Degree of protection	Type 4X, NEMA 4X, IP65 (front cover); panel gasket provided
Electrical connection	
mA output signal	2-core copper conductor, twisted, shielded, 0.82 ... 3.30 mm² (18 ... 12 AWG), Belden 8 760 or equivalent is acceptable
Electrical connection and relay connection	Copper conductor according to local requirements, rated 3 A at 250 V AC
Power supply	
Input voltage option 1	85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.
Input voltage option 2	12 ... 36 V DC; 12 ... 24 V AC, 6 W max.
Transmitter power supply	One or two isolated transmitter power supplies (optional)
• Single power supply	One 24 V DC ± 10 % at 200 mA max.
• Dual power supplies	Two 24 V DC ± 10 % at 200 mA and 40 mA max.
External loop power supply	35 V DC max.
Output loop resistance	• 24 V DC, 10 ... 700 Ω max. • 35 V DC (external), 100 ... 1 200 Ω max.

Technical specifications (continued)

SITRANS RD200	
Displays and controls	
Display	• 14 mm (0.56 inch) high LED • 2X option for 30.5 mm (1.2 inch) high, red LED • Numeric range from -1 999 ... +9 999 • Four digits, automatic lead zero blanking • Eight intensity levels
Memory	• Non-volatile • Stores settings for minimum of 10 years if power is lost
Programming	• Primary: front panel • Secondary: meter copy or PC with SITRANS RD software
Certificates and approvals	CE, UKCA, UL, cUL
Options	
Enclosures	Plastic, steel, and stainless steel (Type 304, EN 1.4301) NEMA 4 and 4X enclosures
Mounting	• 2 inch (5.08 cm) pipe mounting kit (zinc plated seal) • 2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301)

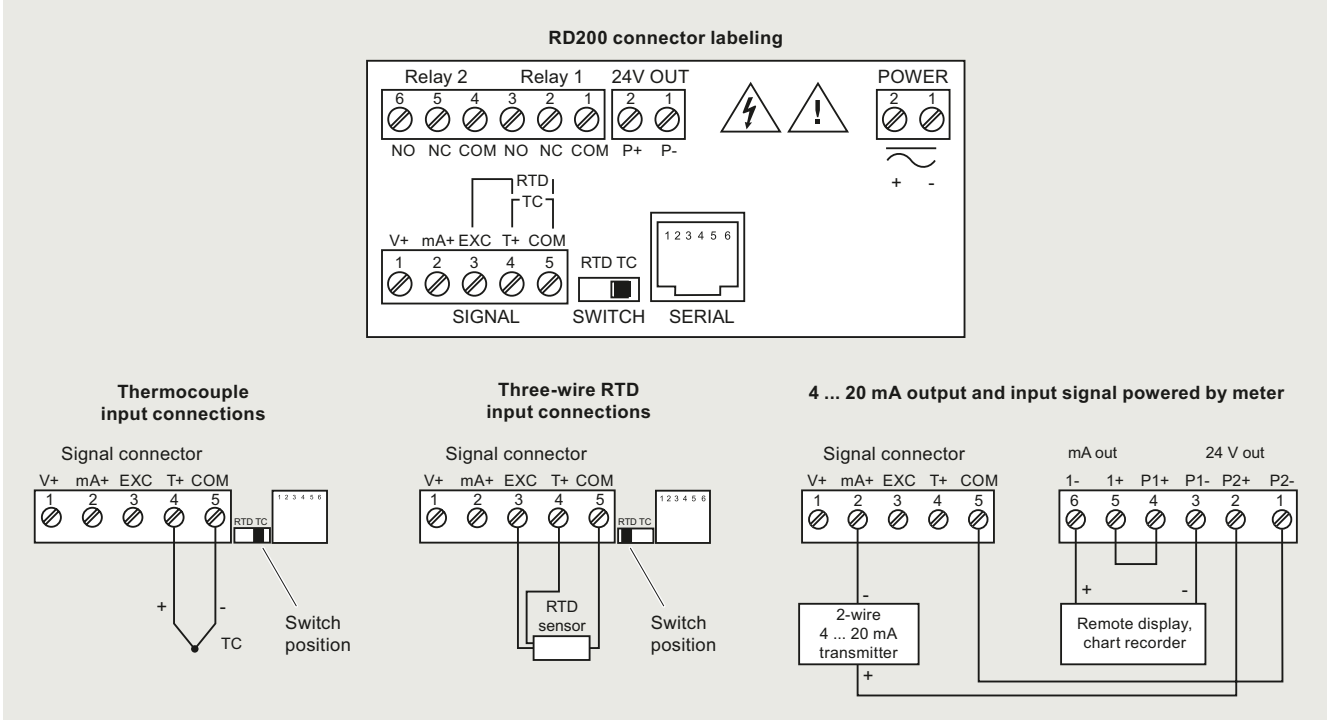
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Dimensional drawings



SITRANS RD200, dimensions in mm (inch)

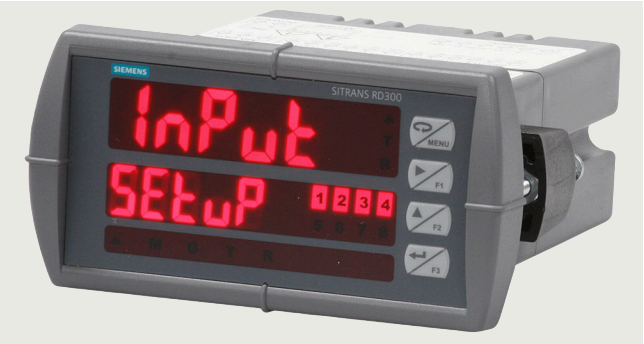
Circuit diagrams



SITRANS RD200 connections

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Overview



The SITRANS RD300 is a panel mount remote digital display for process instrumentation and acts as a multi-purpose, easy to use, rate/totalizer ideal for flow rate, total, and control applications.

Benefits

- Easy setup and programming via front panel buttons or using free RD software available via USB drive
- Display readable in sunlight
- Input: accepts current and voltage
- Single or dual 24 V DC transmitter power supply
- Serial communication using built in protocol or Modbus RTU
- Supports up to 8 relays and 8 digital I/O for process control and alarming
- 32-Point linearization, square root or exponential linearization
- Multi-pump alternation control
- Supports total, grand total or non-resettable grand total
- 9-digit totalizer with total overflow feature
- Large dual-line, 6-digit display
- Configure, monitor, and datalog from a PC
- Dual-input option with math functions: addition, difference, average, multiplication, division, minimum, maximum, weighted average, ratio, concentration

Application

The RD300 is a remote display for level, flow, pressure, weighing, and other process instruments. This display also acts as a multi-purpose, easy to use rate/totalizer ideal for flow rate, total, and control applications.

Data can be remotely collected, logged and presented on your local computer using the free RD software available via USB drive.

The display accepts a single or dual input of current and voltage. This makes the RD300 an ideal fit for use with most field instruments.

The RD300 can be set up as a standard panel mount, or combined with optional enclosures to allow it to house up to 6 displays.

- Key Applications: tank farms, pump alternation control, local or remote display of level, flow, pressure and weighing instrument values, PC monitoring and data logging with RD Software.

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Selection and ordering data

SITRANS RD300 Display Remote digital panel mount process display with current or voltage inputs. Two input, multi-line display, totalizer and pump control.	Article No. 7ML574- 4-	●	●	●	●	●	-	0	A
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Input voltage									
85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.		1							
12 ... 36 V DC; 12 ... 24 V AC, 6 W max.		2							
Output									
None			A						
2 Relays			B						
4 Relays			C						
4 ... 20 mA output			D						
2 Relays and 4 ... 20 mA output			E						
4 Relays and 4 ... 20 mA output			F						
Type									
Single input process and flow rate/totalizer Mtr				A					
Dual input process Mtr				B					
Display									
Standard					0				
SunBright					1				
Approvals									
UL, $_{c}$UL, and CE						0			

Selection and Ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
DIN-Rail Mounting Kit	**7ML1930-6AB**
4 Relays Expansion Module	**7ML1930-6AC**
4 Digital I/O Module	**7ML1930-6AD**
Dual output 4 ... 20 mA expansion module for dual input meter	**7ML1930-6AP**
RD300 RS 232 Serial Adapter	**7ML1930-6AF**
RD300 RS 422/485 Serial Adapter	**7ML1930-6AG**
RD300 USB Serial Adapter	**7ML1930-6AJ**
USB to RS 232 Converter	**7ML1930-6AK**

Selection and Ordering data	Article No.
RS 232 to RS 422/485 isolated converter	**7ML1930-1BU**
USB to RS 422/485 isolated converter	**7ML1930-1BX**
Snubber	**7ML1930-6AL**
Plastic enclosure	
For 1 meter	**7ML1930-6AM**
For 2 meters	**7ML1930-6AN**
For 4 meters	**7ML1930-1CK**
For 5 meters	**7ML1930-1CL**
For 6 meters	**7ML1930-1CM**

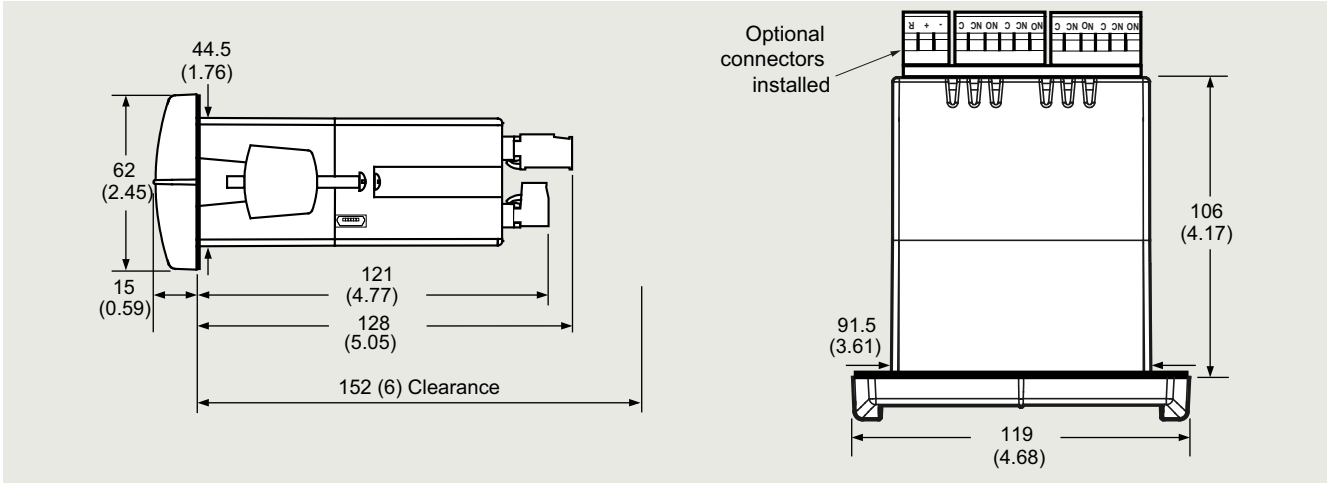
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Technical specifications

SITRANS RD300	
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring points	1 or 2 instruments
Input	
Measuring range	
• Current	4 ... 20 mA, 0 ... 20 mA
• Voltage	0 V DC ... +10 V DC, 1 ... 5 V, 0 ... 5 V
Output signal	
Output	• 4 ... 20 mA (optional) • Modbus RTU
Relays	2 or 4 SPDT (Form C) internal and/or 4 SPST (Form A) external; rated 3 A at 30 V DC and 125/250 V AC resistive load; 1/14 HP (50 W) at 125/250 V AC for inductive loads (optional)
Communications	• RS 232 with Modbus RTU • RS 422/485 with Modbus RTU • USB configuration and monitoring port
Accuracy	
4 ... 20 mA optional output	± 0.1 % FS ± 0.004 mA
Process input	± 0.05 % of span ± 1 count, square root: 10 ... 100 % FS
Rated operating conditions	
Ambient conditions	
• Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)
• Operating temperature range	-40 ... +65 °C (-40 ... +149 °F)
Design	
Weight	269 g (9.5 oz) (including options)
Material (enclosure)	• 1/8 DIN, high impact plastic, UL94V-0, color: gray • Optional plastic, steel and stainless steel (Type 304, EN 1.4301)NEMA 4 enclosures
Degree of protection	Type 4X, NEMA 4X, IP65 (front cover); panel gasket provided
Electrical connection	
mA output signal	2-core copper conductor, twisted, shielded, 0.82 ... 3.30 mm² (18 ... 12 AWG), Belden 8 760 or equivalent is acceptable
Electrical connection and relay connection	Copper conductor according to local requirements, rated 3 A at 250 V AC
Power supply	
Input voltage option	85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max. or jumper selectable 12/24 V DC ± 10 %, 15 W max.
Transmitter power supply	Terminals P+ & P-: 24 V DC ± 10 %, 12/24 V DC powered models selectable for 24, 10, or 5 V DC supply (internal jumper J4), 85 ... 265 V AC models rated at 200 mA max, 12/24 V DC powered models rated at 100 mA max., at 50 mA max. for 5 or 10 V DC supply.
External loop power supply	35 V DC max.
Output loop resistance	• 24 V DC, 10 ... 700 Ω max. • 35 V DC (external), 100 ... 1 200 Ω max.
Displays and controls	
Main display	0.6 inch (15 mm) high, red LEDs
Second display	0.46 inch (12 mm) high, red LEDs, 6-digits: each (-99 999 ... 999 999)
Memory	• Non-volatile • Stores settings for minimum of 10 years if power is lost
Programming	• Primary: front panel • Secondary: Meter Copy or PC with SITRANS RD Software
Certificates and approvals	CE, UL, ¿UL
Options	
Enclosures	Plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 and 4X enclosures

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Dimensional drawings

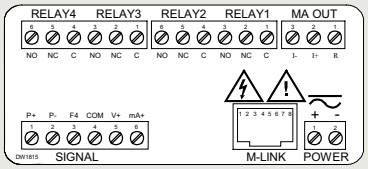


SITRANS RD300, dimensions in mm (inch)

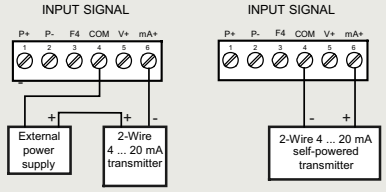
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Circuit diagrams

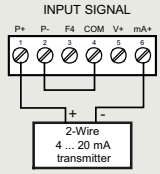
Connector labeling for fully loaded single input meter

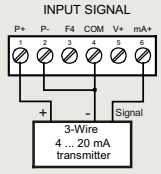


Transmitter powered by external supply or self-powered

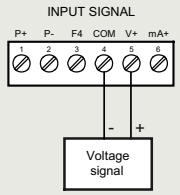


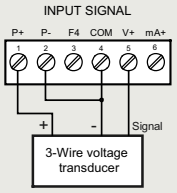
Transmitter powered by internal supply





Voltage Input Connections

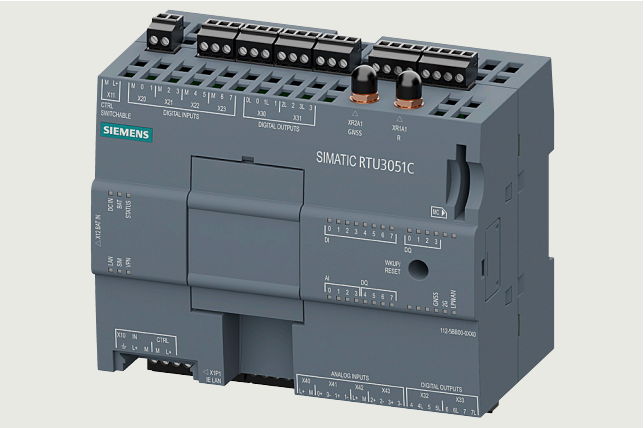




SITRANS RD300 connections

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Overview



The devices of the RTU3000C family are compact telecontrol stations (RTUs: Remote Terminal Units) for applications with their own power supply. They are particularly suited for monitoring and control of external stations that are not connected to an energy supply network. The RTUs can independently collect data from connected sensors with time stamps, preprocess the data, and transfer it to a control center. The RTU3000C is supplied with power by a battery, an accumulator or a solar panel or by a 12 ... 24 V DC power supply unit.

The devices of the RTU3000C series are characterized by the following properties:

- Worldwide data exchange between a remote measuring point and a control center via public or private networks (WAN), e.g. mobile networks, internet
- Communication with a control center (telecontrol center) with the help of the DNP3, IEC 60870-5-104 or SINAUT ST7 telecontrol protocols
- Connection to a control center with TeleControl Server Basic
- Connection to a cloud system via MQTT
- Acquisition of process signals, alarms, count pulses, measured values or output of switching commands by means of integrated inputs as well as digital inputs and outputs: 8 DI, 8 DO, 4 AI as well as HART and Modbus RTU via optional HART/RS485 extension board
- Processing of the acquired signals through a variety of function/program blocks
- Special program blocks support the user in creating the control application:
  - "Formula" block: The block calculates the result of the specified mathematical or Boolean expression, depending on as many as four input variables.
  - "Script" block: The Script block can process up to four inputs with self-programmed logic and set up to four outputs.
- FTP client functionality for transmitting data to an FTP server
- Time synchronization
  - On the basis of NTP (**N**etwork **T**ime **P**rotocol)
  - By means of the partner in the control center
  - By means of the mobile network (RTU3051C)
  - Via GNSS (RTU3011C and RTU3051C)

Overview (continued)

- Position detection using GNSS technologies GPS, Galileo, Beidou and GLONASS
- Automatic alarm transmission per email or text message
- Use as data logger by saving the process values to SD card
- Data buffering in the substations in the event of connection failures
- Remote access to HART devices on the HART/RS485 extension board via SIMATIC PDM
- Remote access to Modbus devices on the HART/RS485 extension board via SIMATIC PDM
- Flexible power supply concept: Battery, rechargeable with solar panel or 12-24 V power supply connection can be freely combined
- LED signaling for fast diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard DIN rail
- Use in harsh environments thanks to extended temperature range from -40 to +70 °C and IP68 protection thanks to optional protective aluminum enclosure
- Fast commissioning thanks to easy configuration using the integrated web server
- Support of bulk configuration for the initial configuration of RTUs
- Configuration transfer: Configurations of different RTU types with the same telecontrol protocol are upward compatible with each other.
- Automatic firmware update: Cyclic check for new firmware versions via FTP/HTTPS server or via SINEMA Remote Connect.
- Local logging of Security and Audit events
- Central logging of Security and Audit events using syslog
- Support of IEC 62443-4-2 Security Level 2
- To facilitate commissioning, RTU3000C supports DCP (Discovery and Configuration Protocol)

For RTU3051C:

- Integrated modem for global wireless data exchange between a remote measuring point and a control center on the basis of the LTE-M or NB-IoTv2 mobile wireless standard.

Note that not all network operators for LTE-M and NB-IoT support the text messaging (SMS) function.

MQTT connection

- Connection to cloud systems via MQTT, for example to Insights Hub, MS Azure, AWS (Amazon) or IBM Cloud
- Support for MQTT publish/subscribe mechanisms for sending topics from the RTU3000C to the cloud (publish) and receiving topics from the cloud (subscribe).

Product versions

Two product variants are offered for the various applications:

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Overview (continued)

- **SIMATIC RTU3011C**
  Compact RTU for variable power supply using batteries, rechargeable batteries, solar or 10.8 V DC to 28.8 V DC for connection of an external industry router; GNSS functionality; connection via TeleControl Basic, DNP3, IEC 60870-5-104 or SINAUT ST7 as well as MQTT protocols, on-board I/O (8 DI, 8 DQ, 4 AI), configuration and diagnostics via web interface; note GNSS country approvals!
- **SIMATIC RTU3051C**
  Compact RTU for variable power supply using batteries, rechargeable batteries, solar or 10.8 V DC to 28.8 V DC with integrated modem for LTE-M/NB-IoTv2; GNSS functionality; connection via TeleControl Basic, DNP3, IEC 60870-5-104 or SINAUT ST7 as well as MQTT protocols, on-board I/O (8 DI, 8 DQ, 4 AI), configuration and diagnostics via web interface; note country approvals!

In conjunction with the "TeleControl Server Basic" control center software, the RTU3000C forms a telecontrol system with additional properties:

- Connection of up to 5000 telecontrol stations to the control center via OPC UA
- Central status monitoring of the substations
- No special provider services required for fixed IP addresses
- Wake-up of substations by calling or text message

Together with MQTT, the application possibilities are expanded to include cloud applications. In addition to monitoring process data and visualization of process states of the RTUs in a telecontrol system, all the advantages of cloud systems are made available in this way:

- Improvement of process quality and detection of malfunctions through (big) data analysis of all relevant parameters, predictive maintenance
- Automatic process optimization by combining with data from other data sources, e.g. weather data for a preventive adaptation of the process to avoid critical conditions

Benefits

get Designed for Industry

- **Flexible location of use**
  A flexible power supply concept allows for use of the RTU3000C at different measuring points in a widely distributed network, independent of an existing power supply network.
- **Rugged hardware**
  The rugged hardware enables reliable operation even in harsh environments with an increased temperature range (-40 °C to +70 °C).
- **Flexible connection to control centers or cloud systems**
  Thanks to reloadable telecontrol protocols, various applications and connection options to different control centers or cloud systems are supported in one device.
- **Fast and flexible data communication**
  Time- and event-driven communication ensures that the operating personnel is informed immediately and reliably about process alarms, statuses and values.
- **Simple and cost-efficient engineering**
  The integrated web server enables easy configuration using the standard web browser without additional engineering tools.
- **Remote access** to HART or Modbus devices on the Extension Board HART/RS485 via SIMATIC PDM.
- **Fully automatic time stamp**
  To enable subsequent and correct archiving of process data in the control system, all data frames are time-stamped at their place of origin.
- **Automatic buffering of process values**
  Data is buffered in the substations to prevent it getting lost in case of connection failures.
- **Secure data transmission**
  Use of OpenVPN technology and encrypted email connections ensures secure data transmission.
  The RTUs also support secure HTTPS access to the web server both over the local Ethernet interface and remotely, e.g. via mobile wireless. In addition, the FTP file transfer can also be carried out with encryption.
- **Time not lost in case of a power outage**
  A buffered real-time clock ensures that the correct time is available even after a power outage.
- **Savings on travel and maintenance costs**
  Thanks to web-based management, configuration, diagnostics, control and monitoring can easily be performed remotely.

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Application

The telecontrol stations of the RTU3000C family can be used as a substation (Remote Terminal Unit) in telecontrol applications. Typical application examples include the acquisition of measured values in plants that are spread over large geographical areas (e.g. level monitoring of water tanks in the water/wastewater industry). In addition to these applications, MQTT enables additional uses in the cloud environment.

- Data exchange and centralized data monitoring for automation systems spread over large geographical areas, including integrated GNSS locating functionality
- Connection of difficult-to-access external stations without network infrastructure
- Connection of measuring points at locations without power supply infrastructure

These applications can be found in the most diverse industries:

- Water/wastewater treatment plants
  - Detection of leaks or water loss
  - Monitoring of pumping stations, water towers/reservoirs
  - Acquisition and monitoring of level / pressure / flow / temperature
  - Flood protection
- Inventory management – monitoring of levels in tanks and silos
- Agriculture – monitoring of irrigation systems or greenhouses
- Wind power – wind measurement for designing wind turbines
- Control and localization of mobile stations, such as monitoring of navigation buoys

Design

The SIMATIC RTU3000C is a compact module in SIMATIC S7-1200 format:

- Rugged, compact plastic enclosure for the temperature range -40 °C to +70 °C
- Easily accessible connection and diagnostics elements
- Easy mounting on a standard DIN rail
- Four plug-in screw-type terminals for eight digital inputs (pushbutton/switch/relay contacts) of which the first two inputs can be configured as counter inputs.
- Four plug-in screw-type terminals for four analog inputs: Current / voltage (0/4 ... 20 mA, 0 ... 10 V, 0 ... 5 V) or temperature measurement (Pt1000)
- Two plug-in screw-type terminals for four digital outputs designed as relay contacts
- RTU30x1C: two additional plug-in screw terminals for four additional digital outputs, designed as solid-state relays
- The close-loop (12 V or 24 V can be selected) and switchable controller outputs X10/X11 can be used for the supply of sensors and actuators
- 5-pin, plug-in terminal strip for connection of an 12 ... 24 V DC external supply voltage; connection protected against polarity reversal
- Connection socket for battery module (up to six battery modules can be connected)
- RJ45 socket for connection to Industrial Ethernet at 10/100 Mbps
- Pushbutton for the functions wake-up, shutdown, warm restart or reset to factory settings
- Slot for an SD card (Siemens SMC, SD or SDHC)
- Installed temperature sensor for monitoring of temperature inside enclosure
- SMA antenna port for mobile radio antenna (RTU3051C only) and GNSS antenna (RTU3051C and RTU3011C)

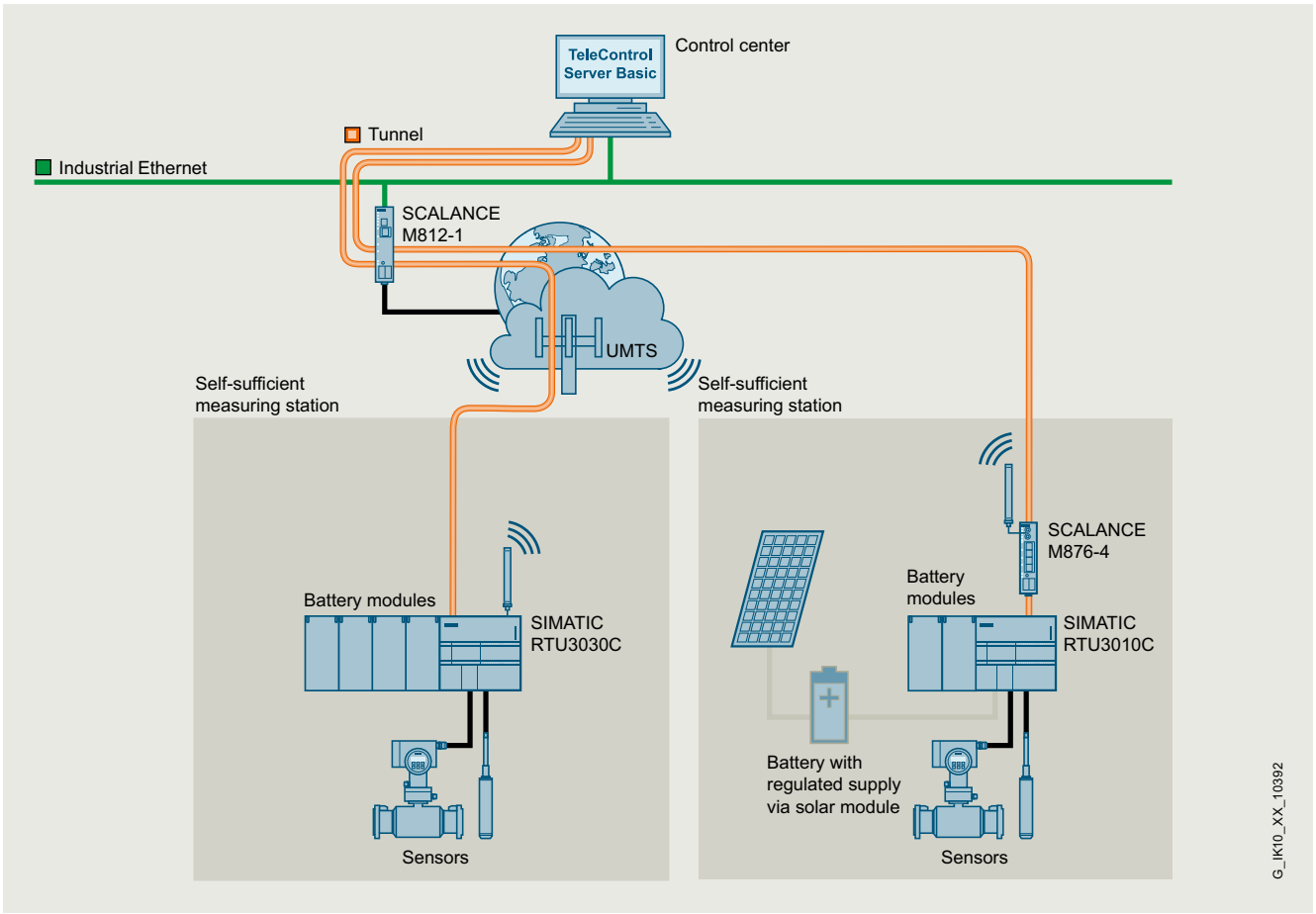
The telecontrol stations of the RTU3000C family can be used in stand-alone operation. The power supply can take place in independent operation by means of battery / accumulator /solar panel. The optional batteries are connected directly on the left side of the device without additional wiring. The power can also be supplied by a 5-pin terminal strip on the bottom of the module, even in combination with battery modules. The SD card tray is located on the front of the module. Removable screw-type terminals make for quick module replacement because the connected sensors must not be wired again.

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Function

The devices of the RTU3000C family are compact telecontrol stations. They enable connection of remote measuring points to TeleControl Server Basic or another control center as well as a cloud system and monitoring of these measuring points. To ensure autonomous operation, the devices can also switch between four different operating modes:

- **Hibernation mode**
  All inputs and communication functions are turned off so that power consumption is minimal. Outputs can retain their last value.
- **Update mode**
  Used to query the inputs and outputs. The query cycle can be configured individually.
- **Communication mode**
  Mobile wireless connection or connection via LAN interface and external router and communication to the central office are active.
- **Service mode**
  Maintenance work can take place without loss of data.



Connection of the SIMATIC RTU3000C to TeleControl Server Basic

Energy-independent mode

The RTU3000C stations can be operated in an energy-saving manner. Depending on the communication requirements and the connected type of power supply (e.g. battery, solar accumulator), independent operation can thus be guaranteed for many years to come. Power consumption can be determined by the RTU (from hardware level V2) for the diagnostics and prognosis of the battery life. The determined value can be logged and transferred to the control center.

Data backup

Data losses are prevented by the data buffering mechanisms integrated in the product. In the event of a connection failure, time-stamped frames are buffered in the device. When the connection returns, the buffered values are automatically transferred to the control center in the right order.

Data logging

The RTU3000C stations support the backup of process data on SD card. The retentively saved data can be sent cyclically by email and/or FTP or, if necessary, be downloaded directly using web-based management (WBM).

Data point configuration

For data point configuration, the RTUs supports a series of data point types: Digital input, digital output, analog input, counter input.

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Function (continued)

Configuration of the data points can take place with little effort using the websites of the RTU3000C stations. A cyclic and/or event-controller transfer of measured values, setpoints or alarms can thus be implemented in just a few steps.

Data preprocessing

Ready-to-use function and program blocks enable data preprocessing directly in the RTU. The process data can be linked by means of process blocks for basic control jobs.

46 different types are supported in the following groups:

- Blocks for logical functions (e.g. AND, OR)
- Blocks for time functions (e.g. ON and OFF delay, astronomical clock)
- Blocks for analog value functions (e.g. threshold value monitoring)
- Counter blocks: Featuring the retentivity option, which saves the current count value during restarting and reconfiguration so that it is not lost.
- Analog and digital bit memories for buffering calculation results
- Blocks for messages (text messages, email)
- Block for FTP file transfer
- Relay blocks (latching relay, pulse relay)
- Blocks for silo volume calculation
- Block for rectangular weir overflow calculation
- "Formula" function block for evaluation of mathematical and Boolean expressions of up to four input variables.
- "Script" block with self-programmed logic.

Time synchronization

The RTUs support time synchronization and therefore ensure that historical data is given the correct time stamp. The following synchronization mechanisms are available: via NTP, the telecontrol center, mobile radio and GNSS, depending on type of RTU.

Alarms sent by email or text message

For timely communication of station statuses to service and maintenance personnel, alarm emails or, in the case of RTU3051C, alarm text messages can be configured. If previously defined events (such as threshold violation) should occur, application-specific information is sent automatically by email or SMS (directly or via the connected router).

Note that not all network operators for LTE-M and NB-IoT (RTU3041C) support the text messaging (SMS) function.

GPS position

The function block checks whether a predefined setpoint position has been reached.

The actual position can also be transferred to the control center as a tag.

Telecontrol communication using standard protocols

For communication with the control center, the RTUs support the DNP3, IEC 60870-5-104 and SINAUT ST7 telecontrol protocols. The RTUs act as a DNP3 station, as an IEC slave or, in the case of SINAUT ST7, as a station connected to an ST7 node station, e.g. TIM 1531 IRC. The RTUs can also be connected to the TeleControl Server Basic (TCSB). TCSB enables a connection to any control center software, e.g. WinCC V7/V8, or via any OPC UA-capable client. With MQTT, all the advantages of cloud systems can be used.

Remote maintenance

The RTU3000C stations provide remote maintenance access via WBM for access from the control center. The RTU3051C can be woken from hibernation mode via text message or phone call. When using the "TeleControl Basic" communication protocol, the wake-up text message can be generated in the CMT of TCSB.

Security mechanisms

Access to the RTU3000C stations requires an authorization. Up to 20 authorized email addresses or phone numbers can be defined in the WBM for email and SMS messages. Data is sent through an OpenVPN tunnel or a secure tunnel of the TeleControl Server Basic. Email messages can be encrypted (support of STARTTLS). FTP uploads can be performed encrypted via SSL with FTPS.

Diagnostics

The RTU3000C stations offer comprehensive diagnostic options for quick and informative analysis of the station status. Basic diagnostics information, such as the status of the power supply, the communication connection and the inputs and outputs are signaled directly to the RTU by LEDs. The current status of the LEDs can also be retrieved through WBM.

Using the web server, comprehensive information can be retrieved, such as facts about the connection history, buffer status, and the transferred measured values.

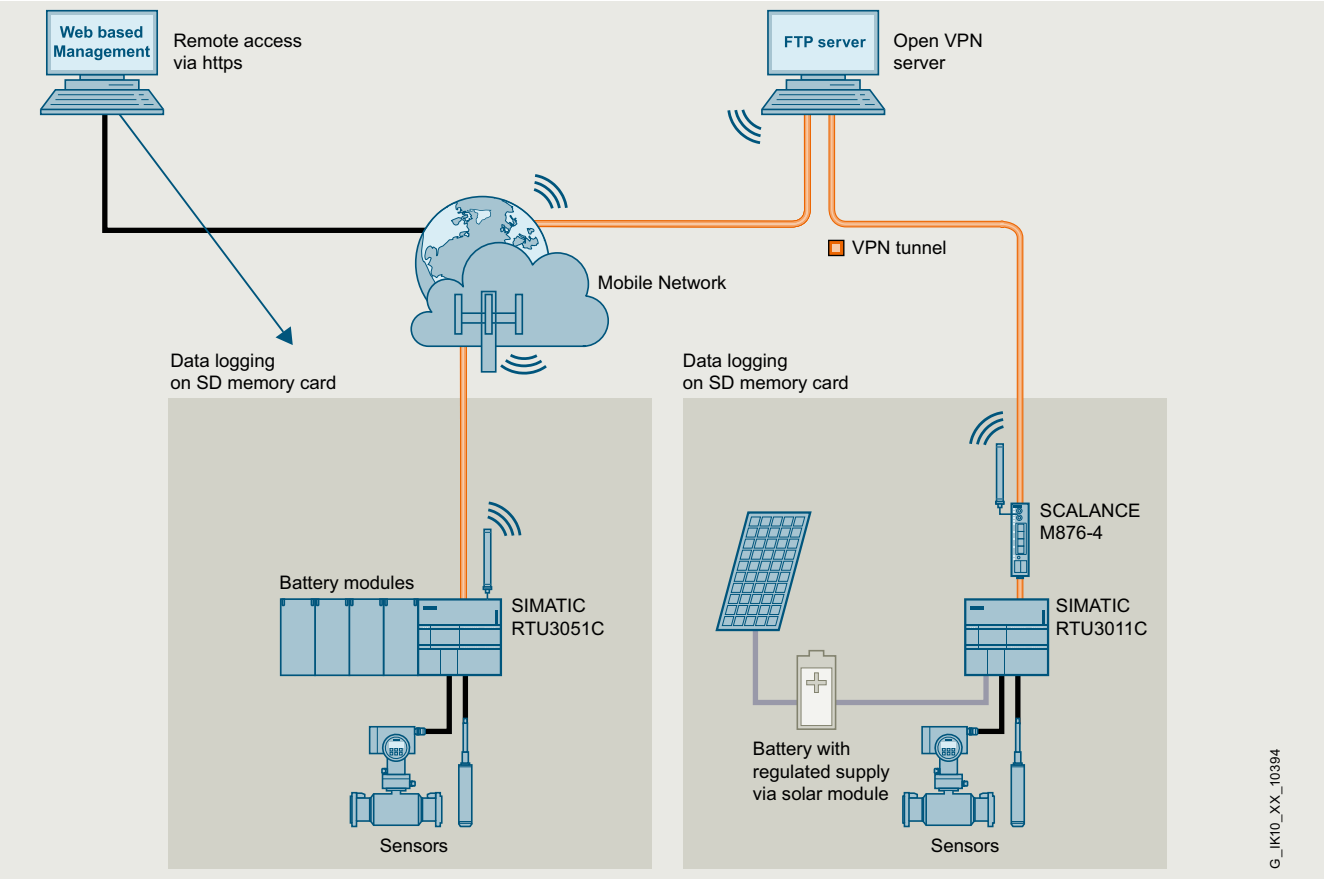
Furthermore, up to four new, freely definable tag tables are available in which an independent overview of all required tags can be composed to provide a display of all significant process values at a glance. Graded user management (Admin and User) ensures that only authorized persons are given access.

Configuration over web server

The integrated web server is accessed locally for diagnostics from a PC or remotely via the mobile wireless interface or Ethernet interface with upstream industrial router. Configuration, firmware update or configuration changes can therefore be performed remotely without additional software thereby saving time and money.

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Integration



Example of configuration for data logging with RTU3000C

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Selection and ordering data

	Article No.
SIMATIC RTU3011C [1] Compact low-power RTU; battery or solar-powered; connection of external power supply 10.8 V DC to 28.8 V DC; connection an of external modem; GNSS; connection to TeleControl Server Basic, DNP3, IEC 60870-5-104 or SINAUT ST7 as well as MQTT; on-board I/Os: 8 DI, 8 DO, 4 AI; FTP client; configuration/diagnostics via web server; time synchronization; email; SD card slot. Note GNSS national approvals!	**6NH3112-0BB00-0XX0**
SIMATIC RTU3051C [1] Compact low-power RTU; battery or solar-powered; connection of external power supply 10.8 V DC to 28.8 V DC; integrated modem for LTE-M/NB-IoTv2; GNSS; connection to TeleControl Server Basic, DNP3, IEC 60870-5-104 or SINAUT ST7 as well as MQTT, on-board I/Os: 8 DI, 8 DO, 4 AI; FTP client; Ethernet port, configuration / diagnostics via web server, time synchronization, text message, email, SD card slot, note country approvals!	**6NH3112-5BB00-0XX0**
HART/RS485 extension board Extension card for low-power RTU3000C family; connection of 16 Modbus RTU slaves or of 16 HART devices in multidrop mode; max. 32 tags.	**6NH3112-3BA00-6XX1**

[1] Please note country approvals.

Accessories

	Article No.
Battery case for SIMATIC RTU3000C Battery case for mounting of two D cell batteries; suitable for SIMATIC RTU3000C; batteries must be procured externally and are not included in the scope of supply! Please observe information on the battery type in the Equipment Manual!	**6NH3112-3BA00-1XX2**
Battery expansion case for SIMATIC RTU3000C Battery expansion case for accommodating two D cell batteries; suitable for SIMATIC RTU3000C; batteries must be procured externally and are not included in the scope of supply. Please observe information on the battery type in the Equipment Manual!	**6NH3112-3BA00-1XX6**
Enclosure in IP68 degree of protection For SIMATIC RTU3000C; Note: Cable glands and sealing plugs must be ordered separately in the necessary quantity	
• **Aluminum enclosure**; Temperature range -40 to +80 °C	**6NH3112-3BA00-1XX3**
M16 cable gland For IP68 enclosure, temperature range -40 to +100 °C, nickel-plated brass	**6NH3112-3BA00-1XX4**
M16 blanking plugs For IP68 enclosure, temperature range -40 to +100 °C, nickel-plated brass	**6NH3112-3BA00-1XX5**
SIMATIC Memory Card	
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
ANT896-4MA 2G/3G/4G antenna Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional characteristic; can be rotated radially with additional joint; with SMA plug for direct mounting on the device; antenna gain 2dBi; IP54	**6GK5896-4MA00-0AA3**
ANT896-4ME 2G/3G/4G antenna Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional characteristic; with N-female connector for remote installation indoors and outdoors; antenna gain 3dBi; IP66	**6GK5896-4ME00-0AA0**
ANT794-4MR antenna Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m connecting cable with fixed connection to antenna; SMA plug; including mounting bracket, screws, wall plugs	**6NH9860-1AA00**
ANT895-6ML GPS antenna ANT895-6ML GPS antenna with integrated signal amplifier, including 0.3 m connecting cable and N-female connector; 3 dBi IP67 (-40 ... +85 °C) mounting with magnet or screw mounting; note country approvals; compact instructions on paper in English/German; scope of supply: 1x ANT 895-6ML	**6GK5895-6ML00-0AA0**
SIMATIC NET antenna connection cable N/SMA male/male Flexible antenna connecting cable for connection of antenna and SCALANCE M	
• 0.3 m	**6XV1875-5LE30**
• 1 m	**6XV1875-5LH10**
• 2 m	**6XV1875-5LH20**
• 5 m	**6XV1875-5LH50**

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Accessories (continued)

	Article No.
SIMATIC NET antenna N-Connect male/male flexible connection cable Flexible cable for connecting an RCoax cable or antenna to a SCALANCE W-700 access point with N-Connect connections; pre-assembled with two N-Connect male connections	
• 1 m	**6XV1875-5AH10**
• 2 m	**6XV1875-5AH20**
• 5 m	**6XV1875-5AH50**
• 10 m	**6XV1875-5AN10**
SIMATIC NET N-Connect/ N-Connect female/female panel feedthrough Cabinet bushing for wall thicknesses up to 4.5 mm, two N-Connect female connectors	**6GK5798-2PP00-2AA6**
LP798-1N lightning protector Lightning protector with N/N female/female connector, IP67 (-40 to +85 °C), frequency range: 0 ... 6 GHz	**6GK5798-2LP00-2AA6**
SITOP PSU100C 1-phase, 12 V DC/2 A Stabilized power supply Input: 100 ... 230 V AC Output: 12 V DC/2 A	**6EP1321-5BA00**
SITOP PSU100C 1-phase, 12 V DC/6.5 A Stabilized power supply Input: 100 ... 230 V AC Output: 12 V DC/6.5 A	**6EP1322-5BA10**
SITOP PSU100C 1-phase, 24 V DC/1.3 A Stabilized power supply Input: 120 ... 230 V AC Output: 24 V DC/1.3 A	**6EP1331-5BA10**
SITOP PSU100C 1-phase, 24 V DC/2.5 A Stabilized power supply Input: 100 ... 230 V AC Output: 24 V DC/2.5 A	**6EP1332-5BA00**
SITOP PSU100C 1-phase, 24 V DC/3.7 A Stabilized power supply Input: 100 ... 230 V AC (110 ... 300 V AC) Output: 24 V DC/3.7 A Limited output power NEC class 2	**6EP1332-5BA20**

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Technical specifications

Article number	6NH3112-0BB00-0XX0	6NH3112-5BB00-0XX0
product type designation	RTU3011C	RTU3051C
product brand name	SIMATIC NET	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6NH3112-0BB00-0XX0	https://i.siemens.com/1P6NH3112-5BB00-0XX0
operating mode	Standby mode (Sleep mode), Actualization mode, Communication mode	Standby mode (Sleep mode), Actualization mode, Communication mode
transfer rate		
transfer rate		
• for Industrial Ethernet	10 ... 100 Mbit/s	10 ... 100 Mbit/s
for GPRS transmission		
- with downlink maximum		264 kbit/s
- with uplink maximum		210 kbit/s
for LTE-M transmission		
- with downlink maximum		588 kbit/s
- with uplink maximum		1 000 kbit/s
for NB-IoT transmission		
- with downlink maximum		120 kbit/s
- with uplink maximum		160 kbit/s
interfaces		
number of interfaces according to Industrial Ethernet	1	1
number of electrical connections		
• at the 1st interface according to Industrial Ethernet	1	1
• for external antenna(s)		2
• for power supply	1	1
number of slots		
• for SIM cards		1
• for memory cards	1	1
type of electrical connection		
• at the 1st interface according to Industrial Ethernet	RJ45 port	RJ45 port
type of electrical connection		
• for external antenna(s)		SMA socket (50 ohms)
• for power supply	5-pole plugable terminal block	5-pole plugable terminal block
type of antenna		
• at connection 1 connectable		mobile wireless antenna
• at connection 2 connectable	active GNSS antenna	active GNSS antenna
slot version		
• for SIM card		Mini SIM card, with adapter Micro SIM card also
• of the memory card	SD 1.0, SD 1.1, SDHC, Siemens SMC	SD 1.0, SD 1.1, SDHC, Siemens SMC
storage capacity of the memory card maximum	32 Gibyte	32 Gibyte
design of the removable storage		
• C-PLUG	No	No
signal inputs/outputs		
number of electrical connections for digital input signals	8	8
type of electrical connection for digital input signals	pluggable screw terminal block	pluggable screw terminal block
digital input version	Suitable for open-drain transistor or switch, 2-wire-technique	Suitable for open-drain transistor or switch, 2-wire-technique
number of electrical connections as counter inputs for digital input signals	2	2
pulse duration at counter input minimum	0.1 ms	0.1 ms
pulse frequency at counter input maximum	5 000 Hz	5 000 Hz
number of electrical connections for digital output signals	8	8
type of electrical connection for digital output signals	pluggable screw terminal block	pluggable screw terminal block
digital output version	4DO bistable relay, 2-wire technology 4DO solid-state relay	4DO bistable relay, 2-wire technology 4DO solid-state relay
output current at digital output	300 mA; Limiting continuous current, with solid-state relays 60 mA	300 mA; Limiting continuous current, with solid-state relays 60 mA
number of analog inputs integrated	4	4

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Technical specifications (continued)

Article number product type designation	6NH3112-0BB00-0XX0 RTU3011C	6NH3112-5BB00-0XX0 RTU3051C
connector type at the analog input	pluggable screw terminal block	pluggable screw terminal block
type of analog input	2-/3-/4-wire-technique	2-/3-/4-wire-technique
product function parameterizable analog inputs	Yes; Current 0/4..20mA, Voltage 0..5/10V, Temperature (Pt1000) -80..+140°C	Yes; Current 0/4..20mA, Voltage 0..5/10V, Temperature (Pt1000) -80..+140°C
A/D resolution at the analog input	12 bit	12 bit
wireless technology		
type of mobile wireless service is supported		
• SMS	No	Yes
• GPRS		Yes
•	over external, IP-based router	GPRS (Multislot Class 10)
• LTE-M		Yes
• NB-IoT		Yes
type of wireless network is supported		
• GSM		Yes
operating frequency for GSM transmission		operating frequency for GSM transmission 850 MHz, operating frequency for GSM transmission 900 MHz, operating frequency for GSM transmission 1800 MHz, operating frequency for GSM transmission 1900 MHz
operating frequency for LTE-M transmission		operating frequency for LTE-M transmission band 1 (2100 MHz), operating frequency for LTE-M transmission band 2 (1900 MHz), operating frequency for LTE-M transmission band 3 (1800 MHz), operating frequency for LTE-M transmission band 4 (1700 MHz), operating frequency for LTE-M transmission band 5 (850 MHz), operating frequency for LTE-M transmission band 8 (900 MHz), operating frequency for LTE-M transmission band 12 (700 MHz), operating frequency for LTE-M transmission band 13 (700 MHz), operating frequency for LTE-M transmission band 18 (850 MHz), operating frequency for LTE-M transmission band 19 (850 MHz), operating frequency for LTE-M transmission band 20 (800 MHz), operating frequency for LTE-M transmission band 26 (850 MHz), operating frequency for LTE-M transmission band 28 (700 MHz)
operating frequency for NB-IoT transmission		operating frequency for NB-IoT transmission band 1 (2100 MHz), operating frequency for NB-IoT transmission band 2 (1900 MHz), operating frequency for NB-IoT transmission band 3 (1800 MHz), operating frequency for NB-IoT transmission band 5 (850 MHz), operating frequency for NB-IoT transmission band 8 (900 MHz), operating frequency for NB-IoT transmission band 12 (700 MHz), operating frequency for NB-IoT transmission band 13 (700 MHz), operating frequency for NB-IoT transmission band 18 (850 MHz), operating frequency for NB-IoT transmission band 19 (850 MHz), operating frequency for NB-IoT transmission band 20 (800 MHz), operating frequency for NB-IoT transmission band 26 (800 MHz), operating frequency for NB-IoT transmission band 28 (700 MHz)
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	DC
supply voltage external at DC	12 ... 24 V	12 ... 24 V
supply voltage external at DC rated value	10.8 ... 28.8 V	10.8 ... 28.8 V
type of output voltage for the supply of external devices	DC 12 V or 24 V	DC 12 V or 24 V
supply voltage for GPS antenna maximum	3.8 V; Nominal 3.8 V (3.575 V @5 mA, 3.35 V @ 10 mA, 3.125 V @ 15 mA)	3.8 V; Nominal 3.8 V (3.575 V @5 mA, 3.35 V @ 10 mA, 3.125 V @ 15 mA)
consumed current note	without connected consumers	without connected consumers
consumed current		

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Technical specifications (continued)

Article number product type designation	6NH3112-0BB00-0XX0 RTU3011C	6NH3112-5BB00-0XX0 RTU3051C
from external supply voltage at 24 V DC		
- in standby mode typical	14 mA	14 mA
- in update mode typical	35 mA	35 mA
- in communication mode typical	55 mA	83 mA
with battery operation at 7.2 V DC		
- in standby mode typical	0.28 mA	0.28 mA
- in update mode typical	71 mA	71 mA
- in communication mode typical	125 mA	208 mA
output current for GPS antenna maximum	15 mA	15 mA
power loss [W]	without connected consumers	without connected consumers
power loss [W] with external supply voltage at 24 V DC		
• in standby mode typical	0.34 W	0.34 W
• in update mode typical	0.85 W	0.85 W
• in communication mode typical	1.25 W	2 W
power loss [W] with battery operation at 7.2 V DC		
• in standby mode typical	0.002 W	0.002 W
• in update mode typical	0.51 W	0.51 W
• in communication mode typical	0.9 W	1.5 W
ambient conditions		
ambient temperature		
• for vertical installation during operation	-40 ... +60 °C	-40 ... +60 °C
• for horizontally arranged busbars during operation	-40 ... +70 °C	-40 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
relative humidity		
• at 30 °C without condensation during operation maximum	95 %	95 %
protection class IP	IP20; IP68 with protective housing (see accessories)	IP20; IP68 with protective housing (see accessories)
design, dimensions and weights		
module format	Compact module	Compact module
width	130 mm	130 mm
height	100 mm	100 mm
depth	75 mm	75 mm
net weight	0.34 kg	0.37 kg
fastening method		
• 35 mm DIN-rail mounting	Yes	Yes
• wall mounting	Yes	Yes
product features, product functions, product components general		
product function		
• DynDNS client		Yes
• no-ip.com client		Yes
product functions cloud connectivity		
protocol is supported		
• Message Queuing Telemetry Transport (MQTT)	Yes	Yes
• HTTP	Yes	Yes
product function for cloud connectivity		
• trigger management	Yes	Yes
• time stamping	Yes	Yes
product feature for cloud connectivity buffered message frame memory	Yes	Yes
performance data		
number of users email addresses definable maximum	20	
number of users/telephone numbers/email addresses definable maximum		20
number of user groups definable maximum	10	10

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Technical specifications (continued)

Article number	6NH3112-0BB00-0XX0	6NH3112-5BB00-0XX0
product type designation	RTU3011C	RTU3051C
number of program block types	45	46
number of configurable program blocks	48	48
number of digital bit memories maximum	48	48
number of analog bit memories maximum	24	24
performance data IT functions		
number of possible connections		
• as client by means of FTP maximum	1	1
number of entries in the FTP buffer maximum	12	12
number of possible connections		
• as server by means of HTTP maximum	2	2
• as server by means of HTTPS maximum	2; http and https can be combined (max. number of 2 connections cannot be exceeded).	2; http and https can be combined (max. number of 2 connections cannot be exceeded). Max. one connection via https is possible on the mobile wireless interface.
• as email client maximum	1	1
number of free texts for emails and SMS maximum	20	20
number of characters per free text for emails or SMS maximum	160	160
number of entries in the email buffer maximum	12	12
performance data telecontrol		
suitability for use		
• node station	No	No
• substation	Yes	Yes
• TIM control center	No	No
control center connection	IEC 60870-5-104, DNP3-capable control stations, SINAUT ST7cc/sc, TeleControl Server Basic	IEC 60870-5-104, DNP3-capable control centers, SINAUT ST7cc/sc, ST7 ScadaConnect, TeleControl Server Basic
• by means of a permanent connection	supported	supported
• by means of demand-oriented connection	supported	supported
protocol is supported		
• DNP3	Yes	Yes
• IEC 60870-5	Yes	Yes
• SINAUT ST1 protocol		No
• SINAUT ST7 protocol	Yes	Yes
product function data buffering if connection is aborted	Yes; number of telegrams for: IEC 60870: approx. 5,000, DNP3: approx. 10,900, SINAUT ST7: approx. 7,700, TeleControl Server Basic: approx. 10.900	Yes; number of telegrams for: IEC 60870: approx. 5,000, DNP3: approx. 10,900, SINAUT ST7: approx. 7,700, TeleControl Server Basic: approx. 10.900
data volume as user data per station in telecontrol mode maximum	256 Kibyte	256 Kibyte
product feature buffered message frame memory	Yes	Yes
performance data teleservice		
diagnostics function online diagnostics with SIMATIC STEP 7	No	No
product function		
• program download with SIMATIC STEP 7	No	No
• remote firmware update	Yes	Yes
• remote configuration	Yes	Yes
product functions management, configuration, engineering		
configuration software		
• required	No, configuration by using the integrated webserver	No, configuration by using the integrated webserver
product function gateway for SIMATIC PDM		
• with Modbus TCP	Yes	Yes
• with HART-IP protocol	Yes	Yes
product functions diagnostics		
product function web-based diagnostics	Yes	Yes
product functions security		
operating mode Virtual Private Network (VPN)	Yes; OpenVPN client	Yes; OpenVPN client
product function with VPN connection	OpenVPN	OpenVPN
type of encryption algorithms with VPN connection	AES-128, AES-256	AES-128, AES-256

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Technical specifications (continued)

Article number product type designation	6NH3112-0BB00-0XX0 RTU3011C	6NH3112-5BB00-0XX0 RTU3051C
type of authentication procedure with VPN connection	certificate based	certificate based
type of authentication with Virtual Private Network PSK	No	No
type of hashing algorithms with VPN connection	SHA-256	SHA-256
number of possible connections with VPN connection	2; one simultaneous productive connection only	2; one simultaneous productive connection only
product function		
• password protection for Web applications	Yes	Yes
• password protection for teleservice access	Yes	Yes
• password protection for VPN	Yes	Yes
• encrypted data transmission	Yes	Yes
• switch-off of non-required services	Yes	Yes
• SysLog	Yes	Yes
product functions time		
protocol is supported		
• NTP	Yes	Yes
product component hardware real time clock	Yes	Yes
product feature hardware real time clock w. battery backup	Yes	Yes
accuracy of the hardware real time clock per day maximum	1.8 s	1.8 s
time synchronization		
• from NTP-server	Yes	Yes
• from GPS-signal	Yes	Yes
• from control center	Yes	Yes
• from mobile network provider		Yes
• PC	Yes	Yes
• manual setting	Yes	Yes
product functions position detection		
product function		
• position detection with GPS	Yes	Yes
• pass on position data	Yes	Yes
standards, specifications, approvals		
certificate of suitability CE marking	Yes	Yes
certificate of suitability UKCA marking	Yes	Yes
certificate of suitability cULus approval	Yes	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes	Yes
certificate of suitability RoHS conformity	Yes	Yes
standards, specifications, approvals hazardous environments header		
certificate of suitability ATEX	Yes	Yes
certificate of suitability IECEx	Yes	Yes
certificate of suitability ULhazloc approval	Yes	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes	Yes
certificate of suitability FM registration	Yes	Yes
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	37.97 kg	37.97 kg
• during manufacturing	28.1 kg	28.1 kg
• during operation	9.4 kg	9.4 kg
• after end of life	0.47 kg	0.47 kg
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net

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Technical specifications (continued)

Article number	6NH3112-0BB00-0XX0	6NH3112-5BB00-0XX0
product type designation	RTU3011C	RTU3051C
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

More information

Technical requirements/compatibility

Corresponding suitable industrial routers (e.g. SCALANCE MUM/M) for the connection to the control center via the Ethernet interface of the RTU3000C can be found under Remote Networks - IP-based modems and routers.

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Overview



IE/PB Link HA and IE/PB Link PN IO

IE/PB LINKs are gateways for connecting the two network types, Industrial Ethernet and PROFIBUS, i.e. they enable access to all PROFIBUS stations connected to the lower-level PROFIBUS network.

Product variants

Two variants are offered as gateways for Industrial Ethernet and PROFIBUS:

- **IE/PB LINK PN IO**
  Gateway with PROFINET IO functionality, S7 routing and data record routing for standard ambient conditions
- **IE/PB LINK HA**
  Gateway optimized for use in the process industry due to the possibility of deployment in harsh ambient conditions and the connection of PROFIBUS field devices to a redundant AS as PROFINET IO controller

Both product variants can be used in two operating modes:

Standard mode enables, for example, loading of programs and configuration data via PG/OP communication, data record routing for configuration and diagnostics of field devices with the SIMATIC PDM tool, S7 routing e.g. for cross-network loading of SIMATIC PLCs on PROFIBUS.

When operated as a PROFINET IO proxy, from the perspective of the PN IO controller, all PROFIBUS DP slaves connected after the IE/PB LINK are treated as PN IO devices according to the PROFINET standard, i.e. the IE/PB LINK is the proxy of the connected PROFIBUS DP slaves.

Both IE/PB LINK versions offer the possibility to use different transmission media by employing BusAdapters.

Benefits

get Designed for Industry

- Protection of investment due to simple connection of PROFIBUS DP slaves to PROFINET IO controller. This enables a step-by-step transition to modern PROFINET networks
- Independence from individual vendors through support of the PROFINET standard for distributed field devices
- Flexible use due to different connection system and hardware; copper (RJ45, FC) and fiber-optic cables (SCRJ for POF/PCF, LC for glass fiber-optic)
- Also enables use in plants with PROFIsafe applications
- Worldwide access to data of the PROFIBUS stations via Industrial Ethernet and Internet for vertical integration
- Access to process data from all enterprise levels
- Loading of STEP 7 programs from a central location
- Easy engineering and extensive diagnostics options due to optimum TIA integration

IE/PB LINK HA also offers:

- High availability through redundancy mechanisms in PROFINET IO through use as S2 device
- Interruption-free plant operation in the redundant system, even when configuration changes are required during operation, through support for Configuration in Run (H-CiR)
- Easy migration of large PROFIBUS networks to PROFINET by supporting up to 125 PROFIBUS DP slaves
- Reliable operation even in harsh ambient conditions

Application

As an autonomous component, both IE/PB LINK versions provide a seamless transition between Industrial Ethernet and PROFIBUS.

Using the IE/PB LINK as a proxy, you can continue to use existing PROFIBUS nodes (even with PROFIsafe functionality V2.0 or higher) and integrate them into a PROFINET application.

IE/PB LINK HA additionally offers connection to a redundant PROFINET IO automation system and the functionality Configuration in Run (H-CIR).

Both IE/PB LINK versions also offers cross-network PG/OP communication by means of S7 routing. Cross-network access to data of S7 stations for visualization with S7 OPC server and S7 routing; via the IE/PB LINK, access is possible from the Industrial Ethernet (for example for HMI applications with OPC client interface) to data of the S7 stations on the PROFIBUS using the S7 OPC server.

In addition, data record routing (PROFIBUS DP) is supported. This means it is possible, for example, to use SIMATIC PDM (on the PC) on Industrial Ethernet to configure and perform diagnostics for a PROFIBUS field device via the IE/PB LINK. IE/PB LINK HA also designed for use in harsh ambient conditions.

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Design

Both IE/PB LINK versions provide all the advantages of the SIMATIC ET 200SP design:

- Compact design;
  the front of the rugged plastic enclosure features:
  - Two RJ45 ports for connecting to Industrial Ethernet; the connection is made via the IE FC RJ45 plug 90 with 90° cable outlet or via a standard patch cable
  - A 9-pin D-sub socket for connection to PROFIBUS
  - A 4-pin terminal strip for connecting the external redundant supply voltage of 24 V DC (two infeeds)
  - Diagnostics LEDs
- Optional connection possibility for Industrial Ethernet via BusAdapter (BA) of the SIMATIC ET 200SP system at the front
- Easy installation on standard mounting rails
- Can be operated without a fan
- Fast device replacement in the event of a fault by using the optional C-PLUG removable data storage medium (not included in scope of supply)

Function

Compact gateway between PROFINET and PROFIBUS

- Connection to Industrial Ethernet via integrated 2-port real-time switch with 100 Mbps full duplex connection with autosensing for automatic switchover
- In case of replacement part: Connection to Industrial Ethernet also with 10 Mbps half duplex
- Connection to PROFIBUS with 9.6 Kbps to 12 Mbps
- Support for MRP (Media Redundancy Protocol) using integrated Real Time Switch
- SIMATIC ET 200SP design: Use of the BusAdapter (BA) of the SIMATIC ET 200SP system for freely selecting the connection system and physical characteristics on the PROFINET side

IE/PB LINK HA also offers

- Use in ambient temperatures from -40 °C to +70 °C
- Conformal coating
- Support for enhanced interference immunity according to NAMUR recommendation NE21

Operation as PROFINET IO proxy

- Connection of PROFIBUS DP slaves to PROFINET IO controller with real-time property, according to PROFINET standard. From the viewpoint of the controller, all DP slaves are treated like devices with PROFINET interface, i.e. the IE/PB LINK PN IO is their proxy

IE/PB LINK HA also offers

- Connection of PROFIBUS DP slaves to a redundant SIMATIC S7 controller (S7-400H) as PROFINET S2 device including support for Configuration in Run (H-CiR)
- Connection of up to 125 PROFIBUS DP slaves on the single controller and up to 64 PROFIBUS DP slaves in operation as S2 device on the redundant controller

Additional functionality for vertical integration (standard operation or operation as PROFINET IO proxy)

- S7 routing
  - Permits cross-network PG communication, in other words, all S7 stations on Industrial Ethernet or PROFIBUS can be programmed remotely using the programming device.
  - Access can take place to visualization data of S7 stations on the PROFIBUS from HMI stations on Industrial Ethernet.
- Data record routing (PROFIBUS DP)
  - Using this option, the IE/PB LINK PN IO can be used as a router for data records that are forwarded to field devices (DP slaves). SIMATIC PDM (Process Device Manager) is a tool that creates data records of this type for parameterization and diagnostics of field devices.
  - The configuration of the IE/PB LINK PN IO for standard mode is possible via SINEC PNI (Primary Setup Tool Network Initialization) as well as STEP 7 / TIA Portal

The supplementary functions for vertical integration can also be used in an existing PROFIBUS application without PROFINET IO for connection to a higher-level Industrial Ethernet.

In this case, the IE/PB Link PN IO is used as an additional DP master Class 2 on a PROFIBUS segment for coupling to Industrial Ethernet and offers the above functions.

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Function (continued)

Media redundancy (MRP):

- IE/PB LINK supports the media redundancy protocol MRP as an MRP client within a PROFINET network with a ring topology

Diagnostics

Extensive diagnostic options are available via STEP 7 or SNMP, including:

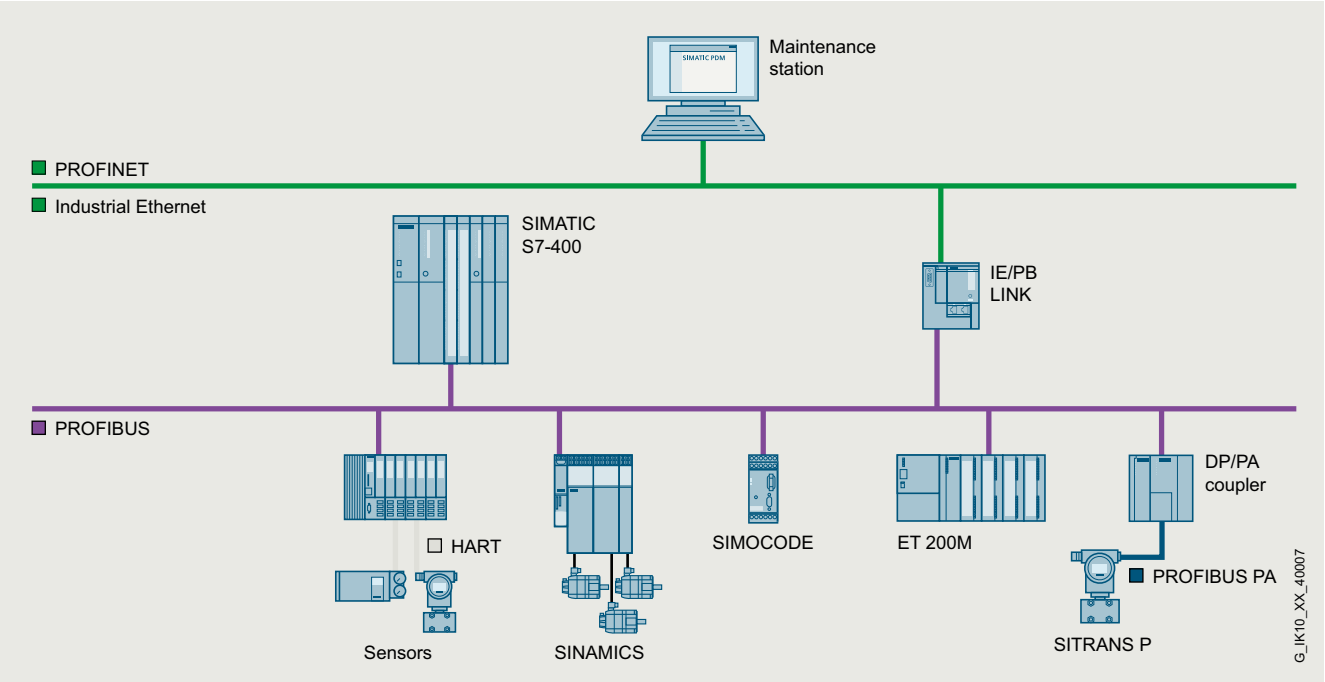
- Diagnostics of the assigned PROFIBUS field devices; using the IE/PB LINK as a proxy, the connected DP slaves can be diagnosed in the same manner as PROFINET IO devices (even in the user program of the PROFINET IO controller)
- General diagnostics and statistics functions
- Connection diagnostics
- Diagnostic buffer
- Integration into network management systems through the support of SNMP V1 MIB-II

Configuration

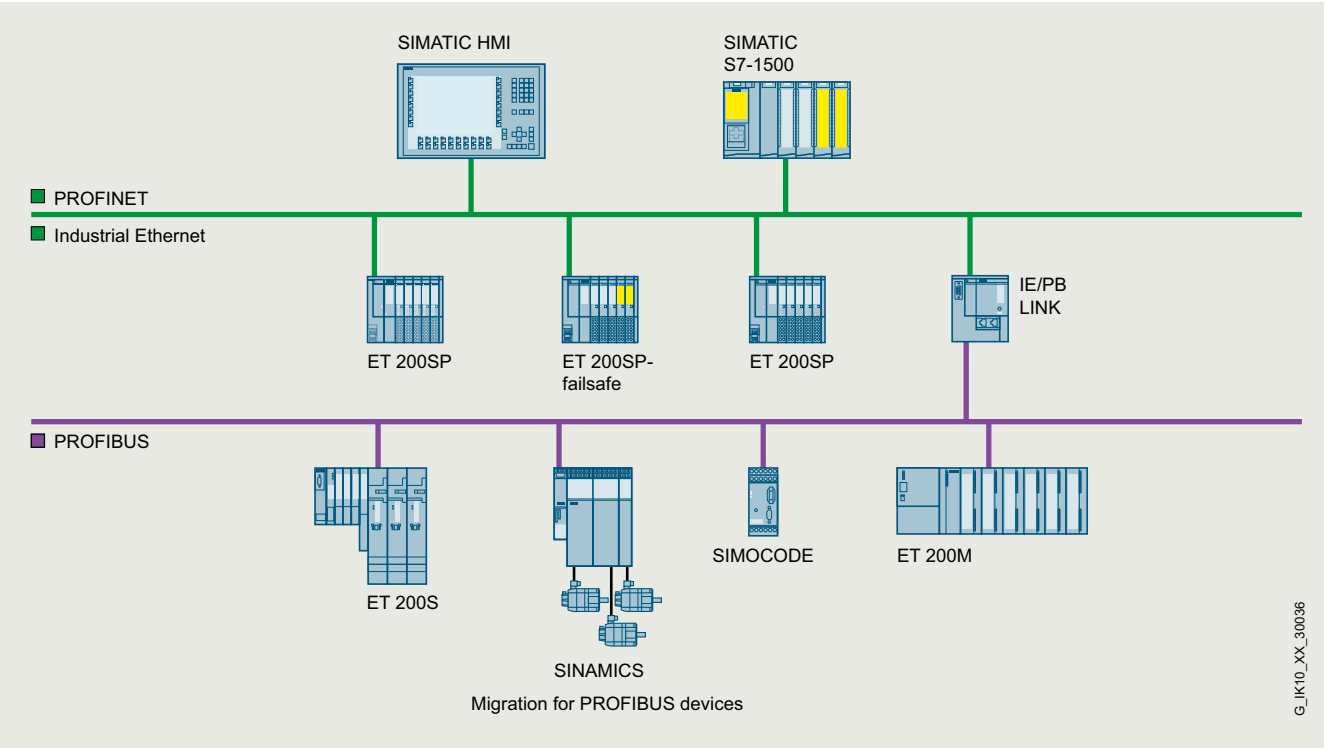
- With STEP 7 V5.x or STEP 7 Professional in the TIA Portal, all the necessary parameters for IE/PB Link, e.g. the addresses and all necessary routing information, are generated automatically
- The configuration data for PROFINET IO created with STEP 7 is saved on the IO controller. Attention must however be paid to the memory capacity.
- IE/PB LINK can be swapped in the event of failure without a programming device because the relevant configuration data is saved on the PN IO controller or on the C-PLUG.
- If the IE/PB LINK PN IO is only to be used as a gateway and not as a PROFINET IO device, the IE/PB LINK behaves like a simple network component. Accordingly, the IP and PROFIBUS parameters and the network settings can also be assigned with a STEP 7 Professional (TIA Portal) without a license
- The IP and PROFIBUS parameters as well as the network settings can also be assigned using SINEC PNI
- The initialization data for the Industrial Ethernet interface is backed up on the C-PLUG (configuration plug) removable data storage medium
- Use in networks that support an exchange of devices without programming devices on the basis of the Link Layer Discovery Protocol (LLDP)

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Integration



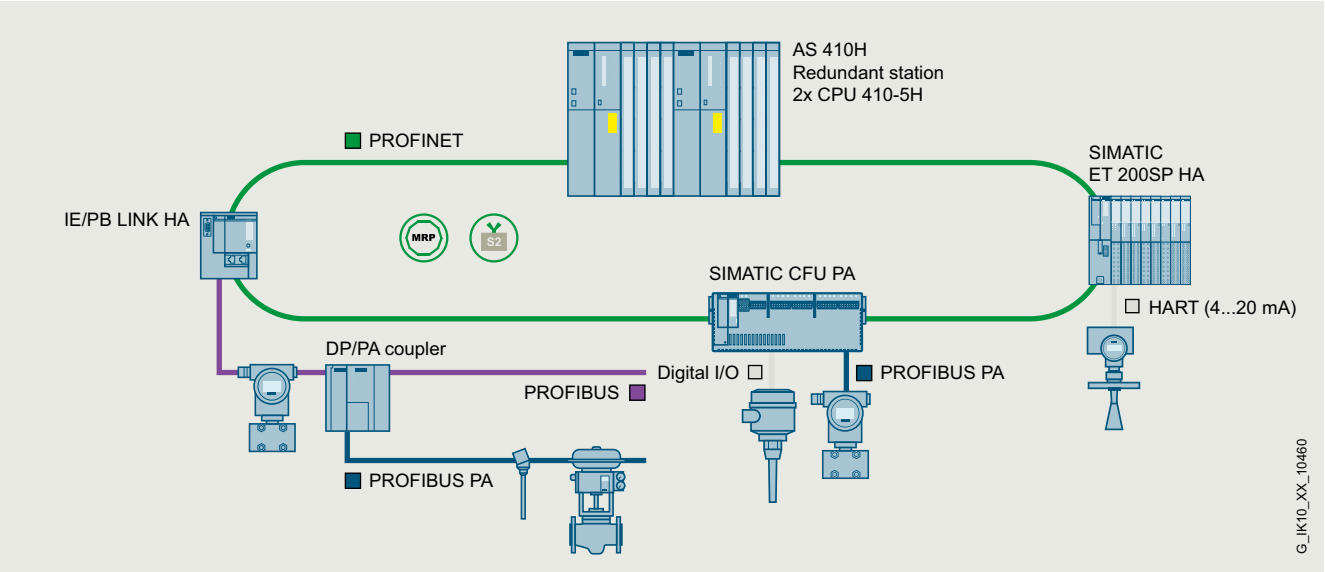
IE/PB LINK: Gateway in standard mode



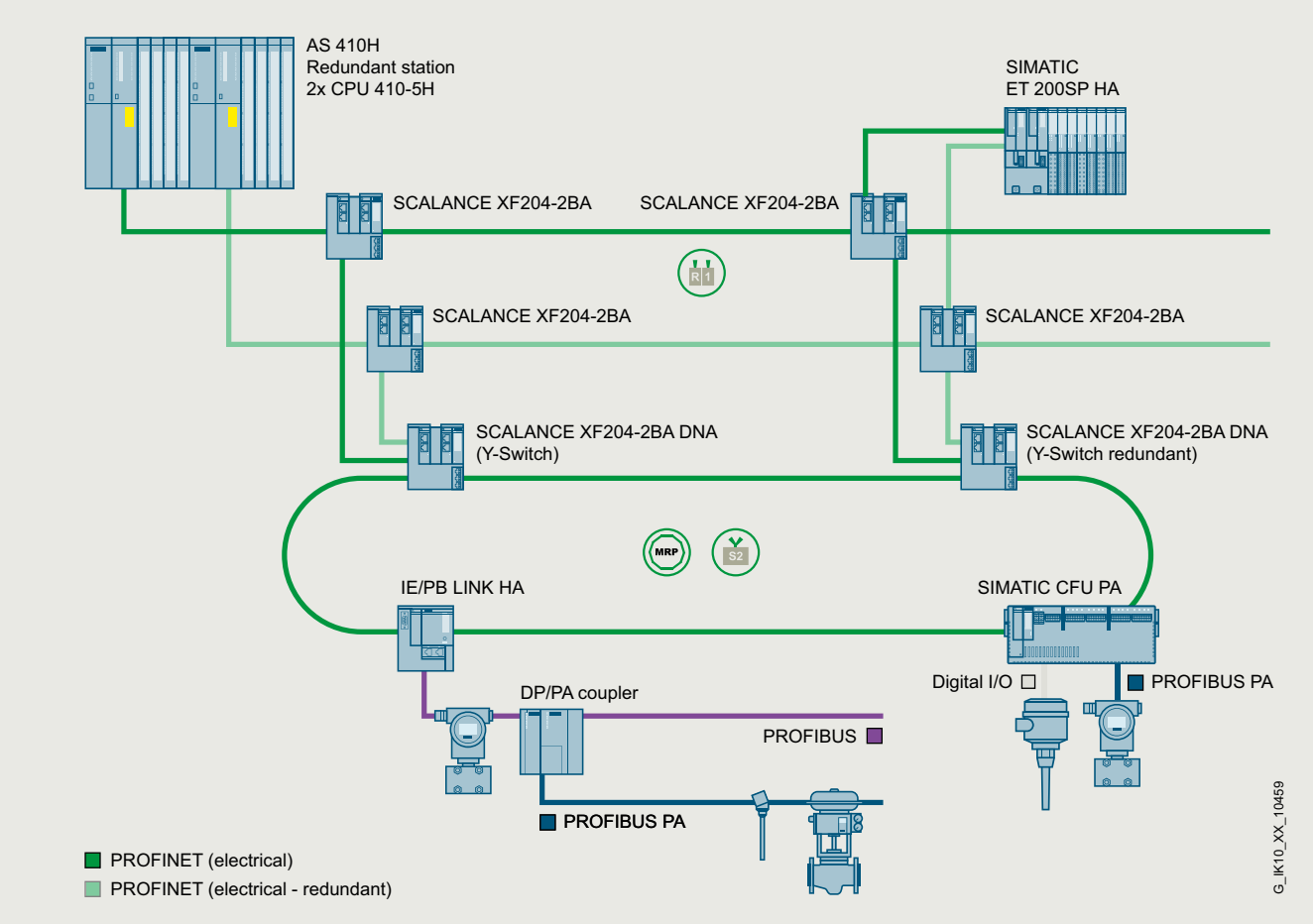
IE/PB LINK: PROFINET IO proxy

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Integration (continued)



IE/PB LINK HA: System redundancy as S2 device in the MRP ring



IE/PB LINK HA: PROFINET system redundancy on R1 system

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Selection and ordering data

	Article No.
IE/PB LINK PN IO Gateway between Industrial Ethernet and PROFIBUS, PROFINET IO proxy with real-time communication, time synchronization via SIMATIC protocol, NTP, SNMP V1, LLDP, S7 routing, data record routing, connection of up to 64 S7/DPV0/DPV1 slaves, support for DP/PA LINK and DP/FF LINK, 10/100 Mbps Fast Ethernet, MRP, 9.6 kbps up to 12 Mbps PROFIBUS, firmware download via configuration tool, redundant power supply, firmware version V4.0 Gateway	**6GK1411-5AB10**
IE/PB LINK HA Gateway between Industrial Ethernet and PROFIBUS, PROFINET IO proxy with real-time communication, system redundancy S2, H-CiR, time synchronization via SIMATIC protocol, NTP, SNMP V1, LLDP, S7 routing, data record routing, connection of up to 125 S7/DPV0/DPV1 slaves, support for DP/PA LINK and DP/FF LINK, 10/100 Mbps Fast Ethernet, MRP, 9.6 kbps up to 12 Mbps PROFIBUS, firmware download via configuration tool, redundant power supply, conformal coating, extended temperature range -40 °C to 70 °C	**6GK1411-5BB00**
Accessories	
C-PLUG Removable data storage medium for easy device replacement if a fault occurs. For storing configuration and application data. Can be used in the following SIMATIC NET products with C-PLUG slot: SCALANCE XC-200, XP-200, XM-400, XR-500, M-800, W-700, SC-600 and S615	**6GK1900-0AB10**
BusAdapter BusAdapters offer a free selection of connection system and hardware for the PROFINET interface. Alternatively, they can be used for the Industrial Ethernet interface on the device. The following BusAdapter versions are supported by the IE/PB LINK PN IO:	
Variants with copper connection (RJ45, FastConnect (FC))	
• BA 2xRJ45 with 2 RJ45 connections	**6ES7193-6AR00-0AA0**
• BA 2xFC with 2 x FastConnect connections	**6ES7193-6AF00-0AA0**
• BA 2xRJ45 HA with 2 RJ45 sockets	**6DL1193-6AR00-0AA0**
• BA 2xFC HA with 2 x FastConnect connections	**6DL1193-6AF00-0AA0**
• SIPLUS BusAdapter BA 2xRJ45 with 2 x RJ45 connections	**6AG1193-6AR00-7AA0**
• SIPLUS BusAdapter BA 2xFC with 2 x FastConnect connections	**6AG1193-6AF00-7AA0**
• BA 2xRJ45 VD HA BusAdapter VD (variable distance), for Ethernet communication via 2-, 4- or 8-wire copper cables, 2 x RJ45 sockets	**6GK5991-2VA00-8AA2**
Variants with fiber-optic connection (FOC)	
• BA 2xLC with LC glass fiber-optic connection	**6ES7193-6AG00-0AA0**
• BA 2xSCRJ with 2 x SCRJ FO connection	**6ES7193-6AP00-0AA0**
• BA 2xLC HA with 2 x LC glass fiber-optic connections	**6DL1193-6AG00-0AA0**
• SIPLUS BusAdapter BA 2xLC with 1 x LC glass fiber-optic connection	**6AG1193-6AG00-2AA0**
• SIPLUS BusAdapter BA2SCRJ with 2 x SCRJ FO connection	**6AG1193-6AP00-2AA0**
Media converter versions	

Selection and ordering data (continued)

	Article No.
• BA LC/RJ45 Media converter glass fiber-optic cable/CU for 1 x LC FO connection and 1 x RJ45 connection	**6ES7193-6AG20-0AA0**
• BA LC/FC Media converter glass fiber-optic cable/CU 1 x LC FO connection and 1 x RJ45 connection	**6ES7193-6AG40-0AA0**
• BA SCRJ/RJ45 Media converter fiber-optic cable/CU 1 x SCRJ FO connection and 1 x RJ45 connection	**6ES7193-6AP20-0AA0**
• BA SCRJ/FC Media converter fiber-optic cable/CU 1 x SCRJ FO connection and 1 x FastConnect connection	**6ES7193-6AP40-0AA0**
• BA LC/RJ45 HA Media converter glass fiber-optic cable/CU, 1 x LC FO connection and 1 x RJ45 connection	**6DL1193-6AG20-0AA0**
• BA LC/FC HA Media converter glass fiber-optic cable/CU, 1 x LC FO connection and 1 x FastConnect connection	**6DL1193-6AG40-0AA0**

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Accessories

C-PLUG

BusAdapters

BusAdapters offer a free selection of connection system and hardware for the PROFINET interface. **Alternatively,** they can be used for the Industrial Ethernet interface on the device.

The following BusAdapter versions are supported by the IE/PB LINK PN IO:

Versions PN copper interfaces (RJ45 or FastConnect (FC))

- **BA 2xRJ45** with 2 RJ45 connections
- **BA 2xFC** with 2 FastConnect connections
- **BA 2xRJ45 HA** with 2 RJ45 sockets
- **BA 2xFC HA** with 2x FastConnect connection
- **BA 2xRJ45 VD HA** with 2 RJ45 connections for variable distance
- **SIPLUS BusAdapter BA 2xRJ45** with 2 RJ45 connections
- **SIPLUS BusAdapter BA 2xFC** with 2 FastConnect connections

Versions with PN fiber-optic connections (FO)

- **BA 2xLC** with two glass fiber-optic connections (Lucent Connector) with increased potential difference
- **BA 2xSCRJ** with 2 SCRJ FO connections with increased potential difference
- **BA 2xLC HA** with LC glass fiber-optic connection
- **SIPLUS BusAdapter BA 2xLC** with LC glass fiber-optic connection
- **SIPLUS BusAdapter BA2SCRJ** with 2 x SCRJ FO connection

Media converter versions:

- **BA LC / RJ45**, with one glass fiber-optic and one RJ45 connection (media converter)
- **BA LC / FC** with one glass fiber-optic and one FastConnect connection (media converter)
- **BA SCRJ / RJ45**, with one SCRJ FO and one RJ45 connection (media converter)
- **BA SCRJ / FC**, with one SCRJ FO and one FastConnect connection (media converter)
- **BA LC/RJ45 HA** with one LC FO connection and one RJ45 connection
- **BA LC/FC HA** with one LC FO connection and one FastConnect connection

The version for connecting IP67 modules of the SIMATIC ET 200AL (BA-SEND, BA 1xFC) is not supported.

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Technical specifications

Article number product type designation	6GK1411-5AB10 IE/PB LINK PN IO	6GK1411-5BB00 IE/PB LINK HA
product brand name	SIMATIC NET	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK1411-5AB10	https://i.siemens.com/1P6GK1411-5BB00
suitability for operation	Gateway between Industrial Ethernet and PROFIBUS	Gateway between Industrial Ethernet and PROFIBUS
transfer rate		
transfer rate		
• at the 1st interface	10 ... 100 Mbit/s	10 ... 100 Mbit/s
• at the 2nd interface	9.6 kbit/s ... 12 Mbit/s	9.6 kbit/s ... 12 Mbit/s
interfaces		
number of electrical connections		
• at the 1st interface according to Industrial Ethernet	2	2
• at the 2nd interface according to PROFIBUS	1	1
• for power supply	2	2
type of electrical connection		
• at the 1st interface according to Industrial Ethernet	RJ45 port onboard or SIMATIC BusAdapter	RJ45 port onboard or SIMATIC BusAdapter
type of electrical connection		
• at the 2nd interface according to PROFIBUS	9-pin Sub-D socket (RS 485)	9-pin Sub-D socket (RS 485)
• for power supply	4-pole terminal block	4-pole terminal block
design of the removable storage		
• C-PLUG	Yes	Yes
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	DC
supply voltage external at DC rated value	24 V	24 V
relative positive tolerance at DC at 24 V	20 %	20 %
relative negative tolerance at DC at 24 V	15 %	15 %
consumed current		
• from external supply voltage at DC at 24 V typical	0.2 A	0.2 A
• from external supply voltage at DC at 24 V maximum	0.3 A	0.3 A
power loss [W]	4.8 W; typical 4.8 W, maximum 7.2 W	4.8 W; typical 4.8 W, maximum 7.2 W
ambient conditions		
ambient temperature		
• for vertical installation during operation	0 ... 40 °C	-40 ... +50 °C
• for horizontally arranged busbars during operation	0 ... 60 °C	-40 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
ambient condition relating to ambient temperature - air pressure - installation altitude	during operation max. 2 000 m above sea level at max. 60 °C ambient temperature	during operation max. 2 000 m above sea level at max. 60 °C ambient temperature
relative humidity		
• at 25 °C without condensation during operation maximum	95 %	95 %
protection class IP	IP20	IP20
design, dimensions and weights		
module format	ET 200SP design	ET 200SP design
width	100 mm	100 mm
height	117 mm	117 mm
depth	74 mm	74 mm
net weight	0.6 kg	0.6 kg
product feature conformal coating		Yes
fastening method		
• 35 mm DIN-rail mounting	Yes	Yes
performance data PROFIBUS DP		
service as DP master		
• DPV0	Yes	Yes
• DPV1	Yes	Yes
number of DP devices		
• at the 2nd interface as DP master maximum	64	125; or 64 as S2 device

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Technical specifications (continued)

Article number product type designation	6GK1411-5AB10 IE/PB LINK PN IO	6GK1411-5BB00 IE/PB LINK HA
data volume		
• of the address range of the inputs as DP master total	2 048 byte	4 096 byte
• of the address range of the outputs as DP master total	2 048 byte	4 096 byte
• of the address range of the inputs per DP device	244 byte	244 byte
• of the address range of the outputs per DP device	244 byte	244 byte
performance data S7 communication		
number of possible connections for S7 communication		
• maximum	32	32
performance data multi-protocol mode		
number of active connections with multi-protocol mode	48	48
performance data PROFINET communication as PN IO device		
product function PROFINET IO device	Yes	Yes
product functions management, configuration, engineering		
product function MIB support	Yes	Yes
protocol is supported		
• SNMP v1	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
configuration software		
• required	STEP 7 as of V5.5 SP4 HF11 and HSP, STEP 7 Professional as of V15, PCS7 V9.0, PCS neo as of V3.0, PNI as of V1.0	STEP 7 as of V5.6 SP2 HF3 and HSP, STEP 7 Professional as of V17, PCS 7 as of V9.0 SP3, SINEC PNI as of V1.0
identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes
• I&M2 - installation date	Yes	Yes
• I&M3 - comment	Yes	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
product functions routing		
service as PROFIBUS dataset routing	Yes	Yes
number of possible connections with dataset routing maximum	32	32
product functions redundancy		
product function		
• ring redundancy	Yes	Yes
product function of the PROFINET IO device is supported		
• PROFINET system redundancy	No	Yes; as an S2 device on CPU 410-5 H, S7-400H and S7-1500R/H
protocol is supported Media Redundancy Protocol (MRP)	Yes	Yes
product functions time		
product function pass on time synchronization	Yes	Yes
protocol is supported		
• NTP	Yes	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes	Yes
standards, specifications, approvals		
certificate of suitability CE marking	Yes	Yes
certificate of suitability UKCA marking	Yes	Yes
certificate of suitability cULus approval	Yes	
certificate of suitability KC approval		Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes	
certificate of suitability RoHS conformity	Yes	Yes
certificate of suitability EAC approval	Yes	Yes
standards, specifications, approvals hazardous environments header		
certificate of suitability ATEX	Yes	Yes
certificate of suitability IECEx	Yes	Yes
certificate of suitability ULhazloc approval	Yes	Yes

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Technical specifications (continued)

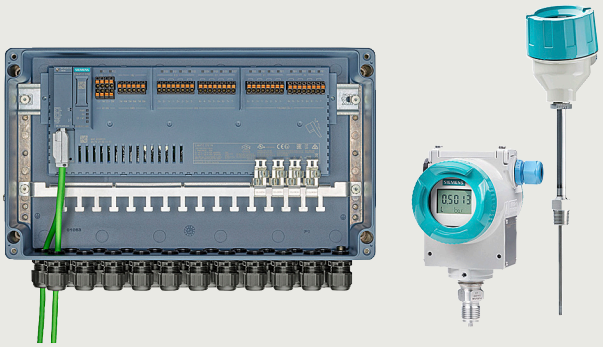
Article number product type designation	6GK1411-5AB10 IE/PB LINK PN IO	6GK1411-5BB00 IE/PB LINK HA
certificate of suitability CCC for hazardous zone according to GB standard	Yes	Yes
certificate of suitability FM registration	Yes	
standards, specifications, approvals marine classification header		
Marine classification association American Bureau of Shipping Europe Ltd. (ABS)	Yes	
Marine classification association French marine classification society (BV)	Yes	
Marine classification association Det Norske Veritas (DNV)	Yes	
Marine classification association Lloyds Register of Shipping (LRS)	Yes	
Marine classification association Nippon Kaiji Kyokai (NK)	Yes	
Marine classification association Polski Rejestr Statkow (PRS)	Yes	
Marine classification association Royal Institution of Naval Architects (RINA)	Yes	
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	153.98 kg	153.98 kg
• during manufacturing	22.6 kg	22.6 kg
• during operation	131 kg	131 kg
• after end of life	0.38 kg	0.38 kg
accessories		
accessories	optional: C-PLUG, SIMATIC BusAdapter of the ET 200SP system	optional: C-PLUG (mandatory for S7 1500R/H), SIMATIC BusAdapter of the ET 200SP system
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
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• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

More information

http://www.siemens.com/profinet

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Overview



Smart Field Distributor – SIMATIC Compact Field Unit

With the new SIMATIC Compact Field Unit (CFU), we are re-interpreting the conventional approach to field device connection. The smart field distributor is installed at the process level and is connected via PROFINET, the world's leading Industrial Ethernet standard, directly to the automation system to form the foundation for digitalization in the field.

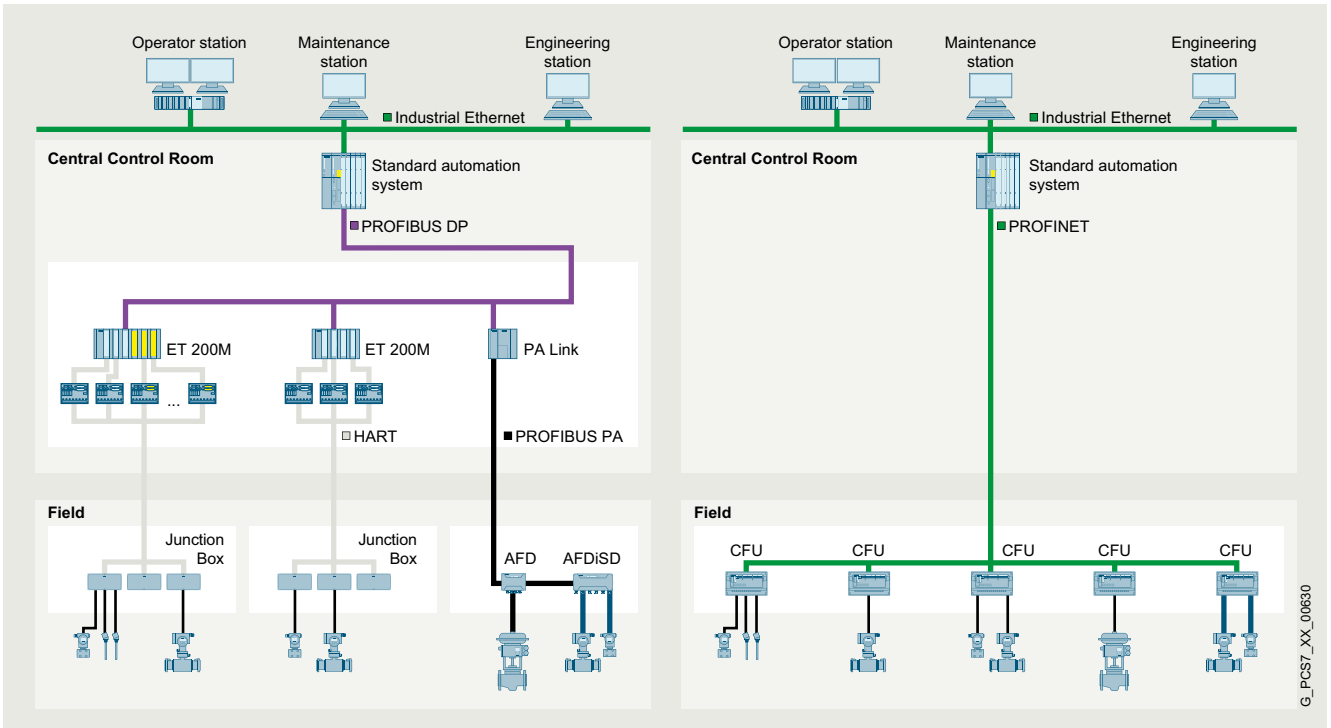
You benefit from greater flexibility and very simple handling coupled with maximum availability. This allows you to efficiently transfer your familiar system concept to the digital world.

Today's challenges for field device connection:

- High overhead for device integration and replacement
- Complicated, error-prone wiring and routing over multiple levels, making the hardware FAT very complex
- Extremely long copper cables and numerous terminal points in the field
- Multiple individual control cabinets
- Large numbers of different components and protocols necessitate costly spare parts inventories and training sessions
- High planning and documentation costs

SIMATIC CFU – The answer to these challenges

Mode of operation



Field device connection with previous technology (left) and with SIMATIC CFU (right)

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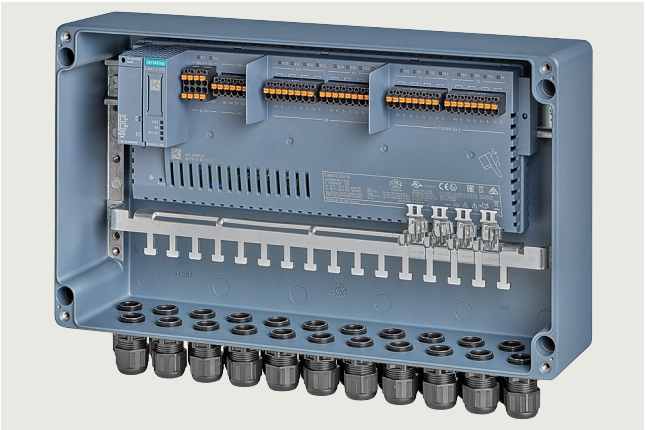
Overview (continued)

The SIMATIC Compact Field Unit (CFU) is a real game-changer in field device connection and offers you entirely new prospects regarding simplicity, flexibility and standardization. The smart field distributor is installed at the process level and is connected via PROFINET directly to the automation system to form the foundation for digitalization in the field. Utilization of digital fieldbus communication considerably simplifies device interfacing compared to conventional 4 ... 20 mA engineering.

Greater flexibility thanks to consistent decentralization

Distributed installation of the SIMATIC CFU means that classic control cabinets are no longer required and you can make considerable savings in cabling and the number of terminal points, as well as reducing planning and documentation overheads. The high granularity (16 I/O per SIMATIC CFU) enables flexible assignment to the higher-level controllers.

Function



The SIMATIC CFU was specifically designed to meet the requirements of the process industry in the Industry 4.0 environment (application example: SIMATIC CFU in a standard cast aluminum housing).

System integration via Industrial Ethernet standard

- Flexible connection options via PROFINET
- Ready for Process Automation (PA Ready):
  - Redundant PROFINET connection (S2) for maximum availability
  - Media redundancy (MRP)
  - Configuration in RUN (CiR)
- BusAdapter (electrical, optical or combination)

Ready for distributed use

- Installation up to hazardous zone 2/22 (with conformal housing)
- Extended temperature range from -40 to +70 °C
- Conformal coating use up to 4000 meters altitude
- Implementation of increased interference immunity according to NAMUR NE 21
- Optional: Aluminum enclosure for direct field deployment in zone 2/22

More information

You can find more information on the CFU and its variants, as well as an overview of all ordering data here:

Product information page

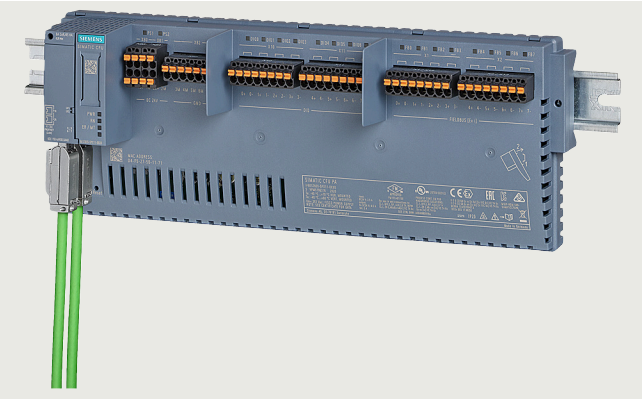
https://support.industry.siemens.com/cs/ww/en/view/109749357

Catalog

https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10398139?tree=CatalogTree

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Overview



SIMATIC CFU here with BusAdapter, PROFINET bus cable and push-in terminals

SIMATIC CFU PA edition

Plug-and-produce simplicity

Digitalization requires a digital infrastructure facilitating integrated digital communication right down to the sensors and actuators. You can use the established and proven PROFIBUS PA standard to achieve this. It is integrated into the PA edition of the SIMATIC CFU, thus combining ruggedness and easy handling with all the advantages of the PROFINET standard based on Industrial Ethernet. Connected devices are automatically addressed. The device is integrated via standardized communication profiles.

This innovative new implementation of the PROFIBUS PA concept makes it possible to combine the simplicity of a point-to-point wiring system with the scalability of digital PROFIBUS PA fieldbus communication. As with digital field devices, it is not necessary to know prior to connection whether the discrete field device is a sensor or actuator – This can be easily configured afterwards via software.

Combination of digital fieldbus and discrete I/Os

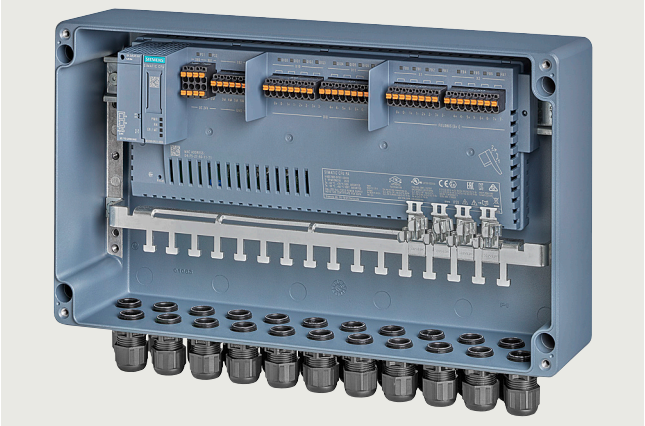
- 8 × digital fieldbus (PROFIBUS PA)
- 8 × digital inputs/outputs, freely configurable (1 x counter functionality / frequency measurement)

Easy to use

- Automatic addressing of PROFIBUS PA field devices
- System-supported detection and integration of PROFIBUS PA field devices into the process control system
  - Utilization of standardized PA profiles
  - Commissioning, device replacement and maintenance wizards
- Implementation of diagnostic messages according to NAMUR NE107
- Installation on a 35 mm DIN rail

Overview (continued)

Aluminum field enclosure



CFU PA with RJ45 and push-in terminals, aluminum field enclosure, open



SIMATIC CFU aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

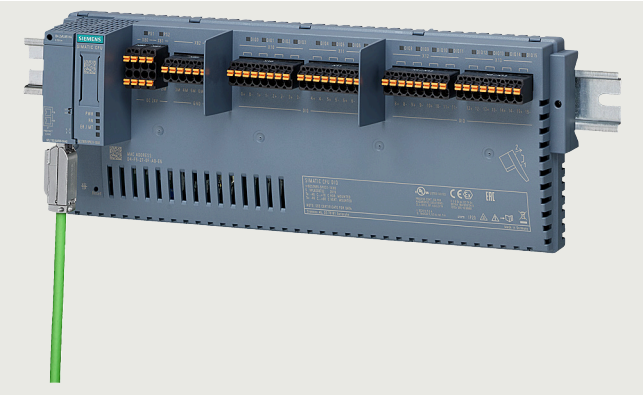
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Selection and ordering data

SIMATIC CFU PA bundle with push-in terminals Comprising: • SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 pre-assembled and tested	**6ES7655-5PX11-1XX0**
SIMATIC CFU PA bundle with aluminum enclosure Comprising: • SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 • Aluminum enclosure with cable glands, shield busbar, shield connection clamps pre-assembled and tested	**6ES7655-5PX11-1AX0**

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Overview



SIMATIC CFU DIQ edition

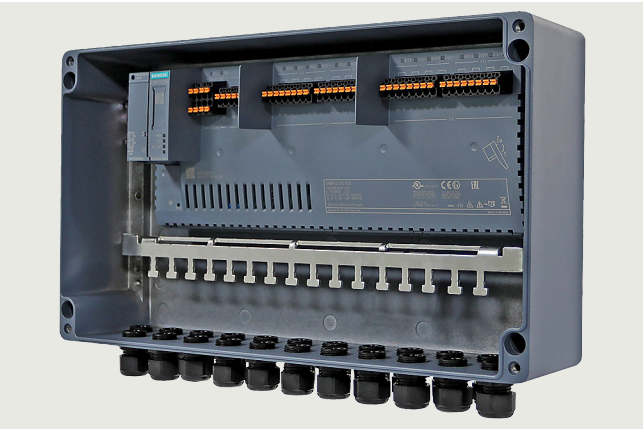
Individual, customer-specific solutions and flexible system/plant extensions are requirements that are becoming increasingly important in the process industry due to digitalization. SIMATIC CFU DIQ edition with 16 freely configurable digital IO channels offers a solution for the growing demands of distributed I/O.

SIMATIC CFU also has expansion functions for optional configuration. Two additional operating modes can be activated for selected digital inputs. "Counter" operating mode and "Frequency measurement" operating mode with a cut-off frequency of 1 kHz.

Actuator shutdown can be set for the digital outputs. The actuator shutdown of the SIMATIC CFU uses a monitoring channel (DI channel) to quickly set all digital outputs to a low digital level.

- 16 × digital inputs/outputs, freely configurable (2 x counter functionality / frequency measurement)

Aluminum field enclosure



SIMATIC CFU DIQ aluminum field enclosure, open

Overview (continued)



SIMATIC CFU aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

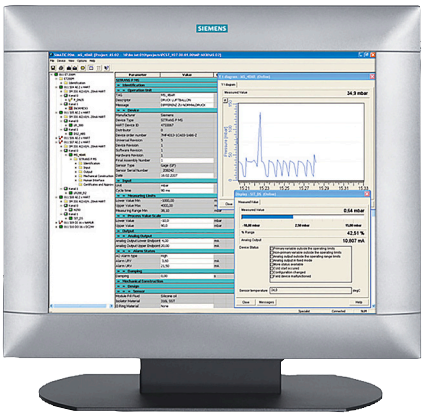
- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

Selection and ordering data

SIMATIC CFU DIQ with aluminum enclosure Comprising: • SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 • Aluminum enclosure with cable glands, shield busbar, shield connection clamp pre-assembled and tested	**6ES7655-5PX31-1AX0**
SIMATIC CFU DIQ Comprising: • SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX31-1XX0 pre-assembled and tested	**6ES7655-5PX31-1XX0**

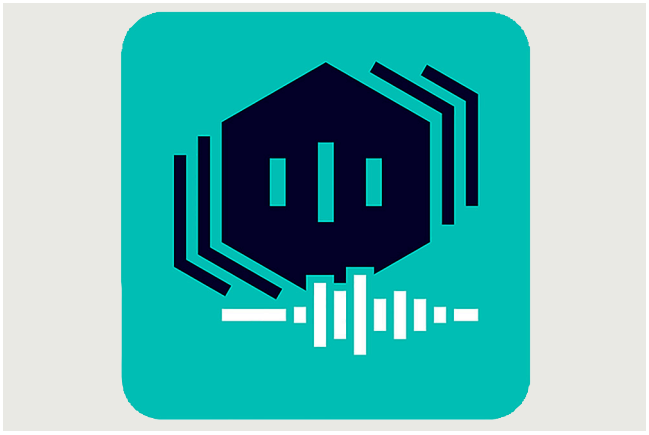
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9/2	**Digitalization**
9/2	Digital solutions & apps
9/2	SITRANS SCM IQ
9/3	SITRANS hub IQ
9/5	SITRANS mobile IQ
9/6	SITRANS serve IQ
9/11	Connectivity
9/11	SITRANS AW050
9/14	**Communication**
9/14	Field device instrumentation
9/14	SIMATIC PDM
9/25	SITRANS DTM
9/26	SITRANS Library
9/27	Communication protocols
9/27	FOUNDATION Fieldbus
9/28	PROFIBUS
9/29	HART communication protocol

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Overview



SITRANS SCM IQ is a Siemens Insights Hub-based cloud application, used in conjunction with SITRANS MS200 and SITRANS CC220, for smart condition monitoring and predictive maintenance.

Benefits

- Detects changes to the normal operating conditions of industrial machinery such as pumps, motors, gears, etc., in industrial settings
- Detects the on/off state of each connected asset
- Labels detected anomalies and sends notifications
- Allows for more efficient maintenance planning through early warnings
- Sustainable sensor design with replaceable battery
- Improves control, protection, and availability of machinery
- Can help to reduce plant downtime
- Detailed FFT visualization for anomaly root cause analysis
- Built-in configuration tools and device management
- Easy commissioning, minimal training required, and long maintenance cycles

Application

SITRANS SCM IQ application, and the corresponding SITRANS MS200 sensors, can be used in process industries such as food and beverage, water/wastewater, power generation, utilities, and chemical. Typical applications include filling stations, agitating vessels, and many types of pumps, gears, compressors, fans or bearings.

Design

SITRANS SCM IQ is designed for use on the Siemens cloud-based IoT ecosystem, Insights Hub. Data and events stored in SITRANS SCM IQ can be utilized by various Siemens cloud-based applications to achieve comprehensive plant supervision and control.

Function

SITRANS SCM IQ, Insights Hub application for smart condition monitoring

- Manages connected SITRANS CC220 gateways and SITRANS MS200 multisensors
- Intuitive training of machine learning models to automatically detect anomalies
- Supports labelling anomalies and sends notifications via email or push notification (when used with SIMATIC Notifier)
- Detects asset state and calculates asset run rate

Selection and ordering data

Selection and ordering data	Article No.
SITRANS SCM IQ SITRANS SCM IQ is a Siemens Insights Hub-based application, used in conjunction with SITRANS MS200 and SITRANS CC220, for smart condition monitoring and predictive maintenance	**SITRANS SCM IQ is distributed by the Siemens Digital Exchange. Please visit:** https://www.dex.siemens.com

Operating Instructions

All literature is available to download for free, in a range of languages, at
http://www.siemens.com/processinstrumentation/documentation

Technical specifications

SITRANS SCM IQ	
Device connectivity	Manages connection of SITRANS MS200 and SITRANS CC220 through a convenient user interface
Sensor data modeling	Activation and management of machine learning models
Anomaly management	Documentation and management of detected anomalies
Notifications	Provides notification of detected anomalies via email or push notification (when used with SIMATIC Notifier).

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Overview



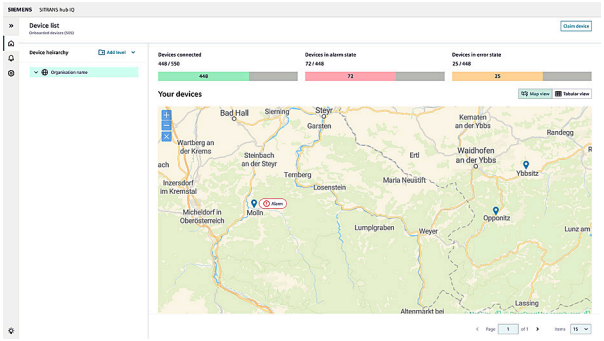
SITRANS hub IQ is a comprehensive cloud-based solution, designed to integrate IoT sensors and gateways, enabling customers to monitor and operate devices remotely. It addresses several customer challenges, such as managing sensors remotely, updating device firmware, and routing sensor data to third-party applications.

Benefits

- Seamless onboarding of Siemens sensors and gateways.
- Remote firmware updates for connected devices.
- Real-time display of device status and measurement values.
- Efficient error identification and troubleshooting support.
- Hassle-free customer onboarding and access to SITRANS hub IQ.
- Free access to essential device management features.

Application

- **Device Management**: easy onboarding and secure over the air firmware update.
- **Remote monitoring and control**: manage sensors and gateways from anywhere for seamless operations.
- **Flexible data sharing**: share standardized process data with apps like SIWA and Senseye for deeper insights.
- **Device diagnostics**: boost up-time with proactive remote diagnostics and configuration.
- **Dashboarding**: visualize key metrics with built-in dashboards, thresholds, and alerts.
- **Geo Location**: devices can be assigned to a designated location to appear on the map.
- **Notification services**: stay informed with push notifications and alarms.



SITRANS hub IQ, map view of devices

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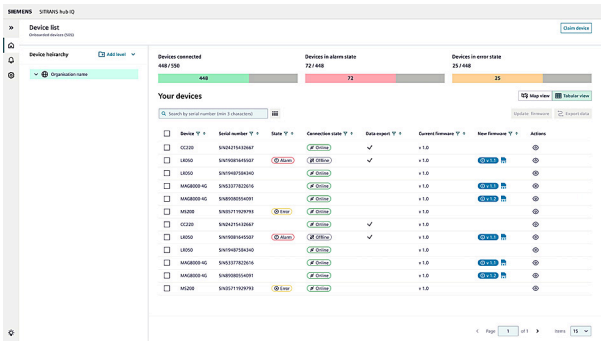
Mode of operation

SITRANS hub IQ

SITRANS hub IQ is a secure, cloud-hosted platform accessible via web browser (Google Chrome web browser is recommended). It ensures safe communication between devices, the SITRANS hub IQ platform, and users over the internet.

Device compatibility

Currently, SITRANS hub IQ supports the SITRANS FM MAG 8000 IIoT flowmeter and SITRANS CC220 gateways.



SITRANS hub IQ, device list with dashboard

Gaining access to SITRANS hub IQ

Access to SITRANS hub IQ is granted through Siemens ID. After a device is purchased, the Siemens Service team creates a SITRANS hub IQ account for the customer and invites a designated customer administrator via the Siemens ID portal. The customer administrator can then invite additional users from their organization to access SITRANS hub IQ.

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Overview



SITRANS mobile IQ is an app that gives you easy access to SITRANS field devices via your smartphone or tablet.

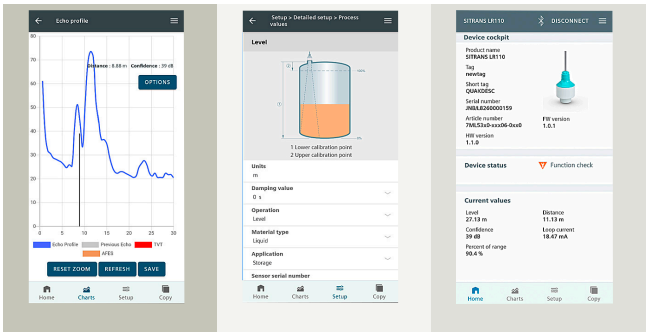
Benefits

- Commissioning and parameterization of field devices.
- Displays device status and measurement values.
- Helps with identifying errors and troubleshooting in case of failures.
- Direct link to manuals, certificates, FAQs, and much more.

Application

Commissioning and parameterization of field devices:

- **Device list**
  All supported devices in the environment are displayed.
- **Device Cockpit**
  Overview of the connected device, device status, and current measured values.
- **Setup**
  Commissioning and parameterization of the device, including graphical support.
- **Charts**
  History of selected measurement and diagnostic values.



Mode of operation

Mobile devices / operating systems

SITRANS mobile IQ is compatible with supported Android and iOS mobile devices.

SITRANS mobile IQ uses a Bluetooth interface to communicate with the field devices. Your mobile device must have a Bluetooth interface, version 4.2 or better.

Currently supported field devices are listed on SIOS (http://www.siemens.com/osSITRANSmobileIQ) and in the App Store and Google Play. Additional field devices are in preparation and require a new installation of the App on your mobile device. Only the listed field devices are compatible with SITRANS mobile IQ.

Data connection: internet connection is required to access additional information such as manuals of supported field devices.

Integration

Further information

Product note in Industry Online Support – Product Support
https://support.industry.siemens.com/cs/document/109775578/sitrans-mobile-iq?dti=0&lc=en-WW

Download App

Available on the App Store

https://apps.apple.com/us/app/sitrans-mobile-iq/id1496146361

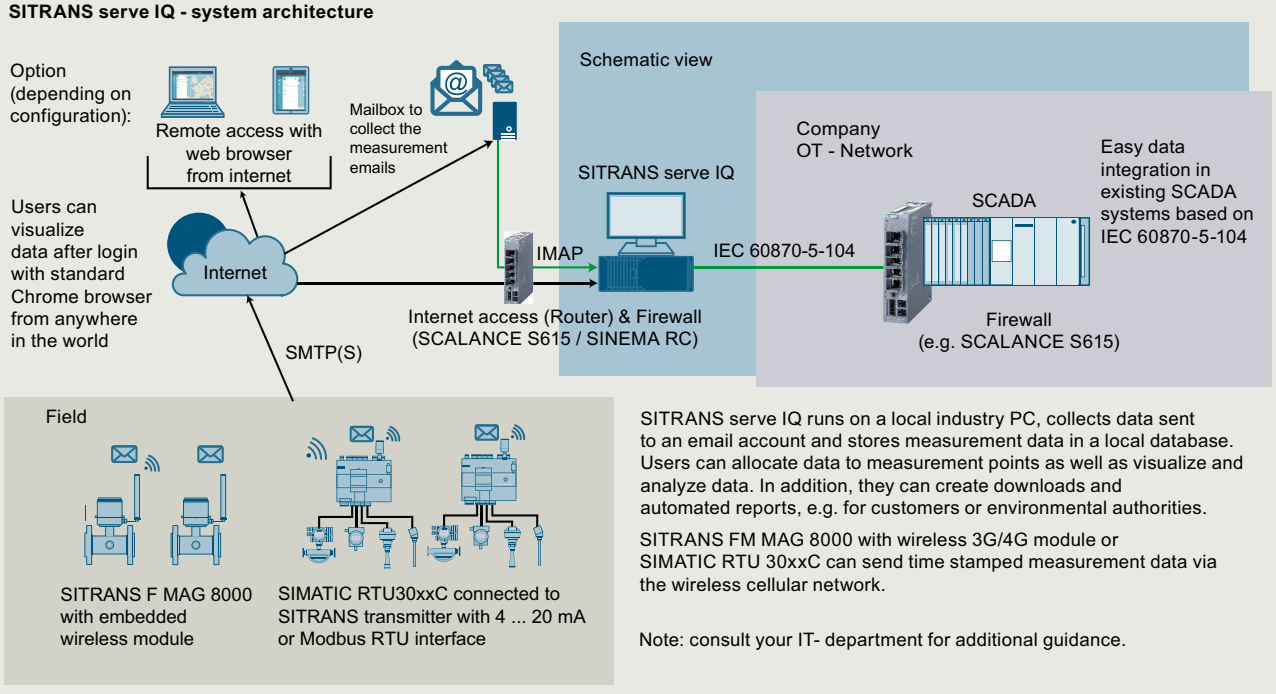
Google play

https://play.google.com/store/apps/details?id=com.siemens.sitransmobileiq&hl=en_US

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Overview

SITRANS serve IQ - system architecture



SITRANS serve IQ runs on a local industry PC, collects data sent to an email account and stores measurement data in a local database. Users can allocate data to measurement points as well as visualize and analyze data. In addition, they can create downloads and automated reports, e.g. for customers or environmental authorities.

SITRANS FM MAG 8000 with wireless 3G/4G module or SIMATIC RTU 30xxC can send time stamped measurement data via the wireless cellular network.

Note: consult your IT- department for additional guidance.

SITRANS serve IQ is an on-premise application that acquires measurement data sent by email (CSV file attachments) from remote sensors. The data is stored locally on an Industry PC and visualized in charts and tables. If configured, authorized users can access this on-premise application via the Internet.

Optionally, users can create and send customized reports on measurement data and log events in a log-book to, for example, document services. An interface for forwarding data to a SCADA system using the telemetry protocol IEC 60870-5-104 is also available.

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Benefits

Widely distributed measuring points are used in a range of applications and industries. These include:

- Flow measurement in water supply networks.
- Level measurement in tanks and silos.
- Height measurement in bodies of water.

Today, remote devices send measurement data and alarms in csv-format via email (e.g. SITRANS MAG 8000 3G/4G or SIMATIC RTU 30xxC).

SITRANS serve IQ supports you by:

- Reading and parsing the email attachment containing the measurement data from the email address provided by you.
- Visualizing historical and current process values in charts or tables and displaying alarms.
- As customers or environmental authorities ask for measurement data, users can create customized reports on totalizer values and send them automatically by email. This optional license also enables the logbook functionality that allows users to comment on measurement data or to document service activities.
- Forwarding process values to SCADA via the optional telemetry protocol IEC 60870-5-104.
- If enabled, users can access the application from the Internet using the Google Chrome web-browser. Access is limited to the organization holding the license. Additional measures to ensure IT-security are required (e.g. firewall).

Application

SITRANS serve IQ software must be installed on a local IPC, on-premise and must have access to an email account used for receiving data from remote devices.

When data from supported devices is sent to the predefined email account, SITRANS serve IQ performs the following activities:

- Reads and parses the email attachment containing the valid measurement data from the user provided email address.
- Reads the time stamped measurement data and store it locally on your PC.
- Visualizes the data in trends, display alarms, and downloads the data in tables to authorized users.

Optional features include:

- Customized reports on totalizer values and the ability to send them automatically by email.
- Logbook functionality allowing users to comment on measurement data or to document service activities.
- On further request, ability to forward measurement data to a SCADA system via IEC 60870-5-104 telemetry protocol that is widely used in the water and power industries.

SITRANS serve IQ can be used with the following products:

- SITRANS F MAG8000 with integrated wireless communication module.
- All transmitters in the SITRANS product family with 4 to 20 mA or Modbus RTU interface that can be connected to a SIMATIC RTU30xxC.

SITRANS serve IQ continuously monitors received measurement values against configurable upper and lower limits. Values exceeding the limits will be reported as warnings or alarms, depending on the user setting.

For details and limitation, consult the Product page available at www.siemens.com/SIOS/sitransserveiq.

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Design

SITRANS serve IQ software is supplied with a Media Package on a USB stick or online software download with an installation program.

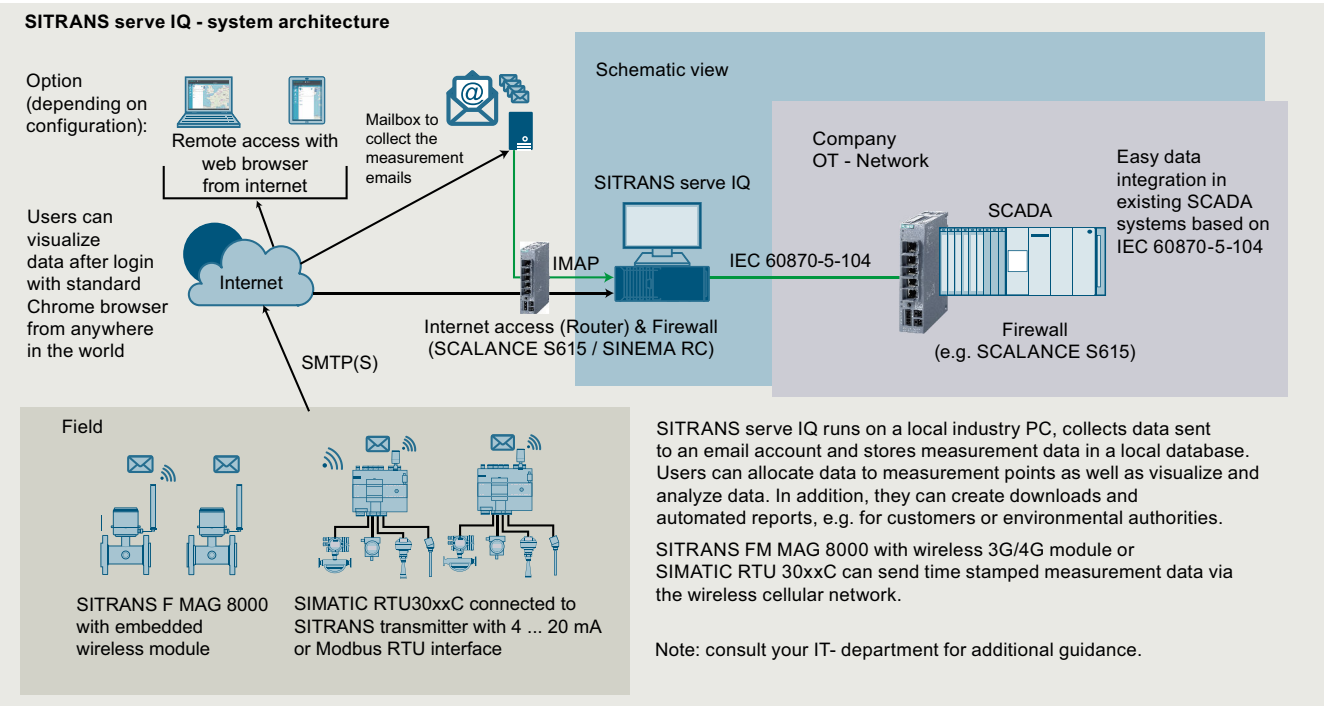
SITRANS serve IQ consists of a software package and several license upgrade options.

Software packages	SITRANS serve IQ perpetual[1)]
Number of sending units supported	10 units, with a maximum of 40 variables each
License type	Perpetual license

License upgrade options:	
Additional devices	SITRANS serve IQ license upgrade for 1, 10, 100, or 500 additional devices according to the customer's requirements, to a maximum of 1 300 devices in total.
Logbook and automated reports	• Comment on measurement data or document service activities • Create reports on totalizer values and send automatically by email.
IEC 60870-5-104 telemetry protocol	• Data interface to SCADA server (single or redundant) with the standardized IEC 60870.5.104 telemetry protocol. • Enables easy integration in SIMATIC PCS 7 Telecontrol.

[1)] SITRANS serve IQ software is protected against unauthorized copying by the Automation License Manager (ALM) tool.

Note: a trial version for 90 days for two (2) devices is available. Following these 90 days, the installed software must be updated to the professional version by means of SITRANS serve IQ perpetual.



SITRANS serve IQ, communication paths: processing, archiving, displaying and transmitting measured values

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Selection and ordering data

SITRANS Serve IQ V1.3 Software Package Complete, 10 devices with logbook and automated reports functionality and support of IEC 60870-5-104 protocol Perpetual license[1)2)]	Article No.
• Software and license on USB stick	6BG0000-0AA10-2CS1
• Software and license via Online software download	6BG0000-0AA10-0CS1

SITRANS Serve IQ V1.3 Software Package Base, 10 devices Perpetual license for 10 devices[1)2)]	Article No.
• Software and license on USB stick	6BG0000-0AA10-2CS0
• Software and license via Online software download	6BG0000-0AA10-0CS0

SITRANS Serve IQ, License upgrade for logbook and automated reports functionality License activates access to the logbook and report functionalities.[1)2)]	Article No.
• Software and license on USB stick	6BG0000-0AA10-3CY5
• Software and license via Online software download	6BG0000-0AA10-1CY5

SITRANS Serve IQ V1.3 Software Package Demo On-premise application for Windows to acquire measurement data from remote sensors as well as store, and visualize data in trends and tables via web browser. 90-day trial license for 2 devices[1)2)]	Article No.
• License and software on USB stick	6BG0000-0AA10-2CR0
• License and software via Online software download	6BG0000-0AA100-0CR0

SITRANS Serve IQ, license upgrade, add IEC 60870-5-104 SITRANS Serve IQ license upgrade to add IEC 60870-5-104 telemetry protocol for data integration to SCADA.[1)]	Article No.
• License on USB stick	6BG0000-0AA10-3CY1
• License via Online software download	6BG0000-0AA10-1CY1

Selection and ordering data (continued)

SITRANS Serve IQ, license upgrade, add 1 unit SITRANS Serve IQ license upgrade to add 1 additional device.[1)2)]	Article No
• License on USB stick	6BG0000-0AA10-3CA0
• License via Online software download	6BG0000-0AA10-1CA0

SITRANS Serve IQ, license upgrade, add 10 units SITRANS Serve IQ license upgrade to add 10 additional devices.[1)2)]	Article No
License on USB stick	6BG0000-0AA10-3CB0
License via Online software download	6BG0000-0AA10-1CB0

SITRANS Serve IQ, license upgrade, add 100 units SITRANS Serve IQ license upgrade to add 100 additional devices.[1)2)]	Article No
• License on USB stick	6BG0000-0AA10-3CC0
• License via Online software download	6BG0000-0AA10-1CC0

SITRANS Serve IQ, license upgrade, add 500 units SITRANS Serve IQ license upgrade to add 500 additional devices.[1)2)]	Article No
• License on USB stick	6BG0000-0AA10-3CD0
• License via Online software download	6BG0000-0AA10-1CD0

[1)] SITRANS serve IQ product sheet and specific terms and software licensing conditions shall apply.

[2)] The number of devices refers to, for example, the number of SITRANS FM MAG8000 flowmeters with a wireless communication module or the number of SIMATIC RTU30xxC devices. Per device, a maximum of 40 values (e.g. process values, indication of battery power, alarms) is possible.

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Technical specifications

SITRANS serve IQ	
Technical specifications for the on-premise installation	
Operating system	Windows 10 Pro, 64-bit, version 2019 LTSC
Docker Desktop, Version 4.16.2	Software and Docker ID to be supplied by customer. Software download available at https://docs.docker.com/desktop/release-notes/. Docker ID available at https://docs.docker.com/docker-id/. Subscription fees may apply.
RAM	Minimum: 8 GB, recommended: 16 GB
Hard disk	At least 250 GB, SSD recommended
Security	Firewall, additional security measures supplied by customer
Internet access	Routers that allow the forwarding of IP ports and address transformations.
Notes	• We recommend installing SITRANS serve IQ on a standalone SIMATIC IPC 427E Microbox PC • To minimize the risk of software conflicts, we recommend installing only Microsoft Office (Windows® 10 Pro 64-bit, Enterprise), Docker Desktop, and SITRANS serve IQ on the IPC. Installation on any other PC and with other software may have a negative impact on performance and proper functioning of SITRANS serve IQ.
Other technical requirements	• Fixed IP address for the PC hosting SITRANS serve IQ • Internet access for the PC hosting SITRANS serve IQ, to read emails, and to access OpenStreetMap. • A dedicated email mailbox supporting IMAP and SMTP protocol to which the measurement data will be sent in a specific protocol.
Limitation of service - ability period	The maximum serviceability period of SITRANS serve IQ is limited to two years. For further information on service, please visit: https://support.industry.siemens.com/cs/sc/5508/process-information?lc=en-DE
For more details, please visit the product page at www.siemens.com/SIOS/sitransserveiq.	

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Overview



SITRANS AW050 is a Bluetooth adapter for compatible SITRANS field devices. In combination with the SITRANS mobile IQ, SITRANS AW050 allows you to easily parametrize and maintain compatible SITRANS field devices via a smartphone or tablet.

Benefits

- Connects to the existing service or display port of the field device
- Enables remote access to field devices for:
  - Commissioning and parameterization
  - Displaying device status and measurement values
  - Identifying errors and troubleshooting in case of failures
  - Displaying graphs and trend views of measurements and diagnosis information
  - Direct links to manuals, certificates, FAQs, and much more

Application

SITRANS AW050 supports commissioning, parameterization, and maintenance of compatible field devices. AW050 will establish a secure connection to your field device. In combination with SITRANS mobile IQ, several functions are supported:

- **Device list**
  All supported devices in the environment are displayed.
- **Device cockpit**
  Overview of the connected device, device status, and current measured values.
- **Setup**
  Commissioning and parameterization of the device, including graphical support.
- **Charts**
  History of selected measurement and diagnostic values.
- **Save device data**
  Save current values, settings, and diagnostic data.

Design

SITRANS AW050 provides a Bluetooth interface for communication with SITRANS mobile IQ.

Integration

SITRANS AW050 is mounted in the existing cable gland and connected to the service or display port of the device.
SITRANS AW050 is compatible with the following devices:

- SITRANS Probe LU240 ultrasonic level transmitter
- SITRANS LR500 series radar level transmitters
- SIPART PS100 valve positioner
- SIPART PS2 valve positioner
- SITRANS FMT020 magnetic flowmeter transmitter



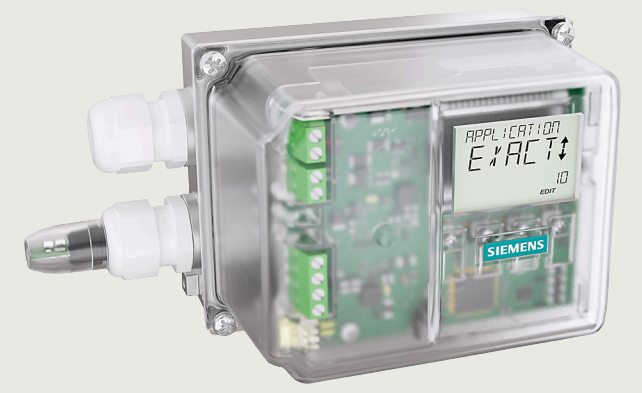
SITRANS AW050, mounted on SITRANS Probe LU240



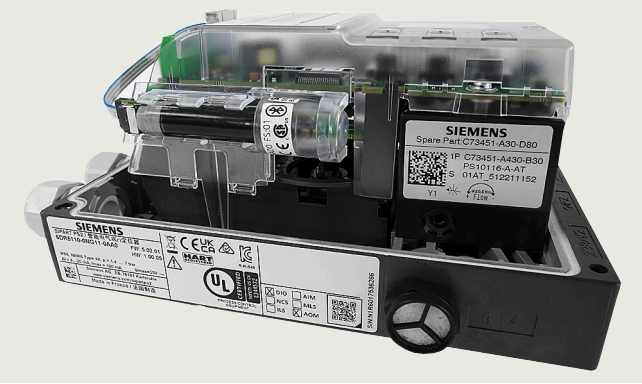
SITRANS AW050, mounted on SITRANS LR530

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Integration (continued)



SITRANS AW050, mounted on SIPART PS100



SITRANS AW050, mounted on SIPART PS2



SITRANS AW050 is internally mounted on SITRANS FMT020

Selection and ordering data

Selection and ordering data	Article No.
SITRANS AW050 Bluetooth adapter, used in combination with SITRANS mobile IQ for easy parametrization and maintenance of compatible SIPART and SITRANS field devices.	
• SITRANS AW050 including mounting kit for SITRANS Probe LU240	**A5E50514198**
• SITRANS AW050 including mounting kit for SITRANS LR500 M20	**A5E51857118**
• SITRANS AW050 including mounting kit for SITRANS LR500 1/2" NPT	**A5E52095588**
• SITRANS AW050 including mounting kit for SIPART PS100	**6DR4004-1BT**
• SITRANS AW050 including mounting kit for SIPART PS2	**6DR4004-2BT**
• SITRANS AW050 including mounting kit for SITRANS FMT020	**7ME69401BT10**

Accessories	Article No.
Operating instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

SITRANS mobile IQ

Application to monitor and parameterize compatible field devices via Bluetooth.
SITRANS mobile IQ is available for Android, iOS, and Windows. For more information see: https://support.industry.siemens.com/cs/ww/en/view/109775578.

Download via Google Play Store or Apple App Store

Available on the App Store

https://apps.apple.com/us/app/sitrans-mobile-iq/id1496146361

Google play

https://play.google.com/store/apps/details?id=com.siemens.sitransmobileiq&hl=en_US

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Technical specifications

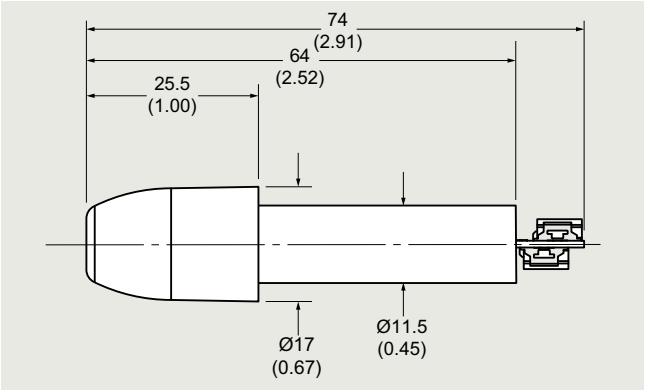
SITRANS AW050	
Software requirements	SITRANS mobile IQ
Operating conditions and structural design	
Ambient conditions	For use indoors and outdoors
Ambient temperature	For ambient temperature ranges, please refer to the operating instructions for the connected SITRANS field device
• Permissible ambient temperature for operation (SITRANS AW050 only)	-40 ... +80 °C (-40 ... +176 °F)
• Relative humidity	0 ... 100 %
Degree of pollution	2
Overvoltage category	II
Input voltage range	2.2 ... 3.4 V DC
Maximum current consumption	2.3 mA
Weight	13 g (0.46 oz)
Degree of protection	• Type 4X, Type 6 according to UL 50E • IP66, IP68 in accordance with IEC 60529
EMC	EN 61326
Material	Polycarbonate
Communication, interface	Bluetooth BLE 4.2
Range	Class 2, approx. 10 m (32.8 ft)
Certificates and approvals	Note: Check the device nameplate for the specific list of certificates and approvals. For a comprehensive list of certificates and approvals, visit the Siemens Industry Online Support: : https://sieportal.siemens.com/su/bl3VT

Notes:

- The instruction manual for the SITRANS AW050, including mounting description is included in the operating instructions of the compatible SITRANS or SIPART field device.
- Compatible with:[1)]
  - SITRANS Probe LU240 with measurement range 6 m (19.69 ft) and 12 m (39.37 ft).
  - SITRANS LR500 series
  - SIPART PS100 with FW 1.03.00 or higher.
  - SIPART PS2 with Firmware 5.05 or higher.
  - SITRANS FMT020 with Firmware 1.02.04 or higher.

[1)] Non-hazardous only.

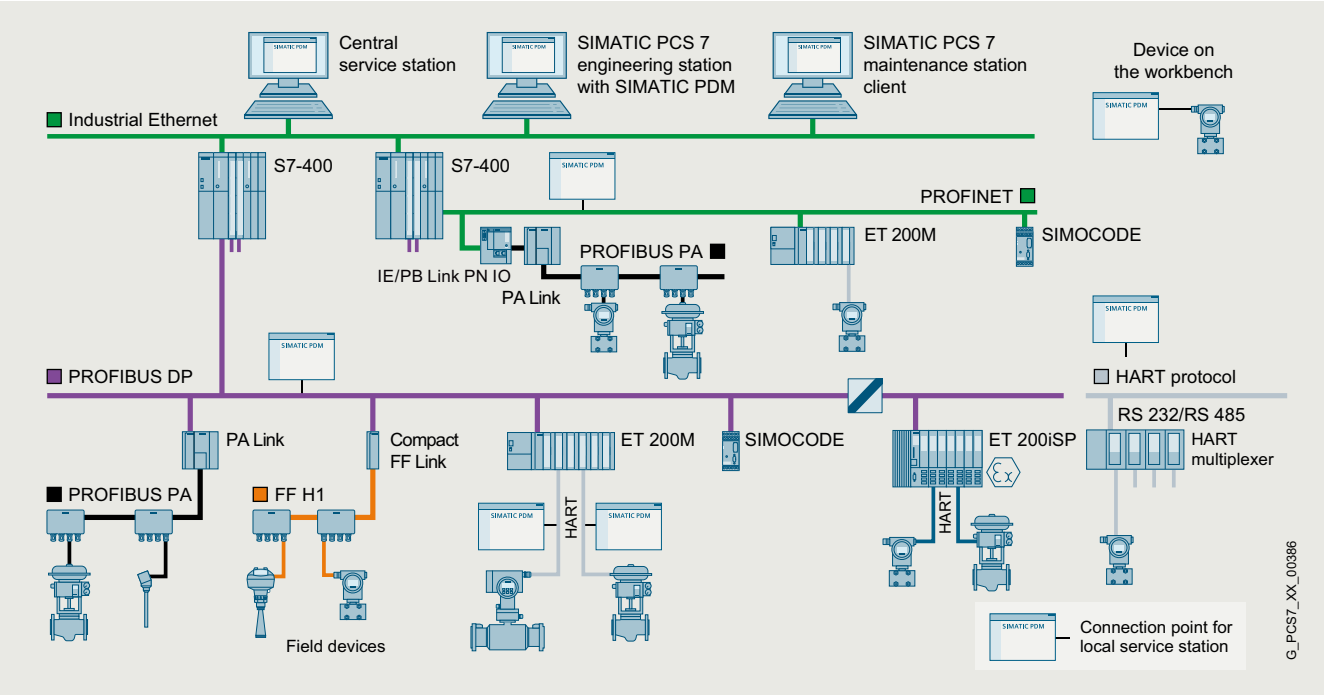
Dimensional drawings



SITRANS AW050, dimensions in mm (inch)

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Overview



Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendor-independent tool for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control-room devices, compact controllers), which in the following sections will be referred to simply as devices.

With *one* software product, SIMATIC PDM enables users to work with over 4 000 devices and device variants from Siemens and over 200 other manufacturers worldwide on a *single* homogeneous user interface.

The user interface satisfies the requirements of the VDI/VDE GMA 2187 and IEC 65/349/CD directives. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Using SIMATIC PDM it is very easy to navigate in highly complex stations such as remote I/Os and even connected field devices.

From the viewpoint of device integration, SIMATIC PDM is the most powerful open process device manager on the global market. Devices not previously supported can be integrated in SIMATIC PDM by importing their device description packages (either EDD or FDI). This provides security for your investment and saves you investment costs, training expenses and follow-up costs.

SIMATIC PDM supports the operative system management in particular through:

- Uniform representation and operation of devices
- Uniform representation of diagnostics information
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs
- Quantity options for
  - Transfer of parameters between devices
  - Transfer of parameter sets to the devices
  - Export and import functions
  - Diagnostics update

SIMATIC PDM can be used extremely flexibly and tailored to a specific task for field device service:

- Single-point station for point-to-point connection to field devices
- Local service and parameter assignment station with connection to fieldbus segments
- Central service and parameter assignment station with connection to plant bus
- Central HART service and parameter assignment station for HART multiplexers and WirelessHART field devices
- Integrated into the stand-alone SIMATIC PDM Maintenance Station
- Integrated into the SIMATIC PCS 7 process control system

Maintenance personnel can assign field device parameters at mobile and stationary workstations with SIMATIC PDM. Practically every workstation integrated in the production plant can be used for

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Overview (continued)

configuration. Service personnel are thus able to work directly at the location of the field device, while data is stored centrally in the engineering station or maintenance station. This leads to a significant shortening of maintenance and travel times. Additional device-independent system functions support higher-level maintenance stations for creating progress lists for work and servicing.

When a maintenance station is configured in the SIMATIC PCS 7 process control system, SIMATIC PDM is integrated into it and transmits parameter data, diagnostic information and processing information. You can switch directly to the SIMATIC PDM views from the diagnostics faceplates in the maintenance station to perform diagnostics and work on the device in more detail.

A SIMATIC PDM user administration system based on SIMATIC Logon is used to assign various roles with defined function privileges to users. These function privileges refer to SIMATIC PDM system functions, e.g. writing to the device.

For all devices integrated with device description packages, SIMATIC PDM provides a range of information for display and further processing on the maintenance station, for example:

- Device type information (electronic rating plate)
- Detailed diagnostics information (manufacturer information, information on error diagnostics and troubleshooting, further documentation)
- Results of internal condition monitoring functions
- Status information (for example local configuration changes), device test completed
- Information on changes (audit trail report)
- Parameter information

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Design

Components	Product packages							
	SIMATIC PDM Stand alone				SIMATIC PDM system-integrated			
	Minimum configuration	Basic configuration	Service and parameter assignment station		in the configuration environment			
			local	central	SIMATIC S7	SIMATIC PCS 7		
	PDM Single Point	**PDM Basic**	**PDM Service**	**PDM Stand alone Server**	**PDM S7**	**PDM PCS 7**	**PDM PCS 7 Server**	**PDM PCS 7 FF**
SIMATIC PDM TAGs[1] in scope of supply	1	4	4 + 50	4 + 100	4 + 100	4 + 100	4 + 100	4 + 100
SIMATIC PDM expansion options								
Count Relevant Licenses (accumulative) - 10 TAGs - 100 TAGs - 1 000 TAGs	*cannot be expanded*	o	o	o	o	o	o	o
SIMATIC PDM Basic		●	●	●	●	●	●	●
SIMATIC PDM Extended		o	o	●	●	●	●	●
SIMATIC PDM integration in STEP 7/PCS 7		o	o	o	●	●	●	●
SIMATIC PDM Routing[2]		●	●	●	o	●	●	●
SIMATIC PDM Server		o	o	●	o	o	●	o
SIMATIC PDM 1 Client[3]		o	o	● (2 ×)	o	o	o	o
SIMATIC PDM Communication FOUNDATION Fieldbus		–	–	–	o	o	o	●
SIMATIC PDM HART Server		o	o	o	o	–	–	–

SIMATIC PDM product structure
● Product component is part of the product package
o Optional product component for the product package; order additive
– Product component is not relevant for the product package or not available
1) For TAG definition, see "Design" section under "SIMATIC PDM TAGs"
2) In combination with SIMATIC PDM Integration in STEP 7/PCS 7
3) In combination with SIMATIC PDM Server

Customer-oriented product structure

The customer-oriented product structure of SIMATIC PDM provides optimal support for the named main use cases and enables you to adapt the scope of functions and performance to your individual requirements. The product range is organized as follows:

SIMATIC PDM Stand alone product packages

- SIMATIC PDM Single Point, a minimum configuration for single device handling
- SIMATIC PDM Basic for local service and parameter assignment stations as well as basic configuration for individual product package with optional product components
- SIMATIC PDM Service for local service and parameter assignment stations
- SIMATIC PDM Stand alone Server for central service and parameter assignment stations, e.g. for various plant units

SIMATIC PDM system-integrated product packages

- SIMATIC PDM S7 for local SIMATIC S7 engineering and service stations
- Various configurations for central SIMATIC PCS 7 engineering and service stations:
  - SIMATIC PDM PCS 7
  - SIMATIC PDM PCS 7 Server (enables device parameter assignment and diagnostics on clients of the PCS 7 engineering station and PCS 7 Maintenance Station)
  - SIMATIC PDM PCS 7-FF (supports the FOUNDATION Fieldbus H1)

In some circumstances, the product packages can be expanded with optional product components (for details, see the Design section).

Product range	SIMATIC PDM V9.1 Single Point	Basic	Service	Stand alone Server	S7	PCS 7	PCS 7 Server	PCS 7-FF
TAGs contained	**1**	**4**	**4 + 50**	**4 + 100**	**4 + 100**	**4 + 100**	**4 + 100**	**4 + 100**
Project: Create offline	●	●	●	●	●	●	●	●
Project: Usable TAG extensions	–	●	●	●	●	●	●	●
Project: Process device network view	●	●	●	●	●	●	●	●
Project: Process device plant view	●	●	●	●	●	●	●	●
Project: Export/import devices	–	–	●	●	–	–	–	–
Project: Export/import parameters	–	o	●	●	●	●	●	●
Project: HW Config	–	o	o	o	●	●	●	●
Project: Utilization of SIMATIC PDM options	–	●	●	●	●	●	●	●
Project: Integration in STEP 7/PCS 7	–	o	o	o	●	●	●	●
Group operations	–	o	o	●	o	●	●	●
Setting device IDs	–	o	o	●	o	●	●	●
Communication: HART modem	●	●	●	●	●	–	–	–
Communication: HART interface	●	●	●	●	●	–	–	–
Communication: PROFIBUS DP/PA	●	●	●	●	●	●	●	●

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Design (continued)

Product range	SIMATIC PDM V9.1 Single Point	Basic	Service	Stand alone Server	S7	PCS 7	PCS 7 Server	PCS 7-FF
Communication: HART over PROFIBUS DP	●	●	●	●	●	●	●	●
Communication: FF H1	–	–	–	–	o	o	o	●
Communication: Modbus	●	●	●	●	●	●	●	●
Communication: Ethernet	●	●	●	●	●	●	●	●
Communication: PROFINET	●	●	●	●	●	●	●	●
Communication: HART over PROFINET	●	●	●	●	●	●	●	●
Devices: Export/import parameters	–	o	o	●	●	●	●	●
Devices: Comparison of parameter values	–	o	o	●	●	●	●	●
Devices: Saving parameters	●	●	●	●	●	●	●	●
Devices: Change log (Audit Trail)	–	o	o	●	●	●	●	●
Devices: Calibration report	–	o	o	●	●	●	●	●
Devices: Print function	●	o	o	●	●	●	●	●
Devices: Document manager	–	o	o	●	●	●	●	●
Lifelist: Basic functionality	●	●	●	●	●	●	●	●
Lifelist: Expanded functionality (scan range, diagnostics, export, addressing)	–	o	o	●	●	●	●	●
Communication: Data record routing	–	o	o	o	o	●	●	●
Communication: HART multiplexer	–	o	o	o	o	–	–	–
Communication: WirelessHART	–	o	o	o	o	–	–	–
Function: HART SHC mode (increased communication speed)	●	●	●	●	●	●	●	●
Function: Device parameterization on PCS 7 maintenance station clients	–	o	o	o	o	o	●	o
Function: Device parameter assignment on SIMATIC PDM clients	–	o	o	● (2 ×)	o	o	o	o

SIMATIC PDM overview of functions and features
● Product component is part of the product package
o Optional product component for the product package; order additive
– Product component is not relevant for the product package or not available

SIMATIC PDM Stand alone product packages

SIMATIC PDM Single Point V9.1

This minimum configuration with handheld functionality is intended for handling exactly *one* field device via point-to-point coupling. It cannot be expanded with functions or with SIMATIC PDM TAG or SIMATIC PDM 1 Client licenses. Upgrading to a different product variant, e.g. SIMATIC PDM Basic, or a different product version is also not possible.

Supported communication types:

- PROFIBUS DP/PA
- HART communication (modem, RS 232 and via PROFIBUS/PROFINET)
- Modbus
- Ethernet
- PROFINET

The functionality is matched accordingly. The device functions are supported as defined in the device description, for example:

- Managing the device library and unlimited device selection
- Parameter assignment and diagnostics according to the device description
- Exporting and importing of parameter data
- Device identification
- Lifelist
- Printing the parameter list

SIMATIC PDM Basic V9.1

SIMATIC PDM Basic is for local service and parameter assignment stations on any computers (IPC/notebook) with local connection to bus segments or direct connection to the device.

Supported communication types:

- PROFIBUS DP/PA
- HART communication (modem, RS 232 and via PROFIBUS/PROFINET)
- Modbus
- Ethernet
- PROFINET

SIMATIC PDM Basic is equipped with all basic functions required for operation and parameter assignment of devices. That is, compared to SIMATIC PDM Single Point, it has the following additional functions:

- EDD-based diagnostics in the lifelist
- Memory function (only exporting and importing of parameter data)
- Report function
- Communication with HART field devices via remote I/Os

As a basic block for an individual configuration, SIMATIC PDM Basic can be expanded with all functional SIMATIC PDM options (PDM Routing only in combination with PDM Integration in STEP 7/PCS 7 required) as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs. Without TAG expansion, SIMATIC PDM Basic is suitable for projects with up to 4 TAGs. SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

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Design (continued)

The SIMATIC PDM Extended option allows the activation of additional SIMATIC PDM system functions (for details, see SIMATIC PDM Extended V9.1 under "Optional product components").

SIMATIC PDM Service V9.1

With this product package for extended service, local service and parameter assignment stations can be realized on any type of computer (IPC/notebook) with a local connection to a bus segment or direct connection to field devices.

It comprises:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- 50 SIMATIC PDM TAGs

Like SIMATIC PDM Basic, SIMATIC PDM Service can be expanded with all functional SIMATIC PDM options (PDM Routing only in combination with PDM Integration in STEP 7/PCS 7 required) as well as with cumulative SIMATIC PDM TAGs (sets of 10, 100 or 1 000) (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option. It is permitted to upgrade to another product version.

Note: For use of gateways and for PROFINET or Ethernet communication with field devices, SIMATIC PDM TAG licenses are charged for according to the objects configured in the process device plant view as follows:

- 10 SIMATIC PDM TAGs per S7 DSGW (data record gateway) with one PROFIBUS subnet
- 20 SIMATIC PDM TAGs per S7 DSGW with more than one PROFIBUS subnet
- 10 TAGs per IE/PB Link
- 1 TAG per field device (except in the case of special specifications)

SIMATIC PDM stand-alone server V9.1

With the SIMATIC PDM Stand alone Server product package, you can establish central service and parameter assignment stations that operate according to the client/server principle. Portals opened on licensed SIMATIC PDM clients (SIMATIC PDM sessions) enable handling of production plant field devices via the SIMATIC PDM server on the plant bus assigned via registration. The product package can be used multiple times within a plant, e.g. for various plant units. It comprises:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM Server
- 2 × SIMATIC PDM 1 Client
- 100 SIMATIC PDM TAGs

SIMATIC PDM Stand alone Server can be expanded with all functional SIMATIC PDM options (PDM Routing only in combination with PDM Integration in STEP 7/PCS 7 required) as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs and SIMATIC PDM 1-client licenses (see "Optional product components"). The portals opened on these clients (SIMATIC PDM sessions) must also be licensed with the SIMATIC PDM 1-client licenses besides the SIMATIC PDM clients. For details about this, refer to "SIMATIC PDM 1 Client" under "Optional product components". For user management of the SIMATIC PDM clients, the SIMATIC Logon product is also required. It is possible to upgrade to another product version.

Note: For use of gateways and for PROFINET or Ethernet communication with field devices, SIMATIC PDM TAG licenses are charged according to the objects configured in the process device plant view (for details, see corresponding note under SIMATIC PDM Service V9.1).

SIMATIC PDM system-integrated product packages

SIMATIC PDM S7 V9.1

The SIMATIC PDM S7 product package designed for use in a SIMATIC S7 configuration environment is intended for setup of a local SIMATIC S7 engineering and service station. It requires the installation of STEP 7 V5.5+SP4. It includes:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- 100 SIMATIC PDM TAGs

SIMATIC PDM S7 can be expanded with the functional options SIMATIC PDM Routing, SIMATIC PDM Communication FOUNDATION Fieldbus, SIMATIC PDM Server, and SIMATIC PDM HART Server as well as with cumulative SIMATIC PDM TAGs (sets of 10, 100 or 1 000) (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

SIMATIC PDM PCS 7 V9.1

The SIMATIC PDM PCS 7 product package suitable for use in a SIMATIC PCS 7 configuration environment is intended for use in a central SIMATIC PCS 7 engineering and service station. It comprises:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- 100 SIMATIC PDM TAGs

SIMATIC PDM PCS 7 can be expanded with the functional options SIMATIC PDM Communication FOUNDATION Fieldbus and SIMATIC PDM Server as well as with cumulative SIMATIC PDM TAGs (sets of 10, 100 or 1000) (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

SIMATIC PDM PCS 7 Server V9.1

Instead of SIMATIC PDM PCS 7, the SIMATIC PDM PCS 7 Server product package expanded with the SIMATIC PDM Server option can also be used for a central SIMATIC PCS 7 engineering and service station. Field devices integrated using an Electronic Device Description (EDD) can then be assigned parameters on any client of the SIMATIC PCS 7 Maintenance Station as well as on local SIMATIC PDM clients. The following are components of SIMATIC PDM PCS 7 Server:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- SIMATIC PDM Server
- 100 SIMATIC PDM TAGs

SIMATIC PDM PCS 7 Server can be expanded with the functional option SIMATIC PDM Communication FOUNDATION Fieldbus as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs and SIMATIC PDM 1-Client licenses (see "Optional product components"). The portals opened on these clients (SIMATIC PDM sessions) must also be licensed with the SIMATIC PDM 1-client licenses besides the SIMATIC PDM clients. For details about this, refer to "SIMATIC PDM 1 Client" under "Optional product components".

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Design (continued)

SIMATIC PDM PCS 7-FF V9.1

Instead of SIMATIC PDM PCS 7, the SIMATIC PDM PCS 7-FF product package expanded with the SIMATIC PDM Communication FOUNDATION Fieldbus option can also be used for a central SIMATIC PCS 7 engineering and service station. This additionally supports parameter assignment of field devices on FOUNDATION Fieldbus H1. Components of SIMATIC PDM PCS 7-FF are:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- SIMATIC PDM Communication FOUNDATION Fieldbus
- 100 SIMATIC PDM TAGs

SIMATIC PDM PCS 7-FF V9.1 can be expanded with the functional option SIMATIC PDM Server as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

Optional product components

SIMATIC PDM Extended V9.1 option

The SIMATIC PDM Extended option enables you to unlock other system functions for SIMATIC PDM Basic and SIMATIC PDM, for example:

- Change log
- Calibration report
- Extended information in the Lifelist
- Export and import functions
- Print functions
- Document manager
- Comparison function
- Group operations
- Setting device IDs

This functionality is already integrated in the following product packages: SIMATIC PDM Stand alone Server, SIMATIC PDM S7, SIMATIC PDM PCS 7, SIMATIC PDM PCS 7 Server and SIMATIC PDM PCS 7-FF.

SIMATIC PDM Integration option in STEP 7/PCS 7 V9.1

This option is used for the integration of SIMATIC PDM in a SIMATIC S7 or SIMATIC PCS 7 configuration environment. SIMATIC PDM can then be started directly from the hardware configurator (HW Config) in STEP 7/SIMATIC PCS 7.

This functionality is already integrated in the product packages of category "SIMATIC PDM System-integrated" (SIMATIC PDM S7, SIMATIC PDM PCS 7, SIMATIC PDM PCS 7 Server, and SIMATIC PDM PCS 7-FF).

SIMATIC PDM Routing V9.1 option

If SIMATIC PDM is used on an engineering station, the SIMATIC PDM Routing option enables handling of every device in the field that can be configured per EDD throughout the plant and across different bus systems and remote I/Os. SIMATIC PDM Routing can be used in combination with SIMATIC PDM Integration in STEP 7/SIMATIC PCS 7.

Routing is already integrated in SIMATIC PDM PCS 7, SIMATIC PDM PCS 7 Server, and SIMATIC PDM PCS 7-FF. SIMATIC PDM Routing can be additionally installed as an option on a local SIMATIC S7 engineering and service station with SIMATIC PDM S7.

SIMATIC PDM Server V9.1 option

The server functionality can be activated in a local or central service station with this option. It enables parameter assignment of selected field devices on any client of the SIMATIC PCS 7 Maintenance Station as well as on local SIMATIC PDM clients. This functionality is already integrated in the SIMATIC PDM Stand alone Server and SIMATIC PDM PCS 7 Server. The SIMATIC PDM clients as well as the portals opened on these clients (SIMATIC PDM sessions) must be licensed with SIMATIC PDM 1 client licenses. For details about this, refer to "SIMATIC PDM 1 Client" under "Optional product components".

SIMATIC PDM Communication FOUNDATION Fieldbus V9.1 option

In a SIMATIC S7/PCS 7 configuration environment, using this option SIMATIC PDM can communicate with field devices on the FOUNDATION Fieldbus H1 via the FF link.

This functionality is already integrated in the SIMATIC PDM PCS 7-FF product package.

SIMATIC PDM HART Server V9.1 option

This option permits the use of HART multiplexers from various vendors in SIMATIC PDM. Furthermore, WirelessHART field devices can also be parameterized with SIMATIC PDM.

SIMATIC PDM TAGs (version-independent)

Depending on the project size, the SIMATIC PDM TAGs supplied with a product package (except SIMATIC PDM Single Point) can be cumulatively expanded with sets of 10, 100 or 1 000 SIMATIC PDM TAGs.

A SIMATIC PDM TAG corresponds to a SIMATIC PDM object that represents the individual field devices or field components within a project, e.g. measuring instruments, positioners, switching devices or remote I/Os. SIMATIC PDM TAGs are also relevant for diagnostics with the lifelist of SIMATIC PDM. In this case, TAGs are considered to be all recognized devices with diagnostics capability, whose detailed diagnostics is effected through the device description (EDD).

SIMATIC PDM 1 Client (version-independent)

SIMATIC PDM 1 Client is a cumulative single-client license for SIMATIC PDM configurations with SIMATIC PDM Server, for example SIMATIC PDM Stand alone Server or SIMATIC PDM PCS 7 Server. The license is used to activate registered SIMATIC PDM clients and SIMATIC PDM sessions (opened portals) on these clients.

Each "SIMATIC PDM 1 Client" license activates one SIMATIC PDM client with one SIMATIC PDM session. A SIMATIC PDM session is defined as one opened portal together with the parameter views of the field devices opened from the portal. Each additional simultaneously opened SIMATIC PDM session on this client requires its own "SIMATIC PDM 1 Client" license. For larger projects, up to 30 registered SIMATIC PDM Clients are possible.

The "SIMATIC PDM 1 Client" license must be transferred to the computer with the SIMATIC PDM Server. The SIMATIC PDM Standalone Server product package comes with 2 "SIMATIC PDM 1 Client" licenses.

SIMATIC PDM Software Media Package V9.1

The current SIMATIC PDM installation software is offered without a license in the form of the SIMATIC PDM Software Media Package. Purchasing of corresponding software licenses is necessary to unlock the product-specific functionalities.

With SIMATIC PDM product packages, a SIMATIC PDM Software Media Package is supplied together with each ordering item when supplied via "Goods delivery" (not with optional product components). Further SIMATIC PDM Software Media Packages must be ordered separately as required.

The software of the SIMATIC PDM Media Package without a license can be used for demonstration purposes in demo mode. The SIMATIC PDM functionality is limited as follows in demo mode:

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Design (continued)

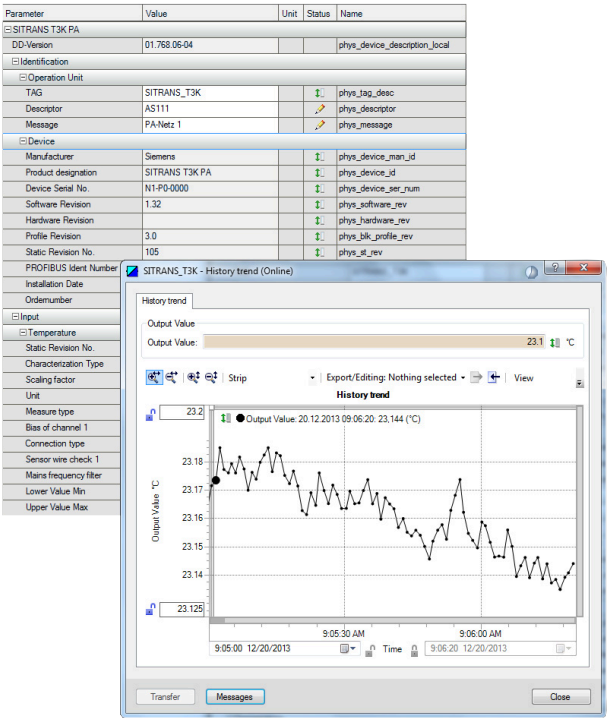
- Stand alone mode
- Storage functions disabled
- Export and import functions disabled
- Expanded functionality disabled
- Communication functions restricted

Information on ordering and delivery

Installation software for the SIMATIC PDM is provided in the form of a software media package. Software media packages and product-specific software licenses are separate packages, which are not merged into a single delivery unit for a goods delivery.

The number of delivered software media packages can be determined by the number of ordered items. You can find more information under "Goods delivery" in the "Software Media and Logistics" section, "PCS 7 Software Packages" subsection in the ST PCS 7 catalog.

Function



SIMATIC PDM, parameter view and trend window

SIMATIC PDM core functions

- Creation of project-specific device libraries
- Adjustment and modification of device parameters
- Comparing (e.g. project and device data)
- Plausibility testing of data input
- Device identification and testing
- Device status indication (operating modes, interrupts, states)
- Simulation
- Diagnostics (standard, detailed)
- Export/import (parameter data, logs, documents)
- Management (e.g. networks and PCs)

Function (continued)

- Commissioning functions, e.g. measuring circuit tests of device data
- Lifecycle management functions, e.g. for device replacement
- Global and device-specific modification logbook for user operations (audit trail)
- Device-specific calibration reports
- Graphic presentations of echo envelope curves, trend displays, valve diagnosis results etc.
- Presentation of incorporated manuals
- Document manager for integration of up to 10 multimedia files

Integration

Device integration

SIMATIC PDM supports all devices defined by the Electronic Device Description (EDD) and devices described by Field Device Integration Technology (FDI Technology V1.2). EDD is standardized to EN 50391 and IEC 61804. Internationally it is the most widely used standardized technology for device integration. At the same time, it is the guideline of the established organizations for

- PROFIBUS and PROFINET (PI – PROFIBUS & PROFINET International)
- HART (FCG: Field Communication Group)
- Foundation Fieldbus (FCG: Field Communication Group)

The devices are integrated directly in SIMATIC PDM through a company-specific EDD or through the libraries of the FCG. To achieve improved transparency, they can be managed in project-specific device libraries.

Field devices are described in the EDD or FDI device description packages in terms of functionality and construction using the Electronic Device Description Language (EDDL). Using this description, SIMATIC PDM automatically creates its user interfaces with the specific device data. By simply importing the manufacturer's device-specific device description packages, you can update existing devices and integrate further devices in SIMATIC PDM.

Technical support

If you wish to use devices which cannot be found in the SIMATIC PDM device description library, we would be pleased to help you integrate them.

Support Request

You can request support by service specialists at Technical Support by using a "Support Request" on the Internet:

Contacts in the Region

The Technical Support responsible for your Region can be found on the Internet at:

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Selection and ordering data

SIMATIC PDM Stand alone product packages	
Minimum configuration	
SIMATIC PDM Single Point V9.1 including 1 TAG; product package for operation and configuration of one field device; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET Additional functions or SIMATIC PDM TAGs are not possible 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3HA68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3HA68-0YH5**
Basic configuration for individual product package as well as local service and parameter assignment stations	
SIMATIC PDM Basic V9.1 including 4 TAGs; product package for operation and configuration of field devices and components; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3AB68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3AB68-0YH5**
Configuration for local service and parameter assignment station	

Selection and ordering data (continued)

SIMATIC PDM Service V9.1 Product package for service and measuring circuit tests on a local service station, with • SIMATIC PDM Basic incl. 4 TAGs • 50 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3JD68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3JD68-0YH5**
Configuration for central service and parameter assignment station	
SIMATIC PDM stand-alone server V9.1 Product package for service and device management in plant units, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Server - 2 × SIMATIC PDM 1 Client - 100 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), single license for 1 installation Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3TX68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3TX68-0YH5**
SIMATIC PDM system-integrated product packages	
Configuration for local SIMATIC S7 engineering and service station	

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Selection and ordering data (continued)

SIMATIC PDM S7 V9.1 Product package for use in a SIMATIC S7 configuration environment, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - 100 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3KD68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3KD68-0YH5**
Configuration for central SIMATIC PCS 7 engineering and service stations	
SIMATIC PDM PCS 7 V9.1 Product package for use in a SIMATIC PCS 7 configuration environment 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information) Floating license for 1 user, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - SIMATIC PDM Routing - 100 TAGs Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3LD68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3LD68-0YH5**
SIMATIC PDM PCS 7-FF V9.1 Product package for use in a SIMATIC PCS 7 configuration environment, including FOUNDATION Fieldbus H1 communication 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information) Floating license for 1 user, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - SIMATIC PDM Routing - SIMATIC PDM Communication FOUNDATION Fieldbus - 100 TAGs Without SIMATIC PCS 7 Software Media Package	

Selection and ordering data (continued)

• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3MD68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3MD68-0YH5**
SIMATIC PDM PCS 7 Server V9.1 Product package for use in a SIMATIC PCS 7 configuration environment, including server functionality 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information) Single license for 1 installation, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - SIMATIC PDM Routing - SIMATIC PDM Server - 100 TAGs Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3TD68-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3TD68-0YH5**
Optional product components for SIMATIC PDM	
SIMATIC PDM Extended V9.1 For enabling additional system functions 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3NX68-2YB5**
• Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online Certificate of License Note: Email address required!	**6ES7658-3NX68-2YH5**
SIMATIC PDM Integration in STEP 7/SIMATIC PCS 7 V9.1 For integration in a SIMATIC S7/SIMATIC PCS 7 configuration environment 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3BX68-2YB5**

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Selection and ordering data (continued)

• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3BX68-2YH5**
SIMATIC PDM Routing V9.1 For plant-wide navigation to field devices 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3CX68-2YB5**
• Online delivery License key download, online Certificate of License Note: Email address required!	**6ES7658-3CX68-2YH5**
SIMATIC PDM Server V9.1 For activating the server functionality 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), single license for 1 installation Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive, Certificate of License	**6ES7658-3TX68-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3TX68-2YH5**
SIMATIC PDM Communication FOUNDATION Fieldbus V9.1 For communication with field devices on FOUNDATION Fieldbus H1 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3QX68-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3QX68-2YH5**
SIMATIC PDM HART Server V9.1 For using HART multiplexers as well as for configuration of WirelessHART field devices 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3EX68-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3EX68-2YH5**

Selection and ordering data (continued)

SIMATIC PDM 1 Client Cumulative client license for SIMATIC PDM configurations with SIMATIC PDM Server, software class A, single license for 1 installation	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3UA00-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3UA00-2YH5**
SIMATIC PDM TAGs TAG licenses for expanding the available TAG volume, cumulative, software class A, floating license for 1 user	
• Goods delivery License key on USB flash drive and Certificate of License	
- 10 TAGs	**6ES7658-3XC00-2YB5**
- 100 TAGs	**6ES7658-3XD00-2YB5**
- 1 000 TAGs	**6ES7658-3XE00-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	
- 10 TAGs	**6ES7658-3XC00-2YH5**
- 100 TAGs	**6ES7658-3XD00-2YH5**
- 1 000 TAGs	**6ES7658-3XE00-2YH5**
SIMATIC PDM Software Media Package	
SIMATIC PDM Software Media Package V9.1 Installation software without license, 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit, Windows Server 2012 R2 Standard 64-bit or Microsoft Windows Server 2016 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information) Without SIMATIC PCS 7 Software Media Package Note: Can only be used in conjunction with a valid license or in demo mode!	
• Goods delivery SIMATIC PDM and device library software on DVD	**6ES7658-3GX68-0YT8**
• Online delivery SIMATIC PDM and device library software download Note: Email address required!	**6ES7658-3GX68-0YG8**

Technical specifications

SIMATIC PDM V9.1	
Hardware	• PG/PC/notebook with processor corresponding to operating system requirements
Operating system (alternatives)	• Windows 7 Professional/Ultimate/Enterprise SP1 32-bit/64-bit • Windows 10 Enterprise 2015 LTSB 64-bit • Windows Server 2012 R2 SP1 Standard Edition, 64-bit • Microsoft Windows Server 2016 Standard 64-bit
Integration in STEP 7/PCS 7	• SIMATIC PCS 7 V8.0+SP2/V8.1/V8.2 (without Communication FOUNDATION Fieldbus) • SIMATIC PCS 7 V9.0 • STEP 7 V5.5+SP4/V5.6
SIMATIC PDM Client	• Microsoft Internet Explorer 10 or 11 • Google Chrome

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More information

Update/Upgrade

Existing installations based on SIMATIC PDM V6.x or V8.x/V9.0 (including SP in each case) can be upgraded straight to V9.1 with upgrade packages.

Projects with SIMATIC PDM V7.0 can only be upgraded to version 9.1 by first upgrading to version 8.0. Two upgrade packages are offered for SIMATIC PDM V8.x/V9.0:

- SIMATIC PDM Upgrade Package Basic[1)] (with/without SIMATIC PDM HART Server option in each case) for configurations based on:
  - SIMATIC PDM Basic
  - SIMATIC PDM Service
  - SIMATIC PDM S7
  - SIMATIC PDM PCS 7
- SIMATIC PDM Upgrade Package Complete[1)] for configurations based on:
  - SIMATIC PDM PCS 7 Server
  - SIMATIC PDM PCS 7-FF

[1)] Optional product components for SIMATIC PDM such as PDM Extended, PDM Integration in STEP 7/PCS 7, PDM Routing, PDM Server and PDM Communication FOUNDATION Fieldbus are each included in a product package listed in the SIMATIC PDM Upgrade Package Basic or SIMATIC PDM Upgrade Package Complete and are implicitly authorized to be updated via the corresponding license. The SIMATIC PDM Upgrade Package Complete is required for use of the product components PDM Server or PDM Communication FOUNDATION Fieldbus.

For more information, see the section "Update/upgrade packages", "Updates/upgrades asynchronous to the PCS 7 version" - "Upgrades SIMATIC PDM".

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Overview



SITRANS DTM provides an easy way for Field Device Tool (FDT)/ Device Type Manager (DTM) users to parameterize Siemens Instruments using international standards.

Benefits

- Same look and feel for all Siemens field instruments
- Support for Quick start wizards and other dialog boxes
- Quick overview using table and tree views
- Online and offline configuration
- Conformity to IEC profiles for HART and PROFIBUS

Application

Electronic Device Description (EDD) is a proven way to describe the behavior and functionality of field instruments and other automation components.

For many years, EDD-based tools such as SIMATIC PDM from Siemens or handheld communicator have been used successfully in the process industry. Some years ago, an additional technology called FDT / DTM with the same approach was introduced to the market. To support the FDT DTM Technology for Siemens devices, the software SITRANS DTM has been developed which combines both technologies, EDD and FDT.

SITRANS DTM uses EDDs as the device description and provides the DTM interface to allow the integration of our field instruments into FDT-frame applications.

The following field instruments are currently available in SITRANS DTM:

- SITRANS TH300 HART
- SITRANS TH400 PA
- SITRANS P300 HART
- SITRANS DSIII HART
- SITRANS FM MAGFLO MAG6000 DP/PA
- SITRANS FC MASSFLO MASS6000 PA/PA
- SITRANS LT500 Service channel
- SITRANS Probe LU240 HART
- SITRANS LR110/120 HART
- SITRANS LR150 HART
- SITRANS LR510/530/550/580 HART
- SIPART PS2 HART, PA

Additionally, the SIPART PS2 FF has a DTM.

Technical specifications

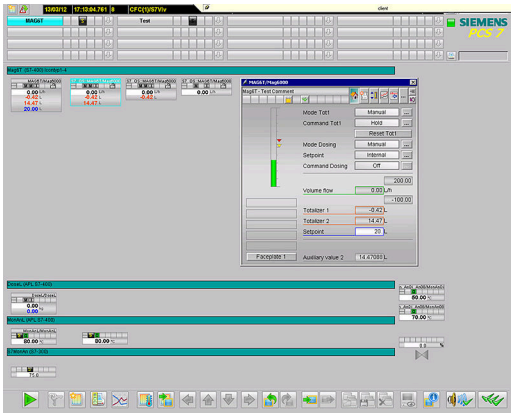
SITRANS DTM	
Current Version	3.1
Compatible with PACTware versions	3.6, 4.0, 4.1
Compatible with Windows	XP, 7
Certified by FDT group	Yes

Free DTM software can be downloaded here:

- SITRANS DTM V3.1:
  https://support.industry.siemens.com/cs/document/53754140/software%3A-sitrans-dtm-v3-1?dti=0&lc=de-WW
- SITRANS DTM V4.1:
  https://support.industry.siemens.com/cs/document/109484287/sitrans-dtm-v4-1?dti=0&lc=de-WW

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Overview



The SITRANS Library for SIMATIC PCS 7 extends the standard functionality of the SIMATIC PCS 7 process control system concentrated in the SIMATIC PCS 7 Advanced Process Library (APL) with technological blocks and faceplates for device-specific functions of the SITRANS field devices.

Benefits

The SITRANS Library allows you to easily operate all device functions, such as dosing, totalizer, min/max pointer, path diagnostic, alarm diagnostics, zero point adjustment (ZPA), etc. In addition, process related diagnostic information is also provided.

The SITRANS Library is based on the modern design of the Advanced Process Library (APL). Together with the APL, the SITRANS Library enables you to create harmonic overall solutions with a consistent look & feel and optimum use of the functions of the SITRANS field devices in many industries.

It helps accelerate the engineering process, reduces the time-to-market, and simplifies process control.

Note:

SITRANS Library V13 will support PCS 7 9.1 SP1 or higher.

Application

The SITRANS Library is best used in combination with SIMATIC PCS 7 and SITRANS field devices.

A current list of SITRANS field devices and the supported SIMATIC PCS 7 versions is available at
http://new.siemens.com/sitranslibrarypcs7devices

The SITRANS Library can be used for all core sectors of the process industry. These are:

- Chemical industry
- Pharmaceutical industry
- Water and wastewater
- Glass and solar
- Oil & gas
- Food and beverage industry
- Minerals and mining

Design

The product structure is geared toward the operational environment in the SIMATIC PCS 7 process control system. Consequently, SITRANS Library is offered in the form of an engineering component:

- SITRANS Library users can use the library with their supported PCS 7 version. No additional licenses are required for Engineering or OS runtime.

The SITRANS Library product component enables you to perform configuration work on a SIMATIC PCS 7 engineering station.

The SITRANS Library product component allows you to run blocks from a library on an automation system.

When using function blocks from SITRANS Library in SIMATIC PC 7 automation systems, please note that SIMATIC PCS 7 AS Runtime POs are also booked.

Function

SITRANS Library for SIMATIC PCS 7

Sublibrary for the functional expansion of the SIMATIC PCS 7 Advanced Process Library with:

- Function blocks and faceplates for SITRANS field devices with S7-400 and S7 -410 systems.

The function blocks are configured in CFC.

Operator control and monitoring from a panel is configured with the panel interface blocks for the SITRANS F M MAG 6000 DP. Taking operating rights and hierarchical operating concepts (multi-control room operation) into consideration, the technological function can then be operated from both an operator station and a Touch Panel.

For detailed information on which field devices, which systems and system versions are supported as well as on the free download, see:
http://new.siemens.com/sitranslibrarypcs7devices

Selection and ordering data

Selection and ordering data	Article No.
SITRANS Library Block library for SIMATIC PCS 7 as of V13.0 with function blocks and faceplates as well as electronic documentation. The following operating systems are supported by SIMATIC PCS 7 V9.1 SP1: • Windows 10 Enterprise LTSC 2019 • Windows Server 2019 Standard Edition • Windows Server 2019 Datacenter Edition Engineering license for one customer plant Type of delivery: free download	**7MP2990-0AA00**

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Overview

Today, distributed automation solutions based on open field buses are state-of-the-art in large areas of the process engineering industry. It is only with fieldbuses that the functional benefits of digital communication can be put to full use, e.g. better resolution of measured values, diagnostics options and remote parameterization.

Like PROFIBUS PA, the FF bus (FOUNDATION Fieldbus) is an open field bus with a large installed base for a wide range of application. Standardization according to IEC 61158 / EN 50170 provides you with future protection for your investment.

Benefits

- A uniform modular system from the sensor to the connection to the control level enables new plant concepts
- Problem-free exchangeability of field devices, including from different manufacturers, that comply with the standard profile
- Networking of transmitters, valves, actuators, etc.
- Implementation of intrinsically safe applications through use of the field bus in hazardous areas
- Easy installation of 2-wire cables for joint energy supply and data transfer
- Reduced cabling costs through savings of material and installation time
- Reduced configuration costs through central, simple engineering of the field devices, also cross-vendor
- Fast and error-free installation
- Lower service costs thanks to simpler wiring and plant structure plus extensive diagnostics options
- Greatly reduced commissioning costs through simplified loop check
- Scaling/digitizing of the measured values in the field device already, hence no rescaling necessary in SIMATIC PCS 7

Application

The transfer technology of the FOUNDATION Fieldbus is tailored to the needs of the process industry. Interoperability between field devices from different manufacturers and remote parameterization of the field devices during operation are guaranteed by the standardized communication services.

FOUNDATION Fieldbus can just as readily be used in standard environments as in hazardous areas. For use in hazardous areas, FOUNDATION Fieldbus and all connected devices have to be designed with type of explosion protection Ex [i].

Function

FOUNDATION Fieldbus enables the direct connection of actuators and sensors.

FOUNDATION Fieldbus is based on a transfer optimized for intrinsically safe application. The transfer technology is internationally standardized in IEC 61158.

For FOUNDATION Fieldbus the data and energy supply for the field devices can be directed through a 2-wire cable.

FOUNDATION Fieldbus enables device-to-device communication ("control in the field").

Integration

Siemens field devices for process automation which are listed in this catalog and can be controlled using Foundation Fieldbus:

Measuring instruments for pressure
SITRANS P300
SITRANS P DS III
SITRANS P410
Measuring instruments for temperature
SITRANS TH400
Electropneumatic positioners
SIPART PS2
Flowmeters
SITRANS FM MAG 6000
SITRANS FM MAG 6000 I / I Ex
SITRANS FC MASS 6000
Level meters
SITRANS LG240/250/260/270

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Overview

Today, distributed automation solutions based on open fieldbuses are standard in many areas of the manufacturing industry and in process engineering. It is only with fieldbuses that the functional benefits of digital communication can be put to full use, e.g. better resolution of measured values, diagnostics options and remote parameterization.

Today, PROFIBUS is the most successful open fieldbus with a large installed base for a wide range of applications. Standardization according to IEC 61158 / EN 50170 provides you with future protection for your investment.

Benefits

- Fully modular system, from the sensor through to the control level, permits new plant concepts
- Problem-free exchangeability of field devices, including from different manufacturers, that comply with the standard profile
- Networking of transmitters, valves, actuators, etc.
- Implementation of intrinsically safe applications through use of the field bus in hazardous areas
- Easy installation of 2-wire cables for joint power supply and data transfer
- Reduced cabling costs through savings of material and installation time
- Reduced configuration costs through central, simple engineering of the field devices (PROFIBUS PA and HART with SIMATIC PDM, also with multi-vendor support)
- Fast and error-free installation
- Lower service costs thanks to simpler wiring and plant structure plus extensive diagnostics options
- Greatly reduced commissioning costs through simplified loop check
- Scaling/digitizing of the measured value in the field device already, hence no rescaling necessary in SIMATIC PCS 7

Application

PROFIBUS is suitable for fast communication with distributed I/O (PROFIBUS DP) in production automation as well as for communication tasks in process automation (PROFIBUS PA). It is the first fieldbus system that meets the demands of both areas with identical communication services.

The transfer technology of PROFIBUS PA is tailored to the requirements of the process industry. The standardized communications services guarantee interoperability between multi-vendor field devices and remote configuration of the field devices during operation.

With SIMATIC PDM (Process Device Manager), a universal tool that is not manufacturer-specific and is used for configuring, parameterizing, commissioning and diagnosing intelligent process devices on PROFIBUS, a variety of process devices of different manufacturers can be configured using a uniform graphic user interface.

PROFIBUS PA can be used both in standard environments and in hazardous areas. For use in hazardous areas, PROFIBUS PA and all connected devices have to be designed with type of protection Ex [i].

The uniform protocol of PROFIBUS DP and PROFIBUS PA enables the linking of both networks and thus the combination of timing performance and intrinsically safe transmission technology.

Function

PROFIBUS PA expands PROFIBUS DP with process-level components for direct connection of actuators and sensors. With PROFIBUS PA, the RS 485 transmission method is replaced by a different transmission method optimized for intrinsically safe applications. Both methods are standardized internationally in IEC 61158.

PROFIBUS PA uses the same communication protocol as PROFIBUS DP; communication services and frames are identical.

With PROFIBUS PA, the information and energy supply for supplying the field devices can be conducted via a 2-wire cable.

Integration

Siemens field devices for process automation listed in this catalog that can be controlled with PROFIBUS:

PROFIBUS PA

Measuring instruments for pressure
SITRANS P300
SITRANS P DS III
SITRANS P410
Measuring instruments for temperature
SITRANS TH400
Flow meters
SITRANS FM MAG 6000 19" / IP67
SITRANS FM MAG 6000 I / I Ex
SITRANS FM TRANSMAG 2
SITRANS FC MASS 6000 19" / IP67 / Ex d
SITRANS FUS060
Level meters
SITRANS LT500
SITRANS LG240/250/260/270
Electropneumatic positioners
SIPART PS2
Acoustic sensors for pump monitoring
SITRANS DA400

PROFIBUS DP

Measuring instruments for temperature
SITRANS TO500
Flowmeters
SITRANS FM MAG 6000 19" / IP67
SITRANS FM MAG 6000 I
SITRANS FC MASS 6000 19" / IP67
SIFLOW FC070 (via ET 200M)
Level meters
SITRANS LT500
Acoustic sensors for pump monitoring
SITRANS DA400

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Overview

HART is a widely used communication standard for field devices. HART devices are specified by the FieldComm Group.

The HART standard expands the analog 4 to 20 mA signal to modulated, industry-tested, digital signal transmission.

Benefits

- Tried-and-tested analog measured value transmission
- Simultaneous digital communication with bidirectional data transfer
- Possibility to transfer multiple measured variables from a field device (e.g. diagnostics, maintenance and process information)
- Connection to higher-level systems such as PROFIBUS DP.
- Easy installation and commissioning

Benefits in connection with SIMATIC PDM

- Manufacturer-neutral operation of all HART devices through standardized parameter sets
- HART field devices described by HART DLL are integrated in SIMATIC PDM via the Fieldcomm catalog. HART-DD (Device Description) in SIMATIC PDM standardized, manufacturer-neutral and very widely used. Additional field devices are integrated in SIMATIC PDM via EDD (Electronic Device Description)
- Simple operation and commissioning of field devices, even in usage locations that are difficult to access
- Advanced diagnostics, evaluating and logging functions

Application

Devices can be connected in different ways:

- Through the distributed I/O
  - SIMATIC ET 200M, ET 200SP
  - SIMATIC ET 200iSP with the HART modules

  or with analog modules 4 to 20 mA and HART Handheld Communicator,
- via a HART modem with which a point-to-point connection between the PC or Engineering System and the HART device can be established
- via HART multiplexers which are contained in the HART server of the HCF.

Integration

Siemens field devices listed in this catalog for process automation that can be controlled with HART:

Measuring instruments for pressure
SITRANS P300
SITRANS P310
SITRANS P320
SITRANS P DS III
SITRANS P410
SITRANS P420
SITRANS P500

Measuring instruments for temperature
SITRANS TF
SITRANS TH300
SITRANS TH320
SITRANS TH420
SITRANS TR300
SITRANS TR320
SITRANS TR420
SITRANS TW

Flowmeters
SITRANS FM MAG 5000
SITRANS FM MAG 6000 19" / IP67
SITRANS FM MAG 6000 I / I Ex
SITRANS FM TRANSMAG 2
SITRANS FC MASS 6000 19" / IP67 / Ex d
SITRANS FC FCT030
SITRANS FS FST030
SITRANS FUS060
SITRANS FX300
SITRANS FX330

Level meters
SITRANS LT500
SITRANS LR110/120
SITRANS LR150
SITRANS LR510/530/550/580
SITRANS Probe LU240
SITRANS LG 240 / LG 250 / LG 260 / LG270

Electropneumatic positioners
SIPART PS2

Power supply units and isolation amplifiers
SITRANS I

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10/2	**Services for Process Instrumentation**
10/3	**Lifecycle Services**
10/3	Remote Services for Process Instrumentation
10/4	Calibration Services
10/5	Lifecycle Management Suite
10/6	Inventory Baseline Services
10/7	Lifecycle Information Services
10/9	Managed System Services
10/10	Preventive System Analysis
10/11	Asset Optimization Services
10/12	Lifecycle Service Contracts for DCS

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Overview

Digital Enterprise Services – passionate about tomorrow

Our services take industry to the next level. Increase digitalization and optimize your transformation processes! With our passion for tomorrow, we accelerate digital transformation with you and our partners, improving availability, productivity, and efficiency.

Our innovative Lifecycle Services offer reliable support, available 24/5 for both regional and global needs, with approximately 120 service centers worldwide. Using the newest technology standards and digital solutions, we enable you to achieve your sustainability goals and by implementing it, you can stay ahead of the competition.

Contact us and benefit from advice from our Service Experts that's tailored to your specific needs.

More information

For more information please visit us via:
www.siemens.com/digital-enterprise-services

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Overview

Optimal system-specific remote support and proactive remote services with globally available know-how from the product manufacturer based on state-of-the-art IT infrastructure.

Your need:

- Ensure engineering, commissioning and maintenance without significant in-house effort
- Complete transparency through central administration of all system accesses
- Sustainable remote solution concepts

Our service offer:

- Communication between customer system and Siemens IT via a common remote service platform
- Providing remote IT infrastructure, including support and maintenance
- Based on this, we offer our Remote Service

Benefits

- Secure remote connection to SIMATIC TechSupport IT infrastructure
- Ensuring fast and worldwide availability of experts
- Innovative service concept thanks to industry-standard service and collaboration software
- Compatible with proven security concepts and TÜV/CERT certification of the Siemens cRSP (common Remote Service Platform) infrastructure

Application

- SIMATIC PCS 7, PCS neo, Step 7, TIA Portal and devices of proccess automation

More information

More information is available online at:
www.siemens.com/siremote

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Overview

Ensuring operational readiness throughout the lifecycle by regularly certifying the accuracy of measurement equipment both offsite and onsite.

Support:

If you have questions about this service, please contact us at calibration.industry@siemens.com

Your need:

- Reliable calibration, measurement and testing of process instrumentation
- High quality engineering performance and related expertise
- Ensuring long-term and reliable performance of equipment and machinery

Our service offer:

- Offsite calibration: Wide range of calibrations for dimension, electronics, and process instruments remotely
- Onsite calibration: Maintenance of measuring devices on site to avoid longer down times
- Traceable calibration for measuring equipment of all manufacturers by Siemens Industrial Laboratory (SIRENT) with accreditation by national accreditation body of the Federal Republic of Germany (DAkkS)

Benefits

- Complying with norms, guidelines and legal specifications while calibrating for quality assurance according to ISO 9000
- Verfication of billing measurements (cold water, flow of heat/cold segments)
- Early fault detection and determination of the operational reliability of measuring equipment

Application

- Process instrumentation field devices.

Options

	Pressure	Temperature	Flow	Dynamic Weighing
Off-site Calibration according to ISO 9001	✓	✓	✓	
Off-site Calibration according to ISO 17025	✓	✓	✓	
Off-site Domestic Custody Transfer Verification			✓	
Off-site Calibration according to ISO 9001*	✓	✓		✓

*On-site services will be performed by local Siemens Customer Service. Please contact Siemens office in your region for further information.

More information

- siemens.com/calibration-sios
- siemens.com/calibration

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Overview

Cloud-based maintenance management system based on COMOS MRO which provides standard operating procedures in the form of checkpoints for lifecycle services assigned to the components of the SIMATIC PCS 7 system and field devices of process instrumentation.

Support:

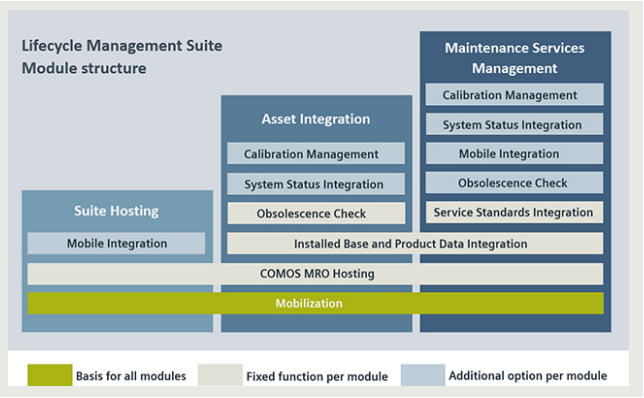
If you have questions about this service, please contact us: https://www.siemens.com/contact-me?Country=ww&Service=Customer%20Request:%20Lifecycle%20Management%20Suite

Your need:

- Efficient maintenance of the plant and ensuring availability and serviceability of the control technology
- Feedback of service activities and continuous analysis of maintenance histories
- Availability of monitoring information also on mobile devices

Our service offer:

- COMOS MRO-based and pre-configured CMMS system with standard operation procedures
- Comprehensive range of calibration and verification functions for field devices
- Generation of maintenance, obsolescence and IT security reports



Lifcycle Management Suite

Benefits

- Full transparency thanks to effective import and analysis functions
- Fast system deployment through online setup
- Optimized maintenance and comprehensive asset lifecycle information

Application

SIMATIC PCS 7, PCS neo, Step 7, TIA Portal, field devices of process instrumentation, 6ES7658

Options

LMS Standard*	9LA1110-5CA00-0DA0
LMS Additional plant add on	9LA1110-5CA00-1DB0
LMS Additional concurrent user add on	9LA1110-5CA00-1DC0
LMS Calibration add on	9LA1110-5CA00-1DD0
LMS MobileWorker add on	9LA1110-5CA00-1DE0
LMS Online Monitoring add on**	9LA1110-5CA00-0DF0
LMS Demo***	9LA1110-5CA00-0DA1
LMS Additional Tech Support 10h	9LA1110-5CA00-1CD0

* Use of the LMS software via cloud access for the subscription period 1 year. Administration of customer-specific software instances including software update, including 10 hours of technical support / subscription term (Monday - Friday 8:00 - 17:00 CET). 1x Floating License for one plant and one user simultaneously from a pool of users within "territory".

** Provision of PRTG Network Monitor in the cloud, to monitor up to 500 aspects of your devices in your network, which usually means about 50 devices.

*** Access to a fully functional LMS instance for 3 months. Some restrictions apply (one concurrent user, limited number of plants).

More information

siemens.com/lms

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Overview

Inventory Baseline Services show which products are used where in the system and represent the lifecycle status of the automation system. The system information is comprehensively recorded and the plant situation is transparently displayed.

Support:

If you have questions about this service, please contact us: services.automation@siemens.com

Your need:

- Knowledge of the current inventory for planning and preparation of further service measures
- Standardized and complete recording of all installed automation components
- Simultaneously lowest possible time and cost expenditure

Our service offer:

- Cost-efficient, data-based inventory of the automation system
- Transparent overview of the currently installed system inventory and the spare parts stock
- Supply of the result through standardized reports
- Professional evaluation by Siemens experts

Benefits

- Decision support for planning future maintenance and modernization measures
- Data basis for further lifecycle services, e.g., SIMATIC System Audit, Lifecycle Information Services or Asset Optimization Services
- Preparation for updates or upgrades

Application

SIMATIC PCS 7, SIMATIC PCS neo, Step 7, WinCC, 6ES7658

Options

Automation systems

Complete execution of the data collection of the installed base on site by Siemens and data evaluation (available only for Germany)	9LA1110-8AJ00-1AA0
Evaluation of the installed base, collected with the SAS DC tool (SIMATIC Assessment Suite Data Collector)	9LA1110-8AJ00-2AA0
Extension of the data collection and analysis with additional 20 PCs or VMs	9LA1110-8AJ00-4AA0

Process instrumentation (field devices)

Complete execution of the data collection of the installed base on site by Siemens and analysis of process instruments (available only for Germany)*	9LA1110-8AJ00-1AB0
Evaluation of the installed base, collected with the SAS DC tool (SIMATIC Assessment Suite Data Collector)*	9LA1110-8AJ00-2AB0

*This service can only be ordered upon request, please contact us via e-mail: services.automation@siemens.com

More information

siemens.com/ibs-sios

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Overview

Lifecycle Information Services delivers tailored, plant-specific product information to support both operational and strategic decision-making.

Support:

If you have questions about this service, please contact us: lifecycle-webservices.industry@siemens.com

Your need:

- Protection of your plant investment
- Ensuring plant and machine avilability and serviceability
- Prevention of unplanned downtime or cost-intensive supply bottlenecks

Our service offer:

- **Service recommendations:** Offers targeted recommendations for plant-specific services to improve operational efficiency and maintenance planning
- **Proactive Lifecycle Insights**: Provides early visibility into product lifecycle changes, enabling timely adjustments
- **Investment Decision Support:** Improves transparency and predictability of follow-up costs related to the initial investments
- **Regular Lifecycle Reporting:** Provides detailed, plant-specific reports to keep stakeholders informed throughout the product lifecycle

Demo:

Click here for a free demo of the web application and discover all its functions: www.siemens.com/lis-demo

Benefits

- Ensure long-term availability of critical components & systems
- Proactively manage obsolescence to avoid unplanned downtime
- Transparency on customers system

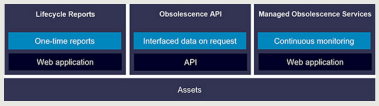
Application

- SIMATIC PCS 7, SIMATIC PCS neo, TIA Portal, S7-400, S7-1500
- 6ES7658, 6DL89, 6ES7823, 6ES74, 6ES76, 6ES75

Options

Lifecycle Information Services feature a modular structure, enabling tailored delivery of lifecycle data to match specific customer requirements:

- **Lifecycle Reports:**Delivered as one-time reports via a web application, categorized into Overview, Basic, 3rd Party and Comprehensive to suit varying information needs.
- **Obsolescence API**: Designed for tech-savvy users, this module offers an Application Programming Interface (API) that integrates essential product lifecycle data directly into customer applications.
- **Managed Obsolescence Services**: A dedicated Support Manager delivers proactive insights into lifecycle changes, assesses obsolescence impacts, and provides tailored mitigation recommendations for customer systems.



Lifecycle Reports		
Basic One	Price per component, minimum order volume of 250, detailed lifecycle data included	9LA1110-8AG10-1AM0
BASIC ONE Subscription	1 year service agreement per user, unlimited component count, detailed lifecycle data incl.	9LA1110-8AG10-1CM0
COMPREHENSIVE ONE	Price per component, minimum order volume of 25, detailed lifecycle data, expert analysis and recommendations included	9LA1110-8AG10-3AM0
LIS 3rd Party	Price per 3rdParty component, minimum order volume of 25, lifecycle data for 3rd Party components included	9LA1110-8AG10-1DM0

Obsolescence API		
API Setup	One-time fee to setup API	9LA1110-8AG10-0AS0
API (5000 requests)	Package price for 5000 requests, incl. detailed lifecycle data	9LA1110-8AG10-0AM0

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Options (continued)

Managed Obsolescence Services as Standalone		
Managed Obsolescence Services	1 year service agreement, 10 hours support, support manager, obsolescence notifications, impact assessment, app for managing obsolescence and contract, limited to 100 components	9LA1110-8AG20-4AA0-ZY01
Managed Obsolescence Option	Enhancing existing Managed System Services (MSS) agreement by obsolescence management	9LA1110-1BL01-0AA0-ZY01
Managed System Services (MSS) for DCS, with Obsolescence and Vulnerability	Bundle package for process automation (PCS 7), 1 year MSS DCS agreement (30 hours) with obsolescence and vulnerability management	9LA1110-1BH01-0BA0-ZY01
Managed System Services (MSS) for Automation, with Obsolescence and Vulnerability	Bundle package for discrete manufacturing, 1 year of MSS Automation agreement (30 hours) with obsolescence and vulnerability management	9LA1110-1BA01-0BA0-ZY01
Lifecycle Manager – 25 components extension	Adds 25 components to the component limit	9LA1110-8AG20-4CA0-ZY01
10 hours extension of Managed Services	Extension of service agreement by additional 10 hours of support	9LA1110-1BL00-0MA0-ZY01
25 hours extension of Managed Services	Extension of service agreement by additional 25 hours of support	9LA1110-1BL00

More information

siemens.com/lis

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Overview

One year exclusive and individual technical product support contract for all industrial systems, to minimize the risk of production downtime.

Support:

If you have questions about this service, please contact us:
services.automation@siemens.com

Your needs:

- Outsourcing of service activities and concentration on core business
- Competent, high-performance support for engineering tasks and maintenance
- Avoidance of on-site service calls by using future-oriented IT-based services

Our service offer:

This service includes comprehensive system inventory, central coordination of all service activities by an exclusive Siemens support manager and regular status reporting.

Siemens support manager:

- Gets familiar with the plant and maintenance processes to integrate them into the system
- Coordinates and manages all your support requests with the highest priority
- Sends you quarterly status reports – from the initial system acceptance to the final report, over the entire period of the contract.

Benefits

- Exclusive channel for fast callback and central request coordination
- Avoid on-site service
- Exclusive access to the Extranet with contract-relevant contents

Application

- SIMATIC PCS 7, PCS neo, Step 7, TIA Portal, field devices of process instrumentation, machine tools, drive systems
- 6ES7658, 6DL89, 6ES74, 6ES76, 6SL3330, 6BK1630, 6FC5800, 1EE1322, 7ME6942, 7MH4960

Options

Contents of all MSS options:

- 1 year service contract
- 30 hrs technical support (if not otherwise agreed)
- Exclusive Service Manager as a central contact person
- Service Manager as central contact person
- Access to further information in SiePortal
- Quarterly reporting on processed service requests

MSS Options

MSS for automation systems	9LA1110-1BA01-0AA0-Z Y01
MSS Fleet for automation syst. (min. 3 systems á 10 hrs)	9LA1110-1BA01-0FA0-ZY01
MSS for process instrumentation (field devices)	9LA1110-1BD01-0AA0-Z Y01
MSS Fleet for process instrumentation (min. 3 systems á 10 hrs)	9LA1110-1BD01-0FA0-ZY01
MSS for DCS systems	9LA1110-1BH01-0AA0-Z Y01
MSS Fleet for DCS systems (min. 3 systems á 10 hrs)	9LA1110-1BH01-0FA0-ZY01
MSS Remote Desktop Sharing	9LA1110-1BR01-0AA0-Z Y01
10h Managed Support Extension	9LA1110-1BL00-0MA0-Z Y01
25h Managed Support Extension	9LA1110-1BL00
Managed Obsolescence Option	9LA1110-1BL01-0AA0-Z Y01
Managed Vulnerability Option	9LA1110-1BV01-0AA0-Z Y01
Bundle MSS DCS with Obsolescence and Vulnerability Management	9LA1110-1BH01-0BA0-Z Y01
Bundle MSS Automation with Obsolescence and Vulnerability Management	9LA1110-1BA01-0BA0-Z Y01

MSS for PCS neo

MSS for PCS neo Premium	9LA1110-1BN01-0AA0-ZY01
MSS for PCS neo – Ready for Virtualization – clarification of a possibility of virtualization	9LA1110-1BN01-0VA0-ZY01
25 hrs support extension for PCS neo	9LA1110-1BL00-0AA0-ZY01

MSS for Machine Tools

Small Package (30 hrs)	9MC1110-0MS00-0AA0
Medium Package (40 hrs)	9MC1110-0MS00-0AA1
Large Package (50 hrs)	9MC1110-0MS00-0AA2
30 hrs support extension for machine tools systems	9MC1110-0MS00-0AA3

MSS for Drive Systems

MSS for Drive Systems 30 hrs technical support for one year	9MC3110-0MS00-0AA0
MSS for Drive Systems – 25 hrs support extension	9MC3110-0MS00-0AA1

More information

- SiePortal
- siemens.com/mss

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Overview

Identification of potential risks for SIMATIC PCS 7 systems

Support:

If you have questions about this service, please contact us.

Your need:

- Preventive system analysis to minimize risks
- Reduction of maintenace costs
- Avoidance of system downtime

Our service offer:

- Detailed system analyses provided by Siemens experts
- Specific "Tailor-made" measures to increase the maintenance efficiency
- Detailed reports on system condition and recommendation

Benefits

- Fast data acquisition
- Intensive data analysis
- Transparent reporting

Application

SIMATIC PCS 7, Step 7, TIA Portal and WinCC, 6ES7658, 6DL89

Options

Preventive System Analysis one-time	System scope: max. 10 systems* System Status Report generated one time	9LA1110-1CD00
Preventive System Analysis 5	System scope: max. 5 systems	9LA1110-1CA00
Preventive System Analysis 20	System scope: max. 20 systems	9LA1110-1CB00
Preventive System Analysis 50	System scope: max. 50 systems	9LA1110-1CC00
Preventive System Analysis 75	System scope: max. 75 systems	9LA1110-1CE00
Preventive System Analysis 100	System scope: max. 100 systems	9LA1110-1CF00

More information

siemens.com/psa

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Overview

Optimize overall spare parts supply for your maintenance activities with a systematic four phases approach to reach high plant availability.

Support:

Should you have any question about the ordering process, please contact us:
https://www.siemens.com/contact-me?Country=ww&Service=Customer%20Request:%20Asset%20Optimization%20Services

Your need:

- Secure reliable supply of spare parts
- Minimize risks related to functional obsolescence
- Reduce maintenance costs by optimizing the stock
- Optimize inventory, technically and economically (reduced capital lockup)
- Maximize transparency in inventory management
- Maintain the balance between a high plant availability and productivity of your installations and a minimal budget dedicated to the stock of spare parts replacement

Our service offer:

- Analysis of the spare parts situation on site: availability, product life cycle, spare parts delivery times.
- Concept: Analysis of actual demand and development of a spare parts concept
- Implementation: Establishment of required storage structures, storage locations and spare parts
- Operation: Continuous spare parts supply, depending on agreed scope cyclical inventory analysis

Benefits

- Avoid the lack of spare parts
- Minimize inventory and the budget allocated to it
- Transparency about actual spare parts requirements
- Ensuring spare parts availability over the entire life cycle, thus providing the basis for improved serviceability
- Technical and economic warehouse optimization (lower capital commitment)

Application

SIMATIC PCS 7, PCS neo, Step 7, TIA Portal, field devices of process instrumentation, 6ES7658, 6ES74, 6ES76

Options

Modules	
Analysis	9LA1110-8AE10-1AA0
Concept	9LA1110-8AE10-2AA0
Implementation	9LA1110-8AE10-3AA0
Operation Spare Parts Supply	9LA1110-8AE10-4AA0
Operation Spare Parts Management	9LA1110-8AE10-4BA0

Options	
Product Extension	9LA1110-8AE10-8AA0
Time Extension	9LA1110-8AE10-8BA0

More information

More information is available online at:
www.siemens.com/aos

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Overview

Modular service program for a lifecycle service contract ensuring sustainable serviceability and increasing plant availability.

Support:

If you have questions about this service offering, please contact us at
services.automation@siemens.com

Your need:

- Long-term assurance of investment protection
- Consistent functionality on renewed and maintained system platform
- Plannability of necessary service measures and costs

Our service offer:

- System modernizations
- On-call service and on-site and remote repairs
- Inspection, maintenance, spare parts & repairs
- Contract management, support and consulting
- Obsolescence management

Benefits

- Transparency of costs for services and modernization
- Increased system availability due to assured start-up times for service, spare parts supply and preventive maintenance measures
- Preservation of the serviceability of the system

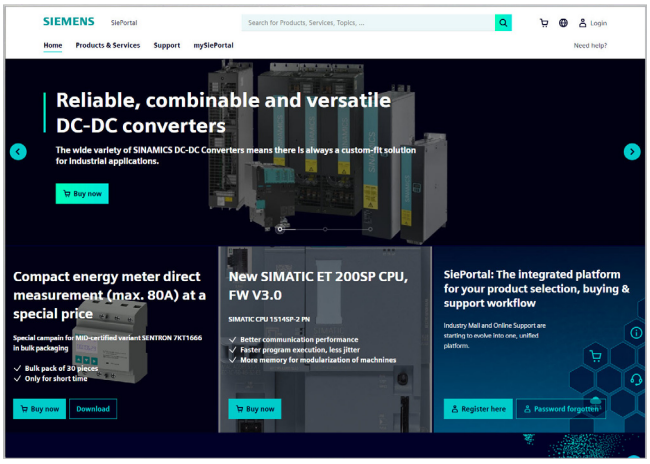
Application

SIMATIC PCS 7, PCS neo and WinCC SCADA systems

More information

siemens.com/pcs7lcs

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Easy product selection and ordering with SiePortal

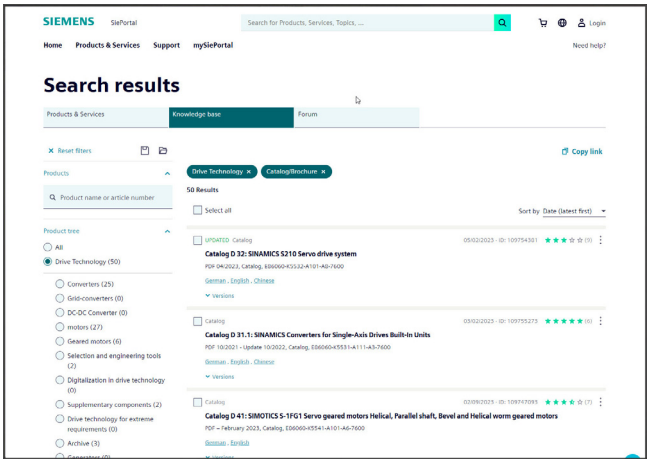
SiePortal > Products & Services

The internet ordering platform of Siemens AG is located in SiePortal. It provides you with online access to a comprehensive product spectrum that is presented in an informative, well-organized way.

Powerful search functions help you select the required products, while configurators enable you to configure complex product and system components quickly and easily. CAx data are also available for you to use.

Data transfer allows the entire procedure, from selection through ordering to tracking and tracing, to be carried out online. Availability checks, individual customer discounting, and quotation preparation are also possible.

https://sieportal.siemens.com



Downloading catalogs

SiePortal > Support > Knowledge base

You can download catalogs and brochures in PDF format from Siemens Industry Online Support without having to register.

The filter box makes it possible to perform targeted searches.

https://sieportal.siemens.com

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Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit **www.siemens.com/cybersecurity-industry**

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
www.siemens.com/cert

Please scan the QR code for more information about the products

Get more information

All the latest information on products for process Instrumentation can be found on the internet
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