

## Flow Measurement

### SITRANS FC (Coriolis)

#### Sensors and Flowmeter systems

#### SITRANS FC330 flowmeter system

##### Overview



The complete flowmeter system SITRANS FC330 can be ordered for standard, hygienic or NAMUR service. The flowmeter is based on the latest developments within digital signal processing technology – engineered for high measuring performance:

- Fast response to rapid changes in flow
- Fast dosing applications
- High immunity against process noise
- High turndown ratio of flowrates
- Suitable for liquid and gas service
- Easy to install, commission and maintain

With all global marine approvals the FC330 is ideal for integration in ship fuel efficiency and environmental measurement systems as well as bunkering solutions.

FC330 is available with current output HART 7.5, Modbus RS 485 RTU, PROFIBUS DP or PROFIBUS PA as standard on Channel 1. Additional functions can be freely configured for analog, pulse, frequency, relay or status output or binary input.

The transmitter comes with a user-configurable graphical display and SensorFlash, a micro SD card for configuration backup, firmware update and data storage.

The SITRANS FC330 flowmeter system consists of a SITRANS FCS300 sensor and a SITRANS FCT030 transmitter.

##### Benefits

- It is compact and light, fitting neatly into dense piping arrangements
- Easy maintenance because modules can be exchanged rapidly
- Effective separation of measurement from plant vibration
- Highly secure operation in safety critical applications
- Non-volatile memory of all setup and operation data
- Reliable measurements due to high signal to noise ratio
- Secure, digital transfer of measurement data from the sensor
- Short overall length; easy drop-in replacement into most existing installations

#### Technical specifications

<b>Sizes</b>	DN 15 (½") DN 25 (1") DN 50 (2") DN 80 (3") DN 100 (4") DN 150 (6")	<b>Process connections</b>	<ul style="list-style-type: none"> <li>• Flanges EN 1092-1 B1, EN 1092-1 B2, EN 1092-1 D, ANSI/ASME B16.5, JIS B 2220</li> <li>• Pipe threads ASME B1.20 (NPT) female pipe thread, ISO 228-1 G female pipe thread (BSPP)</li> <li>• Hygienic threads DIN 11851, SMS 1145</li> <li>• Hygienic clamps DIN 32676 (ISO) Row A</li> </ul>
<b>Accuracy</b>	± 0.10 % or 0.20 % for liquids additional ±0.40 for gases	<b>Approvals</b>	<ul style="list-style-type: none"> <li>• Hazardous area (zone 1) ATEX, IECEx, EAC Ex, CSA, cCSAus, NEPSI, EAC No dust approval PED, CRN EHEDG (DN 25 ... DN 80) (in preparation)</li> <li>• Marine (in preparation for FC330 compact) Germanischer Lloyd/det Norske Veritas, Bureau Veritas, Lloyds of London, American Bureau of Shipping, RINA (Italy)</li> </ul>
<b>Repeatability</b>	± 0.05 %	<b>NAMUR</b>	NAMUR-compliant (e.g. NE 21, NE 41, NE 107 and NE 132)
<b>Flow range (liquids)</b> (water @ 1 bar pressure loss) (Q <sub>nom</sub> )	<ul style="list-style-type: none"> <li>• DN 15 4 500 kg/h (163.3 lb/min)</li> <li>• DN 25 20 500 kg/h (753.2 lb/min)</li> <li>• DN 50 49 000 kg/h (1 800 lb/min)</li> <li>• DN 80 122 000 kg/h (4 483 lb/min)</li> <li>• DN 100 273 000 kg (10 031 lb/min)</li> <li>• DN 150 459 200 kg/h (16 873 lb/min)</li> </ul>	<b>I/O</b>	Up to 4 channels combining analog, relay or digital outputs and binary input
<b>Architecture</b>	Compact or remote configuration	<b>Communication</b>	HART PROFIBUS PA PROFIBUS DP Modbus RTU (RS 485)
<b>Display</b>	Full graphical display, 240 × 160 pixels with selection of 6 languages	<b>EMC performance</b>	Emission EN 55011/CISPR-11 (Class A) Immunity EN/IEC 61326-1 (Industry)
<b>Power supply</b>	20 ... 90 V DC ± 10 %; 100 ... 240 V AC ± 10 %, 47 ... 63 Hz ± 10 %	<b>Mechanical load</b>	18 ... 400 Hz random  The flow meter will mechanically tolerate 3.17 g RMS in all directions. Flow accuracy cannot be guaranteed under all conditions.
<b>Material</b>		<b>Footnote 1)</b>	Flange wetted parts and raised face surface in Nickel Alloy and non wetted parts in AISI 316L.
<ul style="list-style-type: none"> <li>• Sensor - Wetted parts - Enclosure</li> <li>• Transmitter</li> </ul>	316L stainless steel or nickel alloy C4 <sup>1)</sup> 304 stainless steel Aluminum with corrosion-resistant coating class C4	<b>Footnote 2)</b>	If operating outdoors, avoid direct sunlight, particularly in warm climatic regions.
<b>Enclosure rating</b>	IP67 <sup>2)</sup>		
<b>Pressure ratings</b>			
<ul style="list-style-type: none"> <li>• Measuring tubes - 316L - Nickel alloy C4</li> <li>• Sensor enclosure</li> </ul>	100 bar (1 450 psi) 100 bar (1 450 psi) No pressure containment		
<b>Temperature ratings</b>			
<ul style="list-style-type: none"> <li>• Process medium</li> <li>• Ambient</li> <li>• Display</li> </ul>	-50 ... +205 °C (-58 ... +400 °F) -40 ... +60 °C (-40 ... +140 °F) <sup>1)</sup> -20 ... +60 °C (-4 ... +140 °F)		

## Flow Measurement

### SITRANS FC (Coriolis)

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#### SITRANS FC330 flowmeter system

#### Selection and ordering data

#### Article No.

**SITRANS FC330 digital coriolis flowmeter with SITRANS FCS300 standard flow sensor compact or remote mounting with FCT030 transmitter**

7ME4633-

Ord.  
code

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Sensor size, connector size

DN 15, DN 10 (½", 3/8")

3 F

DN 15, DN 15 (½", ½")

3 G

DN 15, DN 20 (½", ¾")

3 H

DN 25, DN 20 (1", ¾")

3 K

DN 25, DN 25 (1", 1")

3 L

DN 25, DN 40 (1", 1½")

3 N

DN 50, DN 40 (2", 1½")

4 B

DN 50, DN 50 (2", 2")

4 C

DN 50, DN 65 (2", 2½")

4 D

DN 80, DN 65 (3", 2½")

4 J

DN 80, DN 80 (3", 3")

4 K

DN 80, DN 100 (3", 4")

4 L

DN 100, DN 80 (4", 3")

5 M

DN 100, DN 100 (4", 4")

5 N

DN 100, DN 150 (4", 6")

5 Q

DN 150, DN 100 (6", 4")

6 D

DN 150, DN 150 (6", 6")

6 F

DN 150, DN 200 (6", 8")

6 H

#### Process connection

EN 1092-1 B1, PN 16

A 0

EN 1092-1 B1, PN 40

A 1

EN 1092-1 B2, PN 63

A 2

EN 1092-1 B2, PN 100

A 3

EN 1092-1 D, PN 40

A 5

ASME B16.5 RF, lass 150

D 1

ASME B16.5 RF, Class 300

D 2

ASME B16.5 RF, Class 600

D 3

ASME B16.5 RF, Class 900  
(p- and t-rating as Class 600)

D 4

ASME B16.5 RF, Class 1500  
(p- and t-rating as Class 600)

D 5

ISO 228-1G female pipe thread

E 1

ASME B1.20.1 NPT female pipe thread

E 3

DIN 11851 hygienic screwed

F 1

DIN 32676 hygienic clamp (ISO) Row A

G 2

SMS 1145 hygienic screwed

K 1

JIS B2220/10K

L 2

JIS B2220/20K

L 4

EN 1092-1, PN 16, NAMUR length

N 1

EN 1092-1, PN 40, NAMUR length

N 2

#### Wetted parts material

AISI 316L/1.4435/1.4404

1

AISI 316L/1.4435/1.4404 (polished)

2

Nickel alloy C4

3

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#### Calibration/Accuracy class

0.2 % flow, 10 kg/m<sup>3</sup> density

0

0.1 % flow, 2 kg/m<sup>3</sup> density

1

0.1 % Standard fraction (with density 2 kg/m<sup>3</sup>)

8

0.1 % Customer selected fraction

9

N O Y

#### Mounting style, transmitter housing and material

None (replacement sensor)

A

Compact, IP67 fieldmount, aluminum

D

Remote, IP67 fieldmount, aluminum, M12

G

Remote, IP67 fieldmount, aluminum, T/Box

K

Remote, IP67, wall mount, aluminium (in preparation)

U

#### Ex approval (depending on variant)

Non-Ex

A

ATEX (zone 1)

C

IECEx (zone 1)

F

US (cCSAus), Div 1

L

Canada (cCSAus), zone 1

M

NEPSI

N

INMETRO (in preparation)

P

KCC (in preparation)

Q

EAC

U

#### Local User Interface

None (replacement sensor, DSL only)

0

Blind

1

Graphical, 240 × 160 pxl

3

#### Selection and ordering data

#### Order code

#### Further designs

Please add "-Z" to Article No. and specify Order code(s).

#### Cable glands

None (replacement sensor)

A00

Metric, no glands

A01

Metric, nylon, limited to -20 °C/-4 °F

A02

Metric, brass/Ni plated

A05

Metric, stainless steel

A06

NPT, no glands

A11

NPT, nylon, limited to -20 °C/-4 °F

A12

NPT, brass/Ni plated

A15

NPT, stainless steel

A16

Metric thread with M12 socket fitted

A20

#### Software functions and CT approvals

None (replacement sensor)

B10

Standard

B11

Selection and ordering data	Order code	Order code
<b>Further designs</b>		<b>Add-on options and accessories</b>
Please add <b>"-Z"</b> to Article No. and specify Order code(s).		Please add <b>"-Z"</b> to Article No. and specify Order code(s).
<b>I/O configuration Ch1</b>		DN 15 ... 50: Multi-point (5 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
No output channel	<b>E00</b>	DN 15 ... 50: Multi-point (10 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
4 ... 20 mA HART Active/Passive (non-Ex)	<b>E02</b>	DN 80: Multi-point (5 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
Ca 4 ... 20 mA HART active (Ex)	<b>E06</b>	DN 80: Multi-point (10 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
Ca 4 ... 20 mA HART passive (Ex)	<b>E07</b>	DN 100: Multi-point (5 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
PROFIBUS PA	<b>E10</b>	DN 100: Multi-point (10 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
PROFIBUS DP (non-Ex)	<b>E11</b>	DN 150: Multi-point (5 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
Modbus RTU RS 485	<b>E14</b>	DN 150: Multi-point (8 flows × 1 pass) Flow 10 ... 100 % of $Q_{norm}$
<b>I/O configuration Ch2, Ch3 and Ch4</b>		<b>Cable</b>
None	<b>F00</b>	None
• Non Ex: Sig O, None, None	<b>F01</b>	5 m (16.4 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted
• Non Ex: Sig O, Sig I/O, None	<b>F02</b>	5 m (16.4 ft), sensor cable, 4 wire, without plugs for terminal connection
• Non Ex: Sig O, Sig I/O, Sig I/O	<b>F03</b>	10 m (32.8 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted
• Non Ex: Sig O, Sig I/O, R	<b>F04</b>	10 m (32.8 ft), sensor cable, 4 wire, without plugs for terminal connection
• Non Ex: Sig O, R, R	<b>F05</b>	25 m (82 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted
• Non Ex: Sig O, R, None	<b>F06</b>	25 m (82 ft), sensor cable, 4 wire, without plugs for terminal connection
• Ex: pSig O, None, None	<b>F11</b>	50 m (164 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted
• Ex: pSig O, pSig I/O, None	<b>F12</b>	50 m (164 ft), sensor cable, 4 wire, without plugs for terminal connection
• Ex: pSig O, pSig I/O, pSig I/O	<b>F13</b>	75 m (246 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted
• Ex: pSig O, pSig I/O, R	<b>F14</b>	75 m (246 ft), sensor cable, 4 wire, without plugs for terminal connection
• Ex: pSig O, R, R	<b>F15</b>	
• Ex: pSig O, R, None	<b>F16</b>	
• Ex: aSig O, None, None	<b>F21</b>	
• Ex: aSig O, aSig I/O, None	<b>F22</b>	
• Ex: aSig O, aSig I/O, aSig I/O	<b>F23</b>	
• Ex: aSig O, aSig I/O, R	<b>F24</b>	
• Ex: aSig O, R, R	<b>F25</b>	
• Ex: aSig O, R, None	<b>F26</b>	
<b>Notes on I/O configurations:</b>		<b>Sensor options</b>
<b>a or p suffix:</b> The I/O module is selected at ordering with either active or passive function.		FCS300 marine approval (in preparation)
<b>Signal:</b> The output can be selected for Current (0 or 4 to 20 mA), frequency or pulse function in the menu.		<b>SD-Card accessibility via USB</b>
<b>I:</b> Discrete status input to the flowmeter. Functions are selected in the menu including 'Freeze output', 'Reset totalizer' (only CH3&4).		(not allowed in USA by Patent)
<b>R:</b> Relay output for discrete status reporting. Function is selected in the menu, including 'Error', 'High flow warning'.		Mass storage enabled
The MLFB structure for FC330 systems must be filled to <b>this level</b> , including <b>"-Z"</b> options A..., B..., E..., and F.		<b>Additional data</b>
		Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.
<b>Add-on options and accessories</b>		<b>Tag name</b>
Please add <b>"-Z"</b> to Article No. and specify Order code(s).		Tag name plate, stainless steel
<b>Certificates</b>		<b>Operating instructions for SITRANS FC330</b>
Certificate EN 10204-2.2 confirmation of pressure containing material	<b>C01</b>	<b>Description</b>
Certificate EN 10204-3.1 material (wetted parts)	<b>C02</b>	<b>Article No.</b>
Certificate NACE MR0175-2009 + MR0103-2012	<b>C04</b>	English
Certificate EN 10204-2.1 Declaration of compliance with the order	<b>C05</b>	• for firmware V 4.0 and onwards
Insp. Certificate EN 10204-3.1 for visual, dimensional and functional test	<b>C06</b>	<b>A5E44030648</b>
Certificate EN 10204-3.1 PMI Positive material ident. of pressure-cont./wetted parts (confirmation only)	<b>C07</b>	German
Certificate EN 10204-3.1 P-test Pressure-test acc. AD2000	<b>C08</b>	• for firmware V 4.0 and onwards
Test pack (pressure test, non-destructive welding test, welder & welding procedure certificate)	<b>C09</b>	<b>TBD</b>
Certificate EN10204-3.1welding X-ray / Dye-penetration test of weldings (pressure cont.)	<b>C10</b>	
Certificate EN10204-2.1 Declaration of accuracy	<b>C11</b>	
Certificate EN10204-3.1 PMI Positive material ident. of pressure-cont./wetted parts (including heat analysis)	<b>C12</b>	
<b>Customer selected calibration</b>		All literature is available to download for free, in a range of languages, at
		<a href="http://www.siemens.com/processinstrumentation/documentation">www.siemens.com/processinstrumentation/documentation</a>