

SIEMENS

SITRANS L

Capacitance switches SITRANS LCS100 I/O Link Version

Operating Instructions




<u>Introduction</u>	1
<u>Safety notes</u>	2
<u>Description</u>	3
<u>Installing/mounting</u>	4
<u>Connecting</u>	5
<u>Operating</u>	6
<u>Service and maintenance</u>	7
<u>Diagnostics and troubleshooting</u>	8
<u>Technical specifications</u>	9
<u>Dimension drawings</u>	10
<u>Options and accessories</u>	11
<u>Product documentation and support</u>	A

7ML700/7ML701 (compact enclosure)
7ML702 (rod version)
7ML703 (cable version)

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

1	Introduction	6
1.1	Purpose of this documentation	6
1.2	Designated use	6
1.3	Checking the consignment.....	6
1.4	Security information	6
1.5	Transportation and storage	7
1.6	Notes on warranty	8
2	Safety notes	9
2.1	Safety notes.....	9
2.2	Safety marking symbols	9
2.3	Preconditions for use	10
2.3.1	Improper device modifications	10
2.4	Requirements for special applications.....	10
3	Description	11
3.1	Measurement principle	11
3.2	Application	11
3.3	Features	11
4	Installing/mounting	13
4.1	Basic safety notes	13
4.1.1	Proper mounting	13
4.1.1.1	Process pressure	13
4.1.1.2	Chemical resistance against the medium.....	13
4.1.1.3	Fastening of the threaded process connection.....	13
4.1.1.4	EHEDG approval/Food grade material	13
4.2	Mounting	14
4.3	Liquids applications	15
4.3.1	LCS100 compact version	15
4.3.2	LCS100 rod version	16
4.3.3	Probe mounting distances - liquids.....	17
4.4	Solids applications	17
4.4.1	LCS100 compact version	17
4.4.2	LCS100 rod version	19
4.4.3	Probe mounting distances - solids	20
5	Connecting	21
5.1	Handling.....	21

5.2	Installation regulations	21
5.3	Power supply switch	21
5.4	Wiring diagram	21
5.5	Supply voltage.....	21
5.6	Cable gland and field wiring cables	21
5.7	M12 mating plug and field wiring cables	22
5.8	Signal output contact protection	22
5.9	Protection against static charging	22
5.10	Functional earthing	23
5.11	Electrical ratings	24
5.12	Output type.....	25
5.13	Cable shield.....	25
5.14	Output logic	26
6	Operating.....	27
6.1	Operating elements (LEDs)	27
6.2	Operation with potentiometer	29
6.2.1	Factory calibration	29
6.2.2	Recalibration	31
6.2.3	Advanced calibration	32
6.2.4	Advanced Calibration - Measurement through non-metal vessel wall.....	35
6.2.5	Advanced possibilities.....	37
6.3	Operation with IO-Link.....	38
6.3.1	Setting of signal outputs.....	42
6.3.2	Calibration possibilities (Switchpoint setting)	42
6.3.3	Switchpoint setting - Level detection of general applications	43
6.4	Operation with IO-Link - Advanced calibration.....	45
6.4.1	Advanced calibration	45
6.5	Advanced possibilities.....	53
6.6	WHG Proof Test	54
7	Service and maintenance	55
7.1	Basic safety notes	55
7.1.1	Maintenance	55
7.2	Maintenance and repair work.....	55
7.2.1	Opening the lid (cover).....	55
7.2.2	Cleaning.....	56
7.2.3	Max. temperature for CIP.....	56
7.2.4	Production date	56
7.2.5	Function test	57
7.2.6	Impermissible repair and maintenance of the device	57
7.2.7	Spare parts	57
7.3	Ordering of spare parts	57

7.4	Transport.....	58
7.4.1	Storage.....	59
7.5	Return procedure.....	59
7.6	Disposal.....	59
8	Diagnostics and troubleshooting	60
8.1	Troubleshooting	60
9	Technical specifications.....	61
9.1	Specifications	61
9.2	Power.....	61
9.3	Performance	62
9.4	Mechanical	62
9.5	Environmental	65
9.6	Process	66
9.7	Approvals	67
10	Dimension drawings.....	68
10.1	Short extension length.....	68
10.2	Pipe extension	71
10.3	Tri-clamp and flange	72
10.4	G 1/2" hygienic process connection/EHEDG approval	74
11	Options and accessories	76
11.1	Options and accessories.....	76
A	Product documentation and support.....	77
A.1	Product documentation	77
A.2	Technical support	78
	Index.....	79

Introduction

1.1 Purpose of this documentation

These instructions contain all information required to commission and use the device. Read the instructions carefully prior to installation and commissioning. In order to use the device correctly, first review its principle of operation.

The instructions are aimed at persons mechanically installing, connecting and commissioning the device, as well as service and maintenance engineers.

1.2 Designated use

Use the device in accordance with the information on the nameplate and in the Technical specifications (Page 61).

1.3 Checking the consignment

1. Check the packaging and the delivered items for visible damages.
2. Report any claims for damages immediately to the shipping company.
3. Retain damaged parts for clarification.
4. Check the scope of delivery by comparing your order to the shipping documents for correctness and completeness.

1.4 Security information

Siemens provides products and solutions with industrial security 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 security 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 security measures that may be implemented, please visit <https://www.siemens.com/industrialsecurity>.

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 Security RSS Feed under <https://www.siemens.com/cert>.

NOTICE

Unauthorized product information or software

Use only authorized Siemens websites when accessing any product information or software, including firmware updates, device integration files (EDD, for example), as well as other product documentation. Using unauthorized product information or software could result in a security incident, such as breach of confidentiality, or loss of integrity and availability of the system.

For more information, see Product documentation and support (Page 77).
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1.5 Transportation and storage

To guarantee sufficient protection during transport and storage, observe the following:

- Keep the original packaging for subsequent transportation.
- Devices/replacement parts should be returned in their original packaging.
- If the original packaging is no longer available, ensure that all shipments are properly packaged to provide sufficient protection during transport. Siemens cannot assume liability for any costs associated with transportation damages.

NOTICE

Insufficient protection during storage

The packaging only provides limited protection against moisture and infiltration.

- | |
|--|
| <ul style="list-style-type: none"> • Provide additional packaging as necessary. |
|--|

Special conditions for storage and transportation of the device are listed in Technical specifications (Page 61).

1.6 Notes on warranty


The contents of this manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. The sales contract contains all obligations on the part of Siemens as well as the complete and solely applicable warranty conditions. Any statements regarding device versions described in the manual do not create new warranties or modify the existing warranty.


The content reflects the technical status at the time of publishing. Siemens reserves the right to make technical changes in the course of further development.


Safety notes

2.1 Safety notes

Special attention must be paid to warnings and notes highlighted from the rest of the text by grey boxes.

 WARNING
Relates to a caution symbol on the product, and means that failure to observe the necessary precautions can result in death, serious injury, and/or considerable material damage.






 WARNING
Means that failure to observe the necessary precautions can result in death, serious injury, and/or considerable material damage.

 CAUTION
Means that failure to observe the necessary precautions can result in considerable material damage.

Note


Means important information about the product or that part of the operating manual.

2.2 Safety marking symbols

In manual	On Product	Description
		Caution: refer to accompanying documents (manual) for details.
		Earth (ground) Terminal
		Protective Conductor Terminal

2.3 Preconditions for use

2.3.1 Improper device modifications

 WARNING
Improper device modifications Risk to personnel, system, and environment can result from modifications to the device: <ul style="list-style-type: none">• Only carry out modifications that are described in the instructions for the device. Failure to observe this requirement cancels the manufacturer's warranty and the product approvals. Do not operate the device after unauthorized modifications.

This device left the factory in good working condition. In order to maintain this status and to ensure safe operation of the device, observe these instructions and all the specifications relevant to safety.

Observe the information and symbols on the device. Do not remove any information or symbols from the device. Always keep the information and symbols in a completely legible state.

2.4 Requirements for special applications

Due to the large number of possible applications, each detail of the described device versions for each possible scenario during commissioning, operation, maintenance or operation in systems cannot be considered in the instructions. If you need additional information not covered by these instructions, contact your local Siemens office or company representative.

Note

Operation under special ambient conditions

We highly recommend that you contact your Siemens representative or our application department before you operate the device under special ambient conditions as can be encountered in nuclear power plants or when the device is used for research and development purposes.

Description

3.1 Measurement principle

The SITRANS LCS100 detects the capacitance around its probe. Due to the active shield technology it has an increased insensitivity to material buildup on the probe.

3.2 Application

The SITRANS LCS100 is a capacitance switch for:

- Level detection of liquids, solids (powder and granules), slurries and foam
- Interface detection (for example, oil / water or foam / liquid)

It works in all types of vessels, pipes, and silos within a wide range of applications, such as:

- Food, brewery, dairy, beverage, and pharmaceuticals
- Chemical and petrochemical
- Water and waste water
- Machine building industry

It can also be used for leakage detection in double walled vessels, tanks and silos or in moldings and collecting ponds.

3.3 Features

Process

- Measurement independent from influence of the vessel wall
- Factory provided precalibration allows measurement of most applications without sensitivity setting on site
- Active shield electrode for compensation of material buildup
- Potted construction protects from shock, vibration, humidity, condensation
- Dielectric constant of 1.5 or more
- Process temperature up to 125°C
- Approvals CE, UKCA, FM, CSA, WHG, VLAREM II

Electronics

- IO-Link, IEC 61131-9 SDCI standard
- PNP, NPN or Push-Pull output (configurable)
- Terminal or M12 plug
- Sensitivity setting by IO-Link or by potentiometer (configurable)

Mechanics

- Corrosion resistant construction with enclosure made of thermoplastic polyester, wetted parts made of PPS, PVDF, PEEK and 316L stainless steel
- Compact probe length
- Pipe extension (max. 4m [157,5"]), optional sliding sleeve allows to change the switch point easily during operation of the device
- Various process connections: threaded (including G $\frac{1}{2}$ " hygienic), flanged (screwed) or Tri-clamp

Installing/mounting

4.1 Basic safety notes

4.1.1 Proper mounting

4.1.1.1 Process pressure

Improper installation may result in loss of process pressure. Observe possible pressure limitation from the used flange type or in case of use of the sliding sleeve.

4.1.1.2 Chemical resistance against the medium

Materials of construction are chosen based on their chemical compatibility (or inertness) for general purposes. For exposure to specific environments, check with chemical compatibility charts before installing.

4.1.1.3 Fastening of the threaded process connection

Mounting torque for the thread may not exceed 40 Nm (metal thread)/ 20 Nm (plastic thread). Use an open-end wrench. Do not fasten by turning the housing, as this will destroy the device.

4.1.1.4 EHEDG approval/Food grade material

The materials are available for the use under normal and predictable applications (according to Reg. (EC) No. 1935/2004). Other conditions can influence the safety.

NOTICE

Incorrect mounting

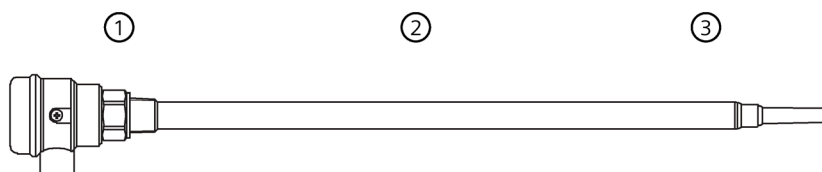
The device can be damaged, destroyed, or its functionality impaired through improper mounting.

- Before installing ensure there is no visible damage to the device.
- Make sure that process connectors are clean, and suitable gaskets and glands are used.
- Mount the device using suitable tools. Refer to the information in Technical specifications (Page 61).

4.2 Mounting

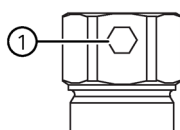
Handling precautions

To prevent damage of the pipe extension, all devices with a pipe longer than 2 m (6.5 ft) must be supported at these three points when lifting from a horizontal position.



- ① At the process connection or flange
- ② Midway across the pipe
- ③ At the end of the pipe before the probe

Sliding sleeve



- ① Tighten both straining screws with 15 Nm to obtain resistance against pressure

Direction of the cable glands (enclosure Ø65mm [2.56"])

When the unit is mounted from the side, ensure, that the cable glands face downwards and are closed to avoid water penetration into the housing. The enclosure can be rotated against the process connection after mounting.

Sealing

Ensure proper seal of the process connection thread in case of process pressure.

Hygienic process connection

Observe that the correct "On site process connection" is present, see G 1/2" hygienic process connection/EHEDG approval (Page 74).

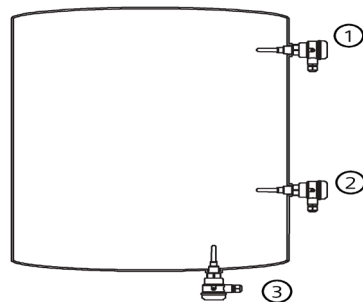
4.3 Liquids applications

4.3.1 LCS100 compact version

⚠ CAUTION

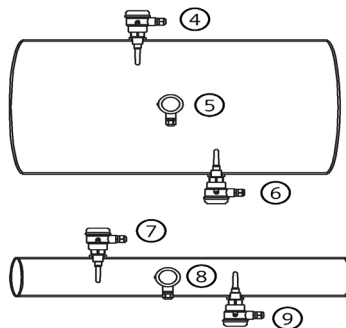
Observe:

- General distances of the probe, see Environmental (Page 65).
- Distance to material flow (filling)
- Max. permitted mechanical load, see Probe mounting distances - liquids (Page 17).



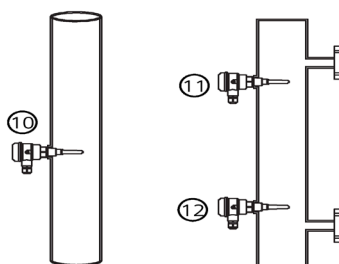
Vertical vessel

- ① Full detector horizontal
- ② Demand or empty detector horizontal
- ③ Empty detector vertical from the bottom



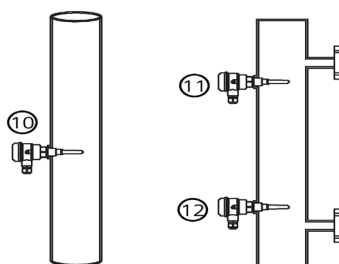
Horizontal vessel

- ④ Full detector vertical
- ⑤ Demand or empty detector horizontal
- ⑥ Empty detector vertical from the bottom



Horizontal pipe

- ⑦ Full detector vertical
- ⑧ Demand or empty detector horizontal
- ⑨ Empty detector vertical from the bottom



Vertical pipe

- ⑩ Full, demand or empty detector horizontal

Bypass

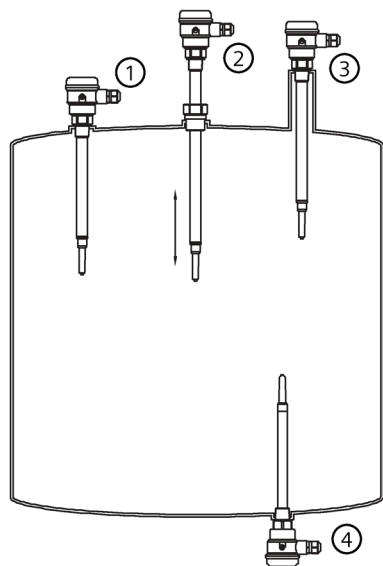
- ⑪ Full detector horizontal
- ⑫ Demand or empty detector horizontal

4.3.2 LCS100 rod version

⚠ CAUTION

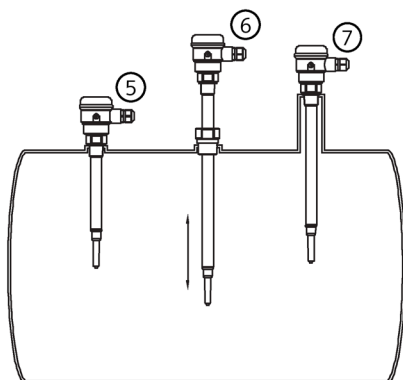
Observe:

- General distances of the probe, see Probe mounting distances - liquids (Page 17).
- Distance to material flow (filling)
- Max. permitted mechanical load, see Environmental (Page 65).



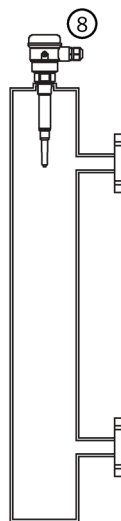
Vertical vessel: Full, demand, or empty detector

- ① Vertical
- ② Vertical with sliding sleeve
- ③ Vertical with long mounting socket
- ④ Vertical from bottom



Horizontal vessel

- ⑤ Full, demand, or empty detector vertical
- ⑥ Vertical with sliding sleeve
- ⑦ Vertical with long mounting socket



Bypass

- ⑧ Full, demand, or empty detector vertical

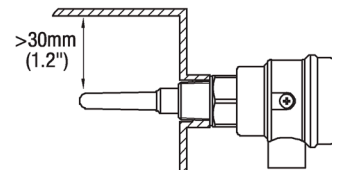
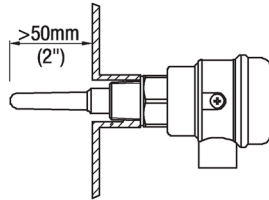
4.3.3 Probe mounting distances - liquids

Probe distance

- Observe nozzle length (Probe should lead into the product).
- Observe minimum distance between two probes, and to the metal vessel wall.

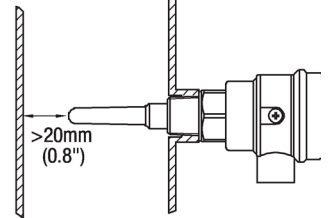
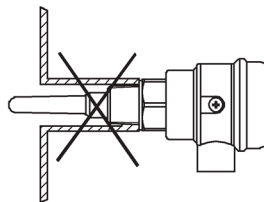
Correct

Probe leads into the product




Wrong

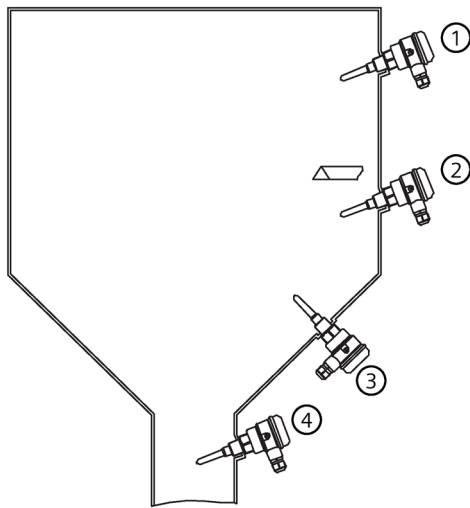
Nozzle too long



4.4 Solids applications

4.4.1 LCS100 compact version

 CAUTION
Observe: <ul style="list-style-type: none">• General distances of the probe, see Probe mounting distances - solids (Page 20).• Distance to material flow (filling)• Max. permitted mechanical load, see Environmental (Page 65).• Wearing due to abrasive bulk material



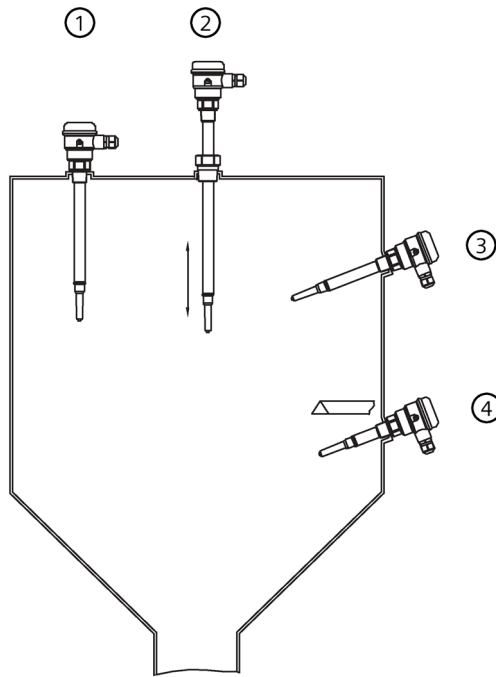
- ① Full detector horizontal or oblique.
Slight incline mounting helps remaining material to fall off more easily
- ② Demand or empty detector horizontal or oblique. Slight incline mounting helps remaining material to fall off more easily. Protective angle recommended depending on load and abrasion of the material
- ③ Empty detector oblique from the bottom
- ④ Empty detector in the silo outlet

4.4.2 LCS100 rod version

CAUTION

Observe:

- General distances of the probe, see Probe mounting distances - solids (Page 20).
- Distance to material flow (filling)
- Max. permitted mechanical load, see Environmental (Page 65).
- Wearing due to abrasive bulk material



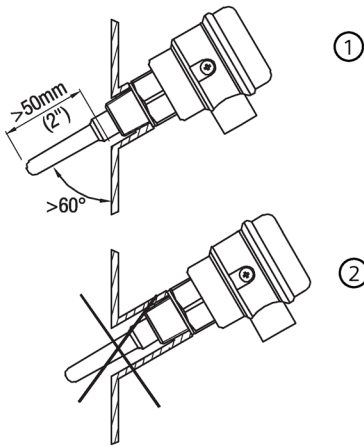
- ① Full detector vertical
- ② Full detector with sliding sleeve
- ③ Full detector horizontal or oblique. Slight incline mounting helps remaining material to fall off more easily
- ④ Demand or empty detector horizontal or oblique. Slight incline mounting helps remaining material to fall off more easily. Protective angle recommended depending on load and abrasion of the material

4.4.3 Probe mounting distances - solids

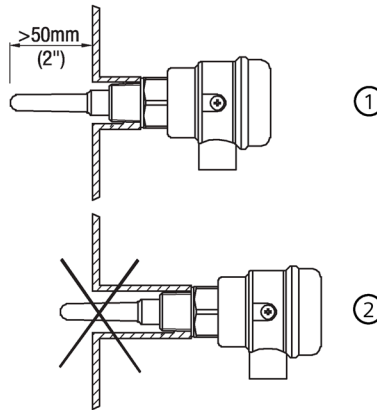
Probe distance

Observe nozzle length.

Oblique mounting



Horizontal mounting

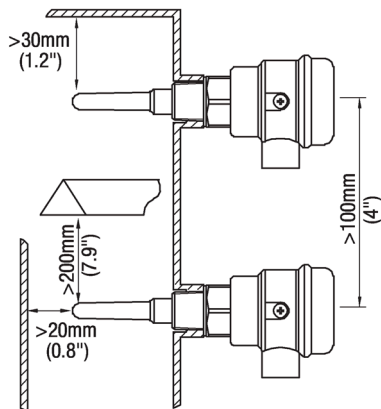


① **Correct**
Probe leads into the product

② **Wrong**
Nozzle too long

Observe mounting angle to ensure, that the active tip of the probe has enough distance to the metal silo wall.

Observe minimum distance between two probes, to metal vessel wall, and to protective angle.



Connecting

5.1 Handling

In the case of inexpert handling or handling malpractice, the electric safety of the device cannot be guaranteed.

5.2 Installation regulations

The local regulations or VDE 0100 (Regulations of German Electro technical Engineers) must be observed.

5.3 Power supply switch

A power-supply-disconnecting switch must be provided and marked near the device.

5.4 Wiring diagram

The electrical connections have to be made according to the wiring diagram.

5.5 Supply voltage

Compare the supply voltage applied with the specifications given on the name plate before switching the device on.

The unit must be supplied from a SELV source providing electrical isolation between the input and output, in order to meet the applicable safety requirements of IEC 61010-1.

Observe reduced supply voltage ratings in wet locations. A wet location is a location where water or other conductive liquid may be present and is likely to increase the risk of electric shock.

5.6 Cable gland and field wiring cables

With use of terminal block and cable gland:

The screwed cable gland must have following specifications:

- Ingress protection IP68
- Temperature range from -40°C to 10 K above max. ambient temperature

5.7 M12 mating plug and field wiring cables

- UL or VDE certified (depending on the country where the unit is installed)
- Pull relief

Make sure that the screwed cable gland safely seals the cable and that it is tight (danger of water intrusion).

The field wiring cables must have following specifications:

- The diameter has to match to the clamping range of the used cable gland.
- The cross section has to match with the clamping range of the connection terminals and consider the max. current.
- The temperature rating must be at least 10 K above max. ambient temperature.

Cut the field wiring cables to appropriate length to fit properly into the housing.

5.7 M12 mating plug and field wiring cables

With use of M12 plug:

The mating plug must have following specifications

- M12x1 according to IEC 61076-2-101, female, 4-pole, coding A-standard
- Ingress protection IP68
- Temperature range from -40°C to 10 K above max. ambient temperature

The field wiring cables must have following specifications:

- The diameter and cross section has to match to the specification of the mating plug.
- The temperature rating must be at least 10 K above max. ambient temperature.
- Install the field wiring cables according to the instructions of the mating plug.

5.8 Signal output contact protection

Provide protection for signal output to protect the device against spikes with inductive loads (e.g. when connecting external relays).

5.9 Protection against static charging

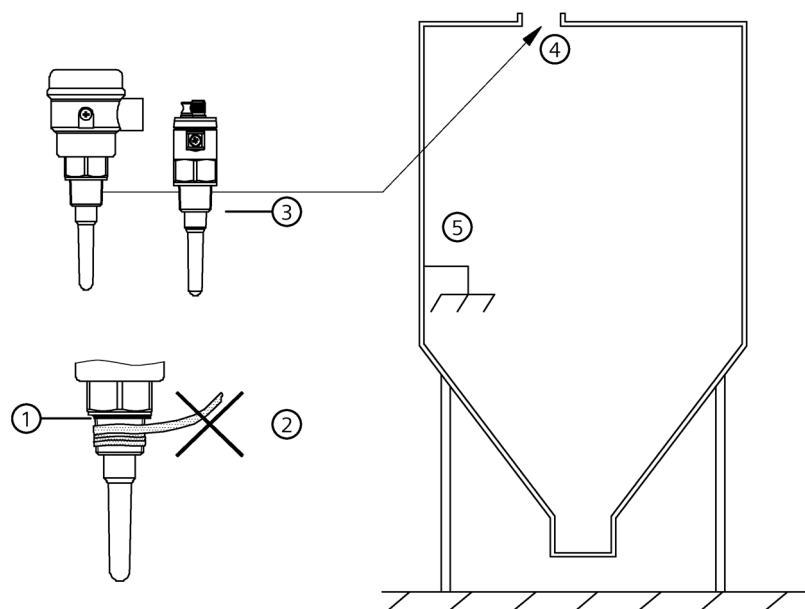
The unit must be earthed in any case to avoid static charging of the unit, especially on applications with pneumatic conveying.

Functional earthing is satisfactory to protect against static charging.

5.10 Functional earthing

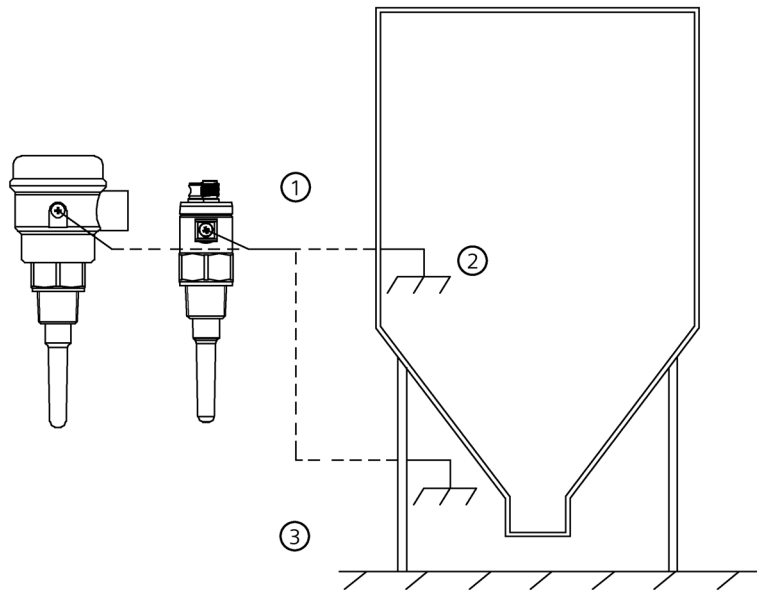
The unit must have connection to earth for proper functioning using one of the methods below.

Earthing through metal process connection



- ① Use flat sealing
- ② Do not use PTFE (Teflon) tape
- ③ Metal process connection
- ④ Metal nozzle
- ⑤ Metal vessel (earthed)

Earthing through external equipotential bonding terminal



- ① Standard cable max. 5 m
- ② Metal vessel (earthed)
- ③ For non-metal vessel, use grounded parts close to the vessel (example, metal fixing elements of the vessel)

5.11 Electrical ratings

Power supply (L+, L-):

10 to 30 V DC incl 10% of EN 61010-1

Operation with IO-link requires min. 18V <55 mA


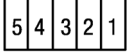
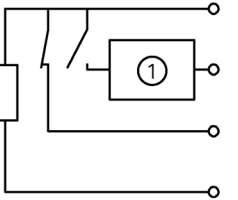
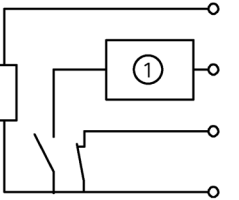
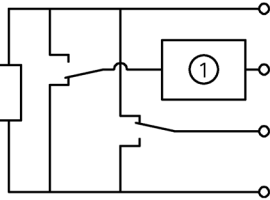
Signal outputs (Out1, Out2)

One output active: max. 200 mA

Both outputs active: max. 100 mA each

5.12 Output type

LCS100 I/O link pin assignment

PNP*	NPN	Push-Pull	Pin assignment		
			M12 plug	Terminal block	
					
			L+	1	1
			Out 1	4	4
			Out 2	2	5
			L-	3	2
Changes to NPN or Push-pull can be done in IO-Link Registers			External fuse in L+: max. 0.5A, fast or slow, HBC 250V Terminal 3, see Cable shield below.		

* factory setting

① IO-link/SIO

5.13 Cable shield

It is recommended to use a shielded cable for stable measurement.

With Terminal block: The cable shield can be connected either to terminal 3 or on the other side to earth. Do not connect both sides of the shield to earth. Note: terminal 3 is internally connected to the external equipotential bonding terminal on the enclosure.

With M12 plug: With use of common M12 cables, the cable shield is connected with the M12 cap nut. Since the M12 thread on LCS100 is made of plastics, the cable shield on the M12 cap nut is not connected with LCS100 and must be connected on the other side to ground.

5.14 Output logic

Output logic (factory setting)

						Fault	
White LED		●		☀		☀ 2Hz	
Yellow LED		●		☀		●	
Output type		PNP/NPN	Push-Pull	PNP/NPN	Push-Pull	PNP/NPN	Push-Pull
Out 1	FSL						
Out 2	FSH						

FSL = Fail safe low

FSH = Fail safe high

Factory setting of output logic: Out 1 is set to FSL, Out 2 is set to FSH.

Output logic can be changed in IO-Link registers.

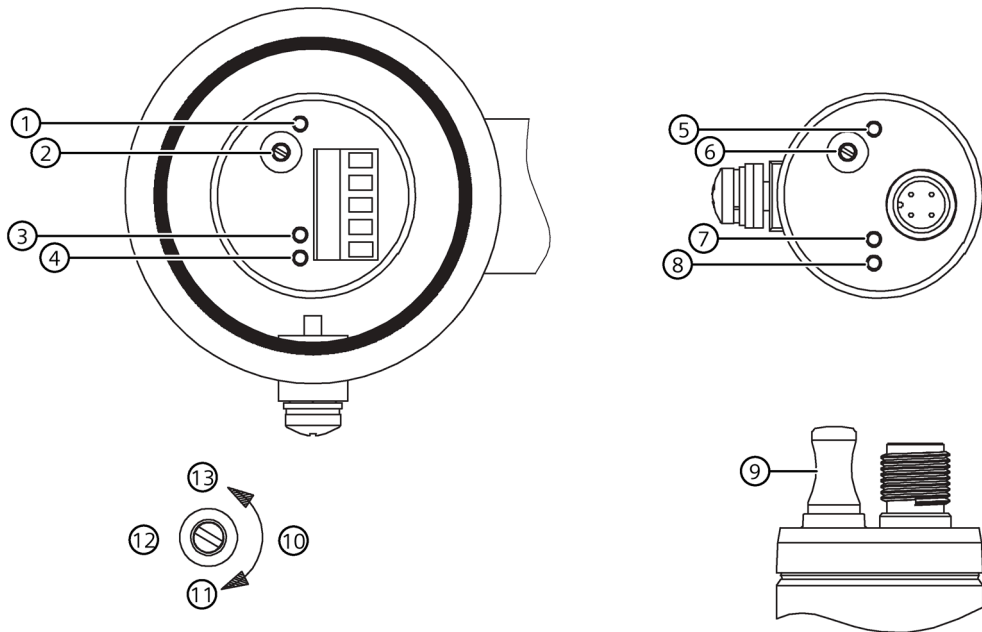
Operating

6.1 Operating elements (LEDs)

Operating elements

Enclosure Ø65mm (2.56")

Enclosure Ø35mm (1.38")







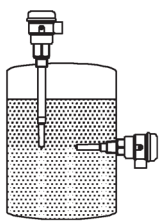

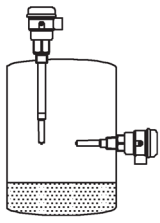




- | | | | |
|---|---------------|---|--------------------------------------|
| ① | LED green | ⑦ | LED white |
| ② | Potentiometer | ⑧ | LED yellow |
| ③ | LED white | ⑨ | Remove sealing cap for potentiometer |
| ④ | LED yellow | ⑩ | Sensitivity |
| ⑤ | LED green | ⑪ | High |
| ⑥ | Potentiometer | ⑫ | Potentiometer: 15 turns |
| | | ⑬ | Low |

LEDs

Green	ON		Power on
	OFF		Power off

6.1 Operating elements (LEDs)

Yellow	ON		Out 1 activated 
	OFF		Out 1 idle 
	Blinks for a few times, then stops blinking		The number of blinks indicates the position of the potentiometer after it was turned.
White	ON		Unit indicates covered Capacitance on probe > set switchpoint 
	OFF		Unit indicates uncovered Capacitance on probe < set switchpoint 
	Blinks fast (twice per second)		Diagnostics has indicated a failure
Yellow + White	Both LEDs blink 5 times, then stop blinking		Blinking happens when the potentiometer is turned. The potentiometer is not valid. Calibration by IO-Link is set.

See also

Advanced calibration (Page 32)

6.2 Operation with potentiometer

6.2.1 Factory calibration

Switchpoint factory calibration - General applications

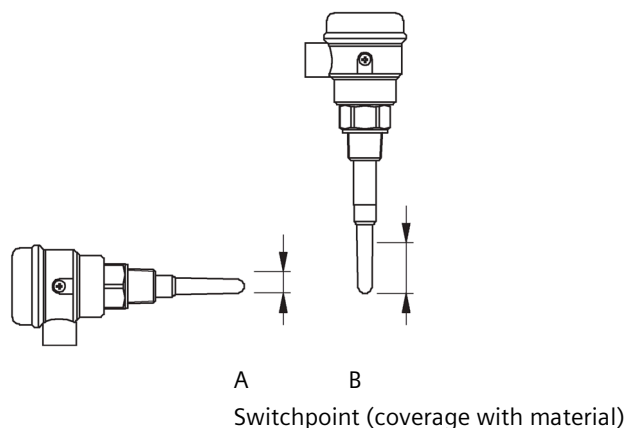
Factory calibration is applicable for general applications.

Typical general application	On site calibration
<ul style="list-style-type: none"> • Low viscosity liquids • Water based liquids • High conductivity liquids without buildup • Dry solids 	Not required

Switchpoint with factory calibration

The unit is factory calibrated to measure dielectric constant of material ≥ 2.0 .

With factory calibration, the probe must be covered with a certain height of material in order to switch from uncovered to covered (switchpoint), as follows:



Dielectric constant of measured material	Probe horizontal A	Probe vertical B
< 2.0	not possible with factory calibration	
2.0	5mm (0.2")	20mm (0.8")
2.0 ... 3.0	0mm (0.0")	15mm (0.6")
3.0 ... 5.0	-5mm (-0.2")*	8mm (0.3")
5 ... 10	-8mm (-0.3")*	5mm (0.2")
>10 ... 40	-10mm (-0.4")*	3mm (0.1")

* Switchpoint is below the probe (material not touching the probe)

The stated values are valid under following conditions:

- The distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and Probe mounting distances - solids (Page 20)
- The Sensguard (see Options and accessories (Page 76)) is not used
- Conductive material is not present

Note

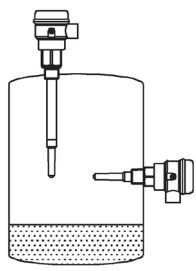
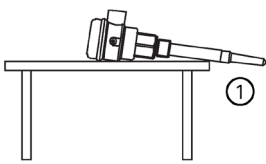
The active shield technology in combination with the length of the probe, resulting in adequate distance between internal measurement electrode and ground electrode, reduces the influence of various measured capacitance due to the mounting situation and of moderate material buildup. As a result, no on site calibration is required for general applications.

6.2.2 Recalibration

Switchpoint setting - In case of recalibration or if factory calibration is not applicable

1. Ensure that the probe is uncovered.

The unit will calibrate to an uncovered probe

	 <p>① Probe</p>
<p>Setting with mounted sensor: Ensure material level is well below the probe</p>	<p>Setting on the bench: Take care not to touch the probe and keep the probe at least 200 mm (7.87") away from any material (for example, the table).</p>

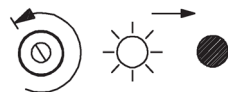
2. Set switchpoint with potentiometer.

Note: 1 second after stopping to turn the potentiometer, the yellow LED blinks for a few times, then stops blinking. This allows to identify the position of the potentiometer which enables more easy service in case external technicians are contacted.

If LED white is off, turn clockwise until LED white is on.



Turn counter clockwise until LED white just stops glowing.



Turn further counter clockwise per chart below:



Dielectric constant of material	Number of turns
1.6 .. 2	1
2 .. 3	2
3 .. 4	3
>4	4

The stated values assume that the distance of the probe to a metal wall is not smaller than stated on Probe mounting distances - liquids (Page 17) and Probe mounting distances - solids (Page 20) and that the Sensguard (see Options and accessories (Page 76)) is not used. Depending on the application and the required switchpoint, the number of turns can be varied.

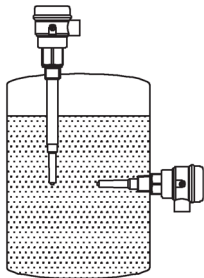
3. Switchpoint setting is finished.

6.2.3 Advanced calibration

Switchpoint setting - demanding applications

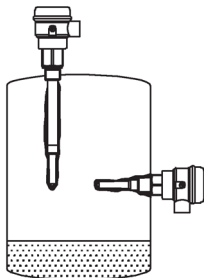
Typical demanding application	On site calibration
<ul style="list-style-type: none"> Material with heavy buildup (non conductive): High viscosity liquids Hygroscopic/wet solids 	Probe covered and then uncovered, retaining max. possible material buildup
<ul style="list-style-type: none"> Heavy buildup (conductive) 	Consult manufacturer

1. Ensure material level is well above the probe.



2. Ensure material level is well below the probe.

It is important that as much material buildup as possible is retaining on the probe.



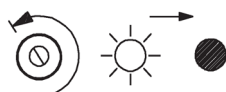
3. Set switchpoint with potentiometer.

Note: 1 second after stopping to turn the potentiometer, the yellow LED blinks for a few times, then stops blinking. This allows to identify the position of the potentiometer which enables more easy service in case external technicians are contacted.

If LED white is off, turn clockwise until LED white is on.



Turn counter clockwise until LED white just stops glowing.



Turn further counter clockwise per chart below:



Dielectric constant of material	Number of turns
1.6 .. 2	1
2 .. 3	2
3 .. 4	3
>4	4

The stated values assume that the distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and here Probe mounting distances - solids (Page 20) and that the Sensguard (see Options and accessories (Page 76)) is not used.

Depending on the application and the required switchpoint the number of turns can be varied.

4. Switchpoint setting is finished.

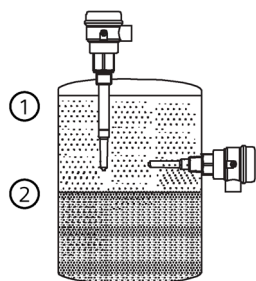
Switchpoint setting - Interface detection

Typical interface application	On site calibration
<ul style="list-style-type: none"> • Ignoring liquid A/ detecting liquid B • Ignoring foam/ detecting liquid 	Immerse probe in liquid A or foam

1. Immerse probe in liquid A or in foam which should NOT be detected.

Ensure that liquid A or foam (which should NOT be detected) is covering the probe.

Liquid A or foam must have a lower dielectric constant than liquid B, which should be detected.



- ① Liquid A or foam
- ② Liquid B

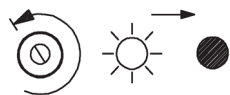
2. Set switchpoint with potentiometer.


Note: 1 second after stopping to turn the potentiometer, the yellow LED blinks for a few times, then stops blinking. This allows to identify the position of the potentiometer which enables more easy service in case external technicians are contacted.

If LED white is off, turn clockwise until LED white is on.



Turn counter clockwise until LED white stops glowing.



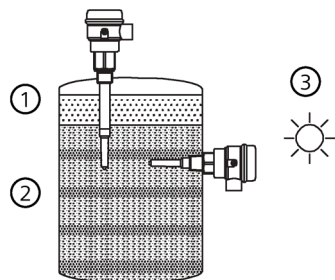
Turn further counter clockwise per chart below: 	
Dielectric constant of liquid A or foam	Number of turns
≤ 10	1
> 10	1/2

The stated values assume that the distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and Probe mounting distances - solids (Page 20) and that the Sensguard, see Options and accessories (Page 76) , is not used.

Depending on the application and the required switchpoint, the number of turns can vary. The sensitivity is now set so that liquid A or foam is NOT detected.

3. Immerse probe in liquid B which should be detected.

Ensure that liquid B (which should be detected) is covering the probe.



① Liquid A or foam

② Liquid B

③ LED white

LED white glows.

4. Switchpoint setting is finished.

6.2.4 Advanced Calibration - Measurement through non-metal vessel wall

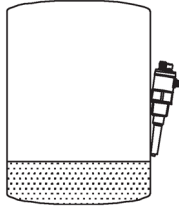
Switchpoint setting - Measurement through non metal vessel wall

Typical application	On site calibration
Measuring through non metal vessel wall	Material below probe

6.2 Operation with potentiometer

1. Ensure material level is well below the probe.

The unit will calibrate to an uncovered probe.



Non-metal vessel wall

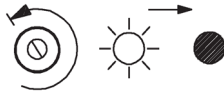
2. Set switchpoint with potentiometer.

Note: 1 second after stopping to turn the potentiometer, the yellow LED blinks for a few times, then stops blinking. This allows the user to identify the position of the potentiometer which enables more easy service in case external technicians are contacted.

If LED white is off, turn clockwise until LED white is on.



Turn counter clockwise until LED white stops glowing.



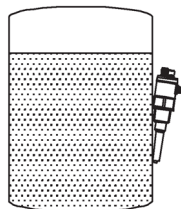
Turn further counter clockwise per chart below:

	Dielectric constant of material	Distance a (material to probe)	Number of turns
<p>A diagram showing a probe inserted into a vessel. A horizontal line labeled 'a' indicates the distance from the probe tip to the vessel wall. A circular inset above shows a potentiometer knob with a clockwise rotation arrow.</p>	≥ 3	$\leq 10\text{mm (0.4")}$	1/4
	> 40	$\leq 20\text{mm (0.8")}$	1/2

Depending on the application and the required switchpoint, the number of turns can vary.

3. Ensure material level is well above the probe.

LED white glows.



4. Switchpoint setting is finished.

See also

Advanced calibration (Page 32)

6.2.5 Advanced possibilities

The unit allows following useful advanced possibilities, which are related to the position of the potentiometer.

Indicating the actual position of the potentiometer

1 second after stopping to turn the potentiometer, the yellow LED blinks for a few times, then stops blinking. This allows to identify the actual position of the potentiometer which enables more easy service in case external technicians are contacted.

Note: The signal output (IO-Link / PNP / NPN / Push-Pull) does not follow the blinking. See Table below.

Relation of potentiometer position to sensitivity

The position of the potentiometer is directly related to the dielectric constant and therefore to the sensitivity of the unit.

See Table below.

Required min. dielectric constant of material to be detected (1)	Position of the potentiometer = No. of potentiometer turns, see (2) below	Number of blinking of yellow LED, see (3) below
not applicable (see below)	0 ... 2	0
1 (Probe in air)	3	1
1.5	4	2
2	5	3
3	6	4
4	7	5
6	8	6
8	9	7
11	10	7

Required min. dielectric constant of material to be detected (1)	Position of the potentiometer = No. of potentiometer turns, see (2) below	Number of blinking of yellow LED, see (3) below
15	11	8
25	12	8
40	13	9
60	14	9
90	15	9

1. The stated values are valid under the following conditions:

- The distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and here Probe mounting distances - solids (Page 20).
- The probe is mounted inside the vessel (no measurement from outside through the vessel wall).
- The Sensguard, see Options and accessories (Page 76), is not used.
- Conductive material is not present.

2. To set the position of the potentiometer to a certain sensitivity, complete the following steps:

a) Turn potentiometer clockwise for min. 15 turns, thus stop position (= max. sensitive position) is safely reached.



b) Turn potentiometer counter clockwise according to the number of turns stated in the table above.



3. Yellow LED starts blinking 1 second after the potentiometer action is completed.



6.3 Operation with IO-Link


IO-Link Data

Communication interface	IO-Link, IEC 61131-9, SDCI standard
IODD version	1.1
IO-Link Profiles	Smart Sensor
Required IO-Link master	as per DIN EN 61131-9
Speed	COM2 (38,4 kBaud)
Min. process cycle time	128 ms
Process data width	16 bit
IO-Link data storage	yes
Block parameter	no
SIO-Mode	yes

IO-Link Registers

Process Data (PDE - Process Data Exchange)

Bit 0 (LSB) to Bit 13 (MSB)	Bit 14	Bit 15	Data Type: UInteger Status Out 1 and Out 2:		
Actual measured value: 0 ... 10000 (equates to 0.00% - 100.00%)	Status Out 1	Status Out 2	1 = contact closed		Pin assignment: See Output logic (Page 26).
			0 = contact open		

 WARNING
In application with overfill approval (WHG, VLAREM II) the use of IO-Link is applicable for setting parameters only.
The "Process data Exchange" is not allowed, instead the signal output (PNP, NPN) must be used.

Item	ISDU (dec)	Access	Length (byte)	Data type	Value Range	Default value
System commands						
System command	2	W	1	UInt	129 = Application Reset 130 = Factory reset 131 = Back-to-box 160 = Reset switchpoints to default values 161 = Switchpoint setting by potentiometer	
System Command 130 sets all stated registers to "Default value", except register 127, which is set to "1 = IO-Link"						
System Command 160 sets registers 96, 97, 112, 113 to "Default values". Register 127 is set to "1 = IO-Link"						
System Command 161 sets register 127 to "0 = Potentiometer"						
IO-Link specific device data						
Vendor ID	7-8	R	2	UInt		42
Device ID	9-11	R	4	UInt		725251
Vendor Name	16	R	64	String		Siemens AG
Product Name	18	R	64	String		
Product Text	20	R	64	String		Capacitance point level switch
Serial number	21	R	64	String		
Hardware Revision	22	R	2	String		
Firmware Revision	23	R	5	String		
Application-specific Tag	24	R/W	32	String		***
Function Tag	25	R/W	32	String		***

6.3 Operation with IO-Link

Location Tag	26	R/W	32	String		***
Device status	36	R	1	UInt	0 = Device is operating properly 3 = Functional-check 4 = Failure	0
Detailed Device Status	37	R	4x3	[String]		
Detailed Device Status	40	R	2	UInt	Values same as Process Data (PDE)	

Item	ISDU (dec)	Access	Length (byte)	Data type	Value Range	Default value
Siemens specific device data						
Setting of signal output:						
Out 1 and Out 2: Output type	64	R/W	1	UInt	0 = Push-Pull 1 = NPN 2 = PNP	PNP
Out 1: Output logic	65	R/W	1	UInt	0 = FSH 1 = FSL	FSL
Out 1: Delay uncovered to covered	66	R/W	2	UInt	5 ... 600 (equates to 0.5 - 60 sec)	0.5 sec
Out 1: Delay covered to uncovered	67	R/W	2	UInt	5 ... 600 (equates to 0.5 - 60 sec)	0.5 sec
Out 2: Output logic	80	R/W	1	UInt	0 = FSH 1 = FSL With Push-Pull Out 2 will be set anti-valent to Out 1	FSH
Out 2: Delay uncovered to covered	81	R/W	2	UInt	5 ... 600 (equates to 0.5 - 60 sec)	0.5 sec
Out 2: Delay covered to uncovered	82	R/W	2	UInt	5 ... 600 (equates to 0.5 - 60 sec)	0.5 sec
Switchpoint setting of sensor:						
Out 1: Switchpoint: covered to uncovered *	96	R/W	2	UInt	0 ... 10000 (equates to 0.00% - 100.00%)	3.00% **
Out 1: Switchpoint: uncovered to covered *	97	R/W	2	UInt	0 ... 10000 (equates to 0.00% - 100.00%)	4.00% **
Out 2: Switchpoint: covered to uncovered *	112	R/W	2	UInt	0 ... 10000 (equates to 0.00% - 100.00%)	3.00% **

Item	ISDU (dec)	Access	Length (byte)	Data type	Value Range	Default value
Out 2: Switchpoint: uncovered to covered *	113	R/W	2	UInt	0 ... 10000 (equates to 0.00% - 100.00%)	4.00% **
Actual switchpoint setting is done by:	127	R	1	UInt	0 = Potentiometer 1 = IO-Link	0

* If register is written, register 127 is set to "1 = IO-Link".

** Factory setted values for switchpoints can slightly deviate from the stated values, since factory calibration is done by use of the potentiometer. This does not influence the proper function of the unit.

Item	ISDU (dec)	Access	Length (byte)	Data type	Value Range	Default value
Diagnostics:						
Operating hours	128	R	4	UInt	0 ... 2 ³²	0
Temperature electronic* actual	131	R	1	Int	-128 ... +127 °C	
Temperature electronic* min.	132	R	1	Int	-128 ... +127 °C	127°C
Temperature electronic* max.	133	R	1	Int	-128 ... +127 °C	-128°C
Functional check	134	R/W	1	UInt	0 = No functional-check 1 = Simulate uncovered probe 2 = Simulate covered probe	0
* Ambient temperature of the electronic inside the enclosure (outside process)						
Identification:						
Ordercode	160	R	64	String		

ISDU = Indexed Service Data Unit

R/W = read/write

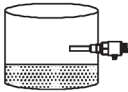
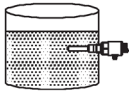












FSL = Fail safe Low = output contact open with uncovered sensor

FSH = Fail safe High = output contact open with covered sensor

6.3.1 Setting of signal outputs

Setting of signal outputs (output logic)

Out 1 and Out 2 can be set individually by the related registers.

Output logic Out 1 and Out 2				
White LED*				
Yellow LED*				
Output type	PNP/NPN	Push-Pull	PNP/NPN	Push-Pull
FSL** Fail safe low				
FSH** Fail safe high				

*In case Out 1 and Out 2 are programmed to have different switchpoints and/or different output logic, the white and yellow LED follows Out 1.

** Factory setting: Out 1 = FSL, Out 2 = FSH

Pin assignment of Out 1 and Out 2: see Output logic (Page 26).

6.3.2 Calibration possibilities (Switchpoint setting)

The switchpoint (sensitivity) is factory set as stated on the next page. If required, the switchpoint can be changed either with the potentiometer or with IO-Link.

Switchpoint setting by potentiometer (default)

The switchpoint in IO-Link registers of Out 1 and Out 2 are automatically set due to the position of the potentiometer. The switchpoints "covered to uncovered" and "uncovered to covered" of each Out 1 and Out 2 are the same.

In case the switchpoints were set before with IO-Link:

- The potentiometer is not valid (register "Switchpoint setting by: 1=IO-Link"). If the potentiometer is turned, both yellow and white LEDs blink 5 times, then stop blinking to indicate that the potentiometer is not valid.
- The setting can be set back to potentiometer: By System Command 161 =Switchpoint setting by potentiometer or By turning the potentiometer to CW (or CCW) stop position and then, within 30 seconds, to CCW (or CW) stop position.
- By setting back to potentiometer the switchpoint registers will be overwritten according to the actual position of the potentiometer. Usually a new calibration by potentiometer is required.

Switchpoint setting by IO-Link

The following settings make the potentiometer invalid:

- System Command 130, 160.
- Write any number in one or more of the IO-Link registers "Switchpoint setting of sensor" for Out 1 and Out 2.

Calibration procedures to find the Switchpoints with IO-Link: see following pages.

Situation when using a spare unit with transfer of the register values

In the case of a preset unit being replaced by a spare unit, and the register values of the present unit are being readout and transferred to the spare unit, the switchpoint values will be transferred as well. It is not relevant whether the switchpoints were set by the potentiometer or by IO-Link. By writing the switchpoints values with IO-Link to the spare unit, the register "Switchpoint setting by: 1 = IO-Link" is set and the potentiometer is not valid.

6.3.3 Switchpoint setting - Level detection of general applications

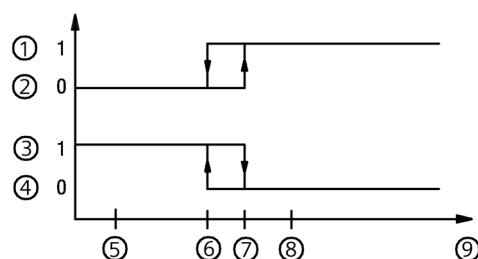
Application

Factory calibration is applicable for general applications.

Typical general application	On site calibration
<ul style="list-style-type: none"> • Low viscosity liquids • Water based liquids • High conductivity liquids without buildup • Dry solids 	Not required

Sensor behaviour:

Material covers the probe: Out1 and Out2 detect this material



- | | | | |
|---|------------------------|---|----------------------------------|
| ① | Out 1, covered probe | ⑤ | Uncovered probe |
| ② | Out 1, uncovered probe | ⑥ | Switchpoint covered to uncovered |
| ③ | Out 2, uncovered probe | ⑦ | Switchpoint uncovered to covered |
| ④ | Out 2, covered probe | ⑧ | Covered probe |
| | | ⑨ | Actual measured value |

The diagram shows:

- Out 1 set to FSL
- Out 2 set to FSH
- 1 = contact closed



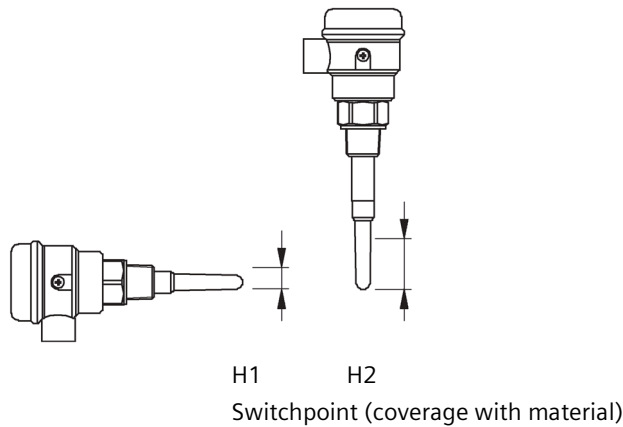
- 0 = contact open



Pin assignment with PNP, NPN, Push-Pull: see Output logic (Page 26)

Switchpoint with factory calibration

The unit is factory calibrated to measure dielectric constant of material ≥ 2.0 . The switchpoints are set in the IO-Link registers as stated here Operation with IO-Link (Page 38), "Switchpoint setting of sensor". With factory calibration, the probe must be covered with a certain height of material in order to switch from uncovered to covered (switchpoint), as follows:



Dielectric constant of measured material	Probe horizontal H1	Probe vertical H2
< 2.0	not possible with factory calibration	
2.0	5mm (0.2")	20mm (0.8")
2.0 ... 3.0	0mm (0.0")	15mm (0.6")
3.0 ... 5	-5mm (-0.2")*	8mm (0.3")
5 ... 10	-8mm (-0.3")*	5mm (0.2")
>10 ... 40	-10mm (-0.4")*	3mm (0.1")

* Switchpoint is below the probe (material not touching the probe).

The stated values are valid under the following conditions:

- The distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and Probe mounting distances - solids (Page 20)
- The Sensguard (see Options and accessories (Page 76)) is not used
- Conductive material is not present

Note

The active shield technology in combination with the length of the probe, resulting in adequate distance between internal measurement electrode and ground electrode, reduces the influence of various measured capacitance. This is due to the mounting situation and of moderate material buildup. As a result, no on site calibration is required for general applications.

Set switchpoints ⑥, ⑦

In case recalibration is required or factory calibration is not applicable, set the switchpoints (⑥, ⑦) as stated in the table below.

See diagram on top of previous page for explanation of sensor behaviour and ⑥,⑦.

Dielectric constant of material	⑥ Switchpoint covered to uncovered	⑦ Switchpoint uncovered to covered
<2	B=3.00%	C=4.00%
2 ... 4	B=5.20%	C=7.00%
>4	B=7.50%	C=10.00%

The stated values assume that the distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and here Probe mounting distances - solids (Page 20), and that the Sensguard (see Options and accessories (Page 76)) is not used.

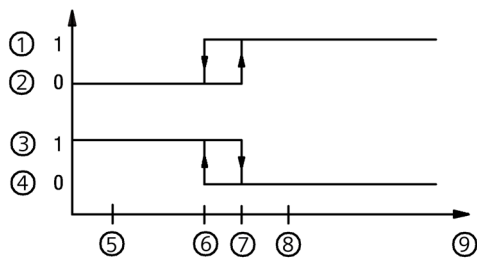
6.4 Operation with IO-Link - Advanced calibration

6.4.1 Advanced calibration

Switchpoint setting - Level detection of demanding applications

Typical demanding application	On site calibration
<ul style="list-style-type: none"> Material with heavy buildup (non conductive): High viscosity liquids Hygroscopic/ wet solids 	Probe covered and then uncovered, retaining max. possible material buildup
<ul style="list-style-type: none"> Heavy buildup (conductive) 	Consult manufacturer

Sensor behaviour: Material covers the probe: Out 1 and Out 2 detect this material



- | | |
|--------------------------|------------------------------------|
| ① Out 1, covered probe | ⑤ Uncovered probe |
| ② Out 1, uncovered probe | ⑥ Switchpoint covered to uncovered |
| ③ Out 2, uncovered probe | ⑦ Switchpoint uncovered to covered |
| ④ Out 2, covered probe | ⑧ Covered probe |
| | ⑨ Actual measured value |

The diagram shows:

- Out 1 set to FSL
- Out 2 set to FSH
- 1 = contact closed

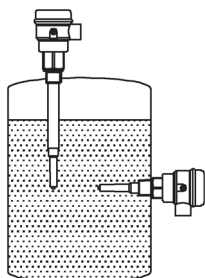


- 0 = contact open



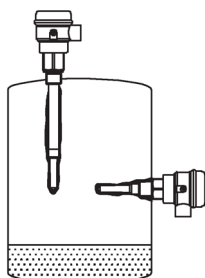
Pin assignment with PNP, NPN, Push-Pull: see Output logic (Page 26)

1. Ensure material level is well above the probe.



2. Ensure material level is well below the probe.

It is important that as much material buildup as possible is retaining on the probe.



3. Set switchpoints.

- Read the "Actual measured value" (process data), which is "⑤ Uncovered probe"
- Set the switchpoints (⑥, ⑦) by increasing "⑤ Uncovered probe" as stated in the table below
- See diagram on top of this page for explanation of ⑤,⑥,⑦

Dielectric constant of material A or foam	⑥ Switchpoint covered to uncovered	⑦ Switchpoint uncovered to covered
1.6 .. 2	$B=0.75 * C$	$C=A+1.80\%$
2 .. 3	$B=0.75 * C$	$C=A+5.00\%$
3 .. 4	$B=0.75 * C$	$C=A+7.60\%$
>4	$B=0.75 * C$	$C=A+9.00\%$

The stated values assume that the distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and here Probe mounting distances - solids (Page 20) and that the Sensguard (see Options and accessories (Page 76)) is not used.

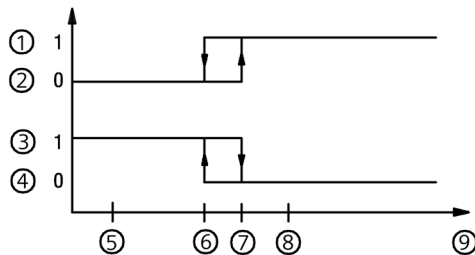
Depending on the application and the required switchpoint, the values ⑥ and ⑦ can vary

4. Switchpoint setting is finished.

Switchpoint setting - Interface detection

Sensor behaviour:

Material 1 (Liquid A or foam) covers the probe: Out 1 and Out 2 do not detect this material.
 Material 2 (Liquid B) with higher dielectric constant than material 1 covers the probe: Out 1 and Out 2 detect this material.



- ① Out 1, covered probe (Liquid B)
- ② Out 1, uncovered probe*
- ③ Out 2, uncovered probe*
- ④ Out 2, covered probe (Liquid B)

- ⑤ Uncovered probe*
- ⑥ Switchpoint covered to uncovered
- ⑦ Switchpoint uncovered to covered
- ⑧ Covered probe (Liquid B)
- ⑨ Actual measured value

* For interface measurement "Uncovered probe" relates to a probe covered by Liquid A or foam

The diagram shows:

- Out 1 set to FSL
- Out 2 set to FSH
- 1 = contact closed

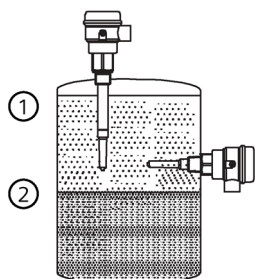


- 0 = contact open



Pin assignment with PNP, NPN, Push-Pull: see Output logic (Page 26)

1. Immerse probe in liquid A or in foam, which should NOT be detected. Ensure that liquid A or foam is covering the probe. Liquid A or foam must have a lower dielectric constant than liquid B, which should be detected.



- ① Liquid A or foam
- ② Liquid B

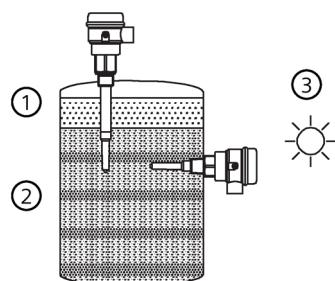
2. Set switchpoints.

- Read the "Actual measured value" (process data), which is "⑤ Uncovered probe"
- Set the switchpoints (⑥, ⑦) by increasing "⑤ Uncovered probe" as stated in the table below. See diagram on top of this page for explanation of ⑤, ⑥, ⑦

Dielectric constant of material A or foam	⑥ Switchpoint covered to uncovered	⑦ Switchpoint uncovered to covered
≤ 10	$B=0.75 \cdot C$	$C=A+2.00\%$
> 10	$B=0.75 \cdot C$	$C=A+4.00\%$

The stated values assume that the distance of the probe to a metal wall is not smaller than stated Probe mounting distances - liquids (Page 17) and Probe mounting distances - solids (Page 20) and that the Sensguard (see Options and accessories (Page 76)) is not used. Depending on the application and the required switchpoint, the values ⑥ and ⑦ can vary. The sensitivity is now set so that liquid A or foam is NOT detected.

3. Immerse probe in liquid B, which should be detected. Ensure that liquid B is covering the probe. LED white glows.



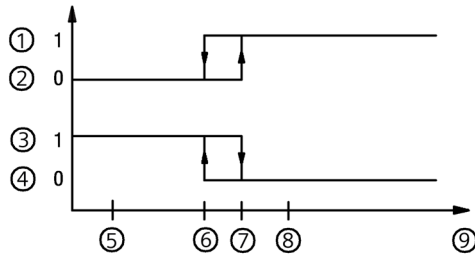
- ① Liquid A or foam
- ② Liquid B
- ③ LED white

4. Switchpoint setting is finished.

Switchpoint setting - Level detection through non metal vessel wall

Sensor behaviour:

Material covers the probe: Out1 and Out2 detect this material



- ① Out 1, covered probe
- ② Out 1, uncovered probe
- ③ Out 2, uncovered probe
- ④ Out 2, covered probe

- ⑤ Uncovered probe
- ⑥ Switchpoint covered to uncovered
- ⑦ Switchpoint uncovered to covered
- ⑧ Covered probe
- ⑨ Actual measured value

The diagram shows:

- Out 1 set to FSL
- Out 2 set to FSH
- 1 = contact closed



- 0 = contact open



Pin assignment with PNP, NPN, Push-Pull: see Output logic (Page 26)

1. Ensure that the probe is uncovered. The unit will calibrate to an uncovered probe.

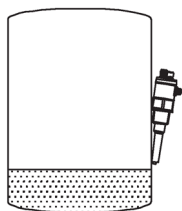


Figure 6-1 non metal vessel wall

2. Set switchpoints.

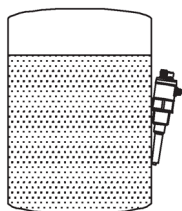
- Read the "Actual measured value" (process data), which is "⑤ Uncovered probe"
- Set the switchpoints (⑥, ⑦) by increasing "⑤ Uncovered probe" as stated in the table below. See diagram on top of this page for explanation of ⑤,⑥,⑦



Dielectric constant of material	Distance 'a' (material to probe)	⑥ Switchpoint covered to uncovered	⑦ Switchpoint uncovered to covered
≥ 3	$\leq 10\text{mm (0.4")}$	$B=0.75 \cdot C$	$C=A+0.50\%$
> 40	$\leq 20\text{mm (0.8")}$	$B=0.75 \cdot C$	$C=A+1.00\%$

Depending on the application and the required switchpoint, the values ⑥ and ⑦ can be varied.

3. Ensure material level is well above the probe. LED white glows.



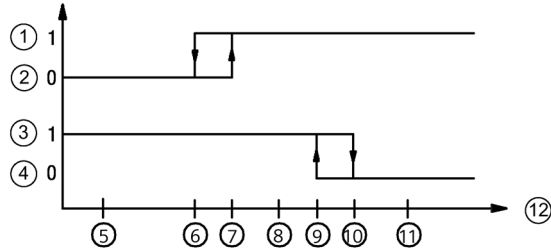
4. Switchpoint setting is finished.

Switchpoint setting - Level detection of two different materials

Sensor behaviour:

Material 1 covers the probe: Out 1 detects this material, Out 2 does not detect this material.

Material 2 with higher dielectric constant than material 1 covers the probe: Out 1 and Out 2 detect this material.



- ① Out 1, covered probe (Material 1 or 2)
- ② Out 1, uncovered probe
- ③ Out 2, uncovered probe
- ④ Out 2, covered probe (material 2)
- ⑤ Uncovered probe
- ⑥ Out 1: Switchpoint covered to uncovered
- ⑦ Out 1: Switchpoint uncovered to covered
- ⑧ Covered probe (Material 1)
- ⑨ Out 2: Switchpoint covered to uncovered
- ⑩ Out 2: Switchpoint uncovered to covered
- ⑪ Covered probe (Material 2)
- ⑫ Actual measured value

The diagram shows:

- Out 1 set to FSL
- Out 2 set to FSH
- 1 = contact closed



- 0 = contact open



Pin assignment with PNP, NPN, Push-Pull: see Output logic (Page 26)

Note: the white and yellow LED follows Out 1.

Set switchpoints ⑥, ⑦, ⑨, ⑩

Set the switchpoints (⑥, ⑦, ⑨, ⑩) as stated in the table below. See diagram on top of this page for explanation of ⑥, ⑦, ⑨, ⑩.

Dielectric constant of material 1	⑥ (Out 1) Switchpoint covered to uncovered	⑦ (Out 1) Switchpoint uncovered to covered
<2	B=3.00%	C=4.00%
2 ... 4	B=5.20%	C=7.00%
>4	B=7.50%	C=10.00%

Dielectric constant of material 2	⑨ (Out 2) Switchpoint covered to uncovered	⑩ (Out 2) Switchpoint uncov- ered to covered
<2	E=3.00%	F=4.00%
2 ... 4	E=5.20%	F=7.00%
>4	E=7.50%	F=10.00%

The stated values assume that the distance of the probe to a metal wall is not smaller than stated in Probe mounting distances - liquids (Page 17) and Probe mounting distances - solids (Page 20), and that the Sensguard (see Options and accessories (Page 76)) is not used. Depending on the application and the required switchpoint, the values ⑥, ⑦, ⑨, ⑩ can vary.

6.5 Advanced possibilities

Relation of "Actual measured value" to dielectric constant

The "Actual measure value" (process data) is directly related to the dielectric constant and therefore to the sensitivity of the unit. See Table below.

Required min. dielectric constant of material to be detected (1)	Actual measured value
1 (Probe in air)	0.0%
1.5	2.6%
2	4.2%
3	7.1%
4	10%
6	14%
8	18%
11	22%
15	27%
25	36%
40	45%
60	53%
90	61%

1. The stated values are valid under following conditions:

- The distance of the probe to a metal wall is not smaller than stated here Probe mounting distances - liquids (Page 17) and here Probe mounting distances - solids (Page 20).
- The probe is mounted inside the vessel (no measurement from outside through the vessel wall).
- The Sensguard, see Options and accessories (Page 76), is not used.
- Conductive material is not present.

6.6 WHG Proof Test

The implementation of the WHG proof test is done in accordance with the documentation "Technical Description" for WHG, Annex 8, Proof Test, by the following possibilities:

Filling the vessel

Filling the vessel until the switchpoint is reached and monitoring the correct reaction of the system.

Simulation of the level

Suitable simulation of the level or of the physical measurement effect.

This can be done, for example, by dismantling the sensor and immersion into the original medium.

Service and maintenance

7.1 Basic safety notes

Note

The device is maintenance-free.

7.1.1 Maintenance

The device is maintenance-free. However, a periodic inspection according to pertinent directives and regulations must be carried out.

An inspection can include:


- Ambient conditions
- Seal integrity of the process connections, cable entries, and cover
- Reliability of power supply, lightning protection, and grounds

7.2 Maintenance and repair work


7.2.1 Opening the lid (cover)

 WARNING
Opening the lid (cover) Before opening the lid for maintenance reasons observe following items: <ul style="list-style-type: none">• No dust deposits or whirlings are present.• No rain can enter into the housing.


7.2.2 Cleaning

 WARNING
Cleaning If cleaning is required by the application, the following must be observed: <ul style="list-style-type: none">• Cleaning agents must comply with the materials of the unit (chemical resistance). Mainly the lid sealing, cable gland, and the surface of the unit must be considered The cleaning process must be done in a way, that: <ul style="list-style-type: none">• The cleaning agent cannot enter into the unit through the lid sealing or cable gland• Leaves the lid sealing, cable gland, and all other parts with no mechanical damage Units with EHEDG (EL class I) certification, which are used in the respective EHEDG application, must be cleaned according to the respective regulations. The device has been developed for Cleaning in Place (CIP) application and must not be dismantled for cleaning.


7.2.3 Max. temperature for CIP

 WARNING
Max. temperature for CIP 135°C (275°F), duration 60min 150°C (302°F), duration 30min (only for SITRANS LCS100 with process connection G 1/2" hygienic) Ambient temperature limited to 50°C (122°F), unit de-energized.


7.2.4 Production date

 WARNING
Production date The production date can be traced by the serial number on the nameplate. Please contact the manufacturer or your local distributor.


7.2.5 Function test

 WARNING
Function test A frequent function test may be required depending on the application. Observe all relevant safety precautions related with a safe work depending on the application. This test does not prove if the unit is sensitive enough to measure the material of the application. A function test is completed by touching the probe with appropriate means (e.g. grounded metal plate or hand) and monitoring if a correct change of the signal output from uncovered to covered occurs.

7.2.6 Impermissible repair and maintenance of the device

 WARNING
Impermissible repair and maintenance of the device <ul style="list-style-type: none">• Repair and maintenance must be carried out by Siemens authorized personnel only.

7.2.7 Spare parts

 WARNING
Spare parts All available spare parts are stated in the selection list.

7.3 Ordering of spare parts

Condition

- You have a Siemens Industry Mall account.

Procedure

1. Open the PIA Life Cycle Portal (<https://www.pia-portal.automation.siemens.com>).
2. Select the desired language.
3. To find spare parts for your device, do one of the following:
 - Enter the complete order number of your device (e.g. 7ME4633-4KA51-8DC3-Z A05+B11+E06+F11) into the "Product number" field and click "Go".
 - Enter the serial number of your device (e.g. N1KXXXXXXX) in the "Serial number" field and click "Go".
 - If you do not know the product or serial number, search for your device under "Product family".
4. Navigate to the "Spare parts" tab.

You see the list of spare parts available for your device.



5. Select a spare part and add it to your watch list.
The watch list opens.
6. Click "Add to cart of Industry Mall".



The Siemens Industry Mall opens and you can order your spare part.

7.4 Transport

Observe the instructions as stated on the transport packaging, otherwise the products may get damaged.

Transport temperature: -40 .. +80°C (-40 .. +176°F) Transport humidity: 20 .. 85%.

Transport incoming inspections must be carried out to check for possible transport damage.

7.4.1 Storage

Products must be stored at a dry and clean place. They must be protected from influence of corrosive environment, vibration and exposure to direct sunlight.

Storage temperature: -40 .. +80°C (-40 .. +176°F)

Storage humidity: 20 .. 85%

7.5 Return procedure

To return a product to Siemens, see Returns to Siemens (www.siemens.com/returns-to-siemens).

Contact your Siemens representative to clarify if a product is repairable, and how to return it. They can also help with quick repair processing, a repair cost estimate, or a repair report/cause of failure report.

NOTICE
<p>Decontamination</p> <p>The product may have to be decontaminated before it is returned. Your Siemens contact person will let you know for which products this is required.</p>

7.6 Disposal



Devices described in this manual should be recycled. They may not be disposed of in the municipal waste disposal services according to the Directive 2012/19/EC on waste electronic and electrical equipment (WEEE).

Devices can be returned to the supplier within the EC and UK, or to a locally approved disposal service for eco-friendly recycling. Observe the specific regulations valid in your country.

Further information about devices containing batteries can be found at: Information about battery / product return (WEEE) (<https://support.industry.siemens.com/cs/document/109479891/>)

Note

Special disposal required

The device includes components that require special disposal.

- Dispose of the device properly and environmentally through a local waste disposal contractor.

Diagnostics and troubleshooting

8.1 Troubleshooting

LEDs			Behaviour	Cause	Action
Green Power supply	Yellow Signal output	White Probe covered/uncovered			
OFF	OFF	OFF		Proper power supply not applied to device. Connector came loose. Defective component in device.	Check power supply. Refasten connector. .Contact distributor
ON	ON or OFF	ON	Probe is uncovered but LED white states covered.	Sensitivity is set too high. Either sensitivity setting not properly done or too much material buildup.	Reduce sensitivity (see Operating elements (LEDs) (Page 27)). If applicable clean, probe from buildup.
ON	ON or OFF	OFF	Probe is covered but LED white states uncovered.	Sensitivity is set too low. Either sensitivity setting not properly done or too low dielectric constant from material.	Increase sensitivity (see Operating elements (LEDs) (Page 27)). Dielectric constant of material must be 1.5 or more.
ON	Blinks for a few times, then stops blinking.	ON or OFF	Blinking happens after the potentiometer was turned.	This is a normal operation. The blinking indicates the position of the potentiometer after it was turned.	No action required.
ON	Both LEDs blink 5 times, then stop blinking.		Blinking happens when the potentiometer is turned.	Calibration by potentiometer is not valid. Calibration by IO-Link is set.	The calibration can be set back to potentiometer: By turning the potentiometer to CW (or CCW) stop position and then within 30 seconds to CCW (or CW) stop position. or With IO-Link by System Command 161 (see page 34).
ON	OFF	Blinks fast (twice per second).	Signal output = idle	Diagnostics has indicated a failure.	Contact distributor.
ON	ON or OFF	ON or OFF	Signal output Out 1 does not follow yellow LED.	Defective component in device.	Contact distributor.
ON	ON or OFF	ON or OFF	No respond (change of white and yellow LED) when potentiometer is turned and probe is uncovered.	Defective component in device.	Contact distributor.

Technical specifications

9.1 Specifications

Note

Siemens makes every attempt to ensure the accuracy of these specifications, but reserves the right to change them at any time.

9.2 Power

Power Supply	10 - 30 V DC, incl. 10% of EN 61010-1 Operation with IO-Link requires min. 18V Current consumption: <55mA	
Signal outputs Electrical ratings	Out 1 and Out 2: Max. current: One output active: 200 mA Both outputs active: 100 mA each (short-circuit proof) Voltage drop: <2V	
Out 1 Configuration	SIO mode*:	
	Factory setting	PNP (FSL)
	Other than factory setting can be configured via IO-Link as follows:	PNP (FSH) or NPN (FSH or FSL) or Push/pull (FSH or FSL)
	COM-mode	IO-Link communication
*Note: If there is no IO-Link communication, the device operates in the SIO mode		
Out 2 Configuration	Factory setting	PNP (FSH) Note: Out 2 PNP is opposite to Out 1 PNP (ambivalent)
	Other than factory setting, can be configured via IO-Link as follows:	PNP (FSL) or NPN (FSH or FSL) or Push/pull (FSH or FSL)
Diagnostics	Self diagnostics present	
Safety operation (FSL,FSH)	Configurable via IO-Link	
Signal delay	Configurable via IO-Link. Factory setting Probe uncovered -> covered ca. 0.5 sec Probe covered -> uncovered ca. 0.5 sec	

9.3 Performance

Indicating light	Build in LEDs: Power (green), Signal output (yellow), Sensor status / Diagnostics (white)
Sensitivity	Factory setting: Adjustable by potentiometer
	Alternative: Programmable by IO-Link
Electrical connection	With enclosure Ø65mm (2.56"): Terminal block, terminals 0.14 - 1.5 mm ² (AWG 28-16)
	With enclosure Ø65mm (2.56") and Ø35mm (1.38"): M12x1 according to IEC 61076-2-101, male, 4-pole, coding A-standard
Cable entry	With enclosure Ø65mm (2.56"): M20 x 1.5 screwed cable gland Clamping range (diameter) of factory provided cable glands: 6..12 mm (0.24 .. 0.47") or NPT 1/2" conduit
Overvoltage category	II
Protection class	III

9.3 Performance

Repeatability	approx. ± 2 mm, for water based liquids
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9.4 Mechanical

Stainless steel process connection, version G 1/2" Hygienic

Material process connection	1.4404 (316L)
Material probe	PEEK ^(1,2)
Seal process connection-probe	FKM (optional FFKM) ⁽²⁾
Thread ⁽³⁾	G 1/2" Hygienic
Wetted sensor surface	Ra ≤ 0.8 µm (31 µin)
Hygienic design	EHEDG

Stainless steel process connection

Material process connection	1.4404 (316L)
Material probe	PPS (glass fibre reinforced) ^(1,2) Optional PVDF ^(1,2)
Seal process connection-probe	FKM (optional FFKM) ⁽²⁾
Thread ⁽³⁾	G 1/2", G 3/4", G 1", NPT 3/4"
Adapters for	G 1 1/2", NPT 1 1/4", NPT 1 1/2"
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) ⁽⁴⁾	DN 25, 40, 50; ASME 1", 1 1/2", 2"

Plastic process connection

Material process connection	PPS (glass fibre reinforced) ^(1, 2) Optional PVDF ^(1,2)
Material probe	PPS (glass fibre reinforced) ^(1,2) Optional PVDF ^(1,2)
Seal process connection-probe	FKM (optional FFKM) ⁽²⁾
Thread ⁽³⁾	G 1", NPT 3/4"

Pipe extension

Material process connection	1.4404 (316L)
Material pipe extension	1.4404 (316L)
Material probe	PPS (glass fibre reinforced) ^(1,2) Optional PVDF ^(1,2)
Seal pipe-probe	FKM (optional FFKM) ⁽²⁾
Thread ⁽³⁾	G 3/4", G 1", NPT 3/4"
Adapters for	G 1 1/2", NPT 1 1/4", NPT 1 1/2"
Flange (screwed) ⁽⁴⁾	DN 25, 40, 50; ASME 1", 1 1/2", 2"

⁽¹⁾ Discoloration is possible due to influence of UV and temperature. This has no negative effect to the material properties.

⁽²⁾ Food grade, FDA registration number:

Seals 21 CFR 177.2600

PVDF 21 CFR 177.1550

PPS 21 CFR 175.300

PEEK 21 CFR 177.2415

⁽³⁾ Thread types: G=DIN ISO 228-1, NPT=ASME B 1.20.1

⁽⁴⁾ Flange pressure rating: DN25 PN16/40, DN40 PN16/40, DN50 PN16/25/40 ASME 150lbs, ASME 300lbs

	Extension length "L"	Tolerance length "L"
Stainless steel process connection	92 mm (3.6")	±5 mm (±0.2")
Plastic process connection	92 mm (3.6")	±5 mm (±0.2")
Pipe extension	300 .. 4000mm (11.8 .. 157")	±10 mm (±0.4")

	Material Enclosure Ø65mm (2.56")	Material Enclosure Ø35mm (1.38")
Material Housing	Thermoplastic polyester (PBT/PC)	1.4404 (316L)
Material Lid	Transparent thermoplastic polycarbonate (PC)	Transparent thermoplastic polycarbonate (PC)
Material Seal between housing and lid	VMQ (vinyl-methyl-silicone)	VMQ (vinyl-methyl-silicone)
Material Nameplate	polyester film	polyester film

Ingress protection: Type 4X / IP68

Sound level: n/a (no sound is produced)

9.4 Mechanical

Overall weight (ca.)

Stainless steel process conn.: 0.35 kg (0.77 lbs)

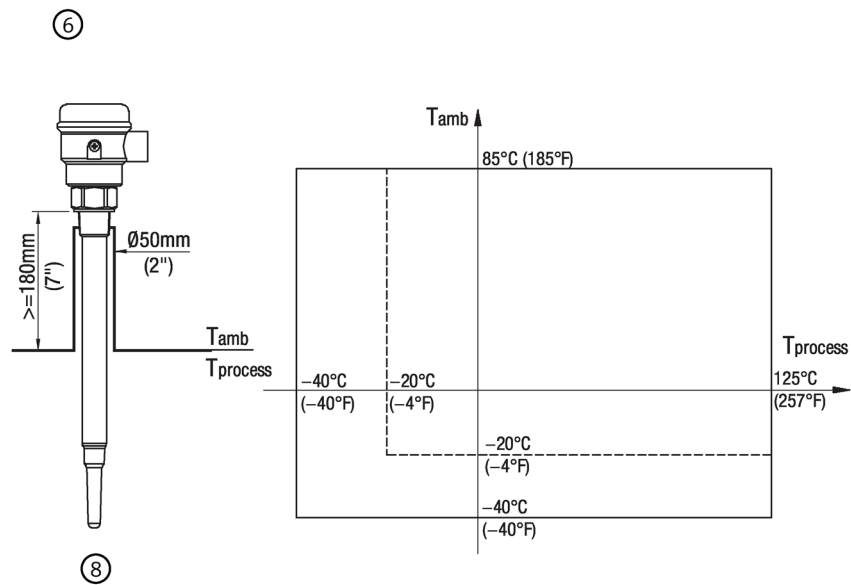
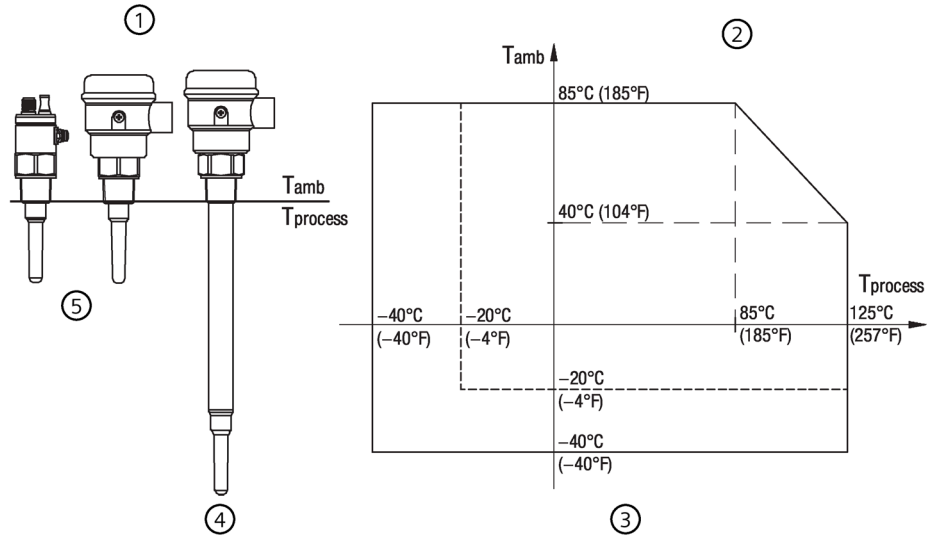
Plastic process connection: 0.25 kg (0.55 lbs)

Pipe extension: 0.6 kg (1.32 lbs) + 0.85 kg/m (1.87 lbs per 39.3")

All weights with threaded process connection.

9.5 Environmental

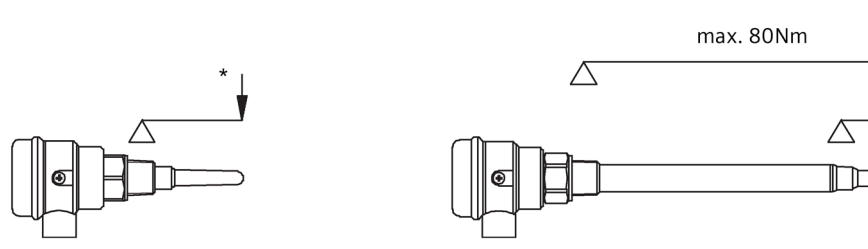
Ambient and process temperature



- ① Mounting with short socket
- ② Derating of ambient temperature with high process temperature
- ③ Ambient- and process temperature limited to -20°C (-4°F) with option FFKM seal O-ring
- ④ LCS100 Rod version

- ⑤ LCS100 compact enclosure
- ⑥ Mounting with long socket
- ⑦ Ambient- and process temperature limited to -20°C (-4°F) with option FFKM seal O-ring
- ⑧ LCS100 Rod version

9.6 Process

Max. temperature for CIP	135°C (275°F), duration 60min 150°C (302°F), duration 30min (only for LCS100 Compact with process connection G 1/2" hygienic) Ambient temperature limited to 50°C (122°F), unit de-energized.	
Max. permitted mechanical torque	SITRANS LCS100 compact version	SITRANS LCS100 rod version
	 <p>*PEEK/PPS: max. 400N (at 40°C), PVDF: max 200N (at 40°C)</p>	
Max. tractive force	LCS100 Cable version: 1.5 kN (at 40°C)	
Max. process pressure Observe possible pressure limitation from the flange type used!	SITRANS LCS100 compact version with stainless steel process connection	-1 to 25 bar (363 psi)
	SITRANS LCS100 compact version with plastic process connection	-1 to 10 bar (146 psi)
	SITRANS LCS100 rod version	-1 to 25 bar (363 psi)
	SITRANS LCS100 rod version with sliding sleeve	-1 to 10 bar (146 psi)
	SITRANS LCS100 cable extension	-1 to 10 bar (146 psi)
Pollution degree	4	
Relative Humidity	0 - 100%, suitable for outdoor use	
Altitude	max. 3,000 m (9,843 ft)	
Ventilation	Ventilation is not required	
Expected product lifetime	Following parameters have a negative influence on the expected product life-time: High ambient- and process temperature, corrosive environment, high vibration, high flow rate of abrasive bulk material passing the probe.	

9.6 Process

Relative dielectric constant (ϵ_r)	Min. 1.5 Factory setting = 2.0 For dielectric constant of applicable materials: see external dielectric constant tables
Switching point	Depending on setting of potentiometer and dielectric constant value of measured material. See Operating elements (LEDs) (Page 27).
Repeatability	2 mm (0.08"), for water based liquids

9.7 Approvals

General Purpose * (Ordinary Locations)	CE UKCA FM / CSA
Overfill and leakage protection *, **	WHG VLAREM II
EMC	EN 61326
RoHS conform	According to directive 2011/65/EU
Hygienic *	EHEDG EL class I
Food grade material	Wetted parts with FDA registration. For more details, see Mechanical (Page 62).
Pressure Equipment Directive (2014/68/EU)	Pressure Equipment Directive (2014/68/EU) As the equipment does not have pressure-bearing housings of its own, it is not subject to the PED: - as "pressure accessory" (see 2014/68/EU Art. 2 (5) and PED Guidelines A-08, A-40) - nor as "safety accessory" (see 2014/68/EU Art. 2 (4) and PED Guidelines A-20, A-25)"

* Not all approvals are available with all models, see selection list for more information

** Relevant information for use in applications with WHG/VLAREM II: see external documentation "Technical Description"

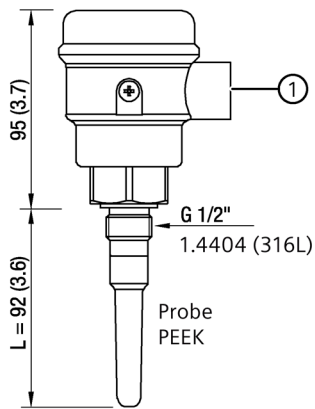
Dimension drawings

10.1 Short extension length

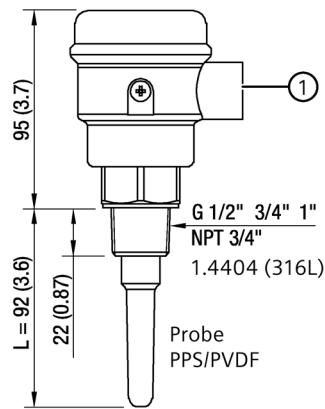
Compact version: Stainless steel process connection

Enclosure Ø65mm (2.56")

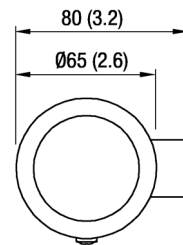
G 1/2" hygienic



G 1/2" G3/4" G1"
NPT 3/4"



Top view

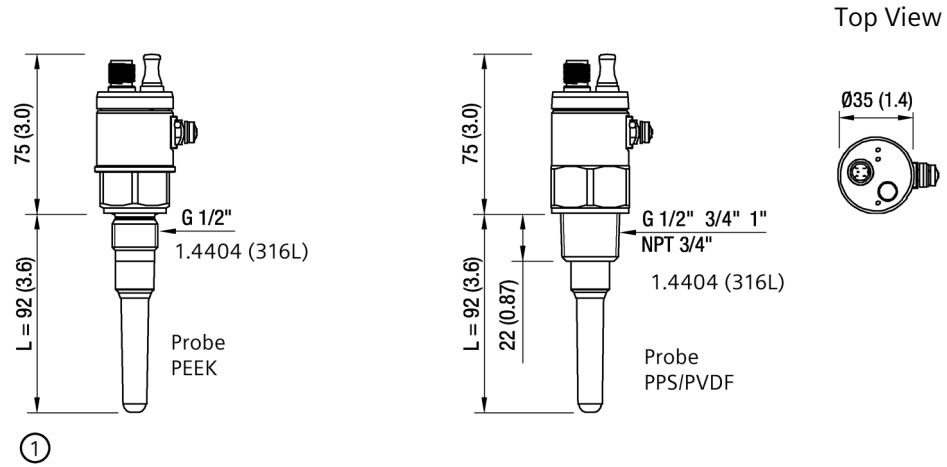


②

① See possible wiring options below

② Short extension length version with stainless steel process connection are available with certificate EHEDG EL class I

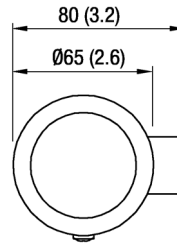
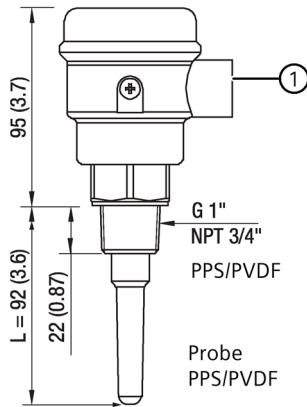
Enclosure Ø35mm (1.38")



- ① Short extension length version with stainless steel process connection are available with certificate EHEDG EL class I

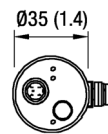
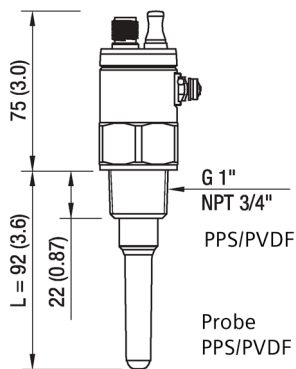
Compact version: Plastic process connection

Enclosure Ø65mm (2.56")



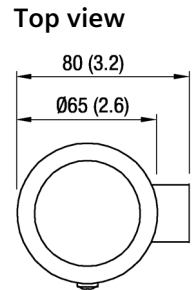
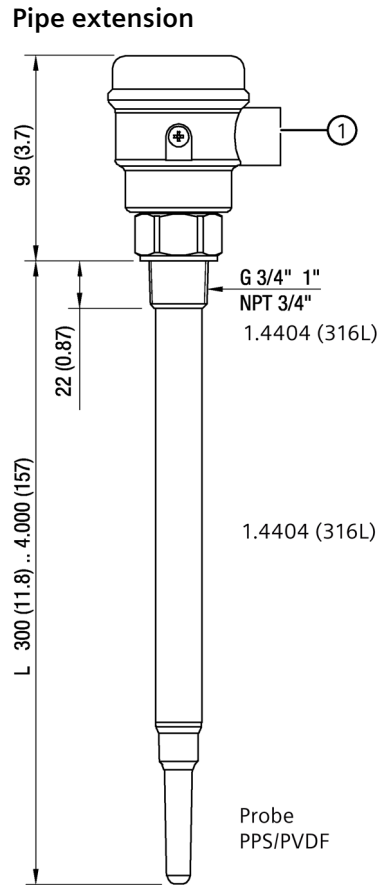
① See possible wiring options below

Enclosure Ø35mm (1.38")



10.2 Pipe extension

Pipe extension



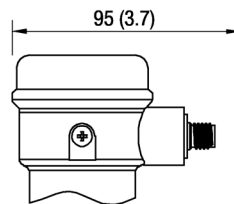
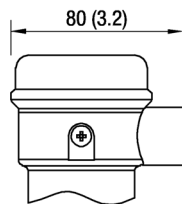
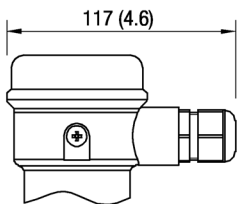
① See possible wiring options below

Enclosure Ø65mm (2.56") Possible wiring

M20x1.5 cable gland

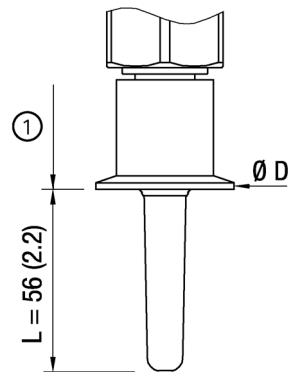
1/2" NPT conduit

M12 plug



10.3 Tri-clamp and flange

Tri-clamp



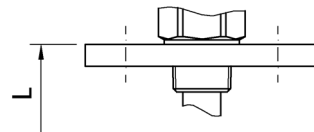
① To top:

Enclosure Ø65mm: 131 (5.2)

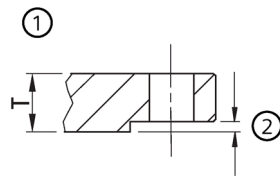
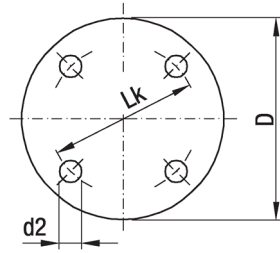
Enclosure Ø35mm: 110 (4.3)

	ØD
DN 25 (1")	50.5 (1.99")
DN 40 (1 1/2")	50.5 (1.99")
DN 50 (2")	64 (2.52")

Flange



The flange is screwed to the process connection



① Raised face
② Facing thickness

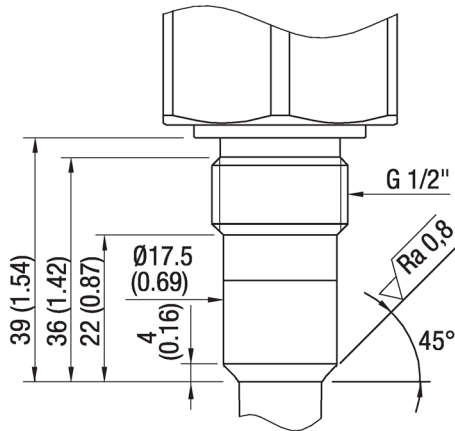
Type	Facing thickness
ASME 150 lbs	2 mm (0.08")
ASME 300 lbs	

	Code	Type	Number of holes	d2 mm (inch)	Lk mm (inch)	D mm (inch)	T thickness mm (inch)
ASME B16.5 Raised face	AL	1" 150 lbs	4	15.9 (0.63)	79.3 (3.12)	108.0 (4.25)	14.3 (0.56)
	AM	1" 300 lbs	4	19.1 (0.75)	88.9 (3.5)	123.8 (4.87)	17.5 (0.69)
	AN	1 1/2" 150 lbs	4	15.9 (0.63)	98.6 (3.88)	127.0 (5.0)	17.5 (0.69)
	AP	1 1/2" 300 lbs	4	22.2 (0.87)	114.3 (4.5)	155.6 (6.13)	20.6 (0.81)
	AQ	2" 150 lbs	4	19.1 (0.75)	120.7 (4.75)	152.4 (6.01)	19.1 (0.75)
	AR	2" 300 lbs	8	19.1 (0.75)	127.0 (5.0)	165.1 (6.5)	22.2 (0.87)
EN 1092-1 Type A Flat-faced	AH	DN25 PN16/40	4	14.0 (0.55)	85.0 (3.35)	115.0 (4.53)	18.0 (0.71)
	AJ	DN40 PN16/40	4	18.0 (0.71)	110.0 (4.33)	150.0 (5.91)	18.0 (0.71)
	AK	DN50 PN16/25/40	4	18.0 (0.71)	125.0 (4.92)	165.0 (6.5)	18.0 (0.71)

10.4 G 1/2" hygienic process connection/EHEDG approval

EHEDG versions: EHEDG (EL class I) approval is available for compact versions with stainless steel process connection G 1/2" hygienic

Process connection

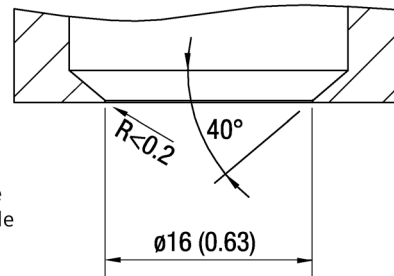
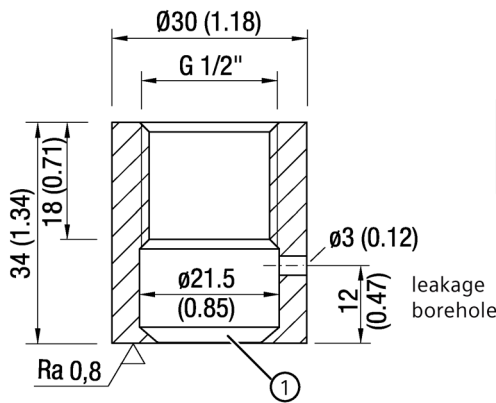


Metal
1.4404 (316L)

PEEK
FDA registration number:
21 CFR 177.2415

Flush welding socket: design

The flush welding socket must meet the following design:



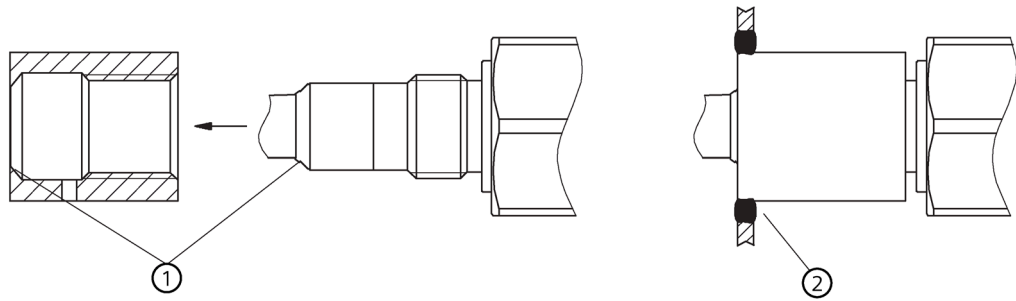
① See Detail A

Metal type according to hygienic and further external requirements

Detail A: Sealing area between device and the on site process connection (metal)

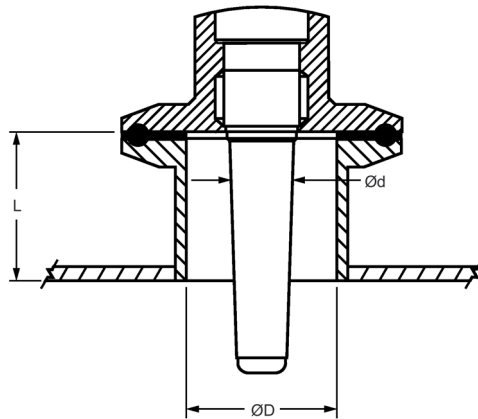
Installation

Install the sensor according to the requirements given in EHEDG Guidelines 8, 10, and 37, that relates to mounting the sensor in a self-draining orientation. In tanks, the cleaning device must be positioned in such a way that the sensor is directly assessed and wetted for cleaning.

Flush welding socket: installation

① Metal-peek sealing
The support must be without a gap.
Do not use PTFE (Teflon) tape or similar.
Fixing torque: 15 Nm

② The food contact surface must be smooth (polished to $Ra < 0.8 \mu m$) and the welding has to be done according to EHEDG Guidelines 9 and 35.

T-piece: Installation

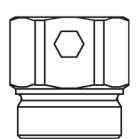
The sensor should be installed flush with the process area. The ratio between the depth of the upstand (L) and the diameter ($D-d$) of the upstand/Sensor shall be $L / (D-d) < 1$.

If welded adapters are used, the food contact surface must be smooth (polished to $Ra < 0.8 \mu m$). The welding must be done according to EHEDG Guidelines 9 and 35. Suitable pipe couplings and process connections with the applicable gaskets must be applied according to the EHEDG Position Paper "Easy cleanable Pipe couplings and Process connections".

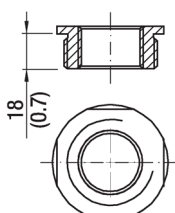
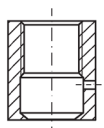
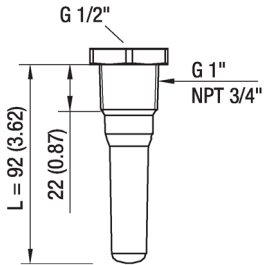
Options and accessories

11.1 Options and accessories

Options

Sliding sleeve	G 1 1/4" / G 1 1/2" / NPT 1 1/4" / NPT 1 1/2" Material: 1.4404 (316L) Sealing material to the extension pipe: FKM Max. process pressure: -1 to 10 bar (146 psi)	
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Accessories

Adapter for process connection	Adapter from G 1" thread to G 1 1/2" Adapter from NPT 3/4" thread to NPT 1 1/4" / NPT 1 1/2" Material: 1.4305 (303) or 1.4404 (316L) Max. process pressure: -1 to 25 bar (363 psi)	
Flush welding socket	For version with EHEDG (EL class I) certificate Fitting to LCS 100 with process connection G 1/2" hygienic Flush welding socket ø30/ G 1/2", 1.4404 (316L)	
Sensguard	Outer thread (process connection): G1" DIN ISO 228-1 or NPT 3/4" ASME B 1.20.1 Internal thread: G 1/2" (requires short extension length version with process connection G 1/2" to fit in). Material: PPS Max. process pressure: -1 to 10 bar (146 psi)	

Complementary products (from outside companies)

M12 mating plug	4 pole, for version with M12 plug
------------------------	-----------------------------------

Product documentation and support

A.1 Product documentation

Process instrumentation product documentation is available in the following formats:

- Certificates (<http://www.siemens.com/processinstrumentation/certificates>)
- Downloads (firmware, EDDs, software) (<http://www.siemens.com/processinstrumentation/downloads>)
- Catalog and catalog sheets (<http://www.siemens.com/processinstrumentation/catalogs>)
- Manuals (<http://www.siemens.com/processinstrumentation/documentation>)

You have the option to show, open, save, or configure the manual.

- "Display": Open the manual in HTML5 format
- "Configure": Register and configure the documentation specific to your plant
- "Download": Open or save the manual in PDF format
- "Download as html5, only PC": Open or save the manual in the HTML5 view on your PC

You can also find manuals with the Mobile app at Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/sc/2067>). Download the app to your mobile device and scan the device QR code.

Product documentation by serial number

Using the PIA Life Cycle Portal, you can access the serial number-specific product information including technical specifications, spare parts, calibration data, or factory certificates.

Entering a serial number

1. Open the PIA Life Cycle Portal (<https://www.pia-portal.automation.siemens.com>).
2. Select the desired language.
3. Enter the serial number of your device. The product documentation relevant for your device is displayed and can be downloaded.

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

Scanning a QR code

1. Scan the QR code on your device with a mobile device.
2. Click "PIA Portal".

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

A.2 Technical support

Technical support

If this documentation does not completely answer your technical questions, you can enter a Support Request (<http://www.siemens.com/automation/support-request>).

For help creating a support request, view this video here (www.siemens.com/opensr).

Additional information on our technical support can be found at Technical Support (<http://www.siemens.com/automation/csi/service>).

Service & support on the Internet

In addition to our technical support, Siemens offers comprehensive online services at service & support (<http://www.siemens.com/automation/serviceandsupport>).

Contact

If you have further questions about the device, contact your local Siemens representative at Personal Contact (<http://www.automation.siemens.com/partner>).

To find the contact for your product, go to "all products and branches" and select "Products & Services > Industrial automation > Process instrumentation".

Contact address for business unit:

Siemens AG

Digital Industries

Process Automation

Östliche Rheinbrückenstr. 50

76187 Karlsruhe, Germany

Index

C

Catalog
 catalog sheets, 77
Certificates, 77
Customer Support, (Refer to Technical support)

D

Disposal, 59, 59
Downloads, 77

H

Hotline, (Refer to Support request)

M

Maintenance, 55
Manuals, 77
Modifications
 correct usage, 10
 improper, 10

P

power requirements
 general purpose/intrinsically Safe, 61
process connections, 63

R

Return procedure, 59

S

Scope of delivery, 6
Service, 78
Service and support
 Internet, 78
Support, 78
Support request, 78

T

Technical support, 78
 partner, 78
 personal contact, 78

W

Warranty, 8