

SIEMENS

SITRANS L

Point Level Transmitters SITRANS LVS300

Operating Instructions




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7ML5736 (compact)
7ML5737 (pipe extension)
7ML5738 (customer supplied pipe extension)

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

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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.

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Introduction

1.1 Applications

The device is used for level monitoring in all types of containers and silos.

It can be used with all powdery and granulated bulk materials with a density greater than 20 g/l (1.25 lb/ft³) that do not show a strong tendency to form crusts or deposits.

The units can be delivered with Ex-approvals for use in Dust Hazardous Areas.

A selection of fields of application:

- Building materials industry
 - lime, moulding sand, etc.
- Food industry
 - milk powder, flour, salt, etc.
- Plastics industry
 - plastics granules etc.
- Timber industry
- Chemical industry
- Mechanical engineering

The LVS300 oscillating probe is normally screwed into the lateral container wall so that it is level with the filling height to be registered and monitored.

The device can also be mounted from the top of the container. In this case an extension piece is used to mount the probe level with the height to be registered.

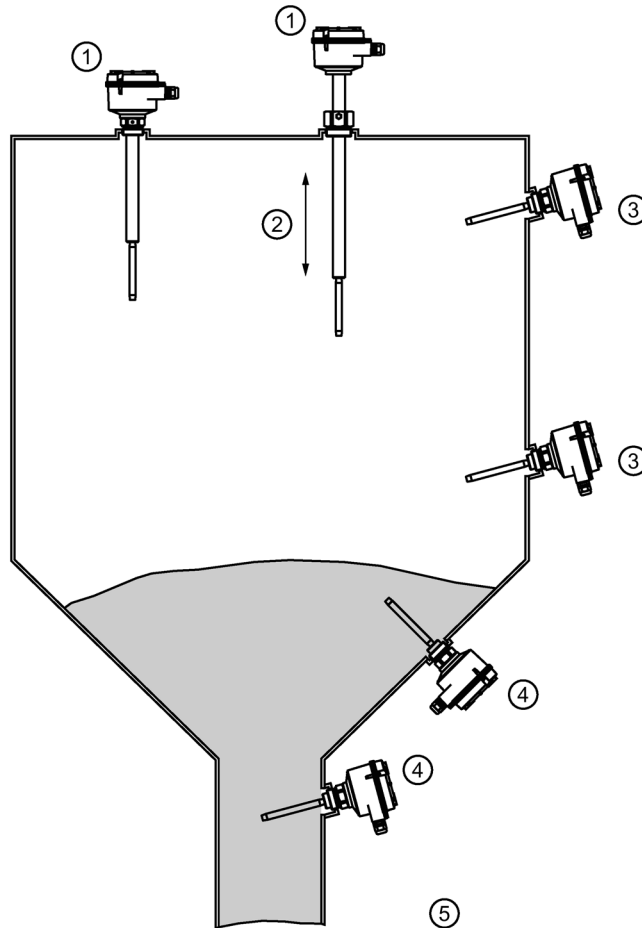
The length of the probe can be up to 4 m (157") with an extension.

The use of a sliding sleeve is recommended so that the switch point can be changed continuously during operation of the device.

1.2 Function

The piezo-electrically stimulated oscillating rod vibrates at its mechanical resonance frequency. If the probe is covered by the bulk material, the damping thus generated is registered electronically and a corresponding signal output is actuated.






The oscillation of the rod ensures a certain self-cleaning effect.

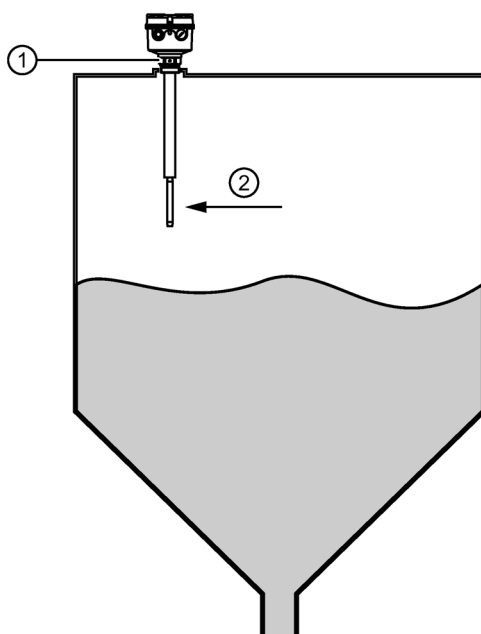


- ① Pipe extension
- ② Optional sliding sleeve
- ③ Compact version or pipe extension
- ④ Compact version
- ⑤ Application in down pipe

Installing/mounting

2.1 General safety instructions

<p> CAUTION</p> <p>Process pressure</p> <p>Improper installation may result in loss of process pressure.</p>
<p> CAUTION</p> <p>Chemical resistance against the medium</p> <p>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.</p>
<p> CAUTION</p> <p>Temperature range</p> <p>The range of the ambient and process temperature of the device must be observed (see Ambient Temperature (Page 37) and for Ex-approvals here). (Page 12)</p>
<p> CAUTION</p> <p>Special conditions of use</p> <p>Model 7ML5738 Extension tube is constructed using Industry Electrical conduit installed by qualified personnel per equipment manual and NFPA 70 National Electrical Code (FM Approved Unit).</p> <p>Model 7ML5738 Extension tube is constructed using Industry Electrical conduit installed by qualified personnel per equipment manual and the Canadian Electrical Code (CEC Part I).</p>
<p> CAUTION</p> <p>Mechanical load</p> <p>The torque at the fastening spot must not exceed 180 Nm (Pipe extension)/ 100 Nm (Customer supplied pipe extension) ①</p> <p>Maximum length "L" in dependence on the deviation (in degrees) from vertical installation ②=Load</p>



Max. deviation	Max. length "L"
5°	4,000 mm (157.5")
45°	1,200 mm (47.24")
>45°	600 mm (23.62")

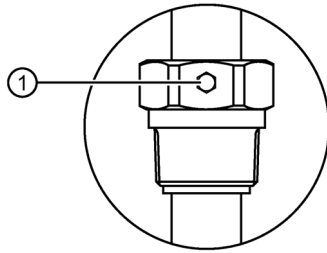
Note

Mounting location

Keep distance to incoming material and to the silo wall. The installation has to be done so that the sensor elements cannot hit the wall of the silo. The flow of the medium and fixtures in the container must be considered. This is especially important for extension length more than 3 m (118.1").

Note

Sliding sleeve



- ① "Pressure tight" version: Tighten both straining screws M8 with 20 Nm to obtain resistance against pressure.

Note**Flange mounting**

A plastic sealing must be used to tighten the flange.

Note**Fastening of the threaded process connection**

Mounting torque for the thread may not exceed 80 Nm. Use a 50 mm (1.97"). For units with sliding sleeve, use a 55 mm (2.17") open-end wrench. Do not fasten by turning the housing .

Note**Food grade material**

The materials are available for the use under normal and predictable applications (according to Reg. (EC) No. 1935/2004 Art.3). Other conditions can influence the safety.

2.2 Additional safety instructions for hazardous locations

Note**Installation regulations**

For devices to be used in hazardous locations, the respective valid installation regulations must be observed.

Note**Sparks**

The installation has to be done so mechanical friction or impact can not cause sparks between the aluminium enclosure and steel.

2.3 Mounting instructions

Note

Oscillating rod

Do not bend, shorten or extend the oscillating rod since this will destroy the device.

Note

Direction of the cable glands

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

Note

Sealing

Seal the process thread with Teflon tape in case of process pressure.

Note

Precaution for later dismounting/ Service

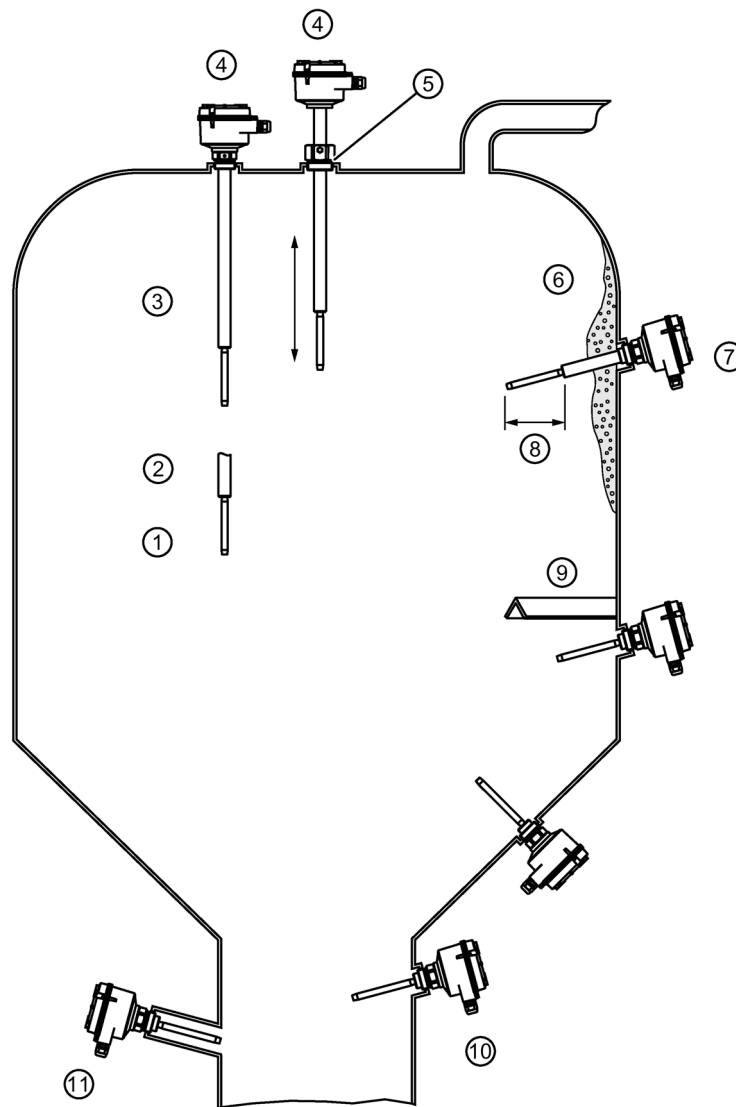
Grease the screws of the lid if corrosive atmosphere is present (e.g. close to sea).

Note

Switching point

Heavy bulk material -> the signal output switches when the oscillating rod is covered by a few mm of material.

Light bulk material -> the signal output switches when the oscillating rod is covered a few cm of material.



- ① Observe max. torque
- ② Empty detector
- ③ Full detector
- ④ Pipe extension
- ⑤ 1½" sliding sleeve (Switch point can be set.)
- ⑥ Bulk material slides down more easily if the device is mounted with inclination (recommended)
- ⑦ Compact version or pipe extended
- ⑧ Sensitive area
- ⑨ Steel angle in case of high mechanical loading (approx. 200 mm (7.87") distance)
- ⑩ CORRECT: Vibrating rod leads into the product
- ⑪ WRONG: Socket too long: material chokes socket

2.4 Zone classification

	Usable in zone	ATEX/UKEX category
Dust applications	20, 21, 22	1 D
	21, 22	2 D
	22	3 D*

* in case of conductive dust, additional demands for the installation are possible.

2.5 General notes

Note

Marking

Devices with EX approval are marked on the nameplate.

CAUTION

Process pressure

The device construction allows process over-pressure up to 16 bar (232 psi). These pressures are allowed for test purposes. The definition of the Ex approval are only valid for a container-overpressure between -0.2 .. +0.1 bar (-2.9 .. +1.45 psi).

For higher or lower pressures the approvals are not valid.

Note

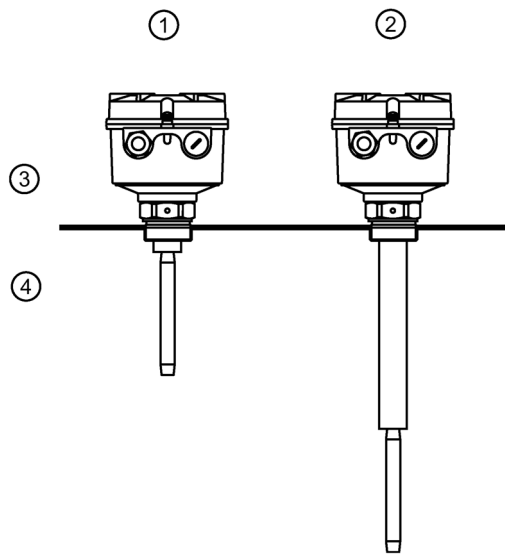
Process and ambient temperature

The permitted temperature ranges are marked on the nameplate. The max. permitted ambient and process temperatures (including temperature derating) stated in this manual must be observed.

ATEX/UKEX: Year of manufacturing

Year of manufacturing	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2029
Marketing code	K	L	M	N	P	R	S	T	U	W	X

2.6 Permitted zones for mounting in partition wall

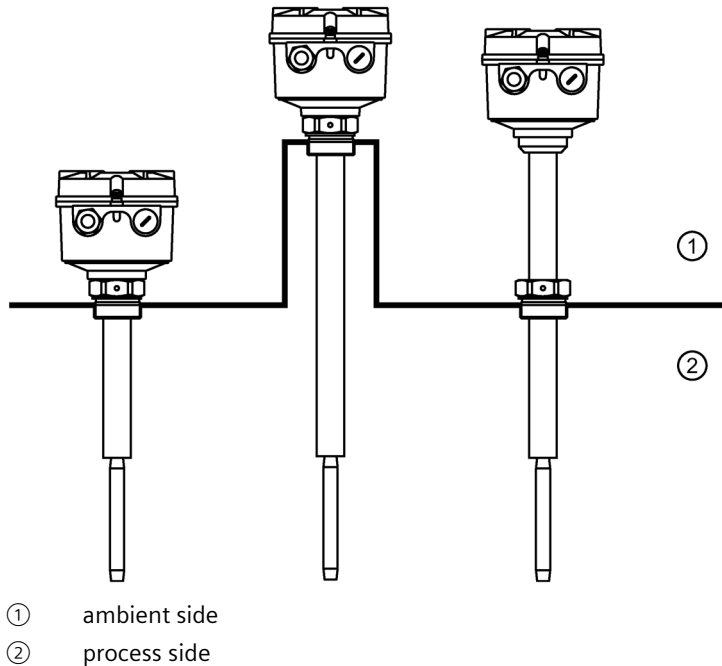


- ① Compact version
- ② Pipe extension
- ③ Category (ATEX/UKEX) 2D, Zone 21
- ④ Category (ATEX/UKEX) 1D, Zone 20

2.7 Max. surface temperature and temperature class

The temperature marking on the type plate refers to the instruction manual. In the following table the relevant temperature ratings are shown.

The maximum surface temperature (resp. temperature class) is the warmest temperature of the unit which could occur during malfunction (according to Ex-definition).




Max. ambient temperature	Max. process temperature	Max. surface temperature (EPL Db)	Max. surface temperature (EPL Da)	Temperature class (Division System)
60°C (140°F)			T ₂₀₀ 115°C (239°F)	
	120°C (248°F)	120°C (248°F)	T ₂₀₀ 120°C (248°F)	T4A
	130°C (266°F)	130°C (266°F)	T ₂₀₀ 130°C (266°F)	T4
	140°C (284°F)	140°C (284°F)	T ₂₀₀ 140°C (284°F)	T3C
	150°C (302°F)	150°C (302°F)	T ₂₀₀ 150°C (302°F)	T3C

2.8 Manufacturing of the extension tube

 CAUTION

Obtain instruction manual for proper manufacturing of the extension tube. In case of deviation from the instruction manual, the unit is not safe for use in Hazardous Locations.

 CAUTION**Specific Conditions of Use**

Model 7ML5738 Extension tube is constructed using Industry Electrical conduit installed by qualified personnel per equipment manual and NFPA 70 National Electrical Code (FM Approved Unit).

Model 7ML5738 Extension tube is constructed using Industry Electrical conduit installed by qualified personnel per equipment manual and the Canadian Electrical Code (CEC Part I).

Note**Demands on the Extension tube**

Material: Stainless steel 1.4301 (SS304) or 1.4305 (SS301) or 1.4571 (SS316Ti) or 1.4404 (SS316L)

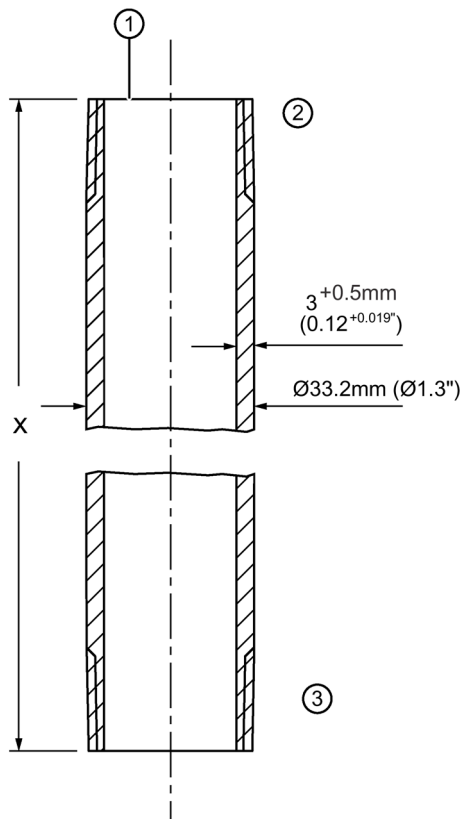
The pipe must be manufactured from one single piece. It is not allowed to weld two or more pieces together.

Carefully observe max. length, diameter, wall thickness, thread, tolerances as specified in the drawing.

All sharp edges must be removed to protect the cable.

Thread testing

Each thread must be tested with go and no-go ring gauge according to standard EN 10226 (R 1" version) or ASME B 1.20.1 (NPT 1" version).



① free from burrs

② ***Version with R 1" thread**

Thread R 1" EN 10226

Effective thread length: 14.5 .. 19.1 mm (0.57 to 0.75")

(dimension L1 according to standard EN 10226)

***Version with NPT 1" thread**

Thread 1" NPT ASME B 1.20.1

Effective thread length: 17.3 +2mm (0.68 +0.08")

(dimension L2 according to standard ASME B 1.20.1)

*The thread on the Extension tube must be manufactured either with R 1" or 1" NPT. This is dependent on the selected version in pricelist pos. "Process connection" and pos. "Approvals". For more details, see Customer supplied pipe extension details. (Page 43)

③ same as the other end

X Pipe length $X = L - 190$ mm (7.5")

Min. L = 250 mm (9.9")

Max. L = 1,500 mm (59") with pos. "Extension length 1.500 mm (59")"

or 4,000 mm (157") with pos. "Extension length 4.000 mm (157")"

Note: L is the total extension length.

2.9 Specific conditions of use

The apparatus shall be installed in a way that danger caused by electrostatic charges is avoided.

2.10 Assembly of the unit

1. Mounting of the Extension pipe

 **CAUTION**

The tube must be assembled very carefully to ensure permanent sealing, electrical grounding and mechanical stability. Observe the follow mounting instructions.

 **CAUTION**

Make sure that the thread of the extension tube and the thread of the screwed piece/ oscillating piece is the same type (do not mix R and NPT thread).

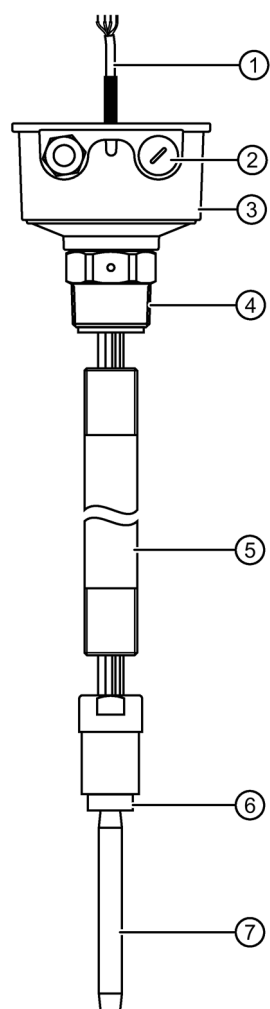
- Feed the connecting wire through the 1" Extension pipe and the screwed piece. Use a separate taut wire for easy working.
- Screw the 1" Extension tube into the oscillating piece and the screwed piece.

Requirements for proper sealing and electrical grounding:

Sealing must satisfy IP67 or NEMA Type 4 at both sides of the extension tube. To reach this, the threads must be sealed with temperature resistant sealing for 150°C (302°F). Max. thickness of the sealing is 0.2 mm (0.008").

The threads must be fixed with 50 Nm.

Use a open-end wrench to attach the oscillating piece (do not use the oscillating rods).



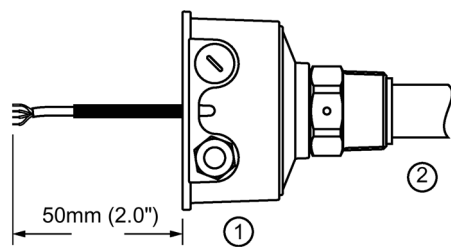
- ① Connecting wire
- ② Cable gland
- ③ Housing
- ④ Screwed piece
- ⑤ Extension pipe
- ⑥ Oscillating piece
- ⑦ Oscillating rod

2. Checking the cable length

Push back the cable into the extension tube until the stated length is present. Take care that no cable is wound up inside the housing.

If the cables are too long to be pushed back, go to step 3; otherwise go on to step 4.

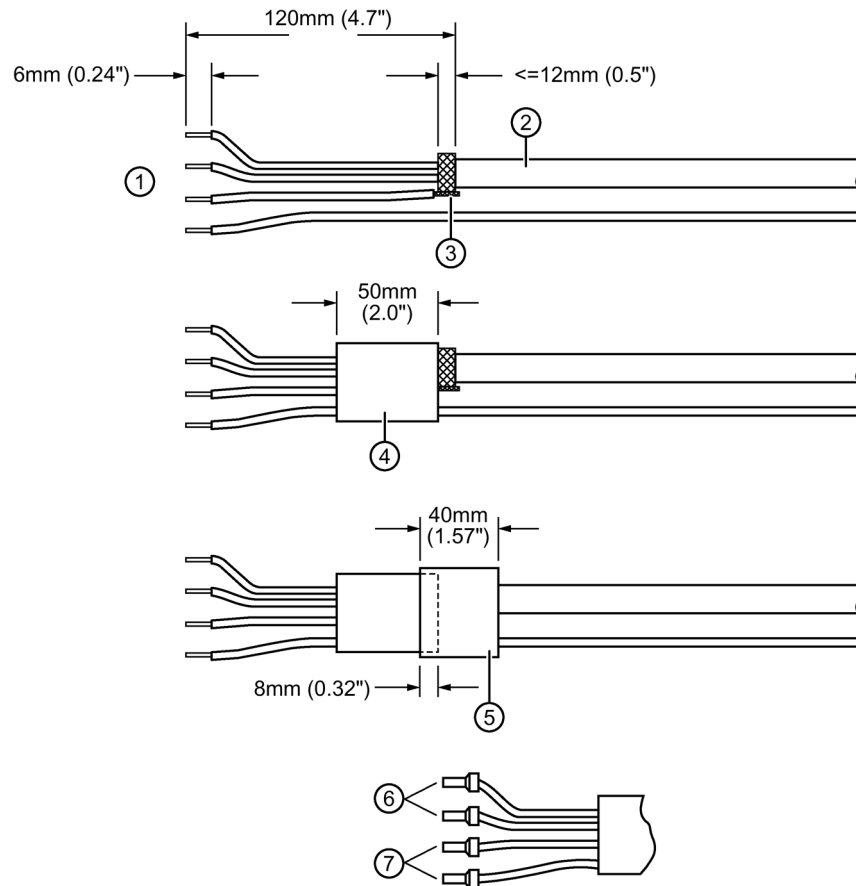
2.10 Assembly of the unit



- ① Housing
- ② Extension tube

3. Cutting the cables (if required)

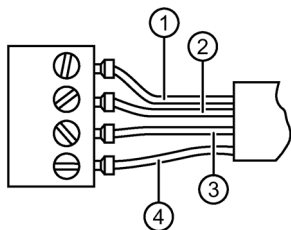
If the cables are too long to be pushed back into the extension tube, shorten the cable to the length as stated in step 2. Prepare the cables as shown. Use the attached hoses and cable sleeves for proper mounting.



- ① red
white
blue
black
- ② red
- ③ Blue cable soldered to shield
- ④ Silicone hose
- ⑤ Shrinking tube
- ⑥ Blue cable sleeves on cables red/white
- ⑦ White cable sleeves on cables blue/black

4. Connecting the plug

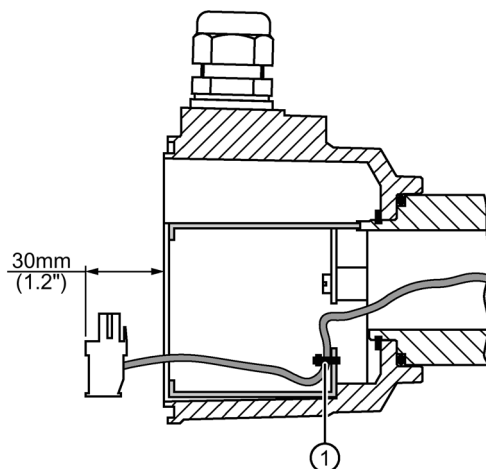
Observe correct sequence.



- ① Red
- ② White
- ③ Blue
- ④ Black

5. Fixing the cable tie

Before fixing the cable tie, observe correct cable length as stated and that no cable is wound up inside the housing.



- ① Cable tie

6. Insert electronics

Insert the plug into the electronic, insert the electronics into the housing, and fix the electronics plastic cover with 4 screws.

Connecting

3.1 General safety instructions

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

Note**Protective earthing**

Before any electrical installation, the device must be connected to the protective earthing terminal inside the housing.

Note**Installation regulations**

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

With use of 24 V supply voltage, an approved power supply with reinforced insulation to mains is required.

Note**Fuse**

Use a fuse as stated in the connection diagrams(Connection (Page 27))

Note**RCCB protection**

In the case of a defect, the distribution voltage must automatically be cut off by a RCCB protection switch so as to protect the user of the device from indirect contact with dangerous electric tensions.

Note**Power supply switch**

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

Note

Wiring diagram

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

Note

Supply voltage

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

Note

Cable gland/ closing element

The screwed cable gland and closing element must have following specifications: Ingress protection IP67, temperature range from -40°C to +70°C, 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). Cable glands that are not used have to be locked with a closing element.

Note

Conduit system

In case of using a conduit system (with NPT thread) instead of a cable gland the regulations of the country where the unit is installed must be observed. The conduit must have a tapered thread either NPT 1/2" or NPT 3/4" in accordance with the unit and ASME B 1.20.1. Not used inlets must be closed tight with a metal closing element.

Note

Field wiring cables

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.

All field wirings must have insulation suitable for at least 250 V AC.

The temperature rating must be at least 90°C (194°F).

If higher immunity interferences as specified in the stated EMC standards are present (see chapter approval), a shielded cable is required, otherwise an unshielded instrumentation cable is satisfactory.

Note

Connecting the terminals

Make sure that max. 8 mm (0.31") of the pigtails are bared (danger of contact with live parts).

Note**Guiding the cables in the terminal box**

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

Note**Relay and transistor protection**

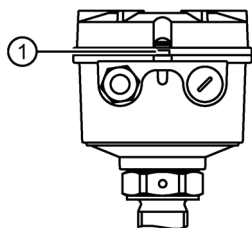
Provide protection for relay contacts and output transistors to protect the device against spikes with inductive loads.

Note**Protection against static charging**

The housing of the unit must be grounded in any case to avoid static charging of the unit on applications with pneumatic conveying and non-metallic containers.

3.2 Additional safety instructions for hazardous locations

Note**External equipotential bonding terminal**



① Connect with equipotential bonding of the plant

Note**Field wiring**

A pull relief must be provided for the field wiring cables, when the device is installed with the factory provided cable glands.

Note

Cable glands and conduit system for ATEX/UKEX

Installation according to the regulations of the country, where the product is installed.

Not used entries have to be closed with blanking elements certified for this purpose.

Where available the factory provided parts must be used.

A strain relief must be provided for the field wiring cables, when the device is installed with the factory provided cable glands.

The diameter of the field wiring cable must match to the clamping range of the cable clamp.

If other than the factory provided parts are used, following must be ensured:

1. The parts must have an approval adequate to the approval of the level sensor (certificate and type of protection).
 2. The approved temperature range must be from the min. ambient temperature of the level sensor to the max. ambient temperature of the level sensor increased by 10 Kelvin.
 3. The parts must be mounted according to the instructions of the supplier.
-

Note

Conduit system for FM

In addition the regulations of the country must be observed. The used flameproof seals and blanking elements must have an adequate type approval and a temperature range of at least -40°C (-40°F) to $+80^{\circ}\text{C}$ (176°F). In addition they shall be suitable for the conditions and correctly installed. Where available the provided original parts of the manufacturer must be used.

Note

Commissioning

Commissioning only with closed lid.

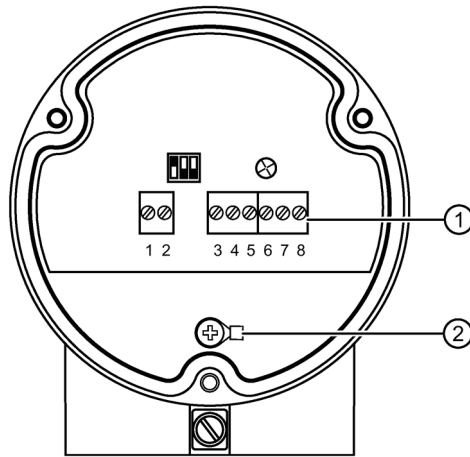
Note

Opening the lid

Before opening the lid take care, that no dust deposits or whirlings are present.

Do not remove the lid (cover) while circuits are alive.

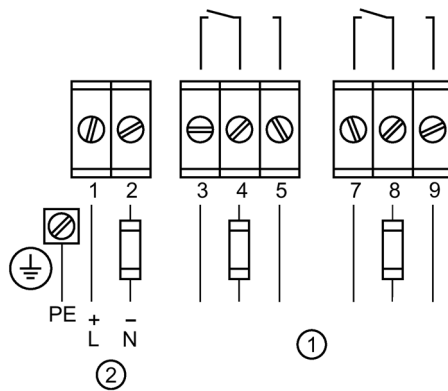
3.3 Connection



- ① Connecting terminals
- ② Protective Conductor Terminal

3.4 Universal voltage

Relay DPDT



- ① Signal output
- ② Power supply

Power supply

21 V .. 230 V 50 - 60 Hz $\pm 10\%$ * 22 VA

22 V .. 45 V DC $\pm 10\%$ * 2 W

*incl. $\pm 10\%$ of EN 61010

Fuse on power supply: max. 10 A, fast or slow, HBC, 250 V

Signal output:

Floating relay DPDT

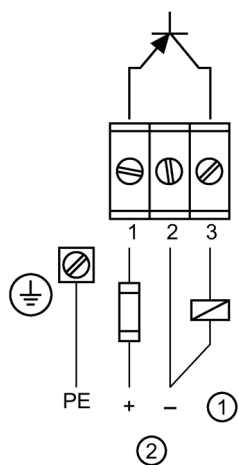
AC max. 250 V, 8A, non-inductive

DC max. 30 V, 5A, non-inductive

Fuse on signal output: max. 10A, fast or slow, HBC, 250 V

3.5 3-wire

PNP



- ① Load
- ② Power supply

Power supply

20 .. 40 V DC $\pm 10\%$ *

*incl. $\pm 10\%$ of EN 61010 Input current: max. 0.5 A

Fuse: max. 4 A, fast or slow, 250 V

Signal output:

max. 0.4 A

Output voltage equal to input voltage, drop < 2.5 V

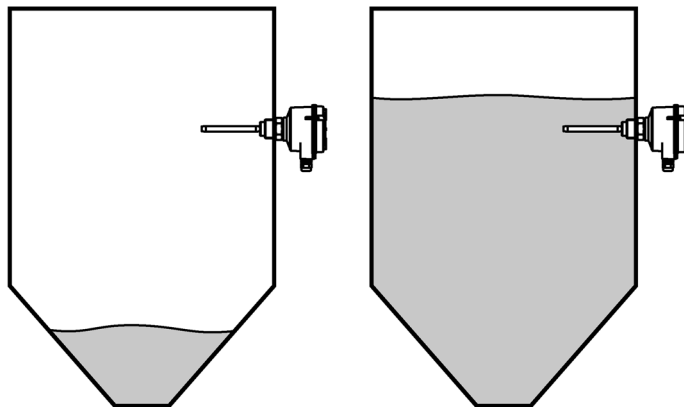
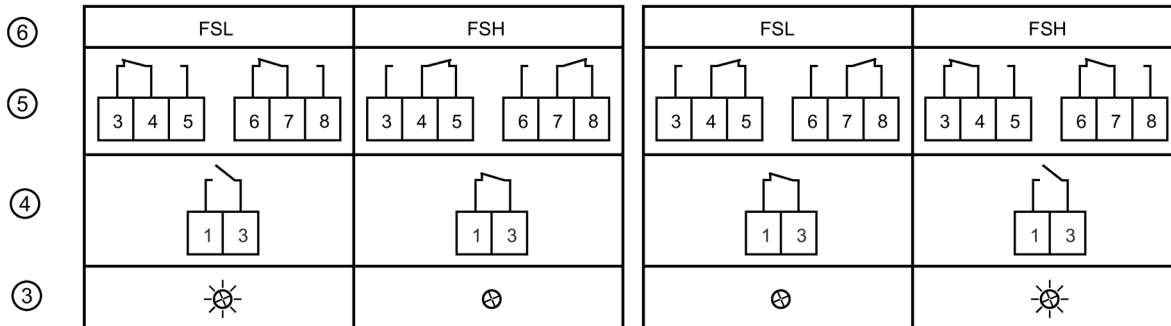
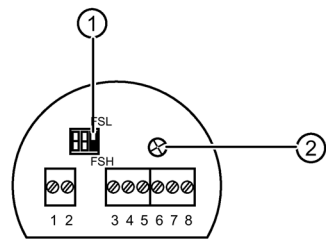
Load for example: PLC, relay, contactor, bulb

Operating

4.1 Signal output

FSL/FSH Setting	
FSH: If the sensor is used to indicate full load, set to Fail Safe High. Power failure or line break is regarded as "full" signal (protection against overcharging).	FSL: If the sensor is used to indicate empty load, set to Fail Safe Low. Power failure or line break is regarded as "empty" signal (protection against running dry).

4.1 Signal output



- ① Setting FSL/FSH (see chart above)
- ② LED Signal Output
- ③ LED Signal Output
- ④ 3-wire PNP
- ⑤ Relay DPDT
- ⑥ Setting

4.2 Sensitivity setting

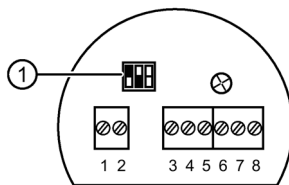
All sensors are factory setted to position "III" to cover the majority of applications.

If the bulk material is heavy and has a strong tendency to cake or deposit, the setting can be set to position "IV" so as to decrease the sensitivity of the probe.

If the bulk material is light and has few or no tendency to cake or deposit, the setting can be set to position "II" or "I" so as to increase the sensitivity of the probe.

The table indicates the approximate min. bulk density depending on the settings.

Please contact manufacturer if you intend to use the device for special purposes.



Setting	Sensitivity/Powder density (ca.)	①
I	High >20 g/l (1.25 lb/ft ³)	
II	Medium high >80 g/l (5 lb/ft ³)	
III*	Medium low >150 g/l (9.4 lb/ft ³)	
IV	Low >300 g/l (18.7 lb/ft ³)	

Service and maintenance

5.1 Maintenance notes

⚠ CAUTION**Opening the lid (cover)**

Before opening the lid for maintenance reasons observe following items:

- Do not remove the lid while circuits are alive.
- No dust deposits or whirlings are present.
- No rain can enter into the housing.

⚠ CAUTION**Frequent check of the unit**

To ensure durable safety in hazardous locations and with electrical safety, following items must be checked frequently depending on the application:

- Mechanical damage or corrosion of any components (housing side and sensor side) and of the field wiring cables.
- Tight sealing of the process connection, cable glands and enclosure lid.
- Properly connected external PE cable (if present).

Note**Cleaning**

If cleaning is required by the application, following must be observed:

- Cleaning agent 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:

- The cleaning agent cannot enter into the unit through the lid sealing or cable gland.
- No mechanical damage of the lid sealing, cable gland or other parts can happen.

A possible accumulation of dust on the unit does not increase the maximum surface temperature and must therefore not be removed for purposes of maintaining the surface temperature in hazardous locations.

! CAUTION

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 (e.g. hazardous locations, hazardous bulk material, electric safety, process pressure).

This test does not proof if the sensor is sensitive enough to measure the material of the application.

Function test is done by stopping the vibration of the vibrating rod with appropriate means and monitor if a correct change of the signal output from uncovered to covered happens.

Note

Production date

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

Note

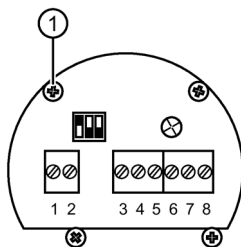
Spare parts

All available spare parts are stated in the selection list.

5.2 Change of the electronic board

De-energize device and secure against being switched on again.

1. Open the housing lid.
2. Remove the field wiring cables/plug.
3. Unscrew the cover plate ①.
4. Take out the electronic board and remove internal plug.
5. Insert a new electronic board in reverse sequence.
6. Connect the field wiring cables.



5.3 Disposal notes

The product consists of materials which can be recycled; for details of the used materials, see chapter Technical Data (Page 36).

Recycling must be done by a specialized recycling company. Since the product is not subject to the WEEE directive 2012/19/EU, it is not permitted to bring it to a public recycling station.

Technical specifications

6.1 Electrical data

Electrical data	
Connection terminals	0.14 - 2.5 mm ² (AWG 26 - 14)
Cable entry	M20 x 1.5 screwed cable gland
	NPT 1/2" conduit connection
	NPT 3/4" conduit connection
	Clamping range (diameter) of the factory provided cable glands: M20 x 1.5: 6 .. 12 mm (0.24 .. 0.47")
Signal delay	Sensor free -> covered ca. 1 sec
	Sensor covered -> free ca. 1 .. 2 sec
Safety operation (FSL,FSH)	Switchable for minimum or maximum safety
Vibration frequency	ca. 330 Hz
Overvoltage category	II
Pollution degree	2 (inside housing)

6.2 Electronics

	Universal voltage Relay DPDT	3-wire PNP
Power supply	21 V .. 230 V 50 - 60 Hz ±10%* 22 V .. 45 V DC ±10%* *incl. ±10% of EN 61010	20 V .. 40 V DC ±10%* *incl. ±10% of EN 61010
Max. ripple of power supply	7 V _{SS} at DC	7 V _{SS}
Installed load/ input current	max. 22 VA / 2W	max. 0.5 A
Signal output	Floating relay DPDT AC max. 250 V, 8 A non-inductive DC max. 30 V, 5 A non-inductive	Open Collector: Permanent load max. 0.4 A Short-circuit, overload and reverse protected Output voltage equal to input voltage, drop <2.5V
Indicating light	Status of signal output by built-in LED	Status of signal output by built-in LED
Isolation	Power supply to signal output: 2,225 V _{rms} Signal output to signal output: 2,225 V _{rms}	-
Protection class	I	III

6.3 Mechanical data

Mechanical data		
Housing	Aluminum housing, powder coat Seal between housing and lid: NBR Seal between housing and process connection: NBR Nameplate: polyester film	
Partition wall between Zone 20 and Zone 21 (EPL Da/Db)	Material:	stainless steel
	Thickness:	min. 1 mm
	Expected lifetime under constant functional vibration stress:	20 years (depending on application and ambient conditions)
	Note: In case of high flow rate of abrasive dust measures shall be provided to mitigate potential abrasion at the partition wall.	
Degree of protection	IP67 (EN 60529), NEMA Type 4X	
Process connection	Material:	Compact version: stainless steel 1.4301 (304)/ 1.4541 (321) or 1.4404 (316L) Pipe extension: stainless steel 1.4301 (304)/ 1.4541 (321) or 1.4404 (316L) (process connection and pipe extension)
	Thread:	G 1", G 1¼", G 1½" DIN 228; NPT 1", NPT 1¼", NPT 1½" ASME B 1.20.1
	Flange:	according to selection 1.4541 (321) or 1.4404 (316L)
	Tri-clamp:	stainless steel 1.4301 (304) or 1.4404 (316L) 2" (DN50) ISO 2852
	All material food grade	
Oscillator	Material: stainless steel 1.4404 (316L) (food grade)	
Sound level	max. 50 dBA	
Overall weight (ca.)	Compact version: 1.3 kg (2.9 lbs) Pipe extension: 1.3 kg (2.9 lbs) +1.3 kg/m (+2.9 lbs per 39.3") extension Customer supplied pipe extension: 1.8 kg (4.0 lbs) +1.3 kg/m (+2.9 lbs per 39.3") extension	

6.4 Operating conditions

Operating conditions		
Ambient temp. (housing)	-40°C .. +60°C (-40 .. +140°F)	
Process temperature	-40°C .. +150°C (-40 .. +302°F) For versions with Ex-approvals: see remarks here (Page 12).	
<p>The technical drawing shows three probe configurations labeled A, B, and C. Configuration A has a diameter of 50 mm (1.97 inches). Configuration B has a probe length of 180 mm (7.08 inches). Configuration C has a shorter probe length. A graph to the right plots temperature (T_{amb} and T_{process}) against probe length. The graph shows a constant ambient temperature of 60°C (140°F) for the first 60 mm of the probe, followed by a linear decrease to 40°C (104°F) at 150 mm. The probe length is marked with 60°C (140°F) and 150°C (302°F) on the x-axis, and 60°C (140°F) and 40°C (104°F) on the y-axis. The graph is divided into regions A, B, and C.</p>		
<p>① T_{amb} ② T_{process}</p>		
Ventilation	Ventilation is not required	
Min. powder density	Setting	Min. powder density (ca.)
	I	20 g/l (1.25 lb/ft ³)
	II	80 g/l (5 lb/ft ³)
	III	150 g/l (9.4 lb/ft ³)
IV	300 g/l (18.7 lb/ft ³)	
Features of bulk material	No strong tendency to cake or deposit	
Max. mechanical load	400 N (@40°C, 104°F) laterally (on oscillator rod) Recommended protection in case of high material load; mounting of a protective angle above the probe	
Max. mechanical torque	Pipe extension: 180 Nm (@40°C, 104°F) Customer supplied pipe extension: 100 Nm (@40°C, 104°F)	
Max. process pressure	16 bar (232 psi) For version with "sliding sleeve without process overpressure": unpressurized. The max. process pressure may be reduced with use of flanges. Observe flange standards for pressure rating and pressure derating with higher temperature. For versions with Ex-approvals: see remarks here (Page 12).	
Vibration	1.5 (m/s ²) ² /Hz according to EN60068-2-64	
Relative humidity	0-100%, suitable for outdoor use	

6.5 Transport and storage

Operating conditions	
Altitude	max. 2,000 m (6,562 ft)
Expected product lifetime	Following parameters have a negative influence on the expected product lifetime: High ambient- and process temperature, corrosive environment, high vibration, high flow rate of abrasive bulk material passing the sensor element.

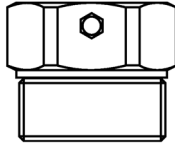
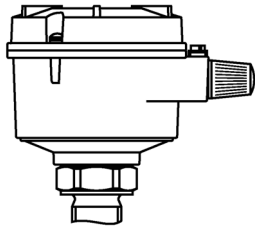
6.5 Transport and storage

Transport and storage	
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.
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%

6.6 Approvals

Approvals			
General Purpose (Ordinary Locations) (Depending on selected version in price list.)	CE/UKCA EN 61010-1 FM		
Hazardous Locations (Depending on selected version in price list.)	ATEX	Dust explosion	ATEX II 1/2 D Ex ta/tb IIIC T! Da/Db
	UKEX	Dust explosion	UKEX II 1/2D Ex ta/tb IIIC T! Da/Db
	FM	Dust explosion	Cl. II, III Div. 1 Gr. E,F,G
EMC	EN 61326 - A1		
Food grade material	According to directive 1935/2004/EC		
RoHS conform	According to directive 2011/65/EU		
Pressure Equipment Directive (2014/68/EU)	<p>These Siemens Level Measurement Instruments fall outside the limits of Article 4, Sections 1 & 2 of the Pressure Equipment Directive (PED), 2014/68/EU. However, in accordance with PED, Article 4, section 3, this potential pressure-keeping equipment has been designed and manufactured in accordance with Sound Engineering Practice (SEP).</p> <p>The Siemens Level Transmitters with flanged, threaded, or clamp type process connections have no pressure-bearing housing of their own and, therefore, do not come under the Pressure Equipment Directive as a pressure accessory. The measuring system alone is not considered as a safety accessory, and the sensor alone does not meet the definition of a pressure accessory or safety accessory.</p> <p>For further information, see EU Commission Guidelines A-05, A-08, A-20, A-25, and A-40.</p>		

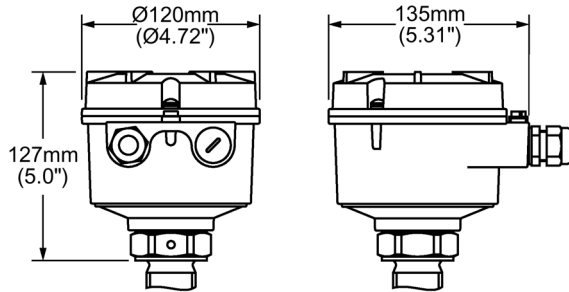
6.7 Options

Options		
Sliding sleeve (Pipe extension)	G 1½" ISO 228 or 1½" NPT ASME B 1.20.1 or flanges Material: 1.4301 (304) or 1.4404 (316L) Sealing material to the extension tube: FKM or NBR	
Bulb	Bright indicating light seen from outside. Not available for use in Hazardous Locations and FM general purpose.	

Dimension drawings

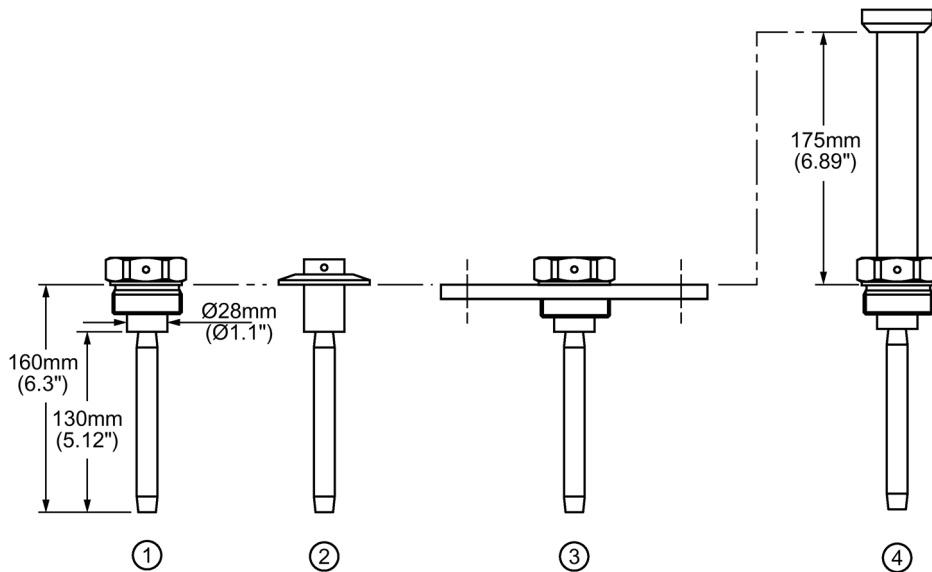
7.1 Head dimension

Head dimension



7.2 Compact version

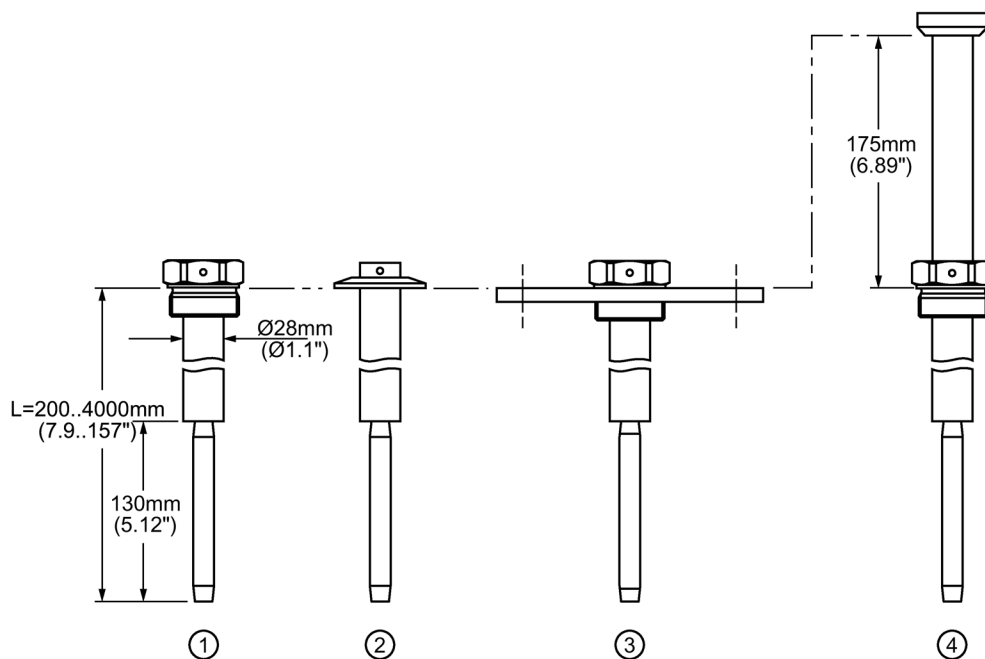
Compact version



- ① Thread
- ② Tri-clamp
- ③ Flange
- ④ Temperature isolator

7.3 Pipe extension

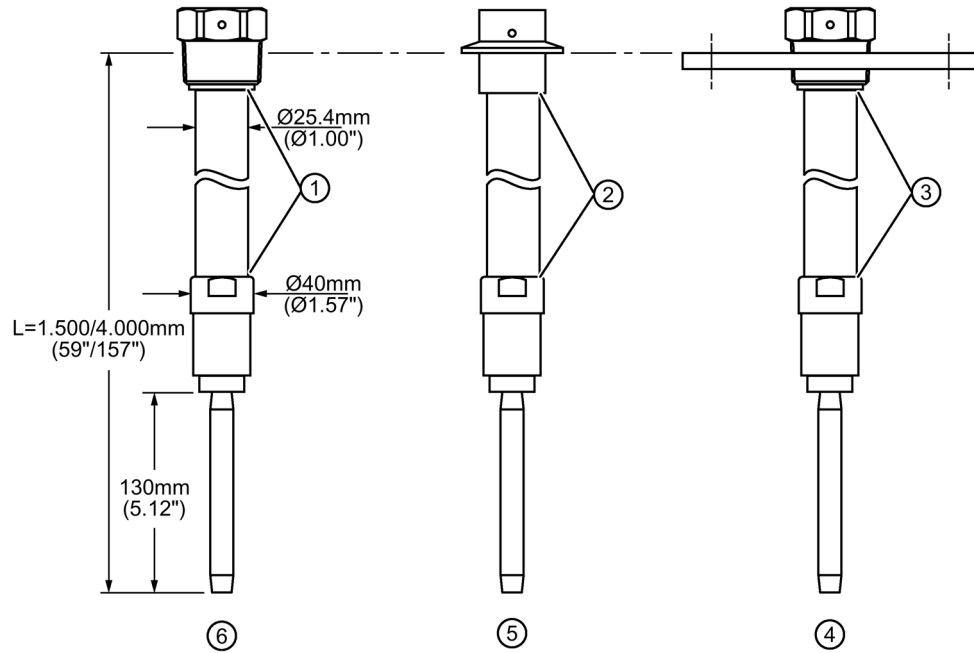
Pipe extension



- ① Thread
- ② Tri-clamp
- ③ Flange
- ④ Temperature isolator

7.4 Pipe extension - customer mounted

Customer supplied pipe extension



①	Approval	Process connection	Thread on extension pipe
	CE, UKCA, ATEX, UKEX	G 1½"	R 1"
	FM	NPT 1½"	NPT 1"
②	Approval	Thread on extension pipe	
	CE, UKCA, ATEX, UKEX	R 1"	
	FM	NPT 1"	
③	Approval	Process connection	Thread on extension pipe
	CE, UKCA, ATEX, UKEX	Flange DN	R 1"
		Flange ASME	NPT 1"
	FM	Flange DN Flange ASME	NPT 1"
④	Flange		
⑤	Triclamp		
⑥	Thread		

Extension pipe NOT part of delivery

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.

See also

Industry Online Support

(<https://support.industry.siemens.com/cs/products?dtp=Certificate&mfn=ps&pnid=17456&lc=en-WW>)

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

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