

TECHNICAL INFORMATION

Level Probe LGC2

Hydrostatic Level
Measurement



With regard to the supply of products, the current issue of the following document is applicable:
The General Terms of Delivery for Products and Services of the Electrical Industry,
published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und
Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause:
"Expanded reservation of proprietorship".

Application

The device is a pressure sensor for hydrostatic level measurement.

Pepperl+Fuchs offers three different versions of the device:

- Device with a stainless steel housing, external diameter of 22 mm (0.87 inch):
This version is excellently suited to drinking water applications and for use in bore holes and wells with small diameters
- Device with a stainless steel housing, external diameter of 42 mm (1.65 inch):
Heavy-duty version and easy to clean thanks to flush-mounted process isolating diaphragm, ideally suited to wastewater and wastewater treatment plants
- Device with plastic insulation, external diameter of 29 mm (1.14 inch):
Robust version for use in salt water and excellently suited to applications on ships (e. g. ballast water tanks)

Your benefits

- High resistance to overload
- High-precision, robust ceramic measuring cell with long-term stability
- Climate proofed sensor thanks to completely potted electronics and 2-filter pressure compensation system
- Simultaneous measurement of level and temperature with optionally integrated Pt100 resistance thermometer
- Accuracy
 - Standard reference accuracy $\pm 0.2\%$
 - Platinum version $\pm 0.1\%$
- Automatic density compensation to increase accuracy
- Usage in drinking water: KTW, NSF, ACS
- Approvals: ATEX, FM, CSA
- Extensive range of accessories provides complete measuring point solutions



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1 Important Document Information

1.1 Document Conventions

1.1.1 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.



Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.



Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols



Note!

This symbol brings important information to your attention.



Action

This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

1.1.2 Electrical symbols







Symbol	Meaning
	Direct current A terminal to which DC voltage is applied or through which direct current flows.
	Alternating current A terminal to which alternating voltage is applied or through which alternating current flows.
	Direct current and alternating current <ul style="list-style-type: none"> • A terminal to which alternating voltage or DC voltage is applied. • A terminal through which alternating current or direct current flows.
	Ground connection A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
	Protective ground connection A terminal which must be connected to ground prior to establishing any other connections.
	Equipotential connection A connection that has to be connected to the plant grounding system: This may be a potential equalization line or a star grounding system depending on national or company codes of practice.

Table 1.1

1.1.3 Symbols for certain types of information






Symbol	Meaning
	Allowed Indicates procedures, processes or actions that are allowed.
	Preferred Indicates procedures, processes or actions that are preferred.
	Forbidden Indicates procedures, processes or actions that are forbidden.
1., 2., 3. ...	Series of steps
	Result of a sequence of actions
	Visual check

Table 1.2

1.1.4 Symbols in graphics



Symbol	Meaning
1, 2, 3 ...	Item numbers
1., 2., 3. ...	Series of steps
A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections
	Hazardous area Indicates a hazardous area.
	Safe area (non-hazardous area) Indicates a non-hazardous location.

Table 1.3

1.2 Terms and Abbreviations

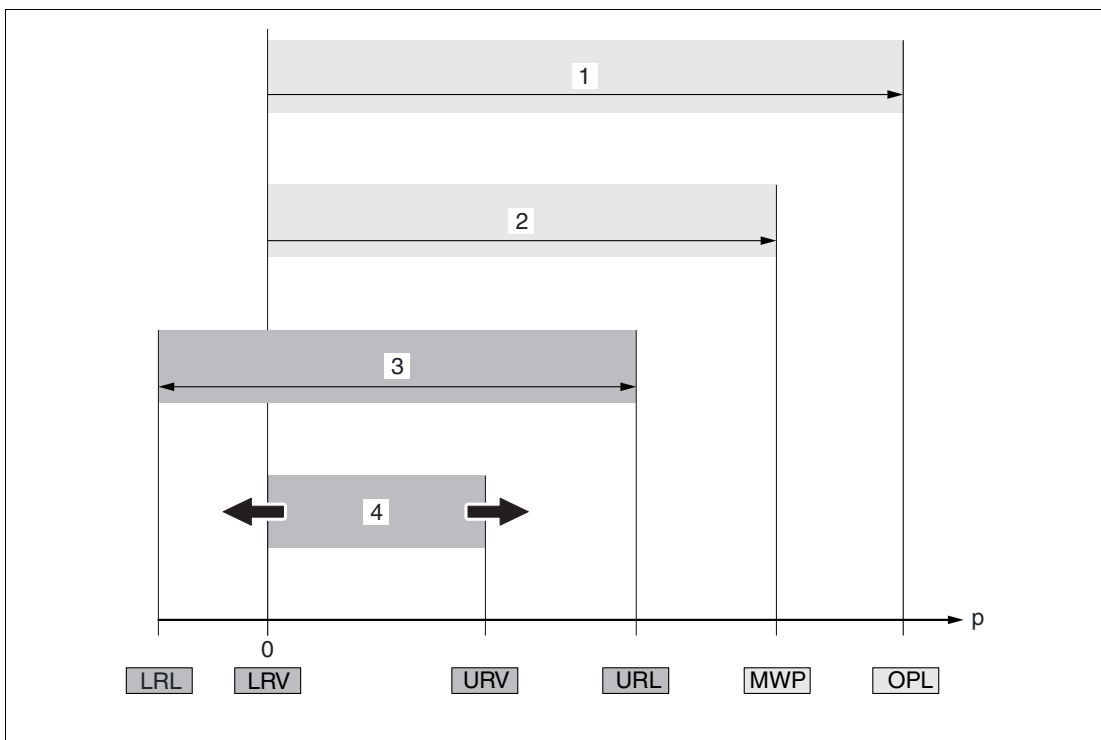


Figure 1.1

Position	Terms/abbreviations	Explanation
1	OPL	The OPL (over pressure limit = sensor overload limit) for the measuring device depends on the lowest-rated element, with regard to pressure, of the selected components, i. e. the process connection has to be taken into consideration in addition to the measuring cell. Also observe pressure-temperature dependency. For the relevant standards and additional notes, see the "Pressure specifications" section. The OPL may only be applied for a limited period of time.
2	MWP	The MWP (maximum working pressure) for the sensors depends on the lowest-rated element, with regard to pressure, of the selected components, i. e. the process connection has to be taken into consideration in addition to the measuring cell. Also observe pressure-temperature dependency. For the relevant standards and additional notes, see the "Pressure specifications" section. The MWP may be applied at the device for an unlimited period. The MWP can also be found on the nameplate.
3	Maximum sensor measuring range	Span between LRL and URL This sensor measuring range is equivalent to the maximum calibratable/adjustable span.
4	Calibrated/adjusted span	Span between LRV and URV Factory setting: 0 to URL Other calibrated spans can be ordered as customized spans.
p	–	Pressure
–	LRL	Lower range limit
–	URL	Upper range limit
–	LRV	Lower range value
–	URV	Upper range value
–	TD (Turn down)	Turn down: Example see the following section.
–	PE	Polyethylene
–	FEP	Fluorinated ethylene propylene

Table 1.4

1.3 Turn down calculation

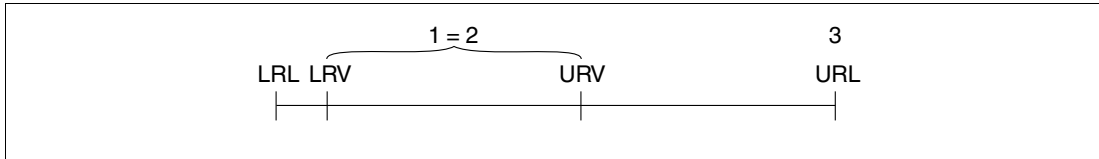


Figure 1.2

- 1 Calibrated/adjusted span
- 2 Zero point-based span (4 to 20 mA analog: customer-specific span can only be set at the factory when ordered)
- 3 Upper range value

Example

- Sensor: 10 bar (150 psi)
- Upper range value (URL) = 10 bar (150 psi)
- Calibrated/adjusted span: 0 to 5 bar (0 to 75 psi)
- Lower range value (LRV) = 0 bar (0 psi)
- Upper range value (URV) = 5 bar (75 psi)

$$TD = URL / (URV - LRV)$$

$$TD = 10 \text{ bar (150 psi)} / (5 \text{ bar (75 psi)} - 0 \text{ bar (0 psi)}) = 2$$

In this example, the TD is 2:1. This span is based on the zero point.

2 Function and System Design

2.1 Device Versions






Caution!

Gas loss when using the device in biogas plants

The device is not suitable for use in biogas plants since the gases can diffuse through the elastomers (seals, probe connection).

Use the devices LHCR-51, LHCS-51 for applications involving biogas.

Outer diameter	22 mm (0.87 inch)	42 mm (1.65 inch)	max. 29 mm (1.14 inch)
			
Field of application	Hydrostatic level measurement in deep wells e. g. drinking water	Hydrostatic level measurement in wastewater	Hydrostatic level measurement in saltwater
Process connection (extension cable)	<ul style="list-style-type: none"> • Suspension clamp • Cable mounting screw with G1-1/2A thread or NPT1-1/2 thread 		
Probe connection	PE, FEP		
Seals	<ul style="list-style-type: none"> • FKM Viton • EPDM ¹ 	FKM Viton	<ul style="list-style-type: none"> • FKM Viton • EPDM ¹
Measuring ranges	<ul style="list-style-type: none"> • Relative pressure: 0 to 0.1 bar (0 to 1.5 psi) to 0 to 20 bar (0 to 300 psi) • Absolute pressure: 0 to 2 bar (0 to 30 psi) to 0 to 20 bar (0 to 300 psi) 		<ul style="list-style-type: none"> • Relative pressure: 0 to 0.1 bar (0 to 1.5 psi) to 0 to 4 bar (0 to 60 psi) • Absolute pressure: 0 to 2 bar (0 to 30 psi) to 0 to 4 bar (0 to 60 psi)
	<ul style="list-style-type: none"> • Customer-specific measuring ranges; factory-calibrated. • The following output units can be configured: %, mbar, bar, kPa, MPa, mm H2O, m H2O, inch H2O, foot H2O, psi and numerous level units. 		
Overload	to 40 bar (600 psi)		to 25 bar (375 psi)
Process temperature range	-10 to +70 °C (+14 to +158 °F)		0 to +50 °C (+32 to +122 °F)
Reference accuracy	<ul style="list-style-type: none"> • ±0.2 % of the set span • optional: ±0.1 % of the set span (Platinum version) 		
Supply voltage	10.5 to 35 V DC, Ex: 10.5 to 30 V DC		
Output	4 to 20 mA Analog		

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Outer diameter	22 mm (0.87 inch)	42 mm (1.65 inch)	max. 29 mm (1.14 inch)
Options	Drinking water approval	-	
	<ul style="list-style-type: none">• Wide range of approvals, including ATEX, FM, CSA• Numerous accessories• Integrated Pt100 resistance thermometer and HUT temperature head transmitter (4 to 20 mA)		
Specialties	<ul style="list-style-type: none">• High-precision, robust ceramic measuring cell with long-term stability• Automatic density compensation• Customer-specific cable marking		

¹ Recommended for drinking water applications, not suitable for use in hazardous areas.

2.2 Measuring Principle

The ceramic measuring cell is a dry measuring cell i. e. the pressure acts directly on the robust, ceramic process isolating diaphragm of the device. Changes in air pressure are guided via a pressure compensation tube through the extension cable to the rear of the ceramic process isolating diaphragm and are compensated for. A pressure-dependent change in capacitance, caused by the movement of the process isolating diaphragm, is measured at the electrodes of the ceramic carrier. The electronics unit then converts this to a signal that is proportional to the pressure and linear to the level.

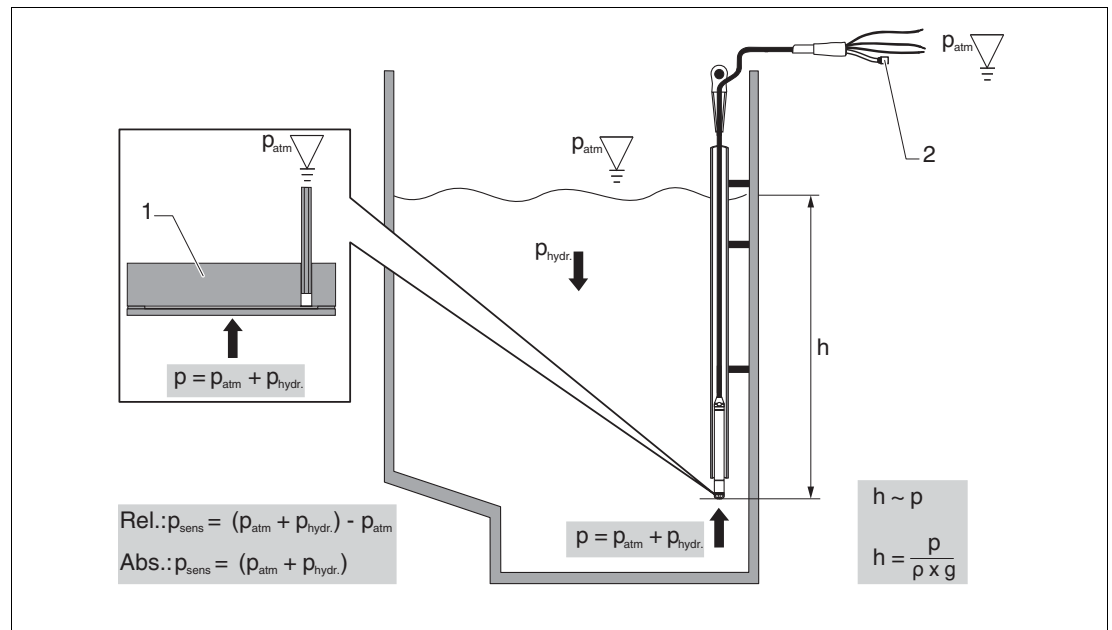


Figure 2.1

- 1 Ceramic measuring cell
- 2 Pressure compensation tube
- h Height level
- p Total pressure = atmospheric pressure + hydrostatic pressure
- r Density of the medium
- g Acceleration due to gravity
- $P_{hydr.}$ Hydrostatic pressure
- P_{atm} Atmospheric pressure
- P_{sens} Pressure displayed on the sensor

Temperature measurement with optional Pt100 resistance thermometer ¹

For simultaneous measurement of level and temperature, Pepperl+Fuchs offers the device with an optional 4-wire Pt100 resistance thermometer. The Pt100 resistance thermometer is categorized as Accuracy Class B as per DIN/EN 60751.

¹ Not for use in hazardous areas.

Temperature measurement with optional Pt100 resistance thermometer and HUT temperature head transmitter ¹

To convert the temperature signal to an analog, scalable 4 to 20 mA output signal, Pepperl+Fuchs also offers the HUT temperature head transmitter. Ordering information: product structure, feature "Accessories", option "XP".

2.3 Measuring System

Application Examples

As standard, the complete measuring system consists of a level probe and a transmitter power supply unit with a supply voltage of 10.5 to 30 V DC (hazardous areas) or 10.5 to 35 V DC (non-hazardous areas).

Possible measuring point solutions with a signal converter and evaluation device:

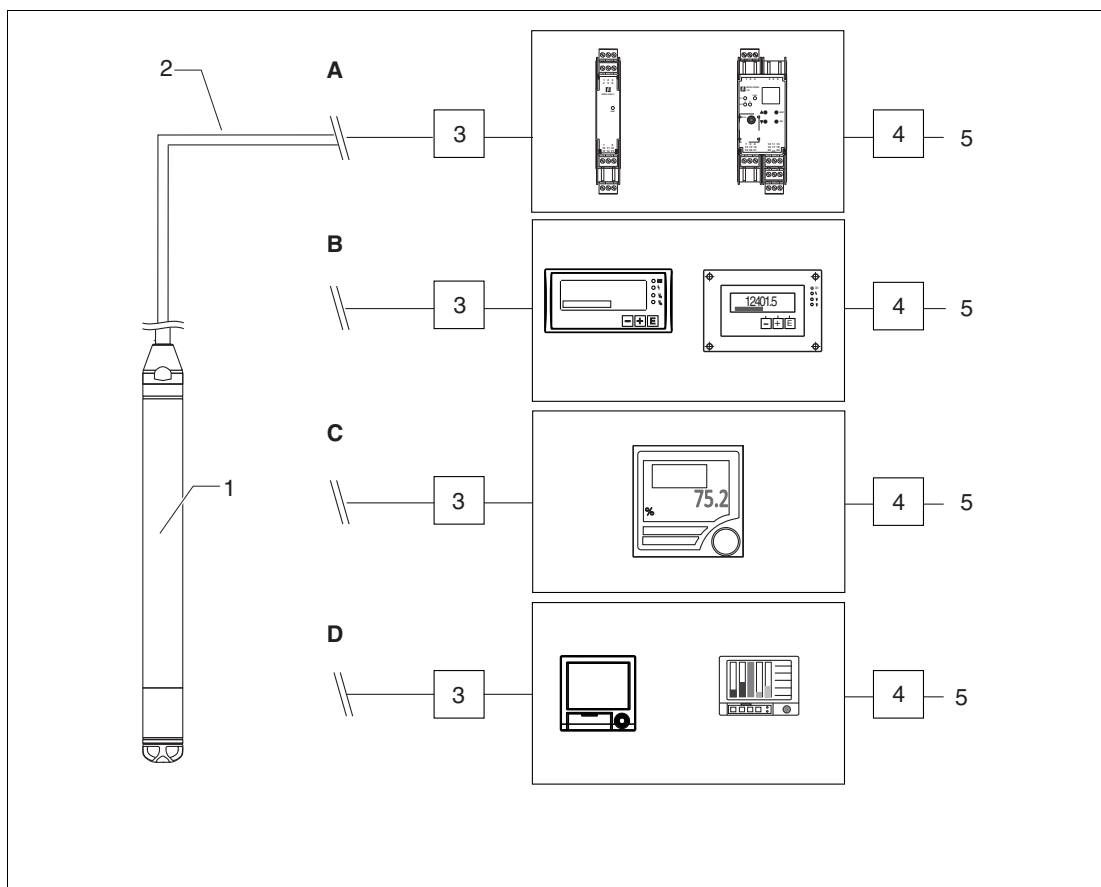


Figure 2.2

- 1 Level probe LGC
- 2 4 to 20 mA
- 3 and 4 Surge protection device, e. g. for DIN mounting rail mounting, selection in accordance with supply voltage, not for use in hazardous areas
- 5 Power supply

¹ Not for use in hazardous areas.

- A:** Easy and cost-effective measuring point solution: power supplied to the device in hazardous and non-hazardous areas via a transmitter power supply. Power supply and additional control of two appliances, such as pumps, via a trip amplifier with local display.
- B:** An evaluation device offers power supply, local display and two switch outputs.
- C:** If several pumps are used, the pump service life can be prolonged by alternate switching. With alternating pump control, the pump which was out of service for the longest period of time is switched on. Use a suitable evaluation device for this application.
- D:** State-of-the-art recording technology with graphic display recorders for documentation, monitoring, visualization and archiving purposes.

Application Examples with the Pt100 Resistance Thermometer

As standard, the complete measuring system consists of a level probe and a transmitter power supply unit with a supply voltage of 10.5 to 30 V DC (hazardous areas) or 10.5 to 35 V DC (non-hazardous areas).

Possible measuring point solutions with a signal converter and evaluation device:

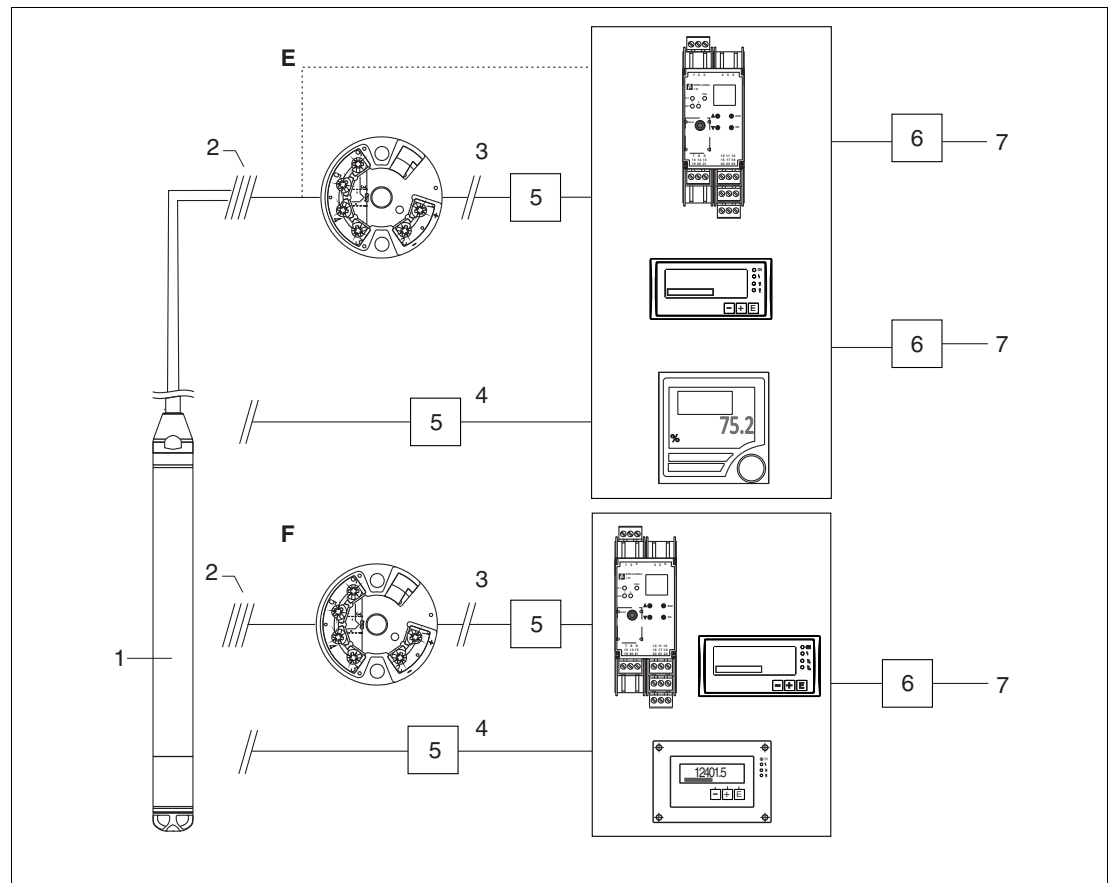


Figure 2.3



- 1 Level probe LGC
- 2 Connection for integrated Pt100 in the device
- 3 Temperature for 4 to 20 mA
- 4 Level for 4 to 20 mA
- 5 Surge protection device, e. g. on the sensor side for field installation: for DIN mounting rail mounting, selection in accordance with supply voltage, not for use in hazardous areas
- 6 Surge protection device, e. g. for DIN mounting rail mounting, selection in accordance with supply voltage, not for use in hazardous areas
- 7 Power supply

E: If you wish to measure, display and evaluate the temperature as well as the level, e. g. to monitor the temperature in fresh water for the purpose of detecting temperature limits for germ formation, the options available to you include the following: The optionally available HUT temperature head transmitter can convert the Pt100 signal into a 4 to 20 mA signal and transfer it to any commonly used evaluation device. Some evaluation devices also offer a direct input for the Pt100 signal.

F: If you wish to record and evaluate the level and temperature measured value with one device, use evaluation devices with two inputs. It is even possible to mathematically link the input signals with this unit.

2.4 Communication Protocol

4 to 20 mA Analog

Ordering information: product structure, feature "Electrical output", option "I2"

2.5 System Integration

The device can be given a tag name.

Ordering information: product structure, feature "Marking", option "I2"

3 Input

3.1 Measured Value

Level probe and Pt100 (optional)

- Hydrostatic pressure of a liquid
- Pt100: temperature

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

Temperature

3.2 Measuring Range

- Customer-specific measuring ranges or calibration that has been preset in the factory
- Temperature measurement of -10 to +70 °C (+14 to +158 °F) with Pt100 (optional)

Relative pressure

Measuring range [bar (psi)]	Lowest calibratable span ¹ [bar (psi)]	Vacuum resistance [bar _{abs} (psi _{abs})]	Option ²
0.1 (1.5)	0.01 (0.15)	0.3 (4.5)	R1A
0.2 (3.0)	0.02 (0.3)	0.3 (4.5)	R1C
0.4 (6.0)	0.04 (1.0)	0	R1D
0.6 (9.0)	0.06 (1.0)	0	R1E
1.0 (15.0)	0.1 (1.5)	0	R2A
2.0 (30.0)	0.2 (3.0)	0	R2C
4.0 (60.0)	0.4 (6.0)	0	R2D
10.0 (150) ³	1.0 (15)	0	R3A
20.0 (300) ³	2.0 (30)	0	R3C

Table 3.1

¹ Largest turn down that can be configured at the factory: 10:1, higher turn down can be configured on request.

² See ordering information: product structure, feature "Measuring range".

³ These measuring ranges are not available for the special version with plastic insulation, external diameter of 29 mm (1.14 inch).

Absolute pressure

Measuring range [bar (psi)]	Lowest calibratable span ¹ [bar (psi)]	Vacuum resistance [bar _{abs} (psi _{abs})]	Option ²
2.0 (30.0)	0.2 (3.0)	0	A2C
4.0 (60.0)	0.4 (6.0)	0	A2D
10.0 (150) ³	1.0 (15)	0	A3A
20.0 (300) ³	2.0 (30)	0	A5A

Table 3.2

¹ Largest turn down that can be configured at the factory: 10:1, higher turn down can be configured on request.

² See ordering information: product structure, feature "Measuring range".

³ These measuring ranges are not available for the special version with plastic insulation, external diameter of 29 mm (1.14 inch).



3.3 Input Signal

Level probe and Pt100 (optional)

- Change in capacitance
- Pt100: change in resistance

HUT temperature head transmitter (optional) for device with 4 ... 20 mA Analog

Pt100 resistance signal, 4-wire

4 Output

4.1 Output Signal

Level probe and Pt100 (optional)

- 4 to 20 mA Analog, 2-wire for hydrostatic pressure measured value.
Ordering information: product structure, feature "Electrical output", option "I2".
- Pt100: temperature-dependent resistance value

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

4 to 20 mA Analog for temperature measured value, 2-wire

4.2 Signal Range

3.8 to 20.5 mA

4.3 Maximum Load

The maximum load resistance depends on the supply voltage (U) and must be determined individually for each current loop, see formula and diagrams for device and temperature head transmitter. The total resistance resulting from the resistances of the connected devices, the connecting cable and, where applicable, the resistance of the probe connection may not exceed the load resistance value.

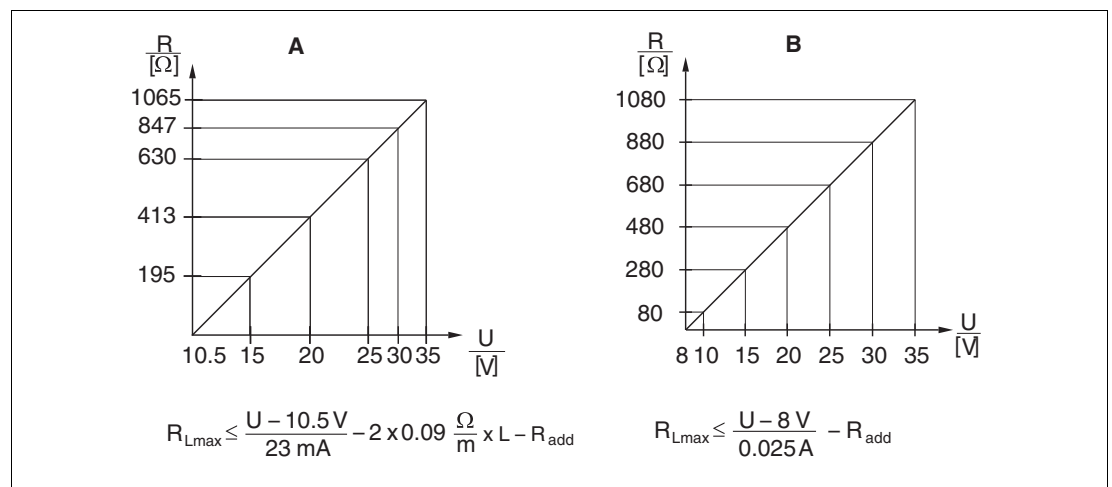


Figure 4.1

A Load diagram of the device for estimating the load resistance. Additional resistances, such as the resistance of the extension cable, have to be subtracted from the value calculated as shown in the equation.

B Load diagram for HUT temperature head transmitter for estimating the load resistance. Additional resistances must be subtracted from the value calculated as shown in the equation.

R_{Lmax} Max. load resistance [Ω]

R_{add} Additional resistances such as resistance of evaluating device and/or display unit, cable resistance [Ω]

U Supply voltage [V]

L Basic length of probe connection [m] (cable resistance per wire ≤ 0.09 Ω/m)



Note!

When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the instruction manuals or installation or control drawings (SI, ZD).

5 Supply



Warning!

Danger to life from wrong connection of the device

The electrical safety of the device is not guaranteed.

When using the measuring device in a hazardous area, the relevant national standards and guidelines as well as the instruction manuals (SI) or installation or control drawings (ZD) must be adhered to. All data relating to explosion protection can be found in separate documentation which is available on request. This documentation is supplied with the devices as standard, see chapter 15.

5.1 Supply voltage

Level probe and Pt100 (optional)

- 10.5 to 35 V DC (non-hazardous areas)
- 10.5 to 30 V DC (hazardous areas)

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

8 to 35 V DC

5.2 Power Consumption

Level probe and Pt100 (optional)

- ≤ 0.805 W at 35 V DC (non-hazardous areas)
- ≤ 0.690 W at 30 V DC (hazardous areas)

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

≤ 0.875 W at 35 V DC

5.3 Current Consumption

Level probe and Pt100 (optional)

- Max. current consumption: ≤ 23 mA
- Min. current consumption: ≥ 3.6 mA

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

- Max. current consumption: ≤ 25 mA
- Min. current consumption: ≥ 3.5 mA

5.4 Connecting the Device

- Device
Reverse polarity protection is integrated into the device and the temperature head transmitter. Changing the polarities will not result in damage to the devices.
- The cable must end in a dry room or a suitable terminal box. The terminal box (IP66/IP67) with GORETEX[®] filter from Pepperl+Fuchs is suitable for outdoor installation. The terminal box may be ordered as an accessory using the order code for the device, ordering information: product structure, feature "Accessories", option "SP".

The electrical connection is made with the corresponding wires of the probe cable and with the optional use of the terminal box and a power supply (e. g. transmitter power supply (see chapter 2.3)).

Level probe and Pt100

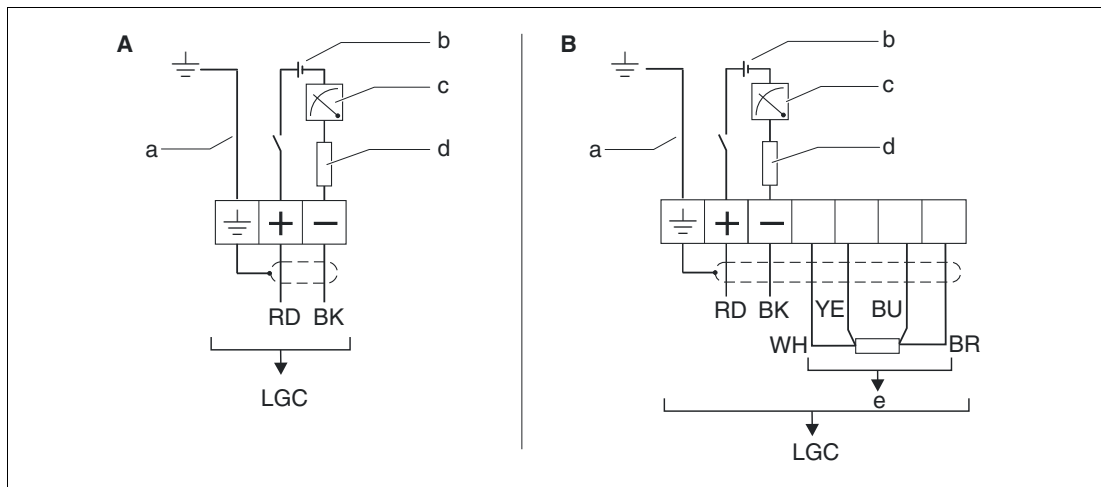


Figure 5.1

- A** Level probe LGC
- B** Level probe and Pt100 resistance thermometer (not for use in hazardous areas), ordering information, feature "Accessories", option "BN"
- a** Not for the level probe with external diameter of 29 mm (1.14 inch)
- b** 10.5 to 30 V DC (hazardous area), 10.5 to 35 V DC
- c** 4 to 20 mA
- d** Resistance (R_L)
- e** Pt100 resistance thermometer

Level probe with Pt100 and HUT temperature head transmitter for device with 4 to 20 mA Analog

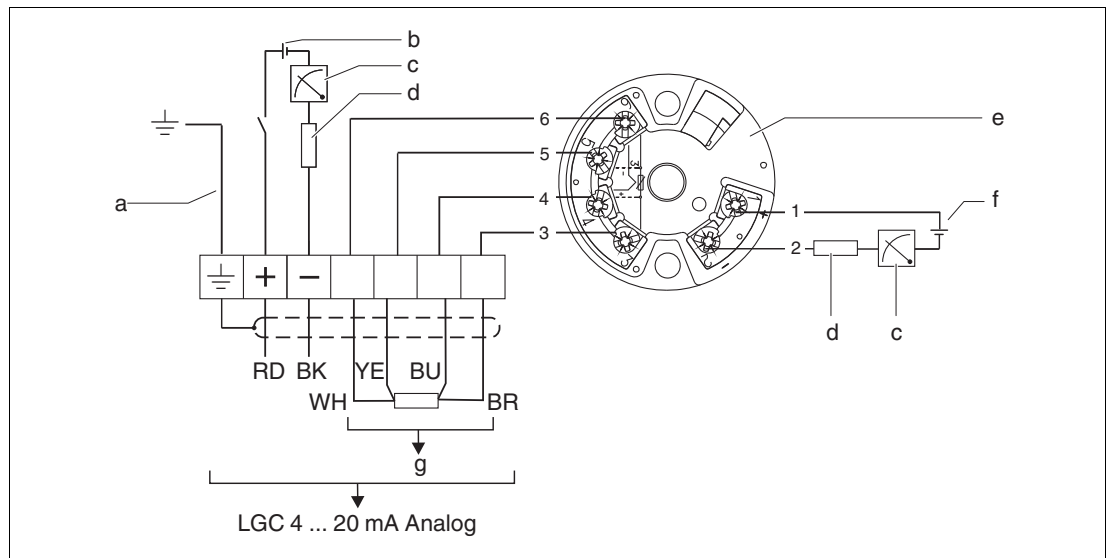


Figure 5.2

- a** Not for the level probe with external diameter of 29 mm (1.14 inch)
- b** 10.5 to 35 V DC
- c** 4 to 20 mA
- d** Resistance (R_L)
- e** Temperature head transmitter HUT (4 to 20 mA) (not for use in hazardous area)
- f** 8 to 35 V DC
- g** Pt100 resistance thermometer
- 1 to 6** Terminal assignment

Ordering information:

Pt100 resistance thermometer: product structure, feature "Accessories", option "BN".

HUT temperature head transmitter: product structure, feature "Accessories", option "XP"

Wire colors

RD = red, BK = black, WH = white, YE = yellow, BU = blue, BR = brown

Connection data

Connection classification as per IEC 61010-1:

- Overvoltage category 1
- Pollution level 1

Connection data in the hazardous area

See relevant instruction manuals (SI, ZD).

5.5 Terminals in the Terminal Box

- Three terminals as standard in the terminal box. The terminal box can optionally be ordered as an accessory.
- 4-terminal strip can be ordered as an accessory, cable cross section 0.08 to 2.5 mm² (28 to 14 AWG)



Note!

The 4-terminal strip is not designed for use in hazardous areas incl. CSA General Purpose.

5.6 Probe Connection (Extension Cable)

- Overall external diameter: 8 mm (0.31 inch) ±0.25 mm (0.01 inch)
- Pressure compensation tube with PTFE filter: external diameter 2.5 mm (0.1 inch), internal diameter 1.5 mm (0.06 inch)

Cross section

- Device: 3 x 0.2 mm² (3 x 26 AWG) and pressure compensation tube with PTFE filter
- Level probe and Pt100 (optional): 7 x 0.2 mm² (7 x 26 AWG) and pressure compensation tube with PTFE filter

5.7 Cable Resistance

per wire: ≤ 0.09 Ω/m

5.8 Cable Specifications

Pepperl+Fuchs recommends using shielded, twisted-pair two-wire cables.



Note!

The probe cables are shielded for device versions with outer diameters of 22 mm (0.87 inch) and 42 mm (1.65 inch).

Level probe and Pt100 (optional)

- Commercially available instrument cable
- Terminals, terminal box: 0.08 to 2.5 mm² (28 to 14 AWG)

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

- Commercially available instrument cable
- Terminals, terminal box: 0.08 to 2.5 mm² (28 to 14 AWG)
- Transmitter connection: max. 1.75 mm² (15 AWG)

5.9 Residual Ripple

Level probe and Pt100 (optional)

No impact on the 4 to 20 mA signal up to ±5 % residual ripple within the permitted voltage range.

HUT temperature head transmitter (optional)

$U_{SS} \geq 5 \text{ V}$ at $U \geq 13 \text{ V}$, $f_{max.} = 1 \text{ kHz}$

6 Performance Characteristics

6.1 Reference Conditions

Level probe and Pt100 (optional)

- As per IEC 60770
- Ambient temperature T_{amb} = constant, in the range: +21 to +33 °C (+70 to +91 °F)
- Humidity φ = constant, in the range: 20 to 80 % r.F
- Ambient pressure p_{amb} = constant, in the range: 860 to 1060 mbar (12.47 to 15.37 psi)
- Position of measuring cell constant, vertical in the range $\pm 1^\circ$
- Supply voltage constant: 21 V DC to 27 V DC
- Pt100: DIN EN 60770, $T_{amb} = +25^\circ\text{C}$ (+77 °F)

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

Calibration temperature +23 °C (+73 °F) ± 5 K

6.2 Reference Accuracy

Level probe and Pt100 (optional)

The reference accuracy comprises the non-linearity after limit point configuration, hysteresis and non-reproducibility in accordance IEC 60770.

Standard version ¹:

Setting ± 0.2 %

- to TD 5:1: < 0.2 % of set span
- from TD 5:1 to TD 20:1: $\pm(0.02 \times \text{TD} + 0.1)$

Platinum version ²:

Setting ± 0.1 % (optional)

- to TD 5:1: < 0.1 % of set span
- from TD 5:1 to TD 20:1: $\pm(0.02 \times \text{TD})$

Class B as per DIN EN 60751

Pt100: max. ± 1 K

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

- ± 0.2 K
- With Pt100: max. ± 0.9 K

¹ Ordering information: product structure, feature "Reference accuracy", option "G".

² Ordering information: product structure, feature "Reference accuracy", option "D".



6.3 Resolution

Current output: 1 μ A

6.4 Long-Term Stability

Level probe and Pt100 (optional)

- ≤ 0.1 % of URL/year
- ≤ 0.25 % of URL/5 years

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

≤ 0.1 K per year

6.5 Influence of Medium Temperature

- Thermal change in the zero output and the output span:
0 to +30 °C (+32 to +86 °F): $< (0.15 + 0.15 \times TD)$ % of set span
-10 to +70 °C (+14 to +158 °F): $< (0.4 + 0.4 \times TD)$ % of set span
- Temperature coefficient (T_K) of the zero output and the output span
-10 to +70 °C (+14 to +158 °F): 0.1 %/10 K of URL

6.6 Warm-up Period

Level probe and Pt100 (optional)

- Device: < 6 s
- Pt100: 20 m

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

4 s

6.7 Response Time

Level probe and Pt100 (optional)

- Device: 400 ms (T90 time), 500 ms (T99 time)
- Pt100: 160 s (T90 time), 300 s (T99 time)

7 Installation

7.1 Installation Instructions

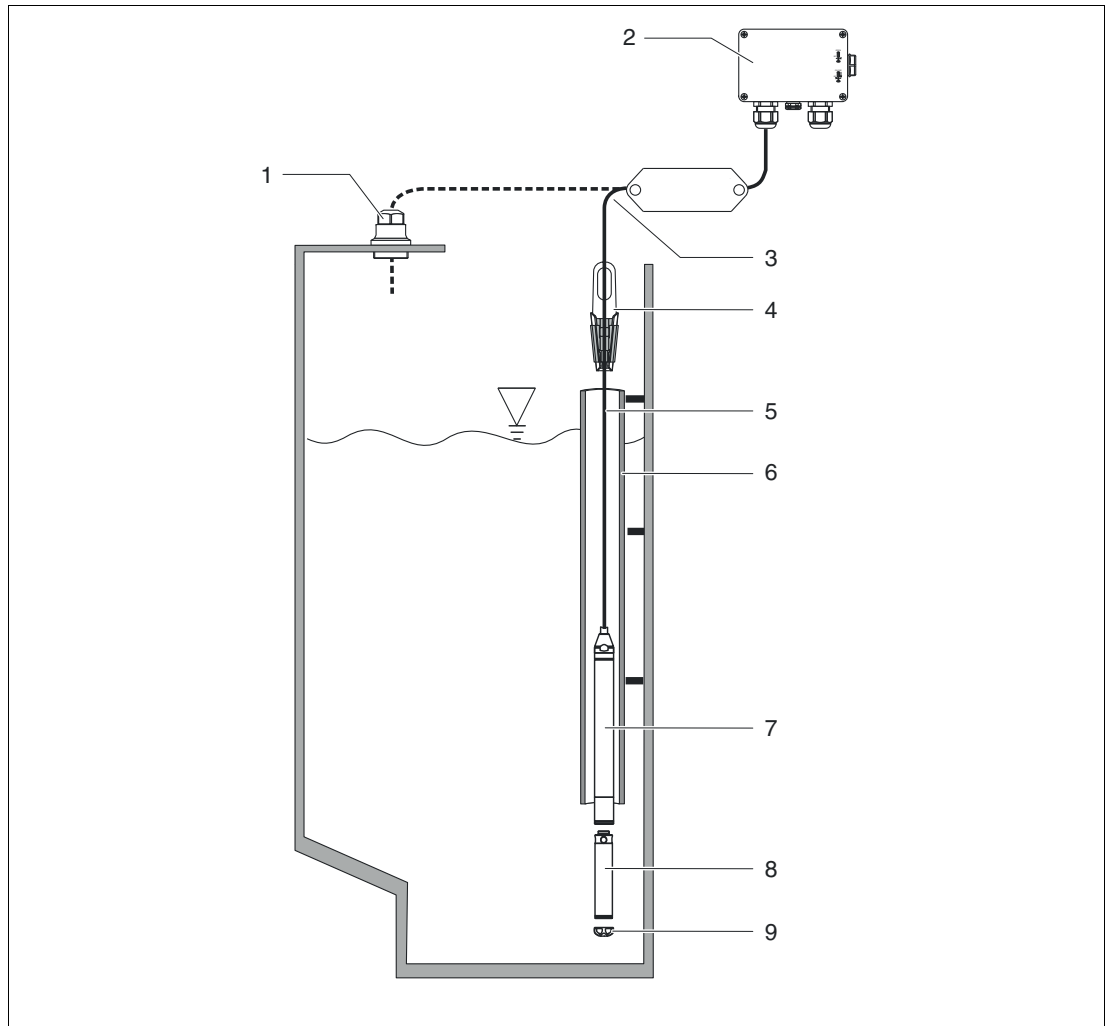


Figure 7.1

- 1 Cable mounting screw can be ordered as an accessory
- 2 Terminal box can be ordered as an accessory
- 3 Bending radius of extension cable > 120 mm (4.72 inch)
- 4 Mounting clamp can be ordered as an accessory
- 5 Probe connection (extension cable), cable length
- 6 Guide tube
- 7 Level probe LGC
- 8 Additional weight can be ordered as an accessory for the level probe with external diameter of 22 mm (0.87 inch) and 29 mm (1.14 inch)
- 9 Protection cap

7.2 Additional Installation Instructions

- Sideways movement of the level probe can result in measuring errors. For this reason, install the probe at a point free from flow and turbulence, or use a guide tube. The internal diameter of the guide tube should be at least 1 mm (0.04 inch) greater than the external diameter of the selected device.
- To avoid mechanical damage to the measuring cell, the device is equipped with a protection cap.
- The cable must end in a dry room or a suitable terminal box. The terminal box from Pepperl+Fuchs provides humidity and climatic protection and is suitable for installation outdoors, see chapter 14.
- Cable length tolerance: < 5 m (16 foot): ± 17.5 mm (0.69 inch); > 5 m (16 foot): ± 0.2 %
- If the cable is shortened, the filter at the pressure compensation tube must be reattached. Pepperl+Fuchs offers a cable shortening kit for this purpose, see chapter 14.
- Pepperl+Fuchs recommends using twisted, shielded cable.
- In shipbuilding applications, measures are required to restrict the spread of fire along cable looms.
- The length of the extension cable depends on the intended level zero point. The height of the protection cap must be taken into consideration when designing the layout of the measuring point. The level zero point (E) corresponds to the position of the process isolating diaphragm. Level zero point = E; tip of probe = L (see the following diagram). For dimensions, see chapter 10.

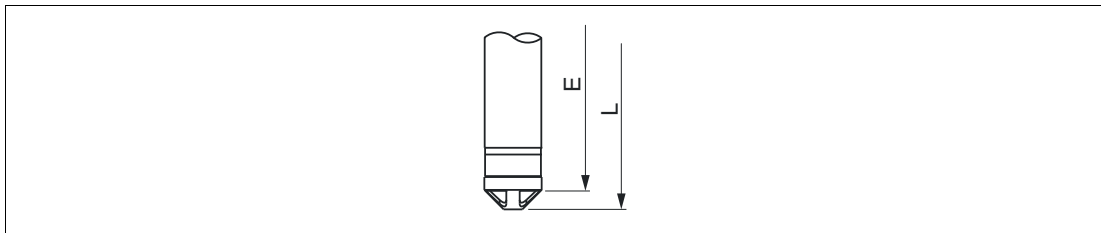


Figure 7.2

7.3 Cable Length

- Pay attention to the load.
- Cable lengths available for order
 - Customer-specific in meters or feet.
 - Limited cable length when performing installation with freely suspended device with cable mounting screw or mounting clamp, as well as for Ex approval: max. 300 m (984 foot).



Note!

When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the instruction manuals (SI) or Installation or Control Drawings (ZD).

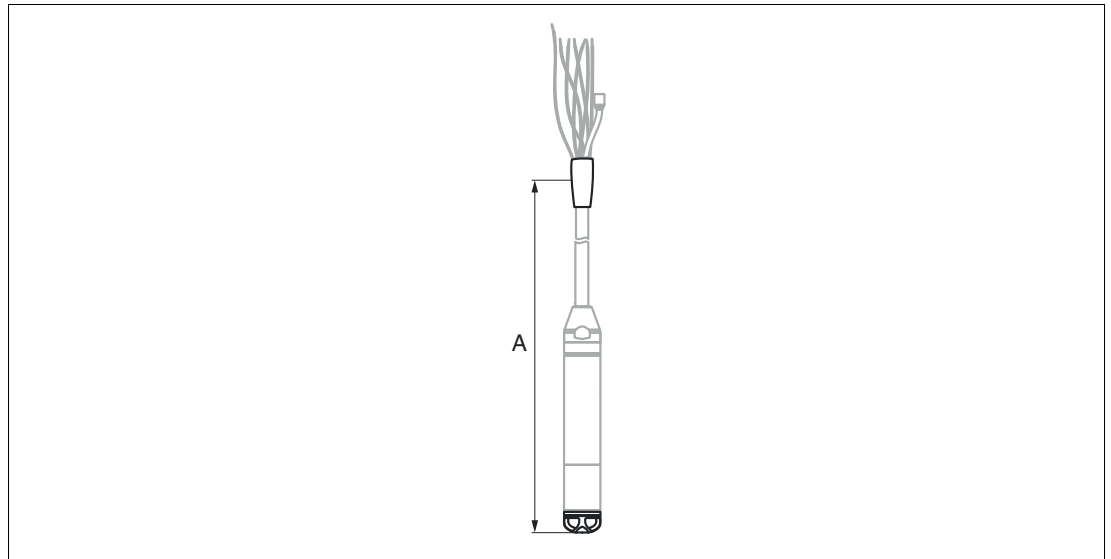


Figure 7.3

A Length of probe connection (extension cable)

Option ¹	Probe connection (extension cable)
2A	10 m cable, shortable, PE
2C	20 m cable, shortable, PE
2M	30 foot cable, shortable, PE
2N	60 foot cable, shortable, PE
3A	10 m cable, shortable, FEP
3C	20 m cable, shortable, FEP
3M	30 foot cable, shortable, FEP
3N	60 foot cable, shortable, FEP
CF	Specification in foot cable, shortable, FEP
CM	Specification in m cable, shortable, FEP
XF	Specification in foot cable, shortable, PE
XM	Specification in m cable, shortable, PE

Table 7.1

¹ Ordering information: product structure, feature "Probe connection"

7.4 Technical Data for Cable

- Minimum bending radius: 120 mm (4.72 inch)
- Tensile strength: max. 950 N (213.56 lbf)
- Cable extraction force (= tensile force required to extract the cable from the probe):
 - PE, FEP: typically ≥ 400 N (89.92 lbf)
 - when used in hazardous area: ≥ 100 N (73.75 lbf)
- UV-resistant (UV = ultraviolet)
- PE: for use in drinking water

7.5 Cable Marking



Figure 7.4

- To make installation easier, Pepperl+Fuchs marks the extension cable if a customer-specific length has been ordered.
Ordering information: product structure, feature "Service", option "RI" or "SI".
- Cable marking tolerance (distance to lower end of level probe):
Cable length < 5 m (16 foot): ± 17.5 mm (0.69 inch)
Cable length > 5 m (16 foot): ± 0.2 %
- Material: PET, stick-on label: acrylic
- Immunity to temperature change: -30 to +100 °C (-22 to +212 °F)



Note!

The marking is used exclusively for installation purposes. The mark must be thoroughly removed without trace in the case of devices with drinking water approval. The extension cable must not be damaged in the process.

Not for use of the device in hazardous areas.

7.6 Cable Shortening Kit

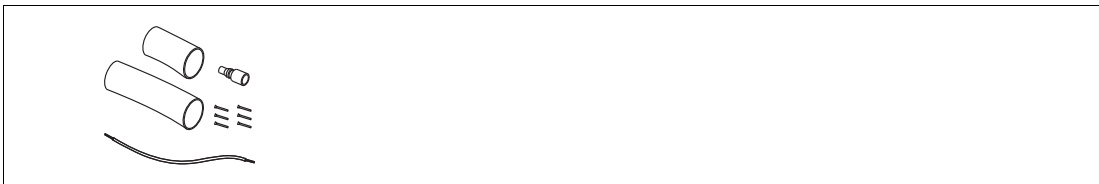


Figure 7.5

The cable shortening kit is used to shorten a cable easily and professionally.



Note!

The cable shortening kit is not designed for the device with FM/CSA approval.

Ordering information: product structure, feature "Accessories", option "WP"

8 Ambient Conditions

8.1 Ambient Temperature Range

Level probe and Pt100 (optional)

- With external diameter of 22 mm (0.87 inch) and 42 mm (1.65 inch):
-10 to +70 °C (+14 to +158 °F) (= medium temperature)
- With external diameter of 29 mm (1.14 inch):
0 to +50 °C (+32 to +122 °F) (= medium temperature)

Probe connection (extension cable)

(when mounted in a fixed position)

- With PE: -30 to +70 °C (-22 to +158 °F)
- With FEP: -40 to +70 °C (-40 to +158 °F)

Terminal box

-40 to +80 °C (-40 to +176 °F)

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

-40 to +85 °C (-40 to +185 °F)

Temperature head transmitter 2-wire, configured for a measuring range of -20 to +80 °C (-4 to +176 °F). This configuration offers a temperature range of 100 K which can be easily mapped. Please note that the Pt100 resistance thermometer is suitable for a temperature range of -10 to +70 °C (14 to +158 °F).



Note!

The temperature head transmitter is not designed for use in hazardous areas incl. CSA General Purpose.

8.2 Storage Temperature Range

Level probe and Pt100 (optional)

-40 to +80 °C (-40 to +176 °F)

Probe connection (extension cable)

(when mounted in a fixed position)

- With PE: -30 to +70 °C (-22 to +158 °F)
- With FEP: -30 to +80 °C (-22 to +176 °F)

Terminal box

-40 to +80 °C (-40 to +176 °F)

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

-40 to +100 °C (-40 to +212 °F)

8.3 Degree of Protection

Level probe and Pt100 (optional)

IP68, permanently hermetically sealed at 20 bar (290 psi) (~200 m H₂O)

Terminal box (optional)

IP66, IP67

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

IP00, condensation permitted

When installed in the optional terminal boxes: IP66/IP67

8.4 Electromagnetic Compatibility (EMC)

Level probe and Pt100 (optional)

- EMC in accordance with all relevant requirements of EN 61326 series. For details, refer to the Declaration of Conformity.
- Maximum deviation: < 0.5 % of span.

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

Interference emission to EN 61326 Class B equipment, interference immunity to EN 61326 Appendix A (Industrial). For details, refer to the Declaration of Conformity.

8.5 Surge Protection

Level probe and Pt100 (optional)

- Integrated overvoltage protection as per EN 61000-4-5 (500 V symmetrical/1000 V asymmetrical)
- Overvoltage protection ≥ 1.0 kV, external if necessary

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

Provide overvoltage protection, externally if necessary, see chapter 2.3.

9 Process Conditions

9.1 Medium Temperature Range

Level probe and Pt100 (optional)

- With external diameter of 22 mm (0.87 inch) and 42 mm (1.65 inch):
-10 to +70 °C (+14 to +158 °F)
- With external diameter of 29 mm (1.14 inch):
0 to +50 °C (+32 to +122 °F)

HUT temperature head transmitter (optional) for device with 4 to 20 mA Analog

-40 to +85 °C (-40 to +185 °F) (= ambient temperature), install temperature head transmitter outside the medium.

Temperature head transmitter 2-wire, configured for a measuring range of -20 to +80 °C (-4 to +176 °F). This configuration offers a temperature range of 100 K which can be easily mapped. Please note that the Pt100 resistance thermometer is suitable for a temperature range of -10 to +70 °C (14 to +158 °F).



Note!

The temperature head transmitter is not designed for use in hazardous areas incl. CSA General Purpose.

9.2 Medium Temperature Limit

Level probe and Pt100 (optional)

With external diameter of 22 mm (0.87 inch) and 42 mm (1.65 inch): -20 to +70 °C (-4 to +158 °F)



Note!

In hazardous area incl. CSA General Purpose, the medium temperature limit is -10 to +70 °C (+14 to +158 °F).

With external diameter of 29 mm (1.14 inch): 0 to +50 °C (+32 to +122 °F)



Note!

The device may be operated in this temperature range. The specification values, such as accuracy, may be exceeded.

10 Mechanical Construction

10.1 Dimensions of the Level Probe

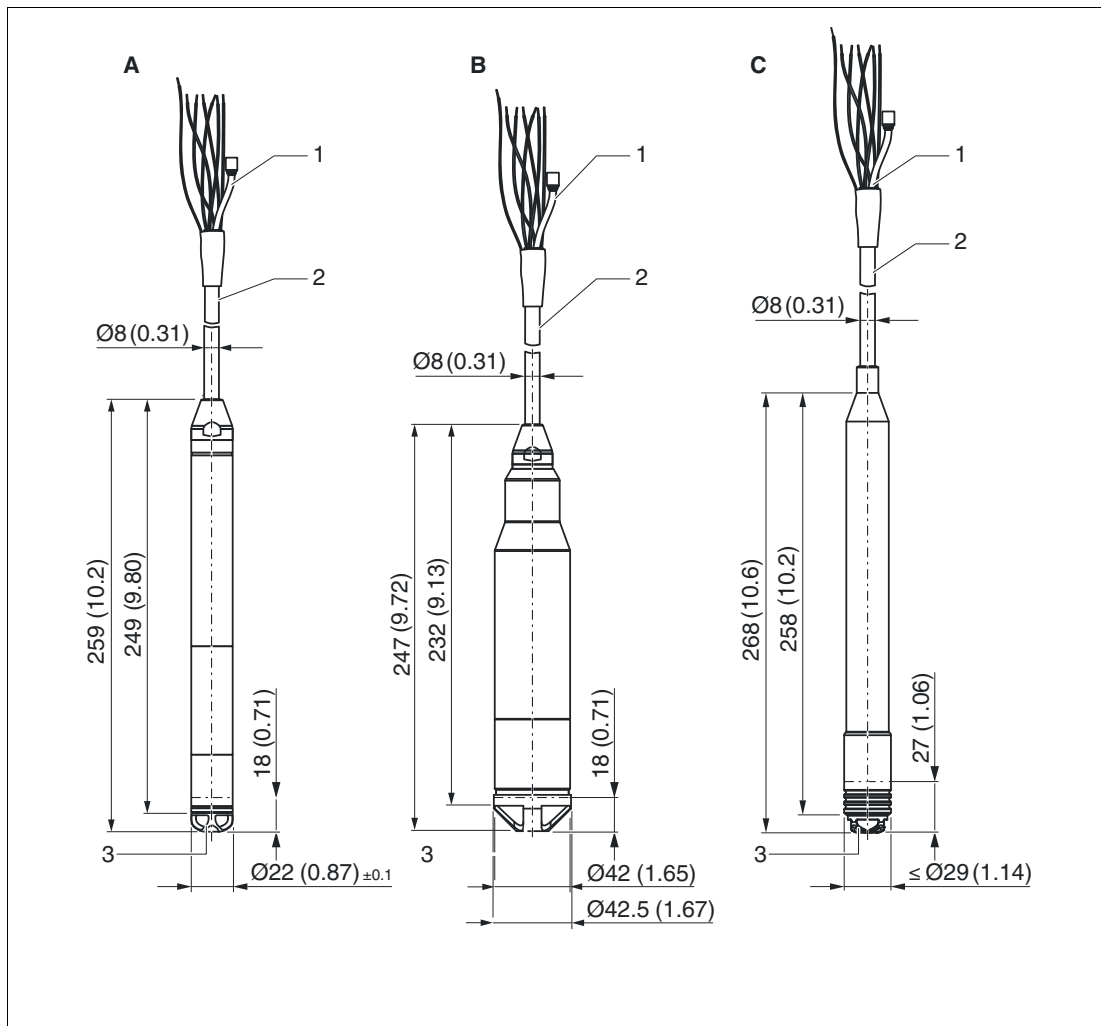


Figure 10.1

- A** Ordering information: product structure, feature "Probe tube", option "S" or "Accessories"
 - B** Ordering information: product structure, feature "Probe tube", option "R"
 - C** Ordering information: product structure, feature "Probe tube", option "P"
 - 1** Pressure compensation tube
 - 2** Probe connection (extension cable)
 - 3** Protection cap
- Measuring unit mm (inch)

10.2 Dimensions of the Suspension Clamp

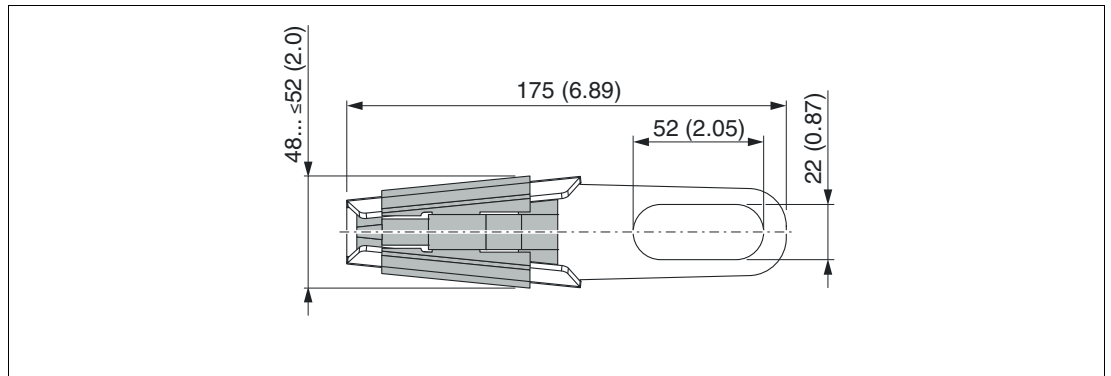


Figure 10.2

Ordering information: product structure, feature "Accessories", option "OP"
Measuring unit mm (inch)

10.3 Dimensions of Cable Mounting Screw

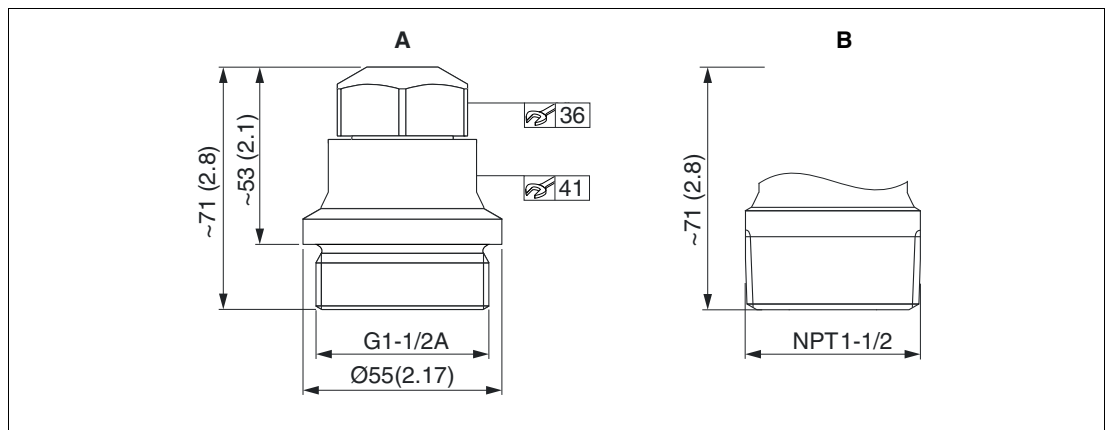


Figure 10.3

- A** G1-1/2A, ordering information: product structure, feature "Accessories", option "PQ"
 - B** NPT1-1/2, ordering information: product structure, feature "Accessories", option "PR"
- Measuring unit mm (inch)



Note!
Use only in unpressurized vessels.

10.4 Dimensions of Terminal Box IP66, IP67 with Filter

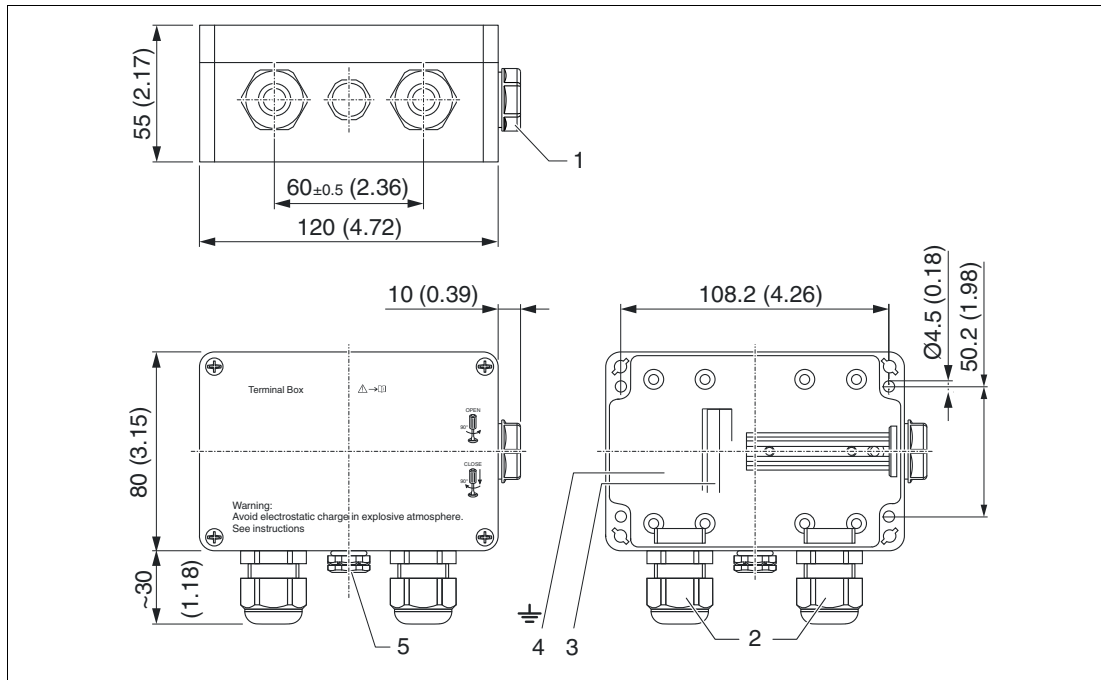


Figure 10.4

- 1 Stopping plug M20 x 1.5
 - 2 Cable gland M20 x 1.5
 - 3 4 to 20 mA; terminals for 0.08 to 2.5 mm (28 to 14 AWG) 0.08 to 2.5 mm²
 - 4 Ground connection; terminals for 0.08 to 2.5 mm (28 to 14 AWG) 0.08 to 2.5 mm²
 - 5 GORE-TEX[®] filter
- Measuring unit mm (inch)

Terminal box IP66/IP67 with GORE-TEX[®] filter incl. 3 installed terminals. The terminal box is also suitable for the installation of a temperature head transmitter or four other terminals.

Ordering information:

- Terminal box: product structure, feature "Accessories", option "SP", see chapter 14
- HUT temperature head transmitter: product structure, feature "Accessories", option "XP", see chapter 14



Note!

The terminal box is not designed for the device with type of protection Ex nA in hazardous areas. If the terminal box is used in a hazardous area, the Safety Instructions of the relevant device must be observed, as well as the applicable regulations for explosion protection.

If the device with optional Pt100 is supplied, a terminal block is provided with the terminal box for the purpose of wiring the Pt100.



Note!

The 4-terminal block is not designed for use in hazardous areas incl. CSA General Purpose.

10.5 Dimensions of the HUT Temperature Head Transmitter

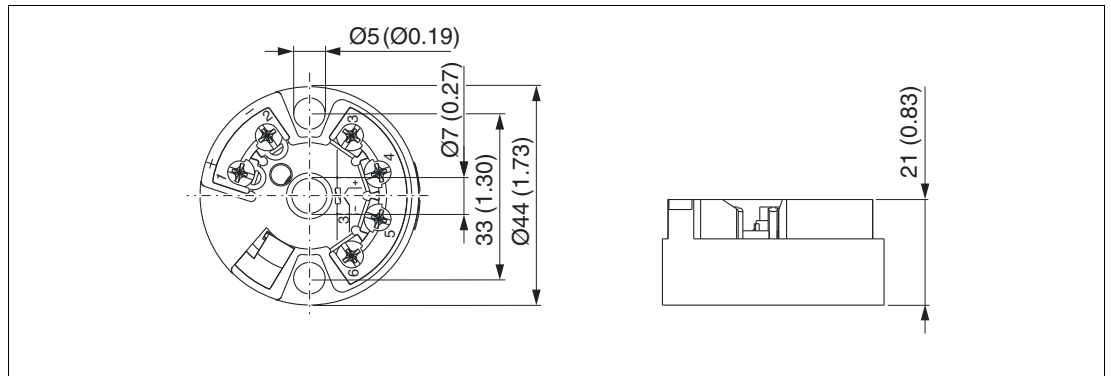


Figure 10.5

Measurement unit mm (inch)

Ordering information: product structure, feature "Accessories", option "XP", see chapter 14

10.6 Terminal Box with Integrated HUT Temperature Head Transmitter

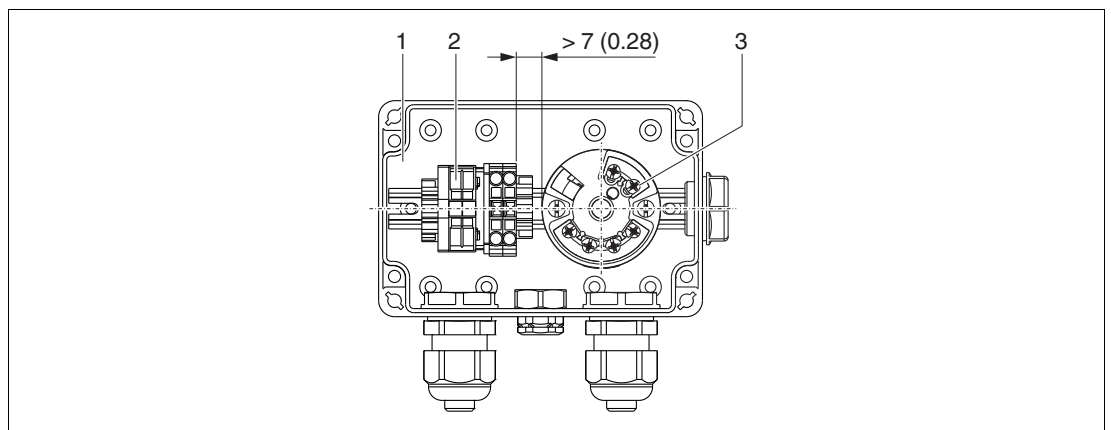


Figure 10.6

- 1 Terminal box
- 2 Terminal block/terminals
- 3 Temperature head transmitter HUT

Measuring unit mm (inch)



Note!

A distance of > 7 mm (0.28 inch) must be maintained between the terminal block and the HUT temperature head transmitter.

10.7 Additional Weight

For device with external diameter of 22 mm (0.87 inch) or 29 mm (1.14 inch)

- Pepperl+Fuchs offers additional weights to prevent sideways movement that results in measuring errors, or to make it easier to lower the device in a guide tube. You can screw several weights together. The weights are screwed directly onto the device. For the device with external diameter of 29 mm (1.14 in), a maximum of 5 weights may be screwed on. In conjunction with the Ex nA approval, a maximum of one additional weight is permitted for the device with external diameter of 29 mm (1.14 in).
- Ordering information: product structure, feature "Accessories", option "UP"

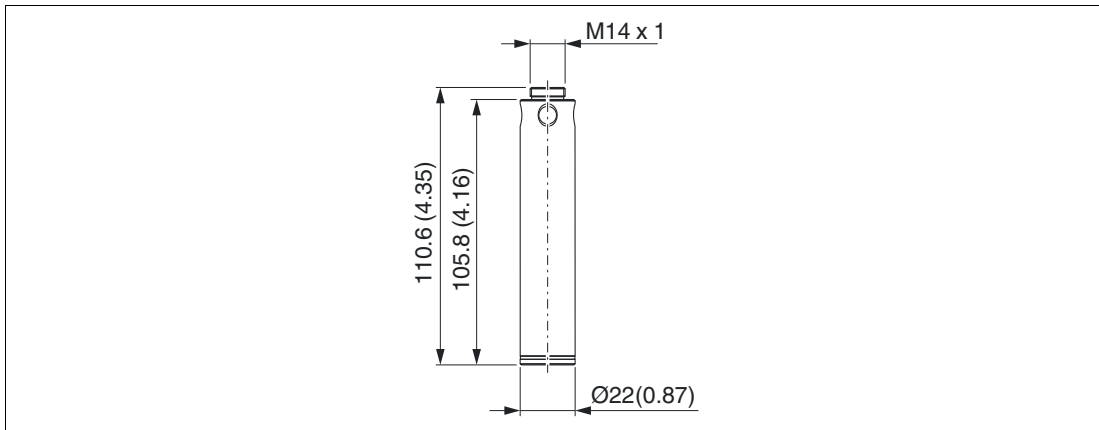


Figure 10.7

Measuring unit mm (inch)

10.8 Testing Adapter

For device with external diameter of 22 mm (0.87 inch) or 29 mm (1.14 inch)

- Pepperl+Fuchs offers a testing adapter to ease function-testing of the level probes.
- Observe the maximum pressure for compressed air hose and maximum overload for level probe, see chapter 3.
- Maximum pressure for the quick coupling piece provided: 10 bar (145 psi)
- Adapter material: 304 (1.4301)
- Material of quick coupling piece: anodized aluminum
- Ordering information: product structure, feature "Accessories", option "VP"

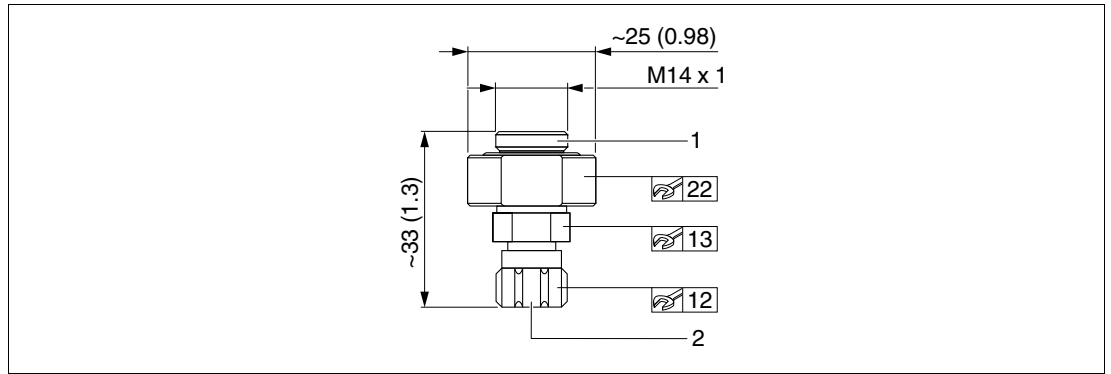


Figure 10.8

- 1 LGC level probe connection
 - 2 Compressed air hose connection, internal diameter, quick coupling piece
4 mm (0.16 inch)
- Measuring unit mm (inch)

10.9 Weight

Component		Weight
Level probe, external diameter of 22 mm (0.87 inch)		344 g
Level probe, external diameter of 42 mm (1.65 inch)		1376 g
Level probe, external diameter of 29 mm (1.14 inch)		394 g
Probe connection (extension cable)	PE	52 g/m (0.035 lbs/foot)
	FEP	108 g/m (0.072 lbs/foot)
Suspension clamp		170 g
Cable mounting screw G1-1/2A		770 g
Cable mounting screw NPT1-1/2		724 g
Terminal box		235 g
HUT temperature head trasnmitter		40 g
Additional weight		300 g
Testing adapter		39 g

Table 10.1

10.10 Materials

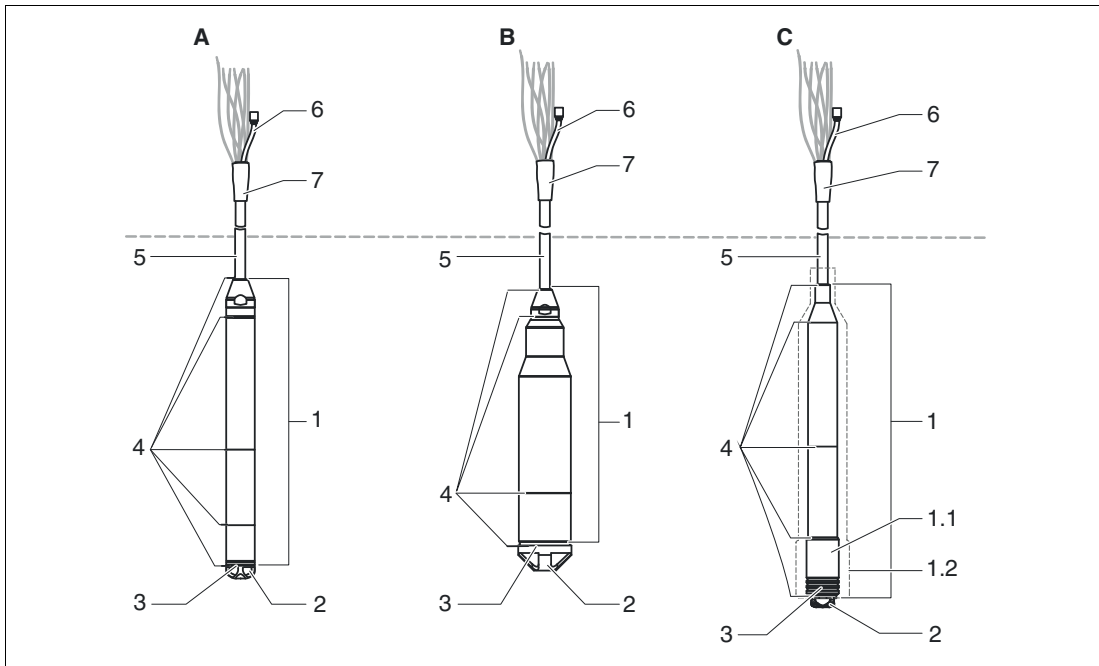


Figure 10.9

Materials in contact with process

Position	Component	Material
1	<ul style="list-style-type: none"> A: Level probe, external diameter of 22 mm (0.87 inch) B: Level probe, external diameter of 42 mm (1.65 inch) C: Level probe, external diameter of max. 29 mm (1.14 inch) 	316L (1.4404/1.4435)
1.1	Sensor sleeve	PPS (Polyphenylene sulfide)
1.2	Heat-shrink tube	Polyolefin and hot melt adhesive
	The heat-shrink tube around the level probe acts as insulation. It prevents electrical contact between the level probe and the tank. Electrochemical corrosion is thus avoided.	
2	Protection cap for A and C: with outer diameter 22 mm (0.87 inch) and 29 mm (1.14 inch) Protection cap for B: device with outer diameter 42 mm (1.65 inch)	POM PFA
3	Process ceramic	Al ₂ O ₃ (Aluminum oxide ceramic)
4	Seal	EPDM ¹ FKM Viton ²
5	Probe connection insulation (extension cable) Additional information	Choose from: <ul style="list-style-type: none"> PE-LD (low-density polyethylene) FEP (fluorinated ethylene propylene)

Table 10.2

¹ Product structure, feature "Seal", option "2"

² Product structure, feature "Seal", option "1"

Materials not in contact with process

Position	Component	Material
6	Pressure compensation tube	PA
7	Heat-shrink tube	Polyolefin

Table 10.3

Terminal box (not in contact with process)

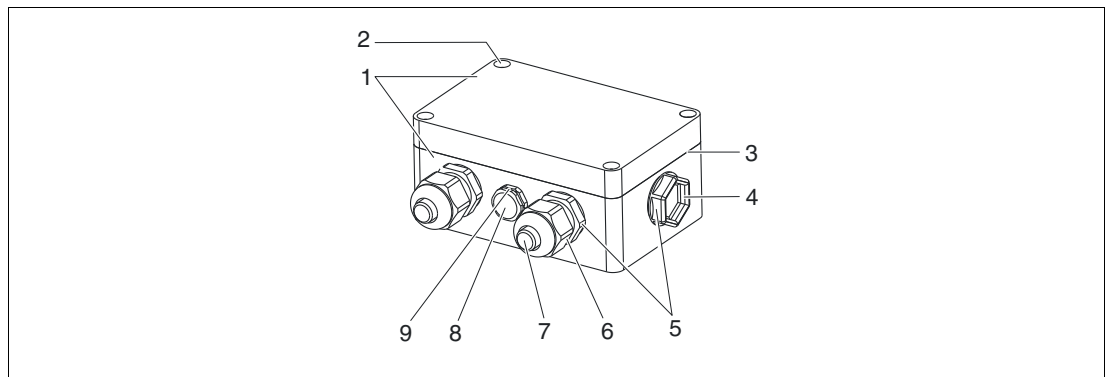


Figure 10.10

- 1 Housing, PC
- 2 Mounting screws (4 x), A2
- 3 Seal, CR (chloropren rubber)
- 4 Stopping plug M20 x 1.5, PBT-GF30
- 5 Cable gland M20 x 1.5, PE-HD
- 6 Cable gland M20 x 1.5, PA6
- 7 Cable gland M20 x 1.5, PA6-GF30
- 8 Pressure compensation filter, PA6-GF10, ePTFE
- 9 Pressure compensation filter O-ring, silicone (VMQ)

Cable mounting screw (not in contact with process)

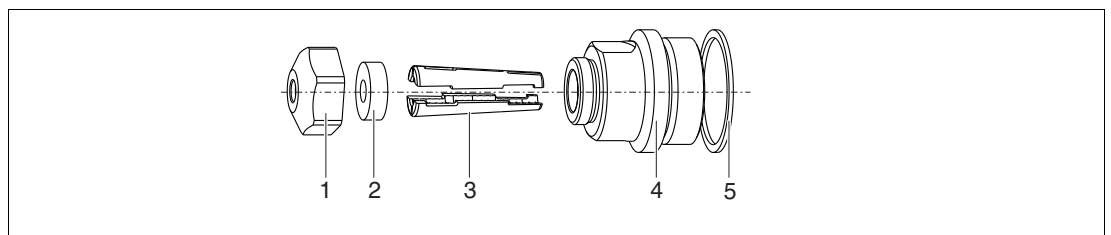


Figure 10.11

- 1 Cover for cable mounting screw, 1.4301/304
- 2 Sealing ring, NBR
- 3 Clamping sleeves, PA66-GF35
- 4 Adapter for cable mounting screw G1-1/2A, NPT1-1/2, 1.4301/304
- 5 Seal, only for G1-1/2A, EPDM



Suspension clamp

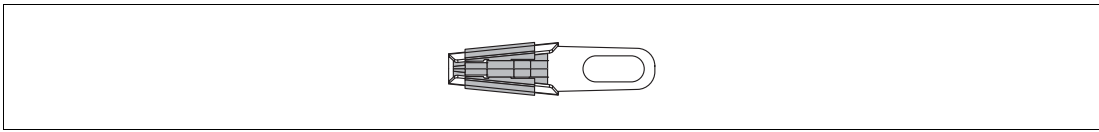


Figure 10.12

1.4404/316L and fiber-glass reinforced PA (polyamide)

Additional weight

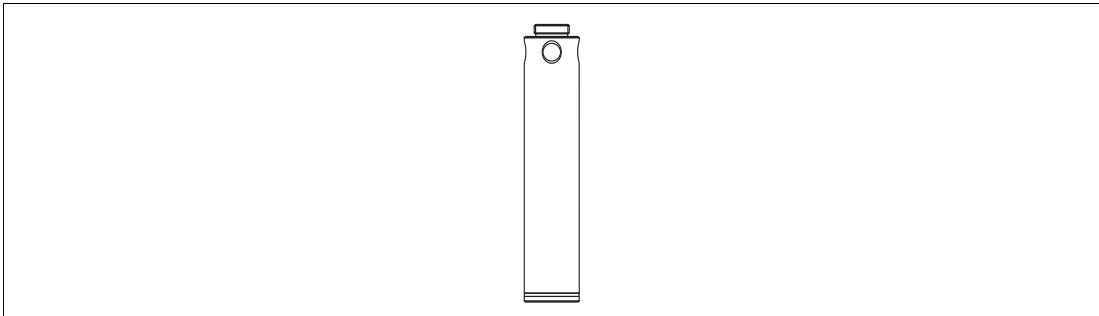


Figure 10.13

1.4435/316L

Testing adapter for device with outer diameter 22 mm (0.87 inch) or 29 mm (1.14 inch)

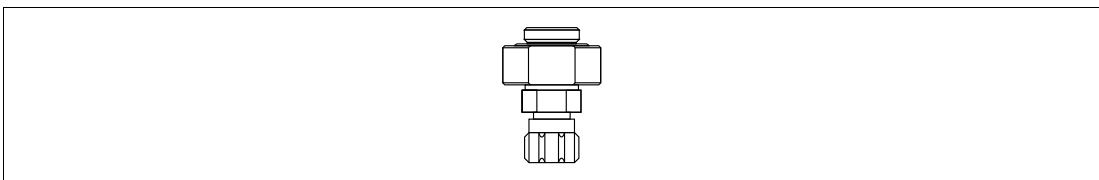


Figure 10.14

Adapter, 1.4301/304

Quick coupling piece, anodized aluminum



Testing adapter for device with outer diameter 42 mm (1.65 inch)

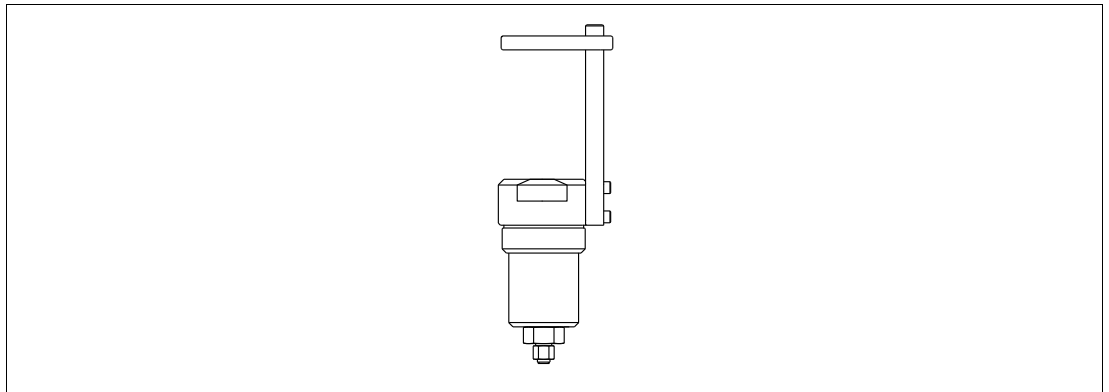


Figure 10.15

Adapter, 1.4301/304

Quick coupling piece, anodized aluminum

Probe connection (extension cable)

PE	FEP
<ul style="list-style-type: none"> • Abrasion-resistant extension cable with strain relief members made of high-strength PE fibers • Shielded (aluminum) • Insulated with polyethylene (PE), black • Copper wires, twisted • Pressure compensation tube with PTFE filter 	<ul style="list-style-type: none"> • Abrasion-resistant extension cable • Shielded with galvanized steel wire netting • Insulated with fluorinated ethylene propylene (FEP), black • Copper wires, twisted • Pressure compensation tube with PTFE filter

Table 10.4



11 Operation

No display or other operation facility is required to operate the device. However, the measured values can be read out with optional evaluation devices.

12 Certificates and Approvals



Note!

The following documents are also available in the download area of the Pepperl+Fuchs website: www.pepperl-fuchs.com

12.1 CE Mark

The device meets the legal requirements of the relevant EU directives. Pepperl+Fuchs confirms that the device has been successfully tested by applying the CE mark.

12.2 Approvals for hazardous area

- ATEX
- CSA C/US
- FM
- IEC



Note!

- The approvals apply exclusively to the device without Pt100 resistance thermometer and without HUT temperature head transmitter.
- The device is only available for use in hazardous areas with the FKM Viton seal.
- All explosion protection data are given in separate documentation which is available upon request. Ex documentation is included with all Ex devices as standard, see chapter 15.

12.3 Potable Water Approval

For device with an external diameter of 22 mm (0.87 inch) with EPDM seal

Designation	Option ¹
KTW	QL
NSF61	RL

Table 12.1

¹ Ordering information: product structure, feature "Other approval"

12.4 Other Standards and Guidelines

The applicable European guidelines and standards can be found in the relevant certificates. The following were also applied:

IEC/EN 60770:

Transmitters for use in industrial process control systems part 1: Methods for performance evaluation

Methods for evaluating the performance of transmitters for control and regulation in industrial process control systems.

DIN 16086:

Electrical pressure measuring instruments, pressure sensors, pressure transmitters, pressure measuring instruments, concepts, specifications on data sheets

Procedure for writing specifications in data sheets for electrical pressure measuring instruments, pressure sensors and pressure transmitters.

EN 61326:

Electrical equipment for measurement, control and laboratory use - EMC requirements

IEC/EN 61010-1:

Protection Measures for Electrical Equipment for Measurement, Control, Regulation and Laboratory Procedures

EN 60529:

Degrees of protection provided by enclosures (IP code)

12.5

Calibration

Designation	Option ¹
Factory calibration certificate, 5-point	1F

Table 12.2

¹ Ordering information: product structure, feature "Calibration"

12.6

Calibration, Unit

Designation	Option ¹
Sensor range, %	A
Sensor range, mbar/bar	B
Sensor range, kPa/MPa	C
Sensor range, mm H2O/m H2O	D
Sensor range, inch H2O/foot H2O	E
Sensor range, psi	F
Customized pressure, see additional specification	J

Table 12.3

¹ Ordering information: product structure, feature "Calibration, Unit"

12.7

Service

Designation	Option ¹
in m cable marking > installation, according to specification: 2 ... 299 m	RI
in foot cable marking > installation, according to specification: 6 ... 982 foot	SI
Special version	XX

Table 12.4

¹ Ordering information: product structure, feature "Service"

13 Ordering Information

13.1 Product Structure



Note!

This overview does not mark options which are mutually exclusive.

Option with * = on request/in preparation

Option with ** = multiple options can be selected

Device	
LGC2	Level probe

Reference accuracy	
D	Platinum, accuracy 0.1 %
G	Standard, accuracy 0.2 %

Probe tube	
P	Ø29 mm, PPS/Polyolefin, application salt-water
R	Ø42 mm, 1.4435/316L, flush mount
S	Ø22 mm, 1.4435/316L
X	Special version

Measuring range	
R1A	100 mbar/10 kPa/1.5 psi relative, 1 m H2O/3 foot H2O/40 inch H2O
R1C	200 mbar/20 kPa/3 psi relative, 2 m H2O/6 foot H2O/80 inch H2O
R1D	400 mbar/40 kPa/6 psi relative, 4 m H2O/13 foot H2O/160 inch H2O
R1E	600 mbar/60 kPa/9 psi relative, 6 m H2O/20 foot H2O/240 inch H2O
R2A	1 bar/100 kPa/15 psi relative, 10 m H2O/33 foot H2O/400 inch H2O
R2C	2 bar/200 kPa/30 psi relative, 20 m H2O/67 foot H2O/800 inch H2O
R2D	4 bar/400 kPa/60 psi relative, 40 m H2O/133 foot H2O/1600 inch H2O
R3A	10 bar/1 MPa/150 psi relative, 100 m H2O/333 foot H2O/4000 inch H2O
R3C	20 bar/2 MPa/300 psi relative, 200 m H2O/667 foot H2O/8000 inch H2O
A2C	2 bar/200 kPa/30 psi absolute, 20 m H2O/67 foot H2O/800 inch H2O
A2D	4 bar/400 kPa/60 psi absolute, 40 m H2O/133 foot H2O/1600 inch H2O
A3A	10 bar/1 MPa/150 psi absolute, 100 m H2O/333 foot H2O/4000 inch H2O
A5A	20 bar/2 MPa/300 psi absolute, 200 m H2O/667 foot H2O/8000 inch H2O
XXX	Special version

Electrical output	
I2	2-wire, 4 to 20 mA

Seal	
1	Measurement cell sealing: FKM Viton
2	Measurement cell sealing: EPDM

Probe connection (extension cable)	
2A	10 m cable, shortable, PE
2C	20 m cable, shortable, PE
2M	30 foot cable, shortable, PE
2N	60 foot cable, shortable, PE
3A	10 m cable, shortable, FEP
3C	20 m cable, shortable, FEP
3M	30 foot cable, shortable, FEP
3N	60 foot cable, shortable, FEP
CF	Specification in foot cable, shortable, FEP
CM	Specification in m cable, shortable, FEP
XF	Specification in foot cable, shortable, PE
XM	Specification in m cable, shortable, PE
XX	Special version

Calibration, unit	
A	Sensor range, %
B	Sensor range, mbar/bar
C	Sensor range, kPa/MPa
D	Sensor range, mm H ₂ O/m H ₂ O
E	Sensor range, inch H ₂ O/foot H ₂ O
F	Sensor range, psi
J	Customized pressure
X	Special version

Approval	
C1	CSA C/US IS Cl. I Div. 1 Group A-D, Ex ia, Zone 1
CG	CSA General Purpose
E3	ATEX II 3G Ex nA IIC T6...T4 Gc
EX	ATEX II 2G Ex ia IIC T6...T4 Gb
F1	FM IS Cl. I Div. 1 Group A-D, AEx ia, Zone 1
IC	IEC Ex ia IIC T6...T4 Gb
NA	Version for non-hazardous area

Other approval	
NA	Without potable water approval
QL	KTW potable water approval
RL	NSF potable water approval

Probe connection length	
L	Specified length of the cable: <ul style="list-style-type: none"> Options CF, XF: 3 to 985 foot Options CM, XM: 1 to 300 m

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Additional Options

Calibration	
1F	Factory calibration certificate, 5-point

Service	
RI	Cable marking > installation, specification in m: 2 to 299 m
SI	Cable marking > installation, specification in foot: 6 to 982 foot
XX	Special version

Accessories	
BN	Pt100 resistance thermometer, 4-wire
OP	Suspension clamp, 316L
QP	Cable mounting screw G1-1/2, 304
RP	Cable mounting screw NPT1-1/2, 304
SP	Terminal box, IP66/67
UP	Additional weight, 316L
VP	Adapter, function test
WP	Shortening kit for probe connection
XP	HUT temperature head transmitter, 2-wire, 4 to 20 mA
X9	Special version

Marking	
1Z	Tagging (TAG), see additional specification

13.2 Scope of Delivery

- Measuring device
- Optional Accessories
- Brief instructions
- Approvals and certificates



13.3 Configuration Data Sheet

Pressure

The following configuration data sheet must be completed and included with the order if option "Customized pressure" has been selected for order code "Calibration, unit" in the product structure.

Pressure unit			
<input type="checkbox"/> mbar	<input type="checkbox"/> mm H2O	<input type="checkbox"/> mm Hg	<input type="checkbox"/> Pa
<input type="checkbox"/> bar	<input type="checkbox"/> m H2O		<input type="checkbox"/> kPa
	<input type="checkbox"/> foot H2O		<input type="checkbox"/> MPa
<input type="checkbox"/> psi	<input type="checkbox"/> inch H2O	<input type="checkbox"/> kgf/cm ²	

Table 13.1

Calibration range/output	
Lower-range value (LRV): _____	[pressure engineering unit]
Upper-range value (URV): _____	[pressure engineering unit]

Table 13.2

Damping	
Damping: _____	s

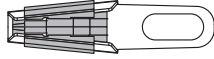
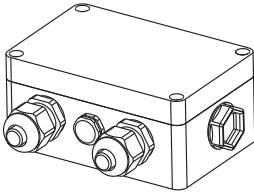
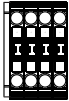
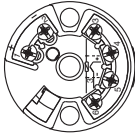
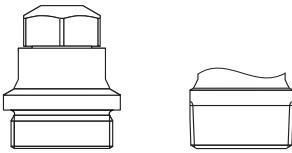

Table 13.3

14 Accessories



Note!

Observe the additional information in the individual sections "Mechanical Construction", "Ambient Conditions", "Process Conditions", and "Installation".

Designation	Figure	Description	Ordering information
Suspension clamp		For easy installation of the device, Pepperl+Fuchs offers a mounting clamp.	Product structure, feature "Accessories", option "OP"
Terminal box		Terminal box for terminal block, temperature head transmitter and Pt100 resistance thermometer	Product structure, feature "Accessories", option "SP"
4-terminal block/terminals		4-terminal block for wiring	
HUT temperature head transmitter for device with 4 to 20 mA Analog		Temperature head transmitter for the conversion of various input signals	Product structure, feature "Accessories", option "XP"
Cable mounting screws	<p style="text-align: center;">A B</p>  <p>A G1-1/2A B NPT1-1/2</p>	Pepperl+Fuchs offers a cable mounting screw for easy device mounting and to seal the measuring aperture.	<ul style="list-style-type: none"> • G1-1/2A Product structure, feature "Accessories", option "QP" • NPT1-1/2 Product structure, feature "Accessories", option "RP"
Additional weight for device with outer diameter 22 mm (0.87 inch) or 29 mm (1.14 inch)		Pepperl+Fuchs offers additional weights to prevent sideways movement that results in measuring errors, or to make it easier to lower the device in a guide tube.	Product structure, feature "Accessories", option "UP"

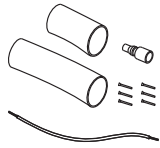
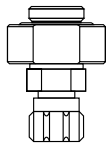
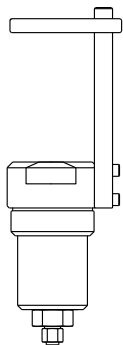
Designation	Figure	Description	Ordering information
Cable shortening kit		The cable shortening kit is used to shorten a cable easily and professionally.	Product structure, feature "Accessories", option "WP"
Testing adapter for device with outer diameter 22 mm (0.87 inch) or 29 mm (1.14 inch)		Pepperl+Fuchs offers a testing adapter to ease function-testing of the level probes.	Product structure, feature "Accessories", option "VP"
Testing adapter for device with outer diameter 42 mm (1.65 inch)		Pepperl+Fuchs offers a testing adapter to ease function-testing of the level probes. <ul style="list-style-type: none"> Observe the maximum pressure for compressed air hose and maximum overload for level probe. Maximum pressure for the quick coupling piece provided: 10 bar (145 psi) 	

Table 14.1

15 Documentation

The documents listed are available on the product detail page of the appropriate product.

15.1 Technical Information (TI)

Planning aid for your device: TI00431O

The document contains all the technical data on the device and provides an overview of the accessories and other products that can be ordered for the device.

15.2 Brief Instructions (KA)

Getting the 1st measured value quickly: 4 to 20 mA Analog – KA01244O

The brief instructions contain all the essential information from incoming acceptance to initial commissioning.

15.3 Manual (BA)

Your comprehensive reference: 4 to 20 mA Analog – BA01605O

These manual contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.

15.4 Instruction Manuals (SI)

Depending on the approval, the following instruction manuals (SI) are supplied with the device. They are an integral part of the documentation.

Option ¹	Approval	Documentation
E3	ATEX II 3G Ex nA IIC T6...T4 Gc	SI00485O
EX	ATEX II 2G Ex ia IIC T6...T4 Gb	SI00454O
IC	IEC Ex ia IIC T6...T4 Gb	SI00455O
C1	CSA C/US IS Cl. I Div. 1 Group A-D, Ex ia, Zone 1	ZD00232O
F1	FM IS Cl. I Div. 1 Group A-D, AEx ia, Zone 1	ZD00231O

Table 15.1

¹ See ordering information: product structure, feature "Approval".



Note!

The nameplate indicates the instruction manuals (SI) that are relevant to the device.

15.5 Potable Water Approval

- NSF potable water approval SD00289O
- KTW potable water approval: SD00319O



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