

Features

- Hydrostatic pressure sensor for level measuring of water
- Measuring ranges: 0 bar ... 0.1 bar to 0 bar ... 20 bar
- High-precision and long-term stability ceramic measuring cell
- High mechanical resistance to overload and aggressive media
- Permanent hermetically sealed level probe
- Electronics comprising 4 mA ... 20 mA output signal and integrated overvoltage protection
- Simultaneous level and temperature measuring by optional integrated Pt100 resistance thermometer
- KTW and NSF drinking water approval

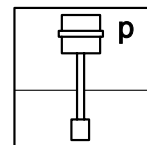
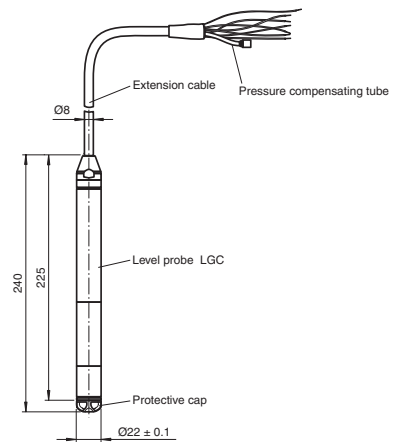
Function

The level probe LGC is a hydrostatic pressure sensor for measuring the level. One outstanding feature of these level probe is their mechanical and electrical durability. The embedded electronics, a heavy-duty conical cable seal and a 2-filter system guarantee a perfect seal resistant to any climatic conditions.

Highly accurate ceramic pressure sensors with longterm stability guarantee reliable and secure filling level measurement. With an external diameter of 22 mm (0.9 in), integrated temperature sensor and extensive drinking water certificates, the level probe is ideally suited for fresh water and drinking water applications. The front-flush ceramic measuring cell also allows reliable applications of the level probe in wastewater.

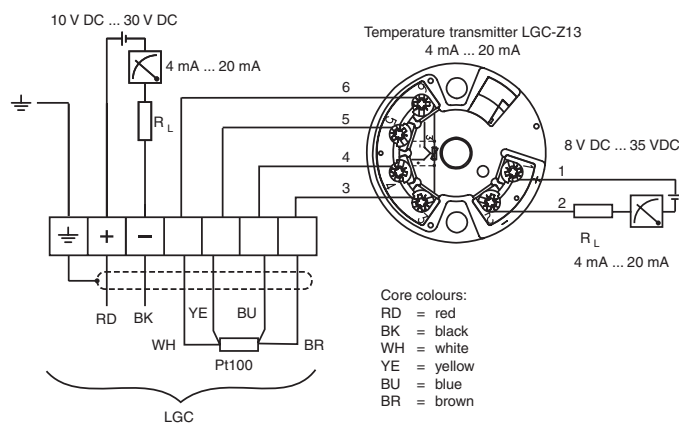
With extensive measurement accessories, like display, power supply and evaluation device, solutions for all typical applications in fresh water and wastewater are guaranteed.

Assembly



Connection

Example: level probe LGC with Pt100 and temperature transmitter LGC-Z13 (4 mA ... 20 mA)



Other connection types see section electrical connections.

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General specifications		
Measuring method		Level control with ceramic measuring cell (dry measuring cell). The pressure acts directly on the rugged ceramic membrane of the device and causes it to move by about max. 0.005 mm. The effects of air pressure on the liquid surface are transferred via a pressure compensating tube through the extension cable to the rear of the ceramic membrane and compensated. Pressure-dependent changes in capacitance caused by membrane movement are measured at the electrodes of the ceramic carrier. The electronics convert the movement into a pressure-proportional signal which is linear to the medium level.
Equipment architecture		The measuring system consists of a level probe and a SMART transmitter power supply (e. g. KFD2-STC4-Ex1) with a supply voltage between 10 ... 30 V DC.
Construction type		device with rod probe
Supply		
Rated voltage	U_r	level probe: 10 ... 30 V DC, Ex nA and Ex ia: 10 ... 30 V DC Pt100 (optional): 10 ... 30 V DC, Ex nA: 10 ... 30 V DC temperature transmitter (optional): 8 ... 35 V DC
Current consumption		level probe: max. ≤ 22.5 mA, min. ≥ 3.5 mA Pt100 (optional): ≤ 0.6 mA temperature transmitter (optional): Pt100 via temperature transmitter ≤ 0.6 mA
Power consumption		level probe and Pt100 (optional): ≤ 0.675 W at 30 V DC temperature transmitter (optional): ≤ 0.875 W at 35 V DC
Reverse polarity protection		Reverse voltage protection is integrated in level probe and in the temperature transmitter LGC-Z13 changing the polarities has no impact on operation.
Residual ripple		level probe: 4 ... 20 mA, 2-wire for hydrostatic pressure measured value Pt100 (optional): temperature-dependent resistance value temperature transmitter (optional): 4 ... 20 mA for temperature measured value, 2-wire
Electrical specifications		
Surge protection		level probe and Pt100 (optional): integrated overvoltage protection to EN 61000-4-5 ≤ 1.2 kV, install overvoltage protection ≥ 1.2 kV, external if necessary temperature transmitter (optional): install overvoltage protection, external if necessary
Input		
Input signal		level probe: change in capacitance Pt100 (optional): change in resistance temperature head transmitter (optional): Pt100 resistance signal, 4-wire
Measured variable		level probe: hydrostatic pressure of a liquid Pt100 (optional): temperature temperature head transmitter (optional): temperature
Measurement range		level probe: - nine fixed pressure measuring ranges in bar, see ordering information - customer-specific measuring ranges, factory-calibrated Pt100 (optional): temperature measurement from -10 ... 70 °C (263 ... 343 K)
Output		
Load		level probe and Pt100 (optional): $R_{total} \leq (U_b - 10 \text{ V})/0.0225 \text{ A} - 2 \times 0.09 \Omega/\text{m} \times l - R_{add}$ temperature transmitter (optional): $R_{total} \leq (U_b - 8 \text{ V})/0.025 \text{ A} - R_{add}$ - R_{total} = max. load resistance [Ω] - R_{add} = additional resistances such as resistance of evaluating device and/or display instrument, line resistance [Ω] - U_b = supply voltage [V]
Output signal		level probe: 4 ... 20 mA, 2-wire for hydrostatic pressure measured value Pt100 (optional): temperature-dependent resistance value temperature transmitter (optional): 4 ... 20 mA for temperature measured value, 2-wire
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 , EN 61326-2-3:2013
Conformity		
Electromagnetic compatibility		NE 21
Degree of protection		IEC 60529:2001
Measurement accuracy		
Reference operating conditions		level probe and Pt100 (optional): acc. to DIN EN 60770, $T_{amb} = 25$ °C (296 K) temperature transmitter (optional): calibration temperature 23 °C ± 5 K (296 K ± 5 K)
Accuracy		level probe: non-linearity including hysteresis and non-repeatability as per DIN EN 60770: ± 0.2 % of upper range value (URV) Pt100 (optional): max. ± 0.7 K (class B to DIN EN 60751) temperature transmitter (optional): ± 0.2 K, with Pt100: max. ± 0.9 K
Long-term drift		level probe and Pt100 (optional): ± 0.1 % of upper range value (URL) per year temperature transmitter (optional): ± 0.1 K per year
Influence of medium temperature		- thermal change in zero signal and output span for typical temperature range 0 ... 30 °C (273 ... 303 K): ± 0.4 % (± 0.5 %)* of the measuring span - thermal change in zero signal and output span for the total medium temperature range -10 ... 70 °C (263 ... 343 K): ± 1.0 % (± 1.5 %)* of the measuring span (Pt100) - temperature coefficient (TK) in zero signal and output span: 0.15 %/10 K (0.3 %/10 K)* of the measuring span (Pt100 and temperature transmitter) *specifications for sensors 0.1 bar and 0.6 bar

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Rise time	level probe: 80 ms, Pt100 (optional): 160 s
Warm-up time	level probe and Pt100 (optional): 20 ms, temperature transmitter (optional): 4 s
Adjustment time	level probe: 150 ms, Pt100 (optional): 300 s
Operating conditions	
Installation conditions	
Installation position	vertical from above
Process conditions	
Medium temperature	level probe and Pt100 (optional): -10 ... 70 °C (263 ... 343 K), for Ex devices see safety information temperature transmitter (optional): -40 ... 85 °C (233 ... 358 K) = ambient temperature, install temperature transmitter outside medium
Medium temperature limits	level probe and Pt100 (optional): -20 ... 70 °C (253 ... 343 K) You may operate the level probe in this temperature range. The specification can then be exceeded, e.g. measuring accuracy, see also DIN 16086.
Ambient conditions	
Ambient temperature	level probe and Pt100 (optional): -10 ... 70 °C (263 ... 343 K) = medium temperature temperature transmitter (optional): -40 ... 85 °C (233 ... 358 K)
Storage temperature	level probe and Pt100 (optional): -40 ... 80 °C (233 ... 353 K) temperature transmitter (optional): -40 ... 100 °C (233 ... 373 K)
Mechanical specifications	
Degree of protection	level probe and Pt100 (optional): IP68, permanently hermetically sealed, optional terminal box IP66/IP67 temperature head transmitter (optional): IP00, moisture condensation permissible, when mounted in the optional terminal box IP66/IP67
Connection	3 terminals in terminal box (accessory) as standard 4 terminals in terminal block (accessory), conductor cross section 0.08 ... 2.5 mm ²
Material	level probe: 1.4435/316L process ceramic: Al ₂ O ₃ aluminum oxide ceramic seal (internal): EPDM or Viton protective cap: PE-HD (high-density polyethylene) terminal box LGC-Z11: PC (polycarbonate) temperature transmitter LGC-Z13: housing PC (polycarbonate) extension cable PE: insulation PE (polyethylene), copper wires, twisted extension cable FEP: insulation FEP (fluorinated ethylene propylene), copper wires, twisted
Cable	level probe: - commercially available instrument cable - terminals, terminal housing level probe: 0.08 ... 2.5 mm ² Pt100 (optional): - If the Pt100 signal is directly connected to a display and/or evaluation unit, we recommend the use of a shielded cable. temperature transmitter (optional): - connection transmitter: max. 1.75 mm ² probe connection (extension cable): - total outer diameter: 8.0 mm ± 0.25 mm - level probe: 3 x 0.2 mm ² and pressure compensation tube with PTFE filter - Pt100 (optional): 7 x 0.2 mm ² and pressure compensation tube with PTFE filter - pressure compensation tube with PTFE filter: external diameter Ø2.5 mm, internal diameter Ø1.5 mm
Mass	level probe: 290 g terminal box LGC-Z11: 235 g temperature transmitter LGC-Z13: 40 g extension cable PE: 52 g/m extension cable FEP: 108 g/m suspension clamp LGC-Z10: 170 g extension cable mounting screw LGC-Z14: 770 g extension cable mounting screw LGC-Z16: 724 g
Dimensions	level probe: Ø22 x 240 mm (Ø0.9 x 9.5 inch) terminal housing LGC-Z11: 120 x 80 x 55 mm (4.7 x 3.15 x 2.2 inch) temperature transmitter LGC-Z13: Ø44 x 21 mm (1.7 x 0.8 inch) extension cable: 10 m (33 ft), 20 m (66 ft) or any length, can be cropped - max. free suspended length (mechanical stability under load): 1000 m (3294 ft) - max. length for non-Ex and EEx nA IIC T6, see section load - max. length for EEx ia IIC T6: see related safety information (SI)
Data for application in connection with hazardous areas	
EU-Type Examination Certificate	TÜV 01 ATEX 1749
Marking	⊕ II 2G Ex ia IIC T6 Gb
Certificate	PF 16 CERT 1658 X
Marking	⊕ II 3G Ex nA IIC T6 Gc
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012 , EN 60079-11:2007 , EN 60079-15:2010
Mechanical construction	

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Mechanical load	<p>extension cable:</p> <ul style="list-style-type: none"> - minimum bending radius: 120 mm (4.7 inch) - tensile strength: min. 950 N - cable extraction force: ≥ 450 N - PE: approved for use with drinking water - resistance to UV light - cable resistance per wire: $\leq 0.09 \Omega/m$
Certificates and approvals	
Drinking water approval	KTW certificate and NSF approval
General information	
Supplementary documentation	<p>technical information (TI) manuals, brief instructions (BA, KA) instruction manuals (SI) control drawings (ZD)</p>
Supplementary information	<p>EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.</p>
Accessories	
Optional accessories	<p>LGC-Z10 mounting clamp, 1.4435/316L LGC-Z11, terminal box (IP65/IP67), PC LGC-Z12, additional weight 300 g, 1.4435/316L LGC-Z13, temperature transmitter, 2-wire, -20 ... 80 °C LGC-Z14, cable mounting screw G with cylindrical threading G1-1/2A, 1.4301/304 LGC-Z15, terminal block with 4 terminals LGC-Z16, cable mounting screw N with tapered thread NPT1-1/2, 1.4301/304</p>

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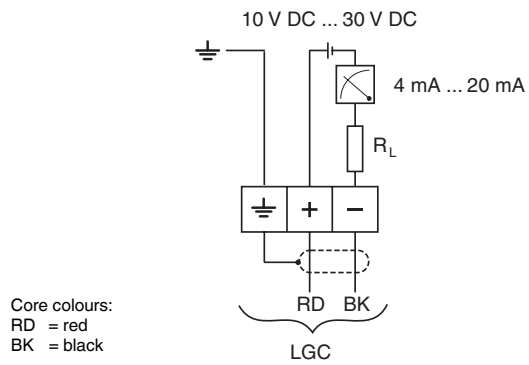
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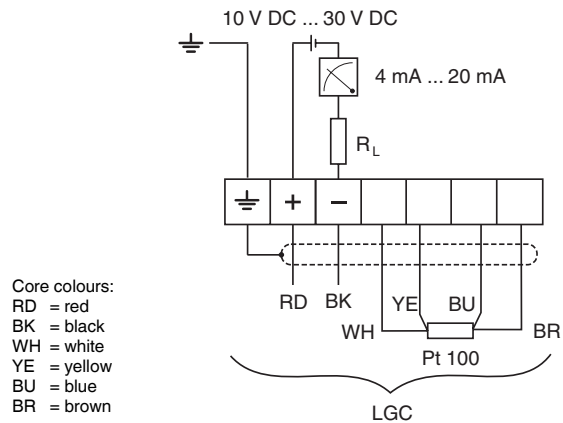
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Electrical connection

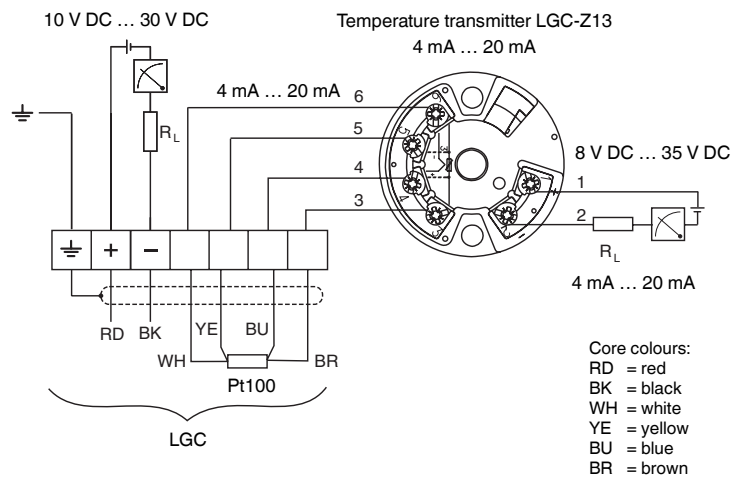
Level probe LGC, standard,
optional equipment N/2



Level probe LGC with Pt100,
optional equipment 1/3



Level probe LGC with Pt100 and temperature
transmitter LGC-Z13 (4 mA ... 20 mA),
optional equipment 4



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Type Code



*This overview does not mark options which are mutually exclusive.
Option with * = on request/in preparation*

Device	
LGC	Level probe

Mechanical connection	
A	mounting clamp, 1.4435/316L
G	cable mounting screw G1-1/2A, 1.4301/304
K	without mechanical connection
N	cable mounting screw NPT1-1/2, 1.4301/304

Probe tube	
P	Ø29 mm, PPS
S	Ø22 mm, 1.4435/316L
T	Ø22 mm, 1.4435/316L with drinking water approval

Measuring range	
H2M	0 ft ... 3 ft H ₂ O
H2N	0 ft ... 6 ft H ₂ O
H3L	0 ft ... 15 ft H ₂ O
H3C	0 ft ... 20 ft H ₂ O
H3M	0 ft ... 30 ft H ₂ O
H3N	0 ft ... 60 ft H ₂ O
H4L	0 ft ... 150 ft H ₂ O
H4M	0 ft ... 300 ft H ₂ O
H4N	0 ft ... 600 ft H ₂ O
H2A	0 m ... 1 m H ₂ O
H2C	0 m ... 2 m H ₂ O
H2D	0 m ... 4 m H ₂ O
H2E	0 m ... 6 m H ₂ O
H3A	0 m ... 10 m H ₂ O
H3C	0 m ... 20 m H ₂ O
H3D	0 m ... 40 m H ₂ O
H4A	0 m ... 100 m H ₂ O
H4C	0 m ... 200 m H ₂ O
P2L	0 psi ... 1.5 psi
P2M	0 psi ... 3 psi
P2N	0 psi ... 6 psi
P3K	0 psi ... 10 psi
P3L	0 psi ... 15 psi
P3M	0 psi ... 30 psi
P3N	0 psi ... 60 psi
P4L	0 psi ... 150 psi
P4M	0 psi ... 300 psi
R1A	0 bar ... 0.1bar
R1C	0 bar ... 0.2bar
R1D	0 bar ... 0.4bar
R1E	0 bar ... 0.6bar
R2A	0 bar ... 1.0bar
R2C	0 bar ... 2.0bar
R2D	0 bar ... 4.0bar
R3A	0 bar ... 10.0bar
R3C	0 bar ... 20.0bar
XXX	set in accordance with customer specification

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

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Extension cable	
2A	10 m, can be cropped, PE
2C	20 m, can be cropped, PE
2M	30 foot, can be cropped, PE
2N	60 foot, can be cropped, PE
3A	10 m, can be cropped, FEP
3C	20 m, can be cropped, FEP
3M	30 foot, can be cropped, FEP
3N	60 foot, can be cropped, FEP
4A	10 m, can be cropped, PUR
4C	20 m, can be cropped, PUR
4M	30 foot, can be cropped, PUR
4N	60 foot, can be cropped, PUR
CF	in foot, can be cropped, FEP
CM	in m, can be cropped, FEP
CP	in foot, can be cropped, PUR
XF	in foot, can be cropped, PE
XM	in m, can be cropped, PE
XP	in m, can be cropped, PUR

Extension cable length	
L	Specified length, for options CF, CM, CP, XF, XM, and XP

Additional equipment	
1	with integrated Pt100 temperature probe, 4-wire
2	terminal box with filter
3	pressure sensor with Pt100, 4-wire and terminal box with filter, IP65/IP67
4	pressure sensor with Pt100, -20 °C ... +80 °C, temperature transmitter 4 mA .. 20 mA, 2-wire; in terminal box with filter, IP65/IP67
N	without additional equipment

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

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