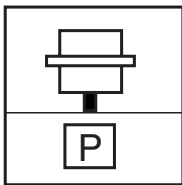


## Process pressure transmitter



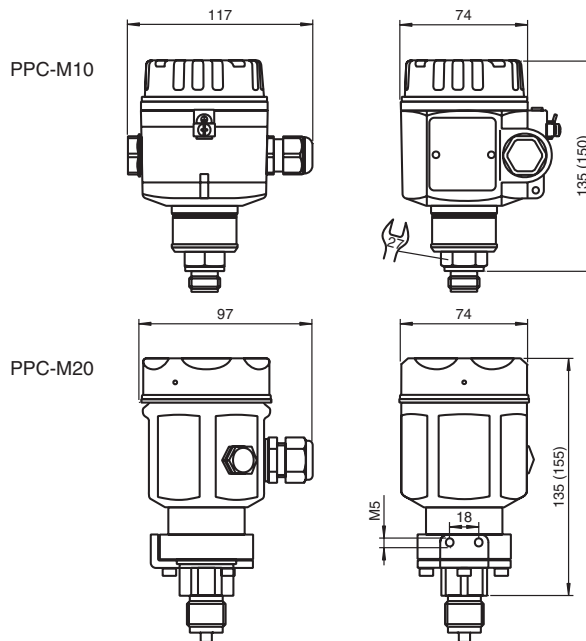
### PPC-M\*\*



### Features

- Process pressure sensor for gases, vapors, liquids and dusts
- High accuracy of measurement
- Housing fulfils the special hygienic requirements of the foodstuff and pharmaceutical industries
- Large selection of process connections: universal use
- Dry capacitive ceramic sensor up to 40 bar
- Piezoresistive metal sensor for measuring ranges up to 400 bar
- Wide variety of electronic modules (e. g., relay, thyristor signal output): the right connection for every process control system
- Process connections acc. to EHEDG
- Up to SIL2 acc. to IEC 61508

## Dimensions



The values in brackets apply for housings with raised cover.

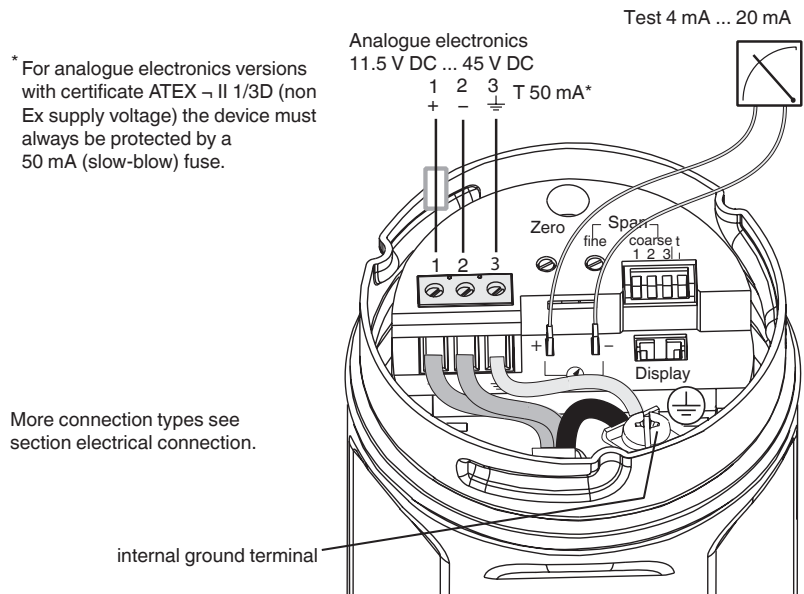
Additional dimensions see section dimensions.

## Function

The process pressure sensor PPC-M\*\* measure absolute and relative pressure in gases, vapours, liquids and dusts. The sensor can be used in all process engineering areas. The modular design of the BARCON pressure transmitter enables it to be used in all industrial environments. All process connections are available as hygienic connections, threaded connections, separators and flanges.

## Electrical connection

Connection I2/I3 analogue electronic (example)



\* For analogue electronics versions with certificate ATEX - II 1/3D (non Ex supply voltage) the device must always be protected by a 50 mA (slow-blow) fuse.

More connection types see section electrical connection.

<b>Application</b>	
Function principle	<p>sensor for absolute and relative pressure measuring in gases, vapors, liquids and dusts metal sensor (PPC-M10) The process pressure acting on the metallic separating diaphragm of the sensor is transmitted via a fill liquid to a resistance bridge. The change in the output voltage of the bridge is proportional to the pressure and is then measured, volume of chamber: smaller than 1 mm<sup>3</sup>. ceramic sensor (PPC-M20) The pressure causes a slight deflection of the ceramic diaphragm of the sensor. The change in the capacitance is proportional to the pressure and is measured by the electrodes of the ceramic sensor, volume of chamber: approx. 2 mm<sup>3</sup>.</p>
<b>Function and system design</b>	
Equipment architecture	<ul style="list-style-type: none"> <li>- with analogue electronics I2/IB 4 ... 20 mA and auxiliary energy, e. g. via transmitter power pack, calibration across potentiometer for lower range value and upper range value, optionally analogue display for measuring value indication</li> <li>- with HART electronics IA/IH with current output 4 ... 20 mA, HART communication signal and auxiliary energy, e. g. via transmitter power pack, calibration via two keys on the device, handheld terminal or PC with operating program, optional digital display for measured variable indication</li> <li>- with PROFIBUS PA electronics PA/PB with digital communication signal PROFIBUS PA and segment coupler for connection to PLC or PC with operating program, optional digital display for measured variable indication</li> </ul>
<b>Input characteristics</b>	
Measured variable	absolute or relative pressure
Measurement range	see section measuring range
<b>Output characteristics</b>	
Output signal	<p>analog electronics I2/IB: 4 ... 20 mA HART electronics IA/IH: 4 ... 20 mA with HART protocol PROFIBUS PA electronics PA/PB: digital communication signal</p>
Signal range	analog electronics I2/IB and HART electronics IA/IH: 3.8 ... 20.5 mA
Signal on alarm	<p>analog electronics I2/IB: signal overrun &gt; 20.5 mA or signal underrun &lt; 3.6 mA HART electronics IA/IH: optional 3.6 mA, 22 mA or last current value will be hold PROFIBUS PA electronics PA/PB: can be set in the analog input block, options: last good value (factory setting), FSAFE value, wrong value</p>
Response time	PROFIBUS PA: cyclic: approx. 10 ms per request, acyclic: < 50 ms
Output damping	<p>analog electronics I2/IB: - directly on device using DIP switches, switch position "On" = 2 s, "Off" = 0 s HART electronics IA/IH: - directly on device using DIP switches, switch position "On" = set value, "Off" = 0 s - with handheld terminal or using operating program: 0 ... 40 s - factory setting: 2 s PROFIBUS PA electronics PA/PB: - with handheld terminal or using operating program: 0 ... 40 s - factory setting: 0.0 s</p>
Load	<p>analog electronics I2/IB and HART electronics IA/IH: - max. 1522 Ω at power supply 11.5 ... 45 V DC for devices for non-hazardous areas, 1/3D, EEx d, EEx nA, FM XP, FM DIP, CSA XP and CSA dust-Ex - max. 840 Ω at power supply 11.5 ... 30 V DC for EEx ia, 1D, 1/2D, 1/2G, FM IS and CSA IS</p>
Resolution	<p>analog electronics I2/IB: - current output &lt; 1 μA, onsite display 30 segments HART electronics IA/IH: - current output typ. 1 μA, max. 6 μA, onsite display 28 segments, display value with resolution 1 per thousand PROFIBUS PA electronics PA/PB: - onsite display 28 segments, display value with resolution 1 per thousand</p>
Read cycles	<p>HART commands: on average 3 to 4 per s PROFIBUS PA: cyclic: on average 100/s, acyclic: on average 20/s</p>
Cycle time	<p>PROFIBUS PA: - The cycle time in a bus segment in cyclic data communication depends on the number of devices, the segment coupler used and the internal PLC cycle time. - The minimum cycle time is approx. 20 ms per device.</p>
<b>Auxiliary energy</b>	
Electrical connection	<p>connection cable: - shielded, twisted pair two-wire cable - terminals for wire cross-sections 0.14 ... 2.5 mm<sup>2</sup> - cable outer diameter: 5 ... 9 mm (0.2 ... 0.35 in) M12 plug Harting plug (Han7D)</p>
Supply voltage	<p>analog electronics I2/IB: 11.5 ... 45 V DC HART electronics IA/IH: 11.5 ... 45 V DC PROFIBUS PA electronics PA/PB: 9 ... 32 V DC Version for hazardous area see safety information.</p>
Current consumption	PROFIBUS PA electronics PA/PB: 11 mA ± 1 mA

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Residual ripple	<p>analog electronics I2/IB and HART electronics IA/IH:</p> <ul style="list-style-type: none"> <li>- without influence on 4 ... 20 mA signal up to <math>\pm 5\%</math> residual ripple within the permitted voltage range (acc. to HART hardware specification HCF_SPEC-54 (DIN IEC 60381-1))</li> <li>- with HART handheld terminal: max. ripple (measured at 500 <math>\Omega</math>) 47 ... 125 Hz: <math>U_{pp} = 200</math> mV, max. noise (measured at 500 <math>\Omega</math>) 500 ... 10 kHz: <math>U_{eff} = 2.2</math> mV</li> </ul>
<b>Measurement accuracy</b>	
Reference operating conditions	<ul style="list-style-type: none"> <li>- as per IEC 60770</li> <li>- ambient temperature range <math>T_{amb} = \text{constant}</math>, in range: 21 ... 33 °C (294 ... 307 K)</li> <li>- humidity = constant, in range: 20 ... 80 % relative humidity</li> <li>- ambient pressure <math>p_{amb} = \text{constant}</math>, in range: 860 ... 1060 mbar</li> <li>- position of measuring cell = constant, in range: horizontal <math>\pm 1^\circ</math></li> <li>- input of Low Sensor Calibration and High Sensor Calibration for lower range value and upper range value</li> <li>- membrane material ceramic (aluminium oxide ceramic) or stainless steel 1.4435/316L</li> <li>- filling oil: mineral oil</li> <li>- supply voltage: 24 V DC <math>\pm 3</math> V DC</li> <li>- load for HART: 250 <math>\Omega</math></li> <li>- Turn down: 1:1 to 10:1</li> </ul>
Maximum measured error	$\pm 0.2\%$ of set span, optional $\pm 0.1\%$ non-linearity of set span
Long-term drift	with reference to the span $\pm 0.1\%$ per year, $\pm 0.25\%$ per 3 years
Influence of vibrations	without any effects up to 5 ... 15 Hz: $\pm 4$ mm (0.16 in) 15 ... 150 Hz: 2 g 150 ... 2000 Hz: 1 g
Rise time	analog electronics I2/IB: 60 ms HART electronics IA/IH: 220 ms PROFIBUS PA electronics PA/PB: 220 ms
Warm-up time	analog electronics I2/IB: 200 ms HART electronics IA/IH: 1 s PROFIBUS PA electronics PA/PB: 1 s
Adjustment time	analog electronics I2/IB: 180 ms HART electronics IA/IH: 600 ms PROFIBUS PA electronics PA/PB: 600 ms
<b>Operating conditions</b>	
Installation conditions	
Installation position	any position, zero point shift due to position can be corrected see Technical Information
Ambient conditions	
Ambient temperature	-40 ... 85 °C (-40 ... 185 °F) onsite display with analogue electronics I2/IB: -30 ... 80 °C (243 ... 353 K) onsite display with HART electronics IA/IH or PROFIBUS PA electronics PA/PB: -25 ... 70 °C (248 ... 343 K) Lower temperatures minimize the display speed.
Storage temperature	-40 ... 100 °C (-40 ... 212 °F) onsite display: -40 ... 80 °C (233 ... 353 K)
Climate class	4K4H, air temperature: -20 ... 55 °C (253 ... 328 K), relative humidity: 4 ... 100 %, condensation possible
Electromagnetic compatibility	<ul style="list-style-type: none"> <li>- maximum deviation: <math>&lt; 0.5\%</math> of span</li> <li>- maximum deviation for 100 mbar sensors: <math>&lt; 1.25\%</math> of span</li> <li>- In the event of surge influence (EN 61000-4-5), deviations greater than the specified measured error can occur briefly.</li> <li>- All measurements were performed with a Turn down = 1:1.</li> </ul>
Process conditions	
Medium temperature	-40 ... 100 °C (-40 ... 212 °F)
Medium pressure limits	see section measuring range
Overload resistance	PPC-M10: up to 4 times the nominal pressure (max. 600 bar) PPC-M20: up to 40 times the nominal pressure (max. 60 bar)
<b>Mechanical specifications</b>	
Protection degree	IP66 for devices with cable gland, cable entry IP68 for devices with assembled cable or M12 plug
<b>Mechanical construction</b>	
Construction type	PPC-M10: version with metal sensor PPC-M20: version with ceramic sensor
Dimensions	housings: stainless steel housing 74 x 97 mm (2.9 x 3.8 in), aluminium housing 74 x 117 mm (2.9 x 4.6 in), length depends on process connection and cover process connections see section dimensions
Mass	PPC-M10: stainless steel 0.9 kg, aluminium 1.2 kg PPC-M20: stainless steel 1.4 kg, aluminium 1.6 kg

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<p>Material</p>	<p>housing: - stainless steel 1.4404/316L or cast aluminium housing with protective polyester based powder coating nameplates: - stainless steel housing: engraved on housing with laser - aluminium housing: 1.4301/304 process connections (in contact with the medium): - PPC-M10: stainless steel 1.4435/316L - PPC-M20: 1.4435/316L or 2.4819 (Hastelloy C276) coupling nuts: - stainless steel 1.4307/304L) process diaphragm (in contact with the medium): - PPC-M10: stainless steel 1.4435/316L, Hastelloy C276, tantalum, PTFE folio 0.09 mm on 1.4435/316L (not for vacuum), PTFE folio 0.25 mm on 1.4435/316L (not for vacuum) - PPC-M20: Al<sub>2</sub>O<sub>3</sub> aluminium oxide ceramic (FDA listed), 96 %, extremely clean 99.9 % seals: - FKM Viton (also in versions grease-free and for oxygen use), NBR, FFKM Kalrez, FFKM Chemraz, EPDM O-ring for cover sealing: - stainless steel housing: silicone - aluminium housing: NBR mounting accessories for pipe and wall mounting: - stainless steel 1.4301/304 measurement cell: - PPC-M10: oil filling: optional mineral oil, inert oil (Voltalef) for oxygen use or vegetable oil - PPC-M20: without oil filling, dry sensor capillary: - 1.4571/316Ti protective hose for capillary: - 1.4301/304</p>
<p>Surface quality</p>	<p>standard surface roughness of parts in contact with the medium <math>R_a \leq 0.8 \mu\text{m}</math>, reduces surface roughness on request.</p>
<p>Process connection</p>	<p>PPC-M10: - cylindrical thread G<math>\frac{1}{2}</math>A to EN 837 and JIS B0202 - cylindrical thread M20 x 1,5 to EN 837 - conical thread <math>\frac{1}{2}</math> MNPT or <math>\frac{1}{2}</math> FNPT to ANSI - conical thread R<math>\frac{1}{2}</math>A to JIS B0203 PPC-M20: - cylindrical thread G<math>\frac{1}{2}</math>A to EN 837 - cylindrical thread G<math>\frac{1}{2}</math>A with bore 11.4 mm (0.45 in) to DIN ISO 228 - cylindrical thread G<math>\frac{1}{2}</math>A G<math>\frac{1}{4}</math> (female) to DIN ISO 228 - cylindrical thread M20 x 1.5 with bore 3 mm (0.12 in) to EN 837 - conical thread <math>\frac{1}{2}</math> MNPT with bore 11.4 mm (0.45 in) to ANSI - conical thread <math>\frac{1}{2}</math> MNPT <math>\frac{1}{4}</math> FNPT to ANSI - cylindrical thread G<math>\frac{1}{2}</math>A to JIS B0202 - conical thread R<math>\frac{1}{2}</math>A to JIS B0203</p>
<p>Electrical connection</p>	<p>housing *1: cable gland M20 x 1.5 housing *2: cable gland <math>\frac{1}{2}</math> NPT housing *3: cable gland G<math>\frac{1}{2}</math> housing *4: Harting plug (Han7D) housing *5: M12 x 1 plug housing *6: assembled cable with pressure compensation, 5 m (197 in)</p>
<p><b>Indication and operation</b></p>	
<p>Display elements</p>	<p>analog electronics I2/IB: - The analog display gives the current pressure value related to the measuring range in the form of a bar graph (30 segments). HART electronics IA/IH: - The digital display gives the pressure in the form of a four-digit number. The appropriate current value from 4 ... 20 mA is shown as a bar graph (28 segments) underneath. PROFIBUS PA electronics PA/PB: - The digital display gives the pressure in the form of a four-digit number. The digital display shows the current pressure value in the form of a bar graph (28 segments).  display resolution: - analog display: bar graph, 1 segment equals 3.33 % of the set span - digital display: 0.1 %, bar graph, 1 segment equals 3.57 % of the set span</p>
<p>Controls</p>	<p>analog electronics I2/IB: - operation directly at the measuring point with one potentiometer each for lower range value and upper range value - a three-step range switch - as well as an on/off switch for damping HART electronics IA/IH with HART protocol: operation mode at the measuring point via - two push buttons for lower range value and upper range value as well as an on/off switch for damping - the handheld terminal at any point along the 4 ... 20 mA line - a PC with operating program PROFIBUS PA electronics PA/PB: operation mode via - two keys for lower-range value and upper-range value - using a PC with operating program</p>
<p><b>Certificates and approvals</b></p>	

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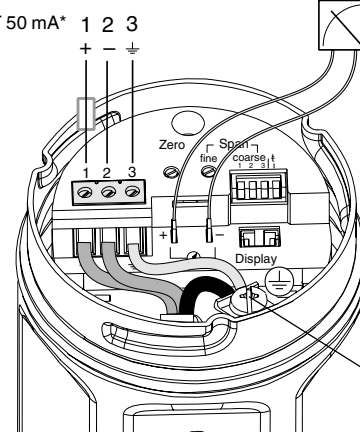
Ex approval	DMT 02 ATEX E 137, DMT 02 ATEX E 138 , for additional certificates see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a>
Type of protection	<p>⊕ II 1G EEx ia IIC T4/T6 (DMT 02 ATEX E 137)</p> <p>⊕ II 1/2G EEx ia IIC T4/T6 (DMT 02 ATEX E 137)</p> <p>⊕ II 2G EEx ia IIC T4/T6 (DMT 02 ATEX E 137)</p> <p>⊕ II 1/2D IP66 T50/82°C (DMT 02 ATEX E 137)</p> <p>⊕ II 1/2D IP66 T85°C (DMT 02 ATEX E 137)</p> <p>⊕ II 1/3D IP66 T110°C (DMT 02 ATEX E 138)</p> <p>⊕ II 3 G EEx nA II T5</p>
SIL classification	up to SIL2 acc. to IEC 61508
<b>General information</b>	
Directive conformity	
Directive 73/23/EEC (Low Voltage Directive)	EN 61010-1
Directive 89/336/EEC (EMC)	emitted interference to EN 61326, class B equipment noise immunity to EN 61326, annex A (industrial sector)
Directive 94/9/EC (ATEX)	EN 50014, EN 50020, EN 50021, EN 50284, EN 50281-1-1
Conformity	
Electromagnetic compatibility	NE 21
Protection degree	EN 60529
Climate class	EN 60721-3-4
Supplementary documentation	<p>technical information PPC-M</p> <p>operating instructions BA200O (version with analogue electronics)</p> <p>operating instructions BA201O (version with HART electronics)</p> <p>operating instructions BA222O (version with PROFIBUS PA electronics)</p> <p>operating instructions KA224O M12 plug with new PIN assignment</p> <p>operating instructions KA525O welded nozzle (LHC-Z20, LHC-Z21, LHC-Z22, LHC-Z23)</p> <p>safety information SI038O (DMT 02 ATEX E 137)</p> <p>safety information SI039O (DMT 02 ATEX E 137)</p> <p>safety information SI040O (DMT 02 ATEX E 138)</p> <p>safety information SI052O (⊕ II3 G EEx nA II T5)</p> <p>safety information SI096O (DMT 02 ATEX E 137), PROFIBUS PA version</p> <p>safety information SI097O (DMT 02 ATEX E 137), PROFIBUS PA version</p> <p>safety information SI098O (DMT 02 ATEX E 138), PROFIBUS PA version</p> <p>FM control drawing ZD039O (version with HART electronics)</p> <p>CSA control drawing ZD040O (version with HART electronics)</p> <p>CSA control drawing ZD051O (version with PROFIBUS PA electronics)</p> <p>FM control drawing ZD052O (version with PROFIBUS PA electronics)</p>
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

Electrical connection

Connection I2/IB with analogue electronics

11.5 V DC ... 45 V DC Test 4 mA ... 20 mA

T 50 mA\* 1 2 3

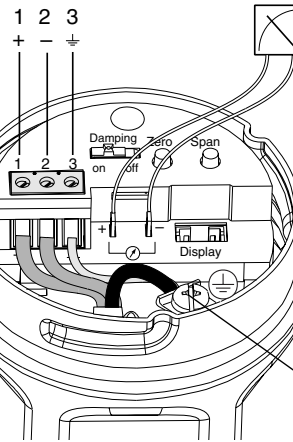


\* For analogue electronics versions with certificate ATEX (Ex) II 1/3D (non Ex supply voltage) the device must always be protected by a 50mA (slow-blow) fuse.

internal ground terminal

Connection IA/IH with HART electronics

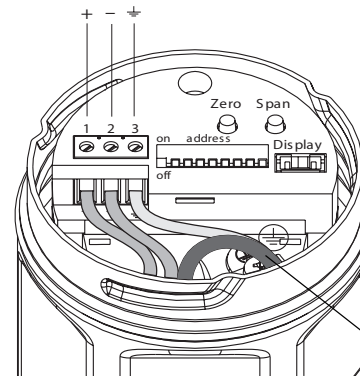
11.5 V DC ... 45 V DC Test 4 mA ... 20 mA  
11.5 V DC ... 30 V DC (Ex i)



internal ground terminal

Connection PA/PB with PROFIBUS PA electronics

9 V DC ... 32 V DC  
9 V DC ... 24 V DC (Ex i)



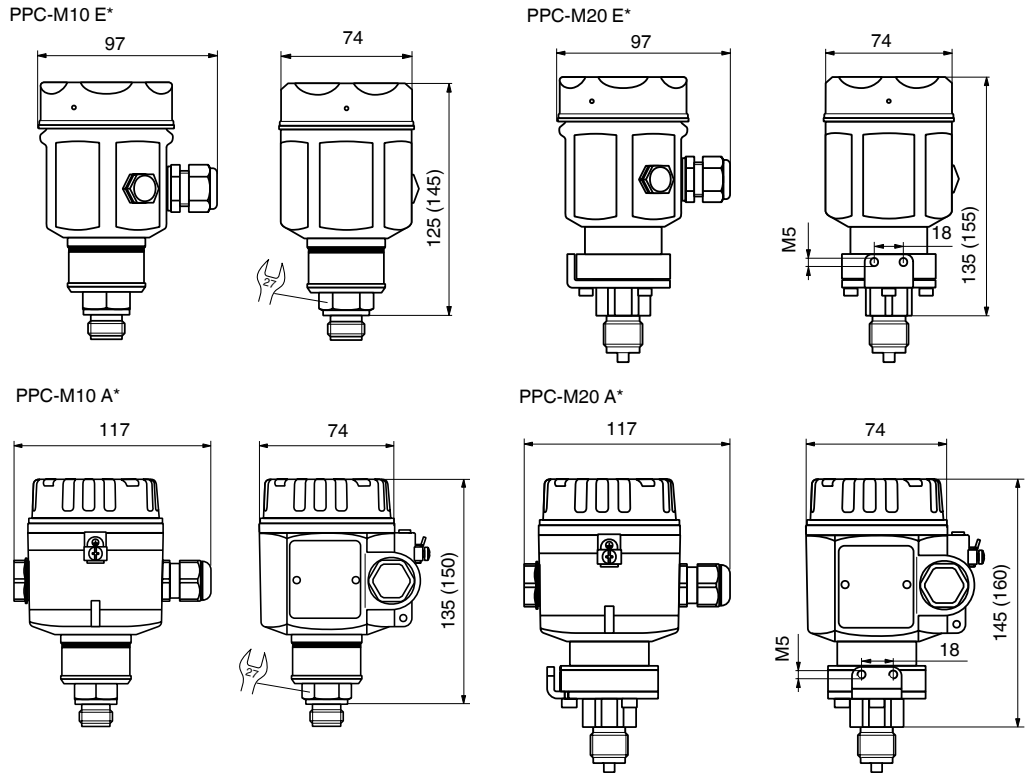
internal ground terminal

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Dimensions

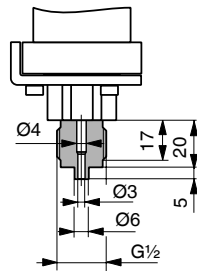
Housings

The values in brackets apply for housings with raised cover.

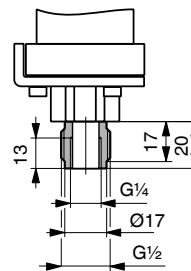


Process connections for PPC-M20

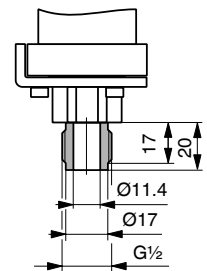
G11, G1C, G½ external



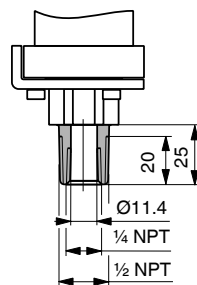
G14, G½ external, G¼ internal



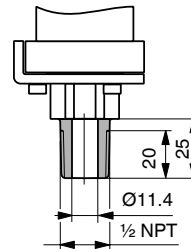
G1M, G½ external, Ø11.4 mm (0.45 in) internal



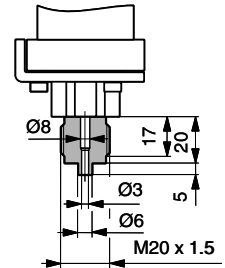
N14, N1C, ½ NPT external, ¼ NPT internal



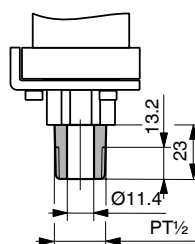
N1M, ½ NPT external, Ø11.4 mm (0.45 in) internal



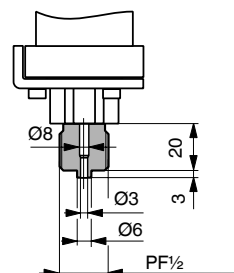
M21, M20 x 1.5 external



J12, PT½ external, Ø11.4 mm (0.45 in) internal



J11, PF½ external,



JIS B 0203-1982

JIS B 0202-1982

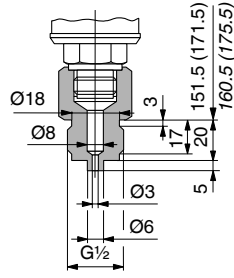
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**Process connections for PPC-M10**

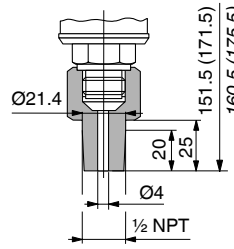
Values in brackets apply for housings with raised cover.

*Values in italics apply to devices with an aluminium housing.*

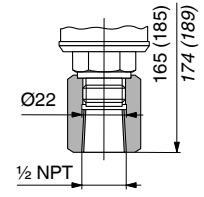
G1G, G½ external



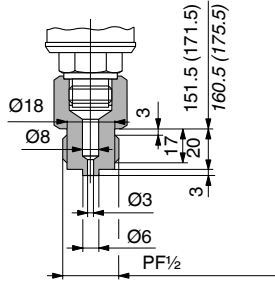
N1A, ½ NPT external



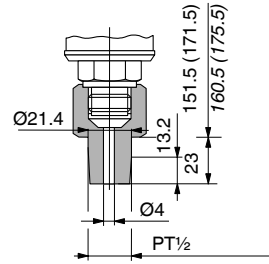
N11, ½ NPT internal



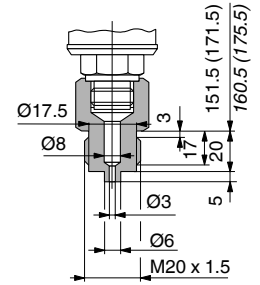
J11, PF½ external



J12, PT½ external



M21, M20 x 1.5, external



JIS B 0202-1982

JIS B 0203-1982

**Process connections**

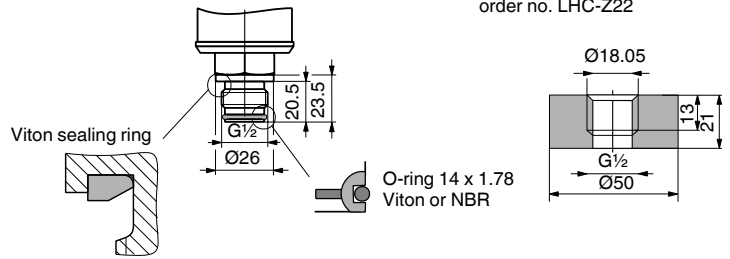
Pressure sensor dummy:

Pepperl+Fuchs offers a pressure sensor dummy for the welding nozzle order no. LHC-Z22.

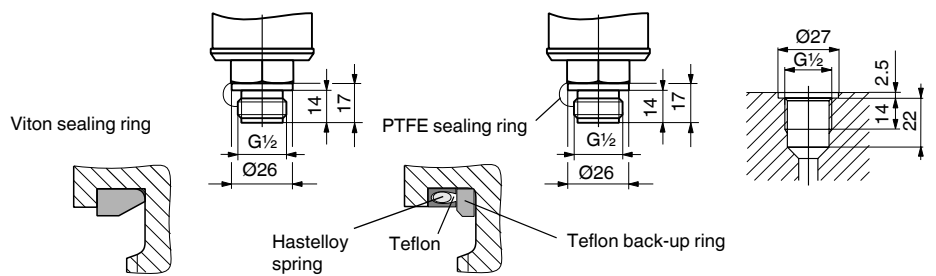
This aids heat removal during welding and prevents nozzles warping during welding.

Order no. LHC-Z20

G1O, G½ external with O-ring for welding nozzles



G1F, G½ external screw-in bolt DIN 3852-E-G½





Measuring range

PPC-M20				PPC-M10			
pressure type	meas. limits in bar	min. span in bar	overload in bar	pressure type	meas. limits in bar	min. span in bar	overload in bar
gauge pressure	0 ... 0.1	0.01	4	rel. pressure	0 ... 1	0.1	4
gauge pressure	0 ... 0.4	0.04	8	rel. pressure	0 ... 4	0.4	16
gauge pressure	0 ... 1	0.1	10	rel. pressure	0 ... 10	1	40
gauge pressure	0 ... 4	0.4	25	rel. pressure	0 ... 40*	4	160
gauge pressure	0 ... 10	1	40	rel. pressure	0 ... 100*	10	400
gauge pressure	0 ... 40	4	60	rel. pressure	0 ... 400*	40	600
gauge pressure	-0.1 ... 0.1	0.02	4	rel. pressure	-1 ... 1	0.2	4
gauge pressure	-0.4 ... 0.4	0.08	8	rel. pressure	-1 ... 4	0.5	16
gauge pressure	-1 ... 1	0.2	10	rel. pressure	-1 ... 10	1.1	40
gauge pressure	-1 ... 4	0.5	25				
gauge pressure	-1 ... 10	1.1	40				
abs. pressure	0 ... 0.4	0.04	8	abs. pressure	0 ... 1	0.1	4
abs. pressure	0 ... 1	0.1	10	abs. pressure	0 ... 4	0.4	16
abs. pressure	0 ... 4	0.4	25	abs. pressure	0 ... 10	1	40
abs. pressure	0 ... 10	1	40	abs. pressure	0 ... 40	4	160
abs. pressure	0 ... 40	4	60	abs. pressure	0 ... 100	10	400
				abs. pressure	0 ... 400	40	600

\*absolute pressure sensors

The given overload will apply for the sensor. Please note the permissible maximum gauge pressure of the diaphragm seals.

Vacuum resistance:

- PPC-M20
  - for sensors with nominal values 0.1 bar: up to 0.7 bar<sub>abs</sub>
  - for all other sensors: up to 0 bar<sub>abs</sub>
- PPC-M10
  - up to 10 mbar<sub>abs</sub>

Accessories

- LHC-Z10, cover with glass window for intrinsically safe units
- LHC-Z11, cover with glass window of polycarbonate for standard units
- LHC-Z12, cover with glass window for intrinsically safe units
- LHC-Z20, dummy for pressure sensors G1½A
- LHC-Z21, dummy for pressure sensors G1A
- LHC-Z22, welded nozzle G1½A
- LHC-Z23, welded nozzle G1A
- LHC-Z30, set for wall and pipe mounting PPC-M20
- LHC-Z30, set for wall and pipe mounting PPC-M10
- LHC-Z40, digital display for electrical outputs IA and PB
- LHC-Z41, analogue display for electrical output IB

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Certificates

- NA** for safe areas
- EX** II 1/2G EEx ia IIC T6
- E1** II 2G EEx ia IIC T6
- E2** II 3G EEx nA IIC T5
- CD** CSA, Cl. I, II, III, Div. 1, Group E-G (dust Ex), Cl. I, Div. 2, Group A-D
- CG** CSA General Purpose
- C1** CSA IS (suitable for Div. 2), Cl. I, II, III, Div. 1, Group A-G
- FM** FM IS, Cl. I, II, III, NI, Div. 1, Group A-G
- FD** FM DIP, Cl. I, II, III, Div. 1, Group E-G
- SX** II 1/2D EEx ia IIC T6
- S2** II 1/3D

Optional equipment

- N** without optional equipment
- M** with mounting bracket for wall and pipe mounting
- Z** 3.1.B material, wetted parts 1.4435/316L, inspection certificate to EN10204

Electrical output, indication

- NA** without electronics/without display
- I2** 4 mA ... 20 mA, analogue electronics
- IB** 4 mA ... 20 mA, analogue electronics with display 0 % ... 100 % bar
- IH** 4 mA ... 20 mA, SMART electronics, HART protocol
- IA** 4 mA ... 20 mA, SMART electronics, HART protocol with display quadruple and 0 % ... 100 % bar
- PA** PROFIBUS PA electronics P3.0. in the PNO certification process
- PB** PROFIBUS PA electronics P3.0 with four-character display and 0 % ... 100 % bar, in the PNO certification process

Housing, cable entry

- E1** stainless steel housing 1.4404/316L, M20 x 1.5 thread, IP66
- E2** stainless steel housing 1.4404/316L, 1/2 NPT entry, IP66
- E3** stainless steel housing 1.4404/316L, G1/2 entry, IP66
- E4** stainless steel housing 1.4404/316L, Harting plug, IP65
- E5** stainless steel housing 1.4404/316L, M12 x 1 plug, metal, IP68
- E6** stainless steel housing 1.4404/316L, cable IP68 with atmospheric pressure compensation
- A1** aluminium housing, M20 x 1.5 thread, IP66
- A2** aluminium housing, 1/2 NPT entry, IP66
- A3** aluminium housing, G1/2 entry, IP66
- A4** aluminium housing, Harting plug, IP65
- A5** aluminium housing, M12 x 1 plug, metal, IP68
- A6** aluminium housing 1.4404/316L, cable IP68 with atmospheric pressure compensation

Seal, diaphragm

- 1** diaphragm 1.4435/316L, Viton, mineral oil
- 2** diaphragm 1.4435/316L, Viton, inert oil, oil and grease free
- A** diaphragm 1.4435/316L, welded, mineral oil
- C** diaphragm 1.4435/316L, welded, inert oil, max. 60 °C (333 K)/120 bar
- D** diaphragm 1.4435/316L, welded, inert oil, oil and grease free
- F** diaphragm 1.4435/316L, NBR, mineral oil (FDA)
- H** diaphragm 1.4435/316L, FKM Viton, mineral oil (FDA)
- P** diaphragm 1.4435/316L, PTFE and Hastelloy C, mineral oil

Process connection

- G1F** G1/2A, EN 837, flush mounted diaphragm
- G1G** G1/2A, EN 837, internal diaphragm
- G1O** G1/2A, DIN ISO 228, flush mounted with O-ring, for welding nozzles (with vegetable oil only)
- N1A** 1/2 NPT external, ANSI, internal diaphragm
- N1I** 1/2 NPT internal, ANSI, internal diaphragm
- J11** PF1/2 external, JIS B 0202, internal diaphragm
- J12** PT1/2 external, JIS B 0203, internal diaphragm
- M21** M20 x 1.5 external, EN 837, internal diaphragm
- XXX** special version

Calibration and units

- 1** 0.2 %, calibration in sensor limits: mbar/bar
- 2** 0.2 %, calibration in sensor limits: kPa/MPa
- 3** 0.2 %, calibration in sensor limits: mm/mH<sub>2</sub>O
- 4** 0.2 %, calibration in sensor limits: inH<sub>2</sub>O/rH<sub>2</sub>O
- 5** 0.2 %, calibration in sensor limits: kgf/cm<sup>2</sup>
- 6** 0.2 %, calibration in sensor limits: psi
- B** 0.2 %, calibrated from ... to ..., technical unit ...
- C** 0.1 %, calibrated from ... to ..., technical unit ...

Pressure range

- R2A** 0 bar ... 1 bar relative pressure sensor, 100 kPa, 15 psig/400 in H<sub>2</sub>O, overload quadruple
- R2D** 0 bar ... 4 bar relative pressure sensor, 400 kPa, 60 psig, overload quadruple
- R3A** 0 bar ... 10 bar relative pressure sensor, 1 MPa, 150 psig, overload quadruple
- R3D** 0 bar ... 40 bar relative pressure sensor, 4 MPa, 600 psig, overload quadruple
- R4A** 0 bar ... 100 bar relative pressure sensor, 10 MPa, 1500 psig, overload quadruple
- R4D** 0 bar ... 400 bar relative pressure sensor, 40 MPa, 6000 psig, overload 1.5-fold
- N2A** -1 bar ... 1 bar sensor, -100 kPa ... 100 kPa, -15 psig ... 15 psig, overload quadruple
- N2D** -1 bar ... 4 bar sensor, -100 kPa ... 400 kPa, -15 psig ... 60 psig, overload quadruple
- N3A** -1 bar ... 10 bar sensor, -0.1 MPa ... 1 MPa, -15 psig ... 150 psig, overload quadruple
- A2A** 0 bar ... 1 bar absolute pressure sensor, 100 kPa, 15 psia, overload quadruple
- A2D** 0 bar ... 4 bar absolute pressure sensor, 400 kPa, 60 psia, overload quadruple
- A3A** 0 bar ... 10 bar absolute pressure sensor, 1 MPa, 150 psia, overload quadruple
- A3D** 0 bar ... 40 bar absolute pressure sensor, 4 MPa, 600 psia, overload quadruple
- A4A** 0 bar ... 100 bar absolute pressure sensor, 10 MPa, 1500 psia, overload quadruple
- A4D** 0 bar ... 400 bar absolute pressure sensor, 40 MPa, 6000 psia, overload 1.5-fold

Transmitter

- M10** metal sensor, piezoresistive

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Certificates

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- E1 II 2G EEx ia IIC T6
- E2 II 3G EEx nA IIC T5
- CD CSA, Cl. I, II, III, Div. 1, Group E-G (dust Ex), Cl. I, Div. 2, Group A-D
- CG CSA General Purpose
- C1 CSA IS (suitable for Div. 2), Cl. I, II, III, Div. 1, Group A-G
- FM FM IS, Cl. I, II, III, NI, Div. 1, Group A-G
- FD FM DIP, Cl. I, II, III, Div. 1, Group E-G
- SX II 1/2D EEx ia IIC T6
- S2 II 1/3D

Optional equipment

- N without optional equipment
- M with mounting bracket for wall and pipe mounting
- Z 3.1.B material, wetted parts 1.4435/316L, inspection certificate to EN10204

Electrical output, indication

- NA without electronics/without indication
- I2 4 mA ... 20 mA, analogue electronics
- IB 4 mA ... 20 mA, analogue electronics with display 0 % ... 100 % bar
- IH 4 mA ... 20 mA, SMART electronics, HART protocol
- IA 4 mA ... 20 mA, SMART electronics, HART protocol with display quadruple and 0 % ... 100 % bar
- PA PROFIBUS PA electronics P3.0, in the PNO certification process
- PB PROFIBUS PA electronics P3.0 with four-character display and 0 % ... 100 % bar, in the PNO certification process

Housing, cable entry

- E1 stainless steel housing 1.4404/316L, M20 x 1.5 thread, IP66
- E2 stainless steel housing 1.4404/316L, 1/2 NPT entry, IP66
- E3 stainless steel housing 1.4404/316L, G1/2 entry, IP66
- E4 stainless steel housing 1.4404/316L, Harting plug, IP65
- E5 stainless steel housing 1.4404/316L, M12 x 1 plug, metal, IP68
- E6 stainless steel housing 1.4404/316L, cable IP68 with atmospheric pressure compensation
- A1 aluminium housing, M20 x 1.5 thread, IP66
- A2 aluminium housing, 1/2 NPT entry, IP66
- A3 aluminium housing, G1/2 entry, IP66
- A4 aluminium housing, Harting plug, IP65
- A5 aluminium housing, M12 x 1 plug, metal, IP68
- A6 aluminium housing 1.4404/316L, cable IP68 with atmospheric pressure compensation

Seal, diaphragm

- 1 FKM Viton sensor sealing
- 2 NBR sensor sealing
- 4 EPDM sensor sealing
- 6 FKM Viton sealing, for oxygen application, grease free, to max. 60 °C (333 K)
- 7 Kalrez sensor sealing
- A FKM Viton sealing, oil and grease free
- C Chemraz sensor sealing

Process connection

- G11 G1/2A, EN 837, 1.4435/316L
- G1C G1/2A, EN 837, Hastelloy C
- G14 G1/2A, G1/4 internal, DIN ISO 228, 1.4435/316L
- G1M G1/2A, 11.4 mm (0.45 in) internal, DIN ISO 228, 1.4435/316L
- N14 1/2 NPT external, 1/4 NPT internal, ANSI, 1.4435/316L
- N1C 1/2 NPT external, 1/4 NPT internal, ANSI, Hastelloy C
- N1M 1/2 NPT external, 11.4 mm (0.45 in) internal, ANSI, 1.4435/316L
- J11 PF 1/2 external, JIS B 0202, 1.4435/316L
- J12 PT 1/2 external, JIS B 0203, 1.4435/316L
- M21 M20 x 1.5 external, EN 837, 1.4435/316L
- XXX special version

Calibration and technical units

- 1 0.2 %, calibration in sensor limits: mbar/bar
- 2 0.2 %, calibration in sensor limits: kPa/MPa
- 3 0.2 %, calibration in sensor limits: mm/mH2O
- 4 0.2 %, calibration in sensor limits: inH2O/tH2O
- 5 0.2 %, calibration in sensor limits: kgf/cm<sup>2</sup>
- 6 0.2 %, calibration in sensor limits: psi
- B 0.2 %, calibrated from ... to ..., technical unit ...
- C 0.1 %, calibrated from ... to ..., technical unit ...

Pressure range

- R1A 0 mbar ... 100 mbar gauge pressure sensor, 10 kPa, 1.5 psig/40 in H<sub>2</sub>O, overload 40-fold
- R1D 0 mbar ... 400 mbar gauge pressure sensor, 40 kPa, 6 psig/160 in H<sub>2</sub>O, overload 15-fold
- R2A 0 bar ... 1 bar gauge pressure sensor, 100 kPa, 15 psig/400 in H<sub>2</sub>O, overload 10-fold
- R2D 0 bar ... 4 bar gauge pressure sensor, 400 kPa, 60 psig, overload 6-fold
- R3A 0 bar ... 10 bar gauge pressure sensor, 1 MPa, 150 psig, overload quadruple
- R3D 0 bar ... 40 bar gauge pressure sensor, 4 MPa, 600 psig, overload 1.5-fold
- N1A -100 mbar ... 100 mbar sensor, -10 kPa ... 10 kPa, -40 in ... 40 in H<sub>2</sub>O, overload 40-fold
- N1D -400 mbar ... 400 mbar sensor, -40 kPa ... 40 kPa, -6 psig ... 6 psig, overload 15-fold
- N2A -1 bar ... 1 bar sensor, -100 kPa ... 100 kPa, -15 psig ... 15 psig, overload 10-fold
- N2D -1 bar ... 4 bar sensor, -100 kPa ... 400 kPa, -15 psig ... 60 psig, overload 6-fold
- N3A -1 bar ... 10 bar sensor, -0.1 MPa ... 1 MPa, -15 psig ... 150 psig, overload quadruple
- A1D 0 mbar ... 400 mbar absolute pressure sensor, 40 kPa, 6 psia, overload 15-fold
- A2A 0 bar ... 1 bar absolute pressure sensor, 100 kPa, 15 psia, overload 10-fold
- A2D 0 bar ... 4 bar absolute pressure sensor, 400 kPa, 60 psia, overload 6-fold
- A3A 0 bar ... 10 bar absolute pressure sensor, 1 MPa, 150 psia, overload quadruple
- A3D 0 bar ... 40 bar absolute pressure sensor, 4 MPa, 600 psia, overload 1.5-fold

Transmitter

- M20 ceramic sensor