



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Cerabar T PMC131, PMP131, PMP135

Process pressure measurement

Pressure transducer with ceramic and metallic sensors

For absolute pressure and gauge pressure measurement up to 400 bar (6000 psi); Extremely stable, overload-resistant and reliable



Application

The Cerabar T is a pressure transducer for measuring absolute pressure and gauge pressure in gases, vapors, liquids and dusts.

Hygienic and threaded connections are available as process connections.

Your benefits

This compact pressure transducer impresses with its well-engineered construction:

- High reproducibility and long-term stability.
- Finely graduated measuring ranges from vacuum up to 400 bar (6000 psi)
- Ceraphire® ceramic sensor: corrosion-proof, abrasion-proof and extremely overload-resistant
- Deployed for pressure monitoring up to SIL 2 as per IEC 61508/IEC 61511-1
- Sensors
 - Dry capacitance ceramic sensor (Ceraphire®) for measuring ranges up to 40 bar (600 psi): overload-resistant, vacuum-proof, stable against alternating load
 - Piezoresistive sensor with metallic process isolating diaphragm for measuring ranges up to 400 bar (6000 psi)

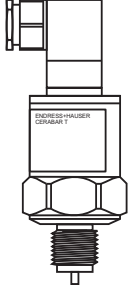
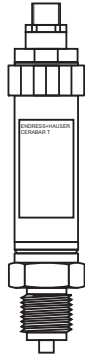
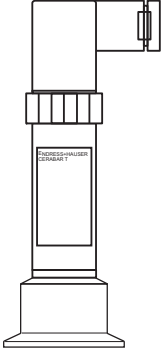
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Function and system design

Device selection

Cerabar T - Product family	PMC131	PMP131	PMP135
	 P01-PMC131xx-14-xx-xx-xx-000 With capacitive measuring cell and ceramic process isolating diaphragm (Ceraphire®)	 P01-PMP131xx-14-xx-xx-xx-000 With piezoresistive measuring cell and metallic process isolating diaphragm	 P01-PMP135xx-14-xx-xx-xx-000 With piezoresistive measuring cell and metallic process isolating diaphragm for hygienic applications
Field of application	Absolute pressure and gauge pressure	Absolute pressure and gauge pressure	Absolute pressure and gauge pressure in hygienic processes
Output	– Current output 4 to 20 mA	– Current output 4 to 20 mA – Voltage output 0 to 10 V – Switch output PNP	– Current output 4 to 20 mA – Switch output PNP
Process connections	Thread: – G ½ – ½ MNPT and ¼ FNPT – G ½, bore 11 mm (0.43 in)	Thread: – G ½ – ½ MNPT and ¼ FNPT – ½ MNPT, bore 11.4 mm (0.45 in) – G ¼ – ¼ MNPT, bore 3.5 mm (0.14 in) – M 20 x 1.5	Hygiene: – Clamp DN 22 (¾") – Tri-Clamp DN 25 to 38 (1" to 1½") – Tri-Clamp DN 40 to 51 (2") – G 1 – SMS 1½"
Measuring ranges	from –1 to 0 bar (–15 to 0 psi) / –100 to 0 kPa up to 0 to 40 bar (0 to 600 psi) / 0 to 4 MPa	0 to 1 bar (0 to 15 psi) / 0 to 100 kPa up to 0 to 400 bar (0 to 6000 psi) / 0 to 40 MPa	0 to 1 bar (0 to 15 psi) / 0 to 100 kPa up to 0 to 40 bar (0 to 600 psi) / 0...4 MPa
Process temperature range	–20 to +100 °C (–4 to +212 °F)	–25 °C to +70 °C (–13 to +158 °F)	–25 to +100 °C (–13 to +212 °F), +135 °C (275 °F) for max. 1 hour

Measuring principle

PMC131

The process pressure causes a slight deflection of the ceramic process isolating diaphragm of the sensor. The pressure-proportional change in capacitance is measured at the electrodes of the ceramic sensor. The ceramic sensor is a dry sensor, i.e. no fill fluid is required for the pressure transfer. This makes the sensor completely suitable for vacuums. Extremely high stability, comparable with the material Alloy, is achieved by using ultrapure Ceraphire® as the ceramic.

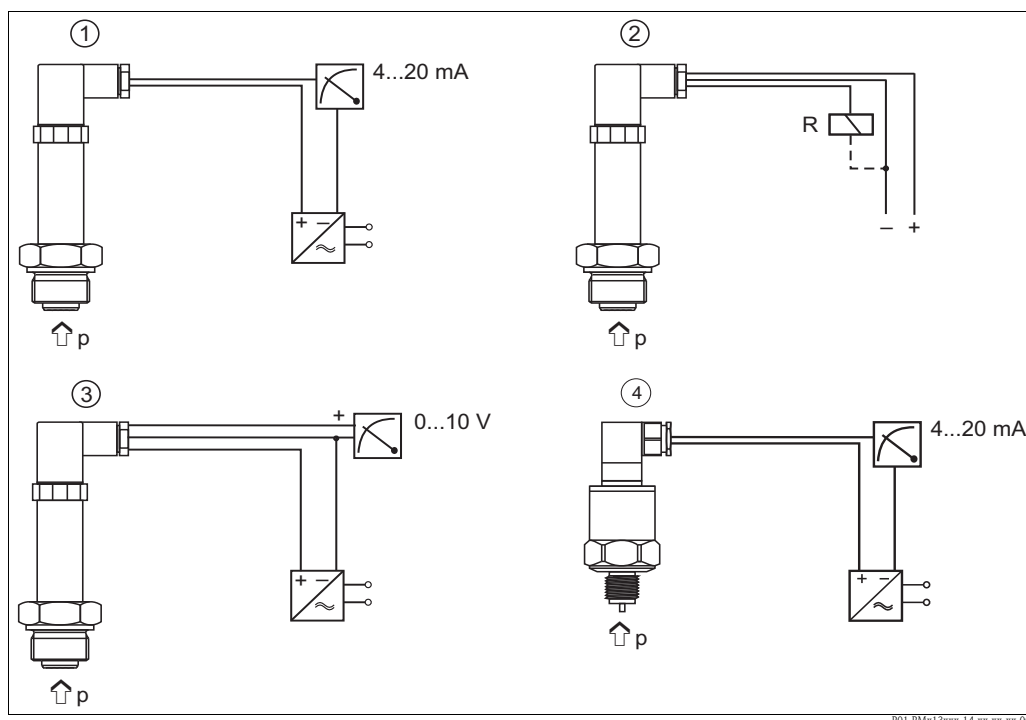
PMP131 and PMP135 with analog output

The process pressure acting upon the metallic process isolating diaphragm of the sensor is transmitted to a resistance bridge via a fluid. The pressure-proportional change of the bridge output voltage is measured and processed further.

PMP131 and PMP135 with switch output

The process pressure acting upon the metallic process isolating diaphragm of the sensor is transmitted to a resistance bridge via a fluid. A differential amplifier creates a standard signal from the pressure-proportional change in output voltage of the bridge. A comparator with an adjustable hysteresis compares this signal with the pre-set switch point and then activates the transistor output.

Measuring system



P01-PMx13xxx-14-xx-xx-xx-002

- 1 PMP131, PMP135: current output with transmitter power supply unit, e.g. RN 221N from Endress+Hauser
- 2 PMP131, PMP135: switch output with load, e.g. PLC, DCS, relay
- 3 PMC131: voltage output with transmitter power supply unit, e.g. RIA452 from Endress+Hauser
- 4 PMC131: current output with transmitter power supply unit, e.g. RN 221N from Endress+Hauser

Input

Measured variable	Absolute pressure or gauge pressure
Measuring range	up to 400 bar (6000 psi), → 19, "Ordering information" section

Output

Analog output (PMC131, PMP131, PMP135)

Output signal	Current output 4...20 mA, 2-wire version (PMC131, PMP131, PMP135) Voltage output 0...10 V, 3-wire version (PMP131)
Load	PMC131 $R_{Lmax} [\Omega] \leq (U_S - 11 \text{ V}) / 0.02 \text{ A}$ PMP131 and PMP135 (current output) $R_{Lmax} [\Omega] \leq (U_S - 12 \text{ V}) / 0.02 \text{ A}$ (R_{Lmax}: Maximum load resistance, U_S: Supply voltage) PMP131 (voltage output) Load resistance $R_{Lmax} \geq 5 \text{ k}\Omega$, current consumption $\leq 6 \text{ mA}$ Switch output (PMP131, PMP135)

Output signal	PNP switch output (positive voltage signal), rate depends on power supply voltage
Output current	■ Switch status ON: $I_a \leq 500 \text{ mA}$

- Switch status OFF: $I_a \leq 1 \text{ mA}$

Power max. 6 W

Switch frequency max. 10 Hz

Input PLC

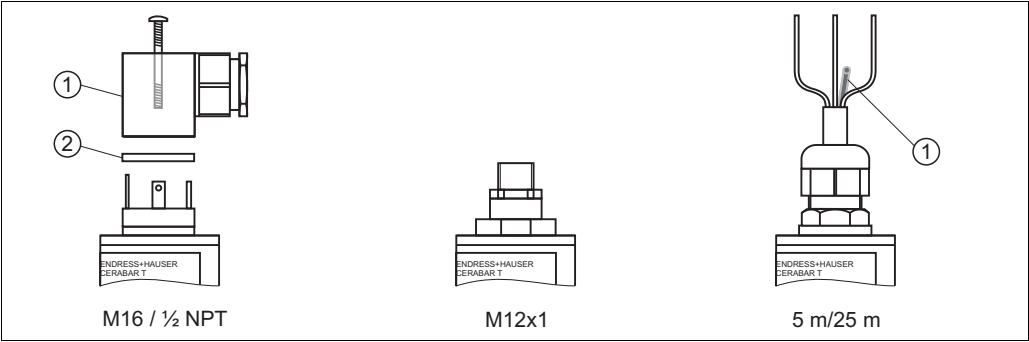
- Input resistance $R_i \leq 2 \text{ k}\Omega$
- Input current $I_i \geq 10 \text{ mA}$

Inductive loads To prevent electrical interference, only operate an inductive load (relays, contactors, solenoid valves) when directly connected to a protective circuit (free-wheeling diode or capacitor).

Power supply

PMC131

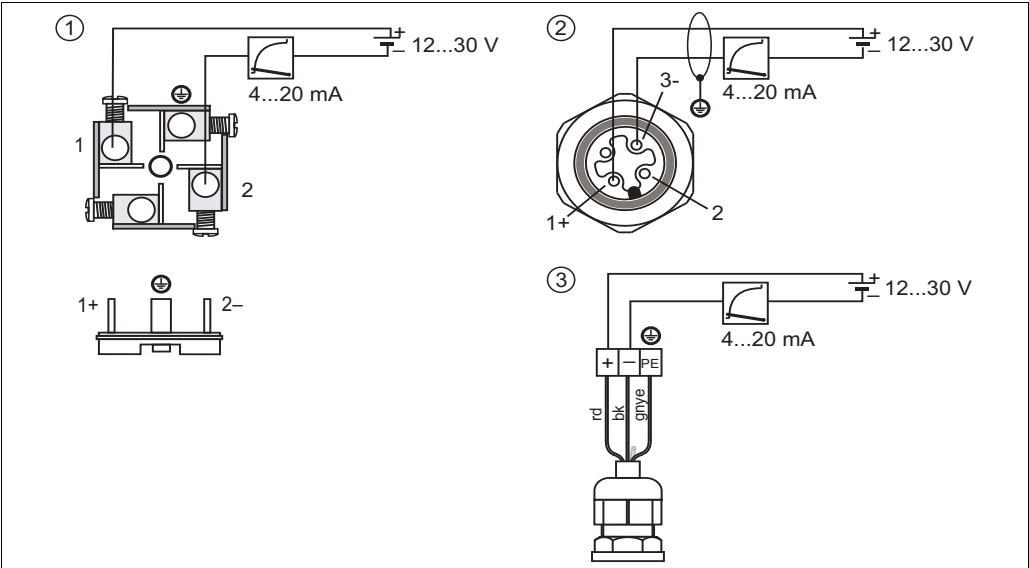
Plug/cable connection



P01-PMC131-xx-04-xx-xx-xx-001

Plug M 16 x 1.5 (DIN 43650/A), 1/2 NPT	Plug M 12x1	5 m (16 ft) / 25 m (82 ft) cable
? Plug-in housing		? Reference pressure line
? Gasket		

Electrical connection: Analog/current output

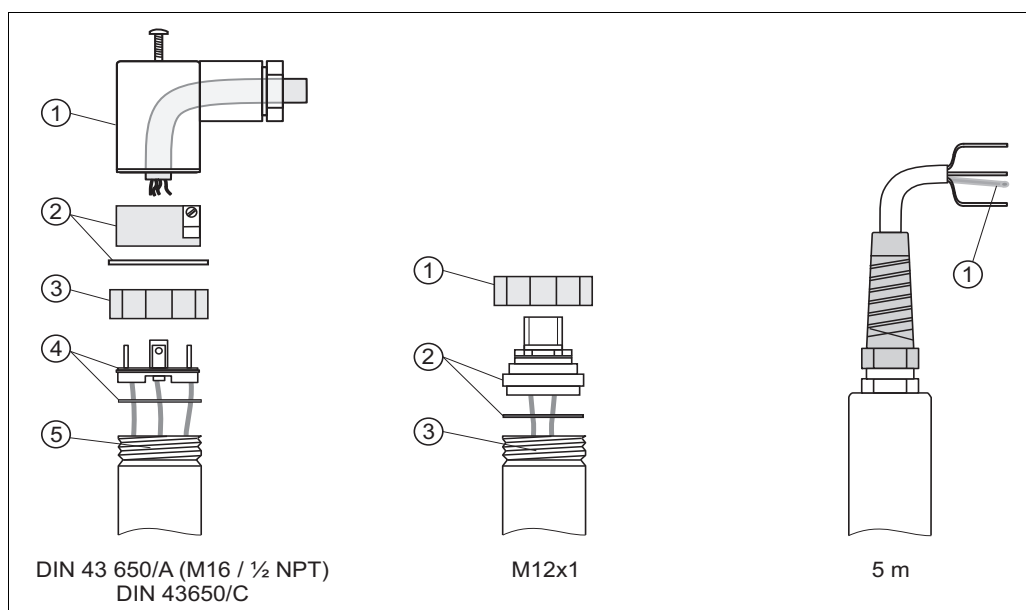


P01-PMC131-xx-04-xx-xx-xx-002

- 1 Plug M 16 x 1.5 (DIN 43650/A), 1/2 NPT
- 2 Plug M 12 x 1
- 3 Cable (rd = red, bk = black, gnye = green-yellow)

PMP131 and PMP135

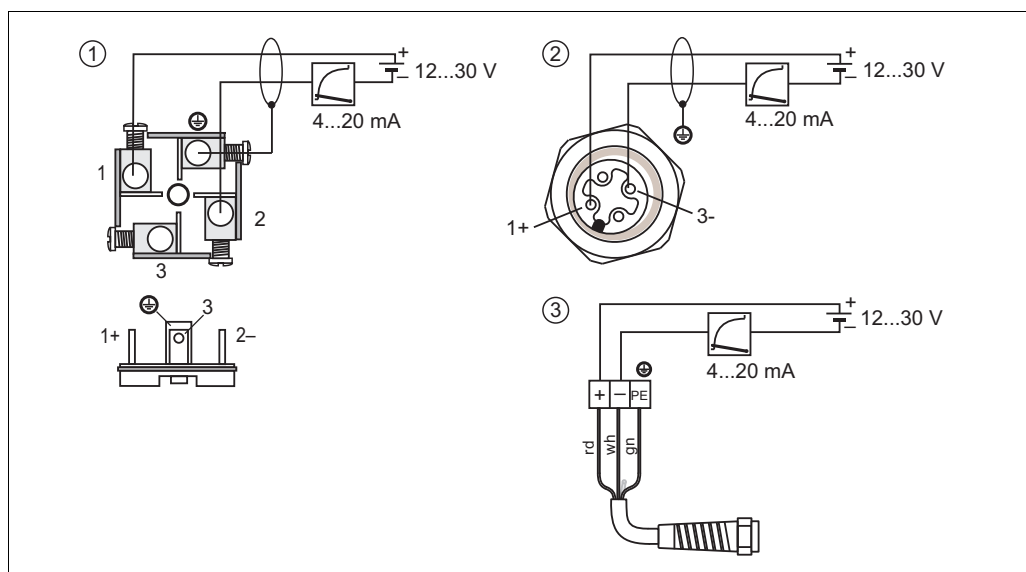
Plug/cable connection



P01-PMP13xxx-04-xx-xx-xx-001

Plug M 16 x 1.5 (DIN 43650/A), 1/2 NPT Plug DIN 43650/C	Plug M 12x1	5 m (16 ft) cable, only analog output
? Plug-in housing	? Coupling nut	? Reference pressure line
? Plug-in jack with gasket	? Connector with gasket	
? Coupling nut	? Operating potentiometer (inner)	
? Plug with O-ring		
? Operating potentiometer (inner)		

Electrical connection: Analog/current output

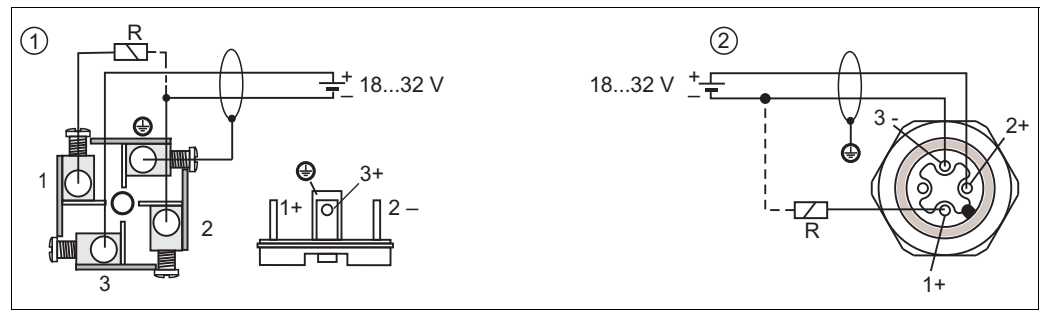


P01-PMP13xxx-04-xx-xx-xx-002

- 1 Plug M 16 x 1.5 (DIN 43650/A), 1/2 NPT and plug DIN 43650/C
 2 Plug M 12 x 1
 3 Cable (rd = red, wh = white, gn = green)

For electrical connection provided by customer use only shielded cable

Electrical connection (switch output)



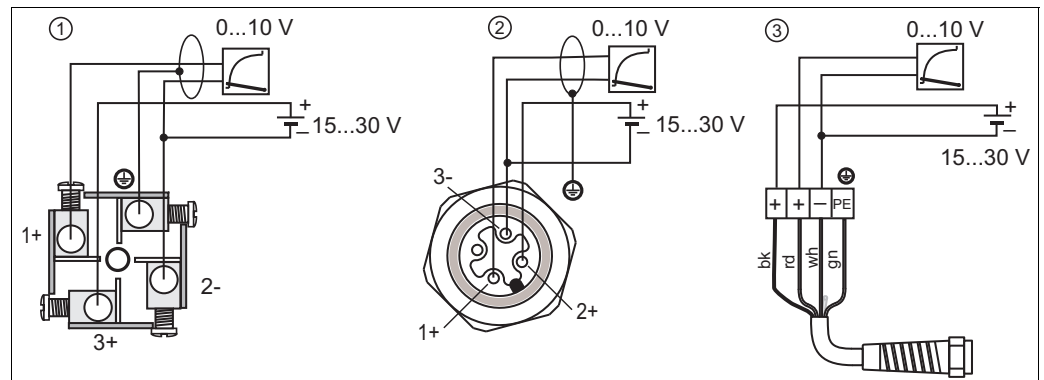
1 Plug M 16 x 1.5 (DIN 43650/A), ½ NPT

2 Plug M 12 x 1

R External load, e.g. relay, programmable logic controller, distributed control system

For electrical connection provided by customer use only shielded cable

PMP131 Electrical connection: Analog-/voltage output



1 Plug M 16 x 1,5 (DIN 43650/A), ½ NPT and plug DIN 43 650/C

2 Plug M 12 x 1

3 Cable (rd = red, wh = white, gn = green)

For electrical connection provided by customer use only shielded cable

Supply voltage

PMC131

11 to 30 V DC

PMP131 and PMP135 (current output, 2-wire version)

- For non-hazardous areas: 12 to 30 V DC
- Ex i: no-load voltage ≤ 26 V DC, short-circuit current ≤ 100 mA, power consumption ≤ 0.8 W

PMP131 (voltage output, 3-wire version)

- 15...30 V DC

PMP131 and PMP135 (switch output)

- 18 to 32 V DC, current consumption without load < 20 mA, with reverse polarity protection

Residual ripple

- Analog output: max. 5 % of supply voltage
- Switch output: max. 10 % of supply voltage

Cable entry

→ 19, "Ordering information" section.

Performance characteristics

Reference operating conditions as per DIN IEC 60770, $T_U = 25\text{ °C}$ (77 °F)

Long-term stability $\leq 0.15\text{ %}$ of URL per year

Reference accuracy Analog output The reference accuracy comprises the non-linearity according to limit point setting, hysteresis and non-reproducibility as per IEC 60770.

PMC131

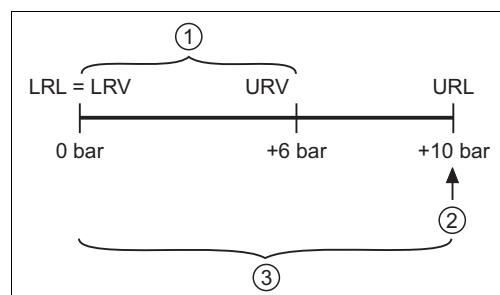
- $\leq 0.5\text{ %}$ of nominal value x TD
(extended specifications apply to customer-specific measuring ranges)

Example: PMC131 version "AIR"

- Nominal value = 10 bar (150 psi)
- Upper range value (URV) = 6 bar (90 psi)
- Lower range value (LRV) = 0 bar

Turn down (is set at factory):

- $\text{Nominal value} / (\text{URV} - \text{LRV}) =$
 $10\text{ bar (150 psi)} / 6\text{ bar (90 psi)} = 10:6$



P01-PMx13xxx-05-xx-xx-xx-001

Example: PMC131 version "AIR"

set span: 0 to 6 bar (0 to 90 psi);

nominal value = 10 bar (150 psi)

- 1 Span set and calibrated at the factory (measuring range)
 - 2 Nominal value $\cong$ Upper Range Limit (URL)
 - 3 Sensor measuring range
- LRL Lower Range Limit
 URL Upper Range Limit
 LRV Lower Range Value
 URV Upper Range Value

PMP131 and PMP135

- $\leq 0.5\text{ %}$ of URL

Switch point

PMP131 and PMP135

- Deviation: $\leq 1\text{ %}$ of URL
- Non-reproducibility: $\leq 0.5\text{ %}$ of URL

Rise time (T90)

PMC131

20 ms

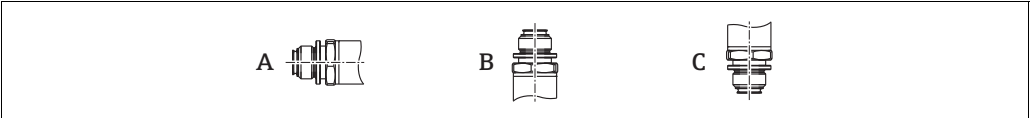
PMP131 and PMP135

2 to 5 ms

Thermal change in the zero output and the output span	PMC131 For customer-specific measuring-ranges: values are doubled Zero output, -20 to +85 °C (-4 to +185 °F): ■ typically 1.5 % of nominal value Output span, -20 to +85 °C (-4 to +185 °F): ■ Nominal value 0.4 to 40 bar (6 to 600 psi): typically 0.8 % of nominal value ■ Nominal value 0.1 to 0.2 bar (1.5 to 3 psi): typically 1.0 % of nominal value
Temperature coefficient (T _K) for lower range value and span	PMP131 and PMP135 (analog output) Zero output: ■ typically: 0.2 % of URL/10 K ■ max.: 0.5 % of URL/10 K ■ Nominal value ≤ 6 bar (90 psi): by 0.1 % of URL/10 K higher Output signal: ■ typically: 0.2 % of URL/10 K ■ max.: 0.5 % of URL/10 K
	PMP131 and PMP135 (switch output) Switch point: ■ typically: 0.2 % of URL/10 K ■ max.: 0.5 % of URL/10 K

Operating conditions (installation)

Orientation	anywhere
Installation instructions	PMP131 Process connection G ½ flush-mounted, max. torque 40 Nm (29.5 lbf ft)
Location dependence	PMC131 without influence PMP131 and PMP135 Any orientation is possible. However, the orientation may cause a zero point shift i.e. the measured value does not show zero when the vessel is empty or partially full.



A0024708

Process isolating diaphragm axis is horizontal (A)	Process isolating diaphragm pointing upwards (B)	Process isolating diaphragm pointing downwards (C)
Calibration position, no effect	Up to +4 mbar (+0.058 psi)	Up to -4 mbar (-0.058 psi)

Operating conditions (environment)

Ambient temperature range	PMC131 –20 to +85 °C (–4 to +185 °F)
	PMP131 and PMP135 ■ For non-hazardous areas: –25 to +70 °C (–13 to +158 °F) ■ Ex i: –25 to +65 °C (–13 to +149 °F)
Storage temperature range	PMC131 –50 to +100 °C (–58 to +212 °F)
	PMP131 and PMP135 –40 to +85 °C (–40 to +185 °F)
Climate class	PMC131 4K4H as per DIN EN 60721-3
	PMP131 and PMP135 4Z with Z = 70 °C (158 °F) as per VDI/VDE 3540
Degree of protection	PMC131 ■ Plug M 16 x 1,5 (DIN 43650/A), ½ NPT: IP 65/NEMA 4X ■ Plug M12x1: IP 65/ NEMA 4 ■ Cable: IP 68/NEMA 6P (1 mWS/24 h)
	PMP131 and PMP135 ■ Plug M 16 x 1,5 (DIN 43650/A), ½ NPT: IP 65/NEMA 4X ■ Plug M 12x1 and gauge pressure sensors: IP 65/NEMA 4X ■ Plug M 12x1 and absolute pressure sensors: IP 68/NEMA 6P (1 mWS/24 h) ■ Cable: IP 68/NEMA 6P (1 mWS/24 h)
Vibration resistance	4M5 as per DIN EN 60721-3
Electromagnetic compatibility	EMC in accordance with all the relevant requirements of the EN 61326 series. Details are provided in the Declaration of Conformity.

Operating conditions (process)

Process temperature range

PMC131

- -20 to +100 °C (-4 to 212 °F)
- Devices for oxygen application: -10 to +60 °C (14 to 140 °F)
(Version "S" for feature 30 "Sensor gasket")

PMP131

-25 to +70 °C (-13 to +158 °F)

PMP135

-25 to +100 °C (-13 to 212 °F), +135 °C (275 °F) for max. 1 hour

Extreme jumps in temperature can result in temporary measuring errors. Temperature compensation takes effect after several minutes. Internal temperature compensation is faster the smaller the temperature jump and the longer the time interval.

Overload resistance

→ 19, "Ordering information" section.

Vacuum resistance

PMC131

URV	Vacuum resistance	Version
0...100 mbar (0...1.5 psi)	700 mbar _{abs} (10.5 psi _{abs})	D10
20 mbar (0.3 psi)		D3W
100 mbar (1.5 psi)		D31
1.5 psi (100 mbar)		V6F
0...1.5 psi (0...100 mbar)		Q4D
15 inH ₂ O		W6N
30 inH ₂ O		W6R
0...200 mbar (0...3 psi)	500 mbar _{abs} (7.5 psi _{abs})	D12
200 mbar (3 psi)		D38
50 inH ₂ O		S4N
80 inH ₂ O		W6O
all other versions	0 mbar _{abs}	

PMP131 and PMP135

10 mbar_{abs} (0.15 psi_{abs})

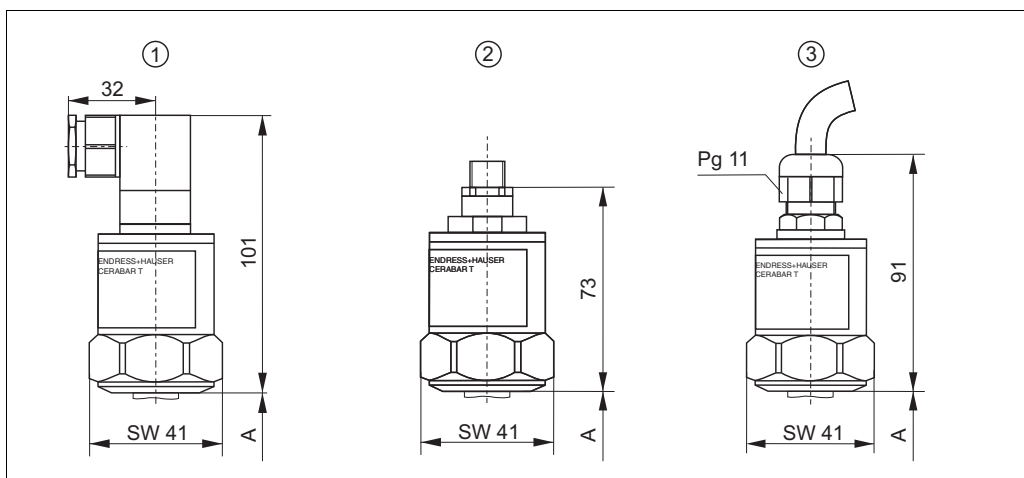
The vacuum resistance applies for the measuring cell under reference operating conditions.

Pressure specifications

- The MWP (maximum working pressure) of the device is specified on the nameplate. It depends on the weakest element, with regard to pressure, of the selected components. See the following sections:
 - → 19 ff, "Ordering information" section, feature 50 "Measuring range; MWP; Nominal value; OPL" or "Sensor range; MWP; OPL".
 - → 12 ff, "Mechanical construction" section.
 The MWP specification on the nameplate is based on a reference temperature of +20 °C (68 °F) and can be present over an unlimited period of time.
- The test pressure corresponds to the overload limit of the measuring device (Over Pressure Limit OPL) and must only be present for a limited period of time.

Mechanical construction

PMC131 Housing



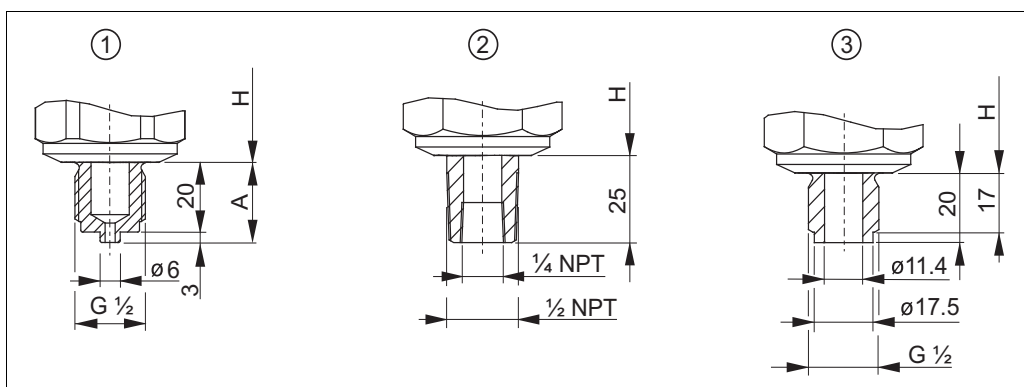
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Housing PMC131; Material AISI 304 (1.4301)

- 1 Versions A1, A2, B1, C1, C2: Plug M 16 or ½ NPT (ISO 4400), IP 65
- 2 Versions A5, B5, C5: Plug M 12, IP 65
- 3 Versions A3, A4, B3, C3: 5 m (16 ft) or 25 m (82 ft) cable, IP 68

→ See the following diagram for the height of process connection A

PMC131 Process connections



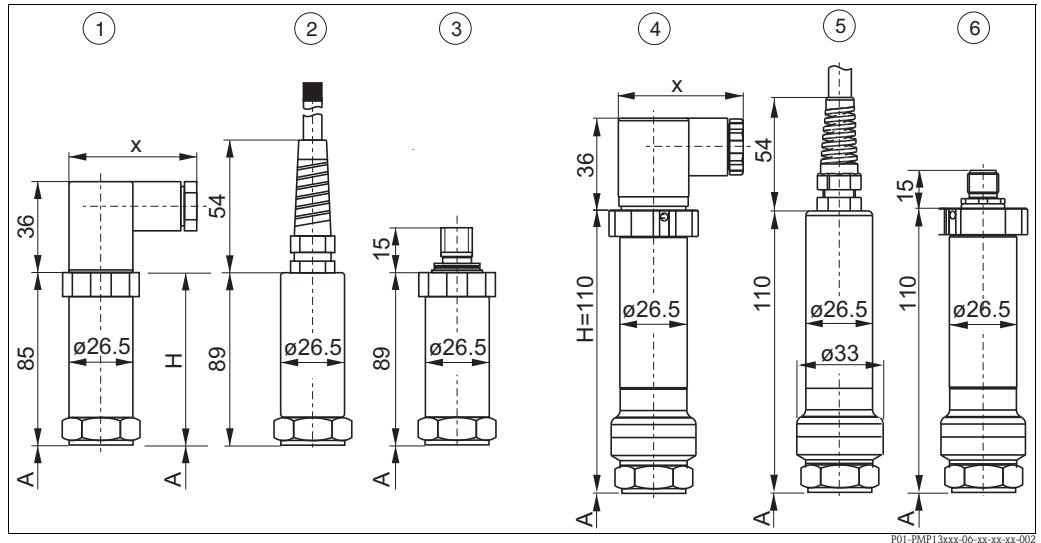
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Process connections PMC131; Material AISI 304 (1.4301)

- 1 Version 1: Thread ISO 228 G ½
- 2 Version 2: Thread ANSI ½ MNPT ¼ FNPT
- 3 Version 5: Thread ISO 228 G ½, bore 11.4 mm (0.45 in)

→ See respective housing for installation height H (previous figure)

PMP131 and PMP135 Housings



Housings PMP131 and PMP135; Material AISI 304 (1.4301)

1...3 PMP131 and PMP135 with sensor range up to 60 bar (900 psi)

4...6 PMP131 with sensor range up to 400 bar (6000 psi)

1 + 4 Versions A1, A2: Plug M 16 (DIN 43650/A) or 1/2 NPT (ISO 4400), IP 65; dimension x = 52 mm (2.05 in)

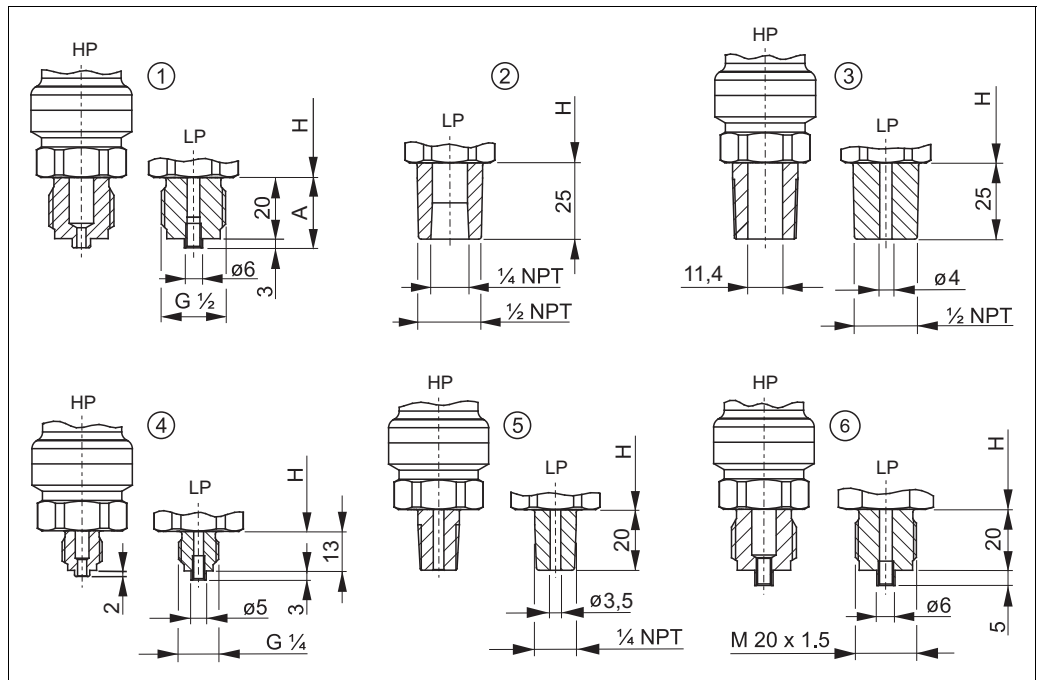
Version A5: Plug DIN 43650/C, IP 65; dimension x = 42 mm (1.65 in)

2 + 5 Version A3: 5 m (16 ft) cable, IP 68

3 + 6 Version A4: Plug M 12, IP 65

→ See the following figure for the dimensions of process connection A

PMP131 Process connections



Process connections PMP131; Material AISI 304 (1.4301)

HP: process connections from 100 to 400 bar (1500 psi to 6000 psi). LP: lower measuring ranges.

1 Version 1: Thread ISO 228 G 1/2

2 Version 2: Thread ANSI 1/2 MNPT 1/4 FNPT

3 Version 3: Thread ANSI 1/2 MNPT, bore 11.4 mm (0.45 in) female

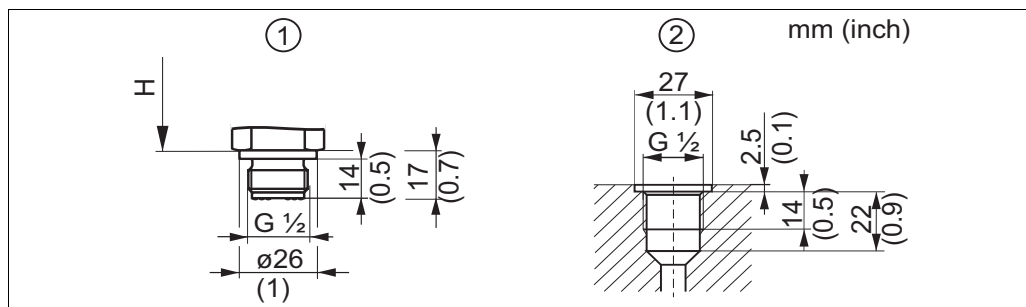
4 Version 4: Thread ISO 228 G 1/4

5 Version 5: Thread ANSI 1/4 MNPT, bore 3.5 mm (0.14 in) female

6 Version 6: Thread M 20 x 1.5

→ See respective housing for installation height H (figure above)

→ Process connections with AF 27 mm



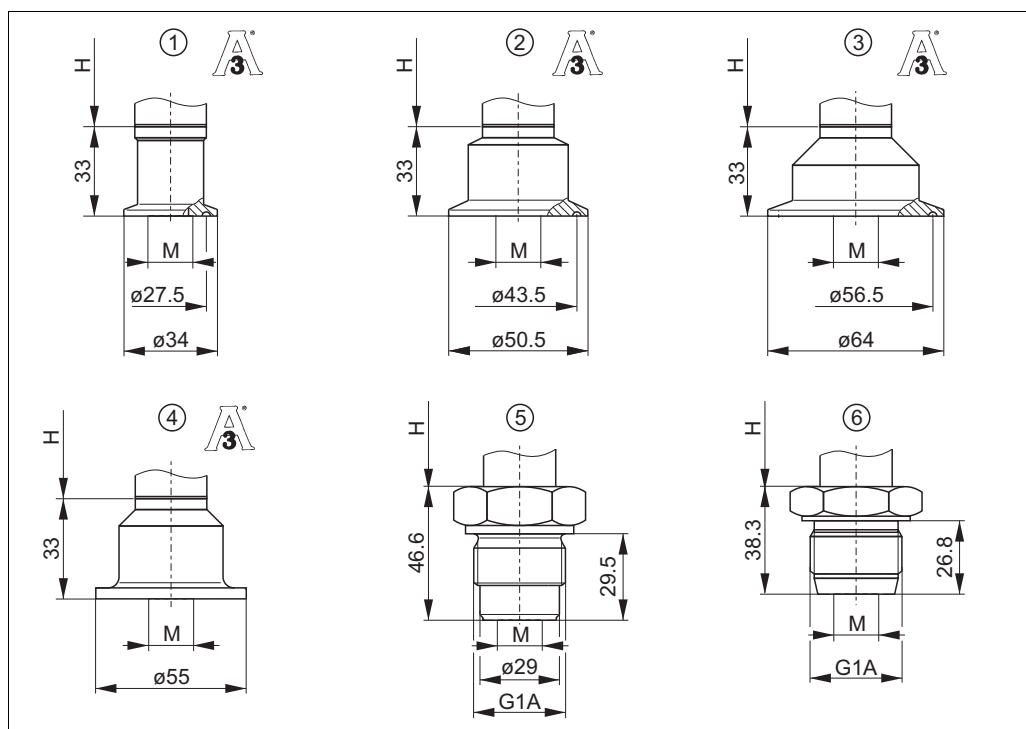
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Process connection PMP131; Material AISI 304 (1.4301)

- 1 Version B: Thread ISO 228 G 1/2, Seal seat as per DIN 3852-A, AISI 304, flush-mounted
- 2 Dimensions for tapped hole G 1/2 as per DIN 3852-11 form X

→ See respective housing for installation height H

PMP135 Process connections



P01-PMP135xx-06-xx-xx-xx-001

Process connections PMP135; Material AISI 316L (1.4435); Surface roughness of the surfaces in contact with the media $R_a \leq 0.8 \mu\text{m}$

M = Diaphragm diameter 17.2 mm (0.68 in)

- 1 Version F: Clamp DN18-22 (DIN 32676), 3A, EHEDG
- 2 Version G: Tri-Clamp 1" to 1 1/2" (ISO 2852) or DN 25 to DN 40 (DIN 32676), 3A, EHEDG
- 3 Version H: Tri-Clamp 2" (ISO 2852) or DN 50 (DIN 32676), 3A, EHEDG
- 4 Version S: SMS 1 1/2" PN 25, 3A, EHEDG
- 5 Version N: G1A (ISO 228), with sealing surface for flush-mounted installation
3A and EHEDG approval in combination with o-ring seal and welding neck 52001051 (see → 24)
- 6 Version M: G1A (ISO 228), with metallic sealing taper, flush-mounted

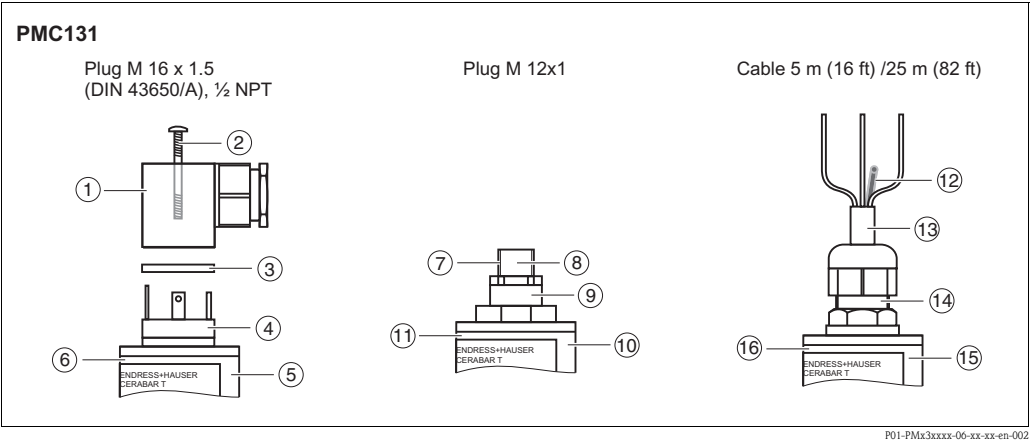
→ See respective housing for installation height H

Weights

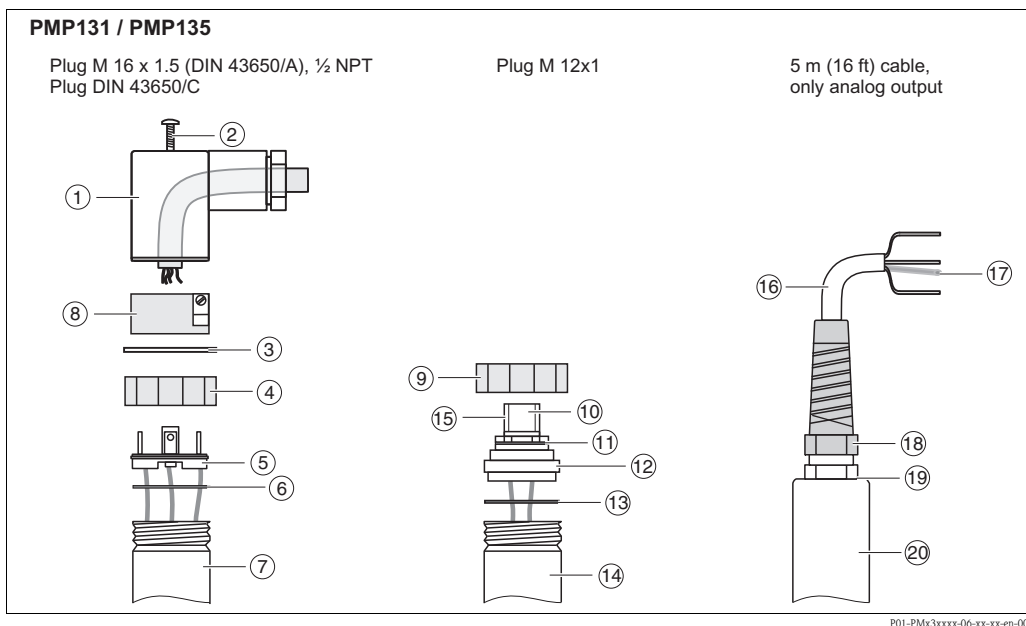
- PMC131: approx. 0.32 kg (0.71 lbs)
- PMP131:
approx. 0.24 kg (0.53 lbs) up to 60 bar (870 psi),
approx. 0.32 kg (0.71 lbs) up to 400 bar (5800 psi)
- PMP135: approx. 0.34 kg (0.75 lbs)

Material (not wetted)

Housing



Item number	Component part	Material
1	Plug housing	PA6 GF
2	Flat sealing	NBR
3	Screw M3 x 35	A2
4	Connection cover	PBT-FR
5	O-ring	NBR
6	Housing	1.4301
7	O-ring for connector	FKM
8	Inner connector	PA
9	M12 connector	GD-Zn, nickel-plated
10	O-ring	NBR
11	Housing	1.4301
12	Hose	PA
13	Cable	PE
14	Gland	PBT
15	O-ring	NBR
16	Housing	1.4301



Item number	Component part	Material
1	Plug housing	PA6 GF
2	Screw M3 x 35	A2
3	Flat sealing	NBR
4	Coupling nut	PA
5	Cover plug	PA66 GF
6	O-ring	NBR
7	Housing	1.4301
8	Plug	PA66 GF
9	Coupling nut	PA
10	Inner connector	PA
11	O-ring	NBR
12	M12 connector	GD-Zn, nickel-plated
13	O-ring	NBR
14	Housing	1.4301
15	O-ring for connector	FKM
16	Cable	PUR
17	Hose	PA
18	Anti-jackknife	PA
19	O-ring	NBR
20	Housing	1.4301

Fill oil:

- PMP131: Tegiloxan 3
- PMP135: Mineral oil, FDA number 21-CFR 178.3570

Material (wetted)

Note!

The wetted device components are listed in the "Mechanical construction" (→ 12 ff) and "Ordering information" (→ 19 ff) sections.

Process connection

- PMC131/PMP131: AISI 304 (1.4301)
- PMP135: AISI 316L (1.4435)

Process isolating diaphragm

- PMC131: Ceraphire® (99,9 % Al₂O₃). The US Food & Drug Administration (FDA) has no objections to the use of ceramics made from aluminum oxide as a surface material in contact with foodstuffs. This declaration is based on the FDA certificates of our ceramic suppliers.
- PMP131, PMP135: AISI 316L (1.4435)

Certificates and approvals

CE mark	The device meets the legal requirements of the EC directives. Endress+Hauser confirms that the device has been successfully tested by applying the CE mark.
Ex approvals	All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas. See also →  25, "Safety Instructions" section.
Pressure Equipment Directive (PED)	This measuring device corresponds to Article 3 (3) of the EC directive 97/23/EC (Pressure Equipment Directive) and has been designed and manufactured according to good engineering practice.
Functional safety SIL 2	The Cerabar T PMP131 and PMP135 pressure transducers with 4 to 20 mA electronics have been assessed by an independent body according to the standards IEC 61508/IEC 61511-1. These devices can be used for monitoring process pressure up to SIL 2. → For a detailed description of safety functions with Cerabar T, settings and characteristic quantities for functional safety, see the "Functional Safety Manual – Cerabar T SD00160P".
Suitability for hygienic processes	All materials in contact with foodstuffs comply with framework Regulation (EC) 1935/2004. The device is available with hygienic process connections (overview: see order code). Caution! Risk of contamination if incorrect seals and parts are used! ■ To avoid the risk of contamination, when installing the device comply with the design principles of EHEDG, Guideline 37 "Hygienic Design and Application of Sensors" and Guideline 16 "Hygienic Pipe Couplings". ■ Suitable assemblies and seals must be used to ensure hygienic design in accordance with 3-A SSI and EHEDG specifications. ■ The leak-proof connections can be cleaned with the cleaning methods typical of this industry (CIP and SIP). Attention must be paid to the pressure and temperature specifications of the sensor and process connections for CIP and SIP processes (clean in place/sterilize in place).
TSE Certificate of Suitability	Cerabar T PMP135 The following applies to wetted device components: They do not contain any materials derived from animals. No auxiliaries or operating materials derived from animals are used in production or processing. Process wetted device components are listed in the "Mechanical construction" and "Ordering information" sections.
Standards and guidelines	DIN EN 60770 (IEC 60770): Transmitters for controlling in systems used in industrial process technology Part 1: Methods for evaluating the operating behavior. DIN EN 61003-1, Edition:1993-12 Systems used in industrial process technology; Devices with analog inputs and two-point or multi-point behavior; Part 1: Methods for evaluating the operating behavior. DIN 16086: Electrical pressure measuring devices, pressure sensors, transmitters, pressure measuring devices Terms, specifications in data sheets. IEC 60529 Degrees of protection provided by enclosures (IP-Code). EN 61326: Electrical equipment for control technology and laboratory application – EMC requirements. IEC 61010 Safety requirements for electrical equipment for measurement, control and laboratory use. NAMUR Association for Standards for Control and Regulation in the Chemical Industry.



Registered trademarks

Ceraphire®

Registered trademark of Endress+Hauser GmbH+Co. KG, Maulburg, Germany

(→ see also www.endress.com/ceraphire)

Ordering information

PMC131

This overview does not mark options which are mutually exclusive.

10	Electrical connection:					
	A1	Plug ISO 4400, M 16, IP 65/NEMA 4X				
	A2	Plug ISO 4400, ½ NPT, IP 65/NEMA 4X				
	A3	5 m cable, IP 68/NEMA 6P				
	A4	25 m cable, IP 68/NEMA 6P				
	A5	Plug M 12, IP 65/NEMA 4				
	B1	Plug ISO 4400, M 16, IP 65, ATEX II 3 G EEx nA II T4				
	B3	5 m cable, IP 68, ATEX II 3 G EEx nA II T4				
	B5	Plug M 12, IP 65, ATEX II 3 G EEx nA II T4				
	C1	Plug ISO 4400, M 16, NEMA 4X, CSA GP				
	C2	Plug ISO 4400, ½ NPT, NEMA 4X, CSA GP				
	C3	5m cable, IP 68/NEMA 6P, CSA GP				
	C5	Plug M12, IP 65/NEMA 4, CSA GP				
20	Process connection:					
	1	Thread ISO 228 G ½, AISI 304				
	2	Thread ANSI ½ MNPT ¼ FNPT, AISI 304				
	5	Thread ISO 228 G ½ bore 11 mm, AISI 304				
30	Sensor seal:					
	E	EPDM				
	F	FKM Viton				
	S	FKM Viton, oxygen application				
40	Additional options:					
	1	Without additional equipment				
	S	GL (German Lloyd) marine certificate				
	2	Final inspection report				
50	Measuring range; MWP; Nominal value; OPL:					
			Measuring range	MWP (Maximum Working Pressure)	Nominal value	OPL (Over Pressure Limit)
			Sensors for gauge pressure			
		A1G	0 to 1 bar / 0 to 100 kPa	6.7 bar	1 bar	10 bar / 1 MPa
		A1H 1)	0 to 1.6 bar / 0 to 160 kPa	12 bar	2 bar	18 bar / 1.8 MPa
		A1K	0 to 2 bar / 0 to 200 kPa	12 bar	2 bar	18 bar / 1.8 MPa
		A1Q	0 to 4 bar / 0 to 400 kPa	16.7 bar	4 bar	25 bar / 2.5 MPa
		A1R 1)	0 to 6 bar / 0 to 600 kPa	26.7 bar	10 bar	40 bar / 4 MPa
		A1S	0 to 10 bar / 0 to 1 MPa	26.7 bar	10 bar	40 bar / 4 MPa
		A1T 1)	0 to 16 bar / 0 to 1.6 MPa	26.7 bar	20 bar	40 bar / 4 MPa
		A1V	0 to 20 bar / 0 to 2 MPa	26.7 bar	20 bar	40 bar / 4 MPa
		A1W 1)	0 to 25 bar / 0 to 2.5 MPa	40 bar	40 bar	60 bar / 6 MPa
		A1X	0 to 40 bar / 0 to 4 MPa	40 bar	40 bar	60 bar / 6 MPa
		A3C 1)	–1 to 0 bar / –100 to 0 kPa	6.7 bar	2 bar	10 bar / 1 MPa
		A3E 1)	–1 to 1 bar / –100 to 100 kPa	6.7 bar	2 bar	10 bar / 1 MPa
		A3G 1)	–1 to 3 bar / –100 to 300 kPa	16.7 bar	4 bar	25 bar / 2.5 MPa
		A3K 1)	–1 to 9 bar / –100 to 900 kPa	26.7 bar	10 bar	40 bar / 4 MPa
		A3N 1)	–1 to 15 bar / –0.1 to 1.5 MPa	26.7 bar	20 bar	40 bar / 4 MPa
		D10	0 to 100 mbar / 0 to 10 kPa	2.7 bar	0.1 bar	4 bar / 400 kPa
		D12 1)	0 to 200 mbar / 0 to 20 kPa	3.3 bar	0.2 bar	5 bar / 500 kPa
		D14	0 to 400 mbar / 0 to 40 kPa	5.3 bar	0.4 bar	8 bar / 800 kPa
		D3W	–20 to 20 mbar / –2 to 2 kPa	2.7 bar	0.2 bar	4 bar / 400 kPa
		D31 1)	–100 to 100 mbar / –10 to 10 kPa	3.3 bar	0.2 bar	5 bar / 500 kPa
		D38 1)	–200 to 200 mbar / –20 to 20 kPa	3.3 bar	0.4 bar	5 bar / 500 kPa
		D39 1)	–300 to 300 mbar / –30 to 30 kPa	5.3 bar	1 bar	8 bar / 800 kPa
PMC131			Order code			

→ For continuation of ordering information of PMC131, see the following page.

1) Span set and calibrated at the factory

PMC131 (continued)

50					Measuring range; MWP; Nominal value; OPL:			
					Measuring range	MWP (Maximum Working Pressure)	Nominal value	OPL (Over Pressure Limit)
					Sensors for gauge pressure			
				Q4D	0 to 1.5 psi	40 psi	1.5 psi	60 psi
				Q4F 1)	0 to 5 psi	80 psi	6 psi	120 psi
				Q4H	0 to 15 psi	100 psi	15 psi	150 psi
				Q4K	0 to 30 psi	180 psi	30 psi	270 psi
				Q4N 1)	0 to 50 psi	250 psi	60 psi	375 psi
				Q4R	0 to 150 psi	400 psi	150 psi	600 psi
				Q4S	0 to 300 psi	400 psi	300 psi	600 psi
				Q4T 1)	0 to 500 psi	600 psi	600 psi	900 psi
				V6F 1)	-1.5 to 1.5 psi	50 psi	3 psi	75 psi
				V6N 1)	-15 to 15 psi	100 psi	30 psi	150 psi
				V6R 1)	-15 to 30 psi	250 psi	60 psi	375 psi
				V6S	-15 to 60 psi	250 psi	60 psi	375 psi
				V6V	-15 to 150 psi	400 psi	150 psi	600 psi
				S4N 1)	0 to 50 inH ₂ O	50 psi	3 psi	75 psi
				S4Q 1)	0 to 100 inH ₂ O	80 psi	6 psi	120 psi
				W6N 1)	-15 to 15 inH ₂ O	40 psi	3 psi	60 psi
				W6O 1)	-80 to 80 inH ₂ O	50 psi	6 psi	75 psi
				W6R 1)	-15 to 30 inH ₂ O	50 psi	3 psi	75 psi
					Sensors for absolute pressure			
				A2G	0 to 1 bar / 0 to 100 kPa	6.7 bar	1 bar	10 bar / 1 MPa
				A2H 1)	0 to 1.6 bar / 0 to 160 kPa	12 bar	2 bar	18 bar / 1.8 MPa
				A2K	0 to 2 bar / 0 to 200 kPa	12 bar	2 bar	18 bar / 1.8 MPa
				A2Q	0 to 4 bar / 0 to 400 kPa	16.7 bar	4 bar	25 bar / 2.5 MPa
				A2R 1)	0 to 6 bar / 0 to 600 kPa	26.7 bar	10 bar	40 bar / 4 MPa
				A2S	0 to 10 bar / 0 to 1 MPa	26.7 bar	10 bar	40 bar / 4 MPa
				A2T 1)	0 to 16 bar / 0 to 1.6 MPa	26.7 bar	20 bar	40 bar / 4 MPa
				A2V	0 to 20 bar / 0 to 2 MPa	26.7 bar	20 bar	40 bar / 4 MPa
				A2W 1)	0 to 25 bar / 0 to 2.5 MPa	40 bar	40 bar	60 bar / 6 MPa
				A2X	0 to 40 bar / 0 to 4 MPa	40 bar	40 bar	60 bar / 6 MPa
				D20 1)	0 to 100 mbar / 0 to 10 kPa	3.3 bar	0.2 bar	5 bar / 500 kPa
				D22	0 to 200 mbar / 0 to 20 kPa	3.3 bar	0.2 bar	5 bar / 500 kPa
				D24	0 to 400 mbar / 0 to 40 kPa	5.3 bar	0.4 bar	8 bar / 800 kPa
				R4D 1)	0 to 1.5 psi	50 psi	3 psi	75 psi
				R4F 1)	0 to 5 psi	80 psi	6 psi	120 psi
				R4H	0 to 15 psi	100 psi	15 psi	150 psi
				R4K	0 to 30 psi	180 psi	30 psi	270 psi
				R4N 1)	0 to 50 psi	250 psi	60 psi	375 psi
				R4R	0 to 150 psi	400 psi	150 psi	600 psi
				R4S	0 to 300 psi	400 psi	300 psi	600 psi
				R4T 1)	0 to 500 psi	600 psi	600 psi	900 psi
995					Marking			
					1 Tagging (TAG), see additional spec.			
PMC131					Complete order code			

1) Span set and calibrated at the factory

PMP131

This overview does not mark options which are mutually exclusive.

10	Electrical connection:		
	A1	Plug ISO 4400, M 16, IP 65/NEMA 4X (DIN 43650/A)	
	A2	Plug ISO 4400, ½ NPT, IP 65/NEMA 4X	
	A3	5 m cable, IP 68/NEMA 6P	
	A4	Plug M 12, IP 65/NEMA 4X	
	A5	Plug DIN 43650/C, IP65, NEMA 4X	
20	Process connection:		
	B	Thread ISO 228 G ½, Seal seat as per DIN 3852, AISI 304, flush-mounted	
	1	Thread ISO 228 G ½, AISI 304	
	2	Thread ANSI ½ MNPT ¼ FNPT, AISI 304	
	3	Thread ANSI ½ MNPT bore 11.4 mm, AISI 304	
	4	Thread ISO 228 G ¼, AISI 304	
	5	Thread ANSI ¼ MNPT bore 3.5 mm, AISI 304	
	6	Thread M 20 x 1.5	
30	Output:		
	0	Analog current output 4 to 20 mA, SIL	
	D	Analog current output 4 to 20 mA, SIL, ATEX II 1/2 G Ex ib IIC T6	
	1	Analog current output 4 to 20 mA, SIL, ATEX II 2 G Ex ib IIC T6	
	5	Analog current output 4 to 20 mA, SIL, ATEX II 3 G EEx nA II T6	
	2	Switch output PNP, 3-wire	
	3	Switch output PNP, 3-wire, ATEX II 3 G EEx nA II T6	
	6	Analog voltage output 0...10 V	
40	Additional options:		
	1	Without additional equipment	
	S	GL/RINA marine approval	
	2	Final inspection report	
50	Sensor range; MWP; OPL:		
		Sensor range	MWP (maximum working pressure)
		Sensors for gauge pressure	OPL (over pressure limit)
	A1G	0 to 1 bar / 0 to 100 kPa	2.7 bar
	A1H	0 to 1.6 bar / 0 to 160 kPa	4 bar
	A1N	0 to 2.5 bar / 0 to 250 kPa	6.7 bar
	A1Q	0 to 4 bar / 0 to 400 kPa	10.7 bar
	A1R	0 to 6 bar / 0 to 600 kPa	16 bar
	A1S	0 to 10 bar / 0 to 1 MPa	25 bar
	A1T	0 to 16 bar / 0 to 1.6 MPa	25 bar
	A1W	0 to 25 bar / 0 to 2.5 MPa	25 bar
	A1X	0 to 40 bar / 0 to 4 MPa	60 bar
	A1Z	0 to 60 bar / 0 to 6 MPa	60 bar
	A70	0 to 100 bar / 0 to 10 MPa	100 bar
	A71	0 to 160 bar / 0 to 16 MPa	160 bar
	A73	0 to 250 bar / 0 to 25 MPa	250 bar
	A74	0 to 400 bar / 0 to 40 MPa	400 bar
	Q4H	0 to 15 psi	40 psi
	Q4K	0 to 30 psi	100 psi
	Q4N	0 to 50 psi	160 psi
	Q4R	0 to 150 psi	400 psi
	Q4S	0 to 300 psi	400 psi
	Q4T	0 to 500 psi	1000 psi
	Q4V	0 to 1000 psi	1000 psi
	Q70	0 to 1500 psi	1500 psi
	Q73	0 to 3000 psi	3000 psi
	Q74	0 to 6000 psi	6000 psi
PMP131			
Order code			

→ For continuation of ordering information of PMP131, see the following page.

PMP131 (continued)

50						Sensor range; MWP; OPL:		
						Sensor range	MWP (maximum working pressure)	OPL (over pressure limit)
						Sensors for absolute pressure		
					A2G	0 to 1 bar / 0 to 100 kPa	2.7 bar	4 bar / 400 kPa
					A2H	0 to 1.6 bar / 0 to 160 kPa	4 bar	6.4 bar / 640 kPa
					A2N	0 to 2.5 bar / 0 to 250 kPa	6.7 bar	10 bar / 1 MPa
					A2Q	0 to 4 bar / 0 to 400 kPa	10.7 bar	16 bar / 1.6 MPa
					A2R	0 to 6 bar / 0 to 600 kPa	16 bar	24 bar / 2.4 MPa
					A2S	0 to 10 bar / 0 to 1 MPa	25 bar	40 bar / 4 MPa
					A2T	0 to 16 bar / 0 to 1.6 MPa	25 bar	64 bar / 6.4 MPa
					A2W	0 to 25 bar / 0 to 2.5 MPa	25 bar	100 bar / 10 MPa
					A2X	0 to 40 bar / 0 to 4 MPa	60 bar	160 bar / 16 MPa
					A2Z	0 to 60 bar / 0 to 6 MPa	60 bar	240 bar / 24 MPa
					B70	0 to 100 bar / 0 to 10 MPa	100 bar	400 bar / 40 MPa
					B71	0 to 160 bar / 0 to 16 MPa	160 bar	600 bar / 60 MPa
					B73	0 to 250 bar / 0 to 25 MPa	250 bar	600 bar / 60 MPa
					B74	0 to 400 bar / 0 to 40 MPa	400 bar	600 bar / 60 MPa
					R4H	0 to 15 psi	40 psi	60 psi
					R4K	0 to 30 psi	100 psi	150 psi
					R4N	0 to 50 psi	160 psi	240 psi
					R4R	0 to 150 psi	400 psi	600 psi
					R4S	0 to 300 psi	400 psi	1500 psi
					R4T	0 to 500 psi	1000 psi	2400 psi
					R4V	0 to 1000 psi	1000 psi	3600 psi
					R70	0 to 1500 psi	1500 psi	6000 psi
					R73	0 to 3000 psi	3000 psi	9000 psi
					R74	0 to 6000 psi	6000 psi	9000 psi
995						Marking		
						1	Tagging (TAG), see additional spec.	
PMP131						Complete order code		

PMP135

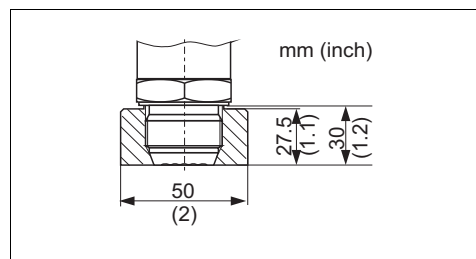
This overview does not mark options which are mutually exclusive.

10	Electrical connection:				
	A1	Plug ISO 4400, M 16, IP 65/NEMA 4X			
	A2	Plug ISO 4400, ½ NPT, IP 65/NEMA 4X			
	A3	5 m cable, IP 68/NEMA 6P			
	A4	Plug M 12, IP 65/NEMA 4X			
20		Process connection:			
	F	Clamp ISO 2852, DN 22 (¾"), AISI 316L, 3A, DIN 32676 DN 20, EHEDG, 3A			
	G	Tri-Clamp ISO 2852, DN 25 to 38 (1" to 1½"), AISI 316L, 3A, DIN 32676 DN 25 to 40, EHEDG, 3A			
	H	Tri-Clamp ISO 2852, DN 40 to 51 (2"), AISI 316L, 3A, DIN 32676 DN 50, EHEDG, 3A			
	M	Thread ISO 228, G 1, with metallic sealing taper, AISI 316L, flush-mounted, adapter 52005087			
	N	Thread ISO 228, G 1, with sealing surface for flush-mounted installation, AISI 316L, adapter 52001051 EHEDG, 3A (3A and EHEDG approval in combination with o-ring seal and welding neck)			
	S	SMS 1½", PN 25, AISI 316L, EHEDG, 3A			
30		Output:			
	0	Analog 4 to 20 mA, SIL			
	D	Analog 4 to 20 mA, SIL, ATEX II 1/2 G Ex ib IIC T6			
	1	Analog 4 to 20 mA, SIL, ATEX II 2 G Ex ib IIC T6			
	5	Analog 4 to 20 mA, SIL, ATEX II 3 G EEx nA II T6			
	2	Switch output PNP, 3-wire			
	3	Switch output PNP, ATEX II 3 G EEx nA II T6			
40		Additional options:			
	1	Basic version			
	C	EN10204-3.1 material (wetted parts) inspection certificate			
	D	Final inspection report + EN10204-3.1 material (wetted parts) inspection certificate			
	2	Final inspection report			
50			Sensor range; MWP; OPL:		
			Sensor range	MWP (maximum working pressure)	OPL (over pressure limit)
			Sensors for gauge pressure		
		A1G	0 to 1 bar / 0 to 100 kPa	2.7 bar	4 bar / 400 kPa
		A1H	0 to 1.6 bar / 0 to 160 kPa	4 bar	6.4 bar / 640 kPa
		A1N	0 to 2.5 bar / 0 to 250 kPa	6.7 bar	10 bar / 1 MPa
		A1Q	0 to 4 bar / 0 to 400 kPa	10.7 bar	16 bar / 1.6 MPa
		A1R	0 to 6 bar / 0 to 600 kPa	16 bar	24 bar / 2.4 MPa
		A1S	0 to 10 bar / 0 to 1 MPa	25 bar	40 bar / 4 MPa
		A1T	0 to 16 bar / 0 to 1.6 MPa	25 bar	64 bar / 6.4 MPa
		A1W	0 to 25 bar / 0 to 2.5 MPa	25 bar	100 bar / 10 MPa
		A1X	0 to 40 bar / 0 to 4 MPa	60 bar	160 bar / 16 MPa
		Q4H	0 to 15 psi	40 psi	60 psi
		Q4K	0 to 30 psi	100 psi	150 psi
		Q4N	0 to 50 psi	160 psi	240 psi
		Q4R	0 to 150 psi	400 psi	600 psi
		Q4S	0 to 300 psi	400 psi	1500 psi
		Q4T	0 to 500 psi	1000 psi	2400 psi
			Sensors for absolute pressure		
		A2G	0 to 1 bar / 0 to 100 kPa	2.7 bar	4 bar / 400 kPa
		A2H	0 to 1.6 bar / 0 to 160 kPa	4 bar	6.4 bar / 640 kPa
		A2N	0 to 2.5 bar / 0 to 250 kPa	6.7 bar	10 bar / 1 MPa
		A2Q	0 to 4 bar / 0 to 400 kPa	10.7 bar	16 bar / 1.6 MPa
		A2R	0 to 6 bar / 0 to 600 kPa	16 bar	24 bar / 2.4 MPa
		A2S	0 to 10 bar / 0 to 1 MPa	25 bar	40 bar / 4 MPa
		A2T	0 to 16 bar / 0 to 1.6 MPa	25 bar	64 bar / 6.4 MPa
		A2W	0 to 25 bar / 0 to 2.5 MPa	25 bar	100 bar / 10 MPa
		A2X	0 to 40 bar / 0 to 4 MPa	60 bar	160 bar / 16 MPa
		R4H	0 to 15 psi	40 psi	60 psi
		R4K	0 to 30 psi	100 psi	150 psi
		R4N	0 to 50 psi	160 psi	240 psi
		R4R	0 to 150 psi	400 psi	600 psi
		R4S	0 to 300 psi	400 psi	1500 psi
		R4T	0 to 500 psi	1000 psi	2400 psi
995			Marking		
			1	Tagging (TAG), see additional spec.	
PMP135				Complete order code	

Accessories

Welding neck with sealing taper

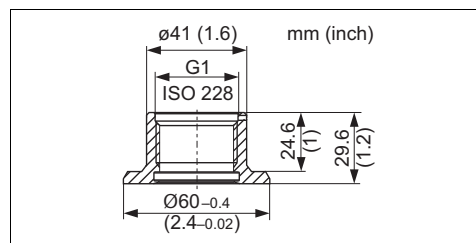
- Welding neck for flush-mounted installation of the process connection G1 A with metallic sealing taper (PMP135, version M)
Material: AISI 316L (1.4435)
Order number: 52005087
- with inspection certificate 3.1
Order number: 52010171
- Pressure sensor dummy for welding the welding neck without any problems with order number 52005087 or 52010171
Material: CuZn
Order number: 52005272



P01-PMP135xx-00-xx-00-xx-002

Welding neck with sealing surface

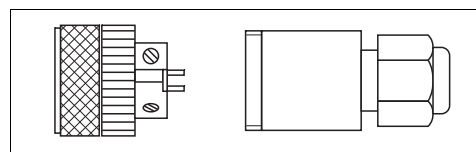
- Welding neck for flush-mounted installation of the process connection G1 A with sealing surface (PMP135, version N)
Material: AISI 316L (1.4435)
Gasket (enclosed): silicone O-ring
Order number: 52001051
- Optional with inspection certificate 3.1
Order number: 52011896



P01-PMP135xx-00-xx-00-xx-005

Plug-in jack

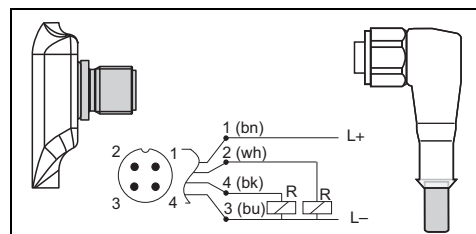
- Plug-in jack M 12x1, straight
Self-made connection to M 12x1 housing plug
Material: Handle body PA; Coupling nut CuZn, nickel-plated, degree of protection (inserted): IP 67
Order number: 52006263



P01-PMP13xxx-00-xx-00-xx-003

Connecting cable

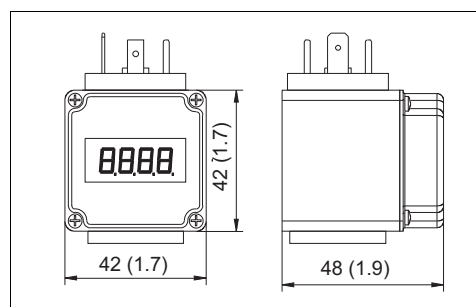
- Cable, 4 x 0.34 mm² (AWG 21) with M12 socket, elbowed, screw plug, length 5 m (16 ft), sprayed cable
Materials: Body PUR
Coupling nut: Cu Zn/Ni, brass, nickered
Cable: PVC
Protection: IP 67 (fully locked)
order number: 52010285



P01-PMx13xxx-07-xx-xx-xx-000

Plug-on display PHX20/PHX21

- Plug-on display for electrical connections
 - PMC131 version A1, A2, B1, C1, C2
 - PMP131/135 version A1, A2.
 4-digit red LED display for looping into 4 to 20 mA circuit via elbow plug ISO4400, rotatable in 90° steps, programmable via 2 keys
Display range: -1999 to +9999
Degree of protection: IP 65
Material: Housing Pa6 GF30, front screen PMMA
Voltage drop: ≤5 V (corresponds to max. 250 Ω load)
Approval for PHX21: ATEX II 2G
Order number PHX20: 52022914
Order number PHX21: 52022915



P01-PHX2xxxx-06-xx-xx-xx-002

Documentation

Field of Activities	■ Pressure measurement, powerful measuring devices for process pressure, differential pressure, level and flow: FA00004P/00/EN
Technical Information	■ EMC test procedures: TI00241F/00/EN
Operating Instructions	■ Cerabar T PMC131: KA00085P/00/A3 ■ Cerabar T PMP131: KA00103P/00/A3 ■ Cerabar T PMP135: KA00198P/00/A3
Functional Safety Manual (SIL)	■ Cerabar T PMP131, PMP135: SD00160P/00/EN

Safety Instructions

Certificate/Type of protection	Device	Documentation	Version in the order code
ATEX II 3 G EEx nA II T4 ¹⁾	PMC131	– XA00191P	B1, B3, B5
ATEX II 1/2 G Ex ib IIC T6 ATEX II 2 G Ex ib IIC T6 ATEX II 3 G EEx nA II T6 ¹⁾	PMP131, PMP135	– XA00142P – XA00191P	D 1 3, 5

- 1) In the event of applications in a Zone 2 explosive atmosphere (EEx nA explosion protection) protect the housing from impact.

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