

Pressure Transducer *cerabar T PMP 131*

**Pressure transducer with polysilicon sensor
For absolute and gauge pressures up to 400 bar
Version available for hazardous areas**



Application

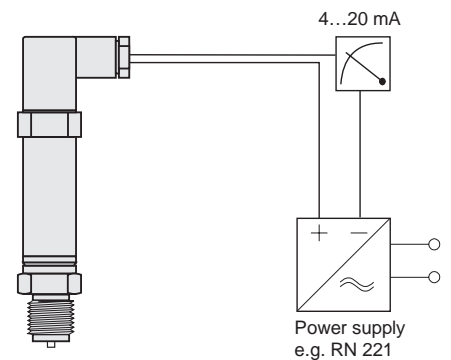
Cerabar T PMP 131 is designed for measuring absolute and gauge pressure of gases, vapours and liquids.

Features and Benefits

- Finely graduated measuring ranges up to 400 bar or 6000 psi
- Up to 4 times overload resistance
- Extremely stable
- Flush diaphragm process connection or manometer connection for 1/2 BSP (G 1/2), 1/4 BSP (G 1/4) or 1/2 NPT
- Electronic versions with
 - analogue output 4...20 mA
 - switch output PNP transistor
- Approved for EEx ib IIC T6

Measuring System

- Pressure transducer Cerabar T PMP 131 with 4...20 mA output or switch output.
- Power supply, e.g. RN 221 transmitter power supply unit from Endress+Hauser



Endress + Hauser

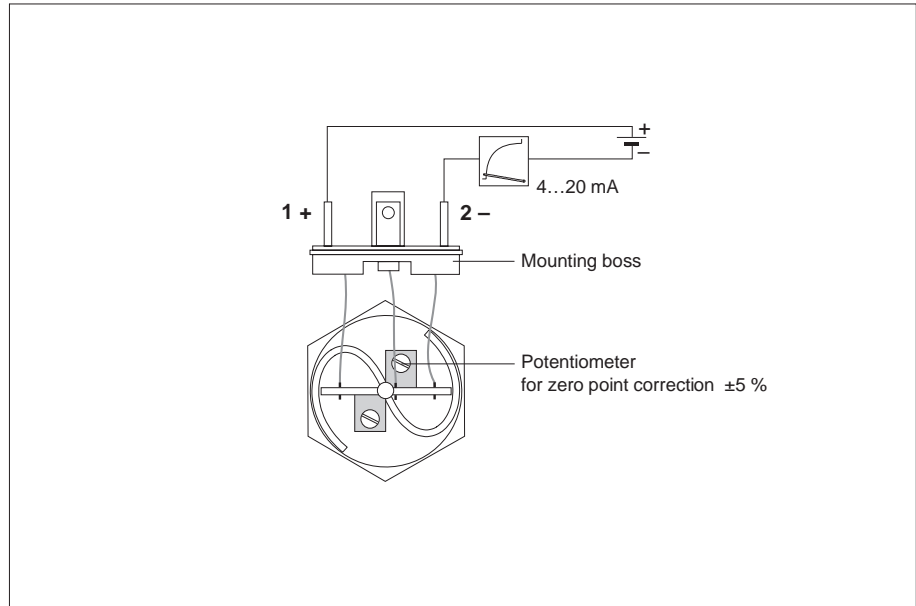
The Power of Know How



Operation

Zero Point Adjustment

For the PMP 131 with analogue output and plug, the zero point can be adjusted to $\pm 5\%$. The potentiometer used for this is located below the base of the plug.



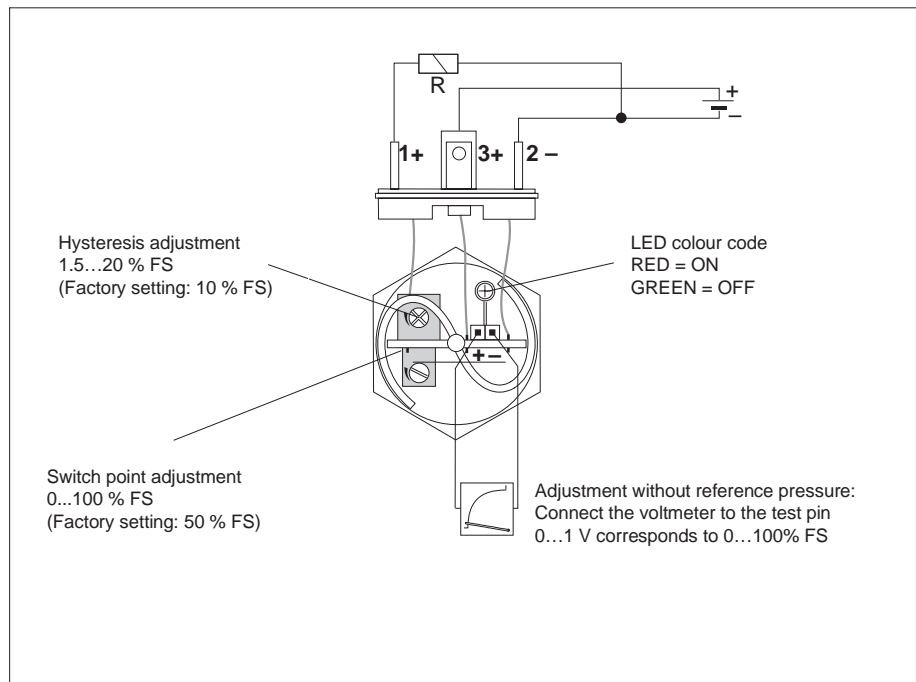
Zero Point Adjustment

- Remove plug
- Loosen coupling nut
- Remove mounting boss

Do not turn the cap nut when loosening or tightening the base of the plug!

Switch Point and Hysteresis Adjustment

For the PMP 131 with switch output, both the switch point and hysteresis can be adjusted. This can also be carried out at atmospheric pressure using the enclosed test cable and a voltmeter. The potentiometer used for this adjustment is located below the base of the plug.



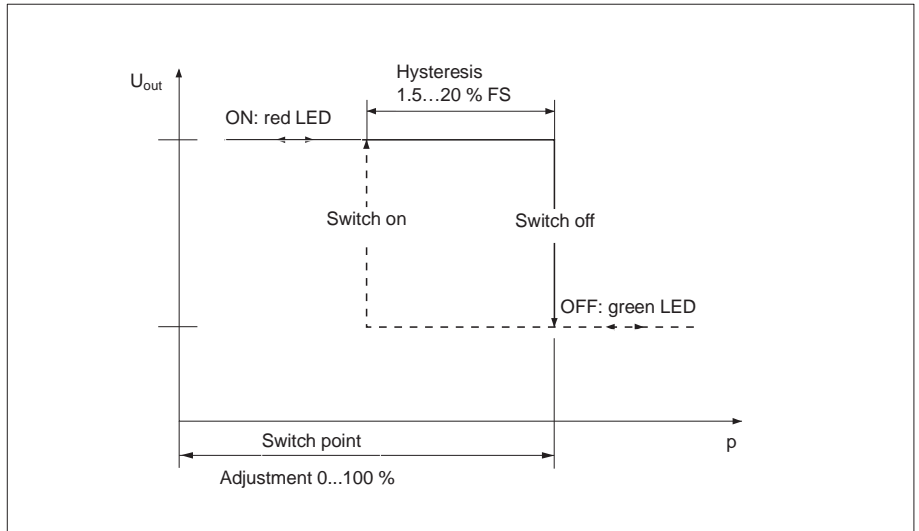
Switch Point and Hysteresis Adjustment

- Remove plug
- Loosen coupling nut
- Remove mounting boss

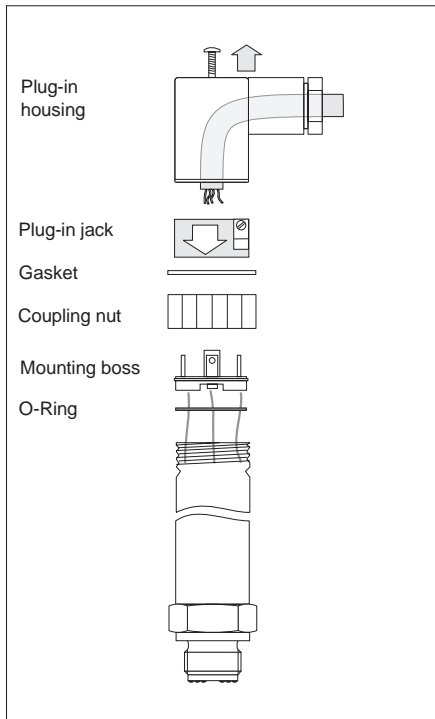
Do not turn the cap nut when loosening or tightening the base of the plug!

Instructions for Switch Point and Hysteresis Adjustment

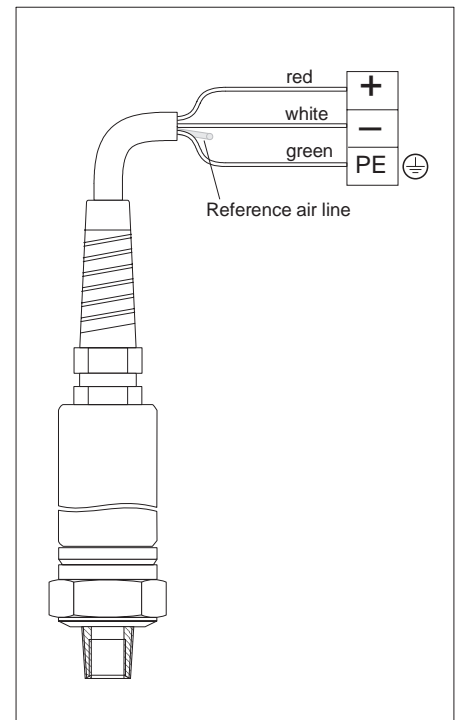
Switch point and hysteresis adjustment
 FS: Full Span (measuring range)
 U_{out} : output voltage
 p: acting pressure



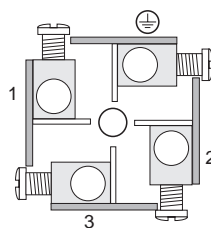
Electrical Connection



left:
 PMP 131 with plug
 right:
 PMP 131 with cable



Connector DIN 43 650/A



Analogue output 4 ... 20 mA

2-wire

- 1 Power supply and output (+)
- 2 Power supply and output (-)
- 3 not assigned
- ⊕ Ground (PE)

Switch output

3-wire

- 1 Output (+)
- 2 Power supply and output (-)
- 3 Power supply (+)
- ⊕ Ground (PE)

PMP 131
 Plug version,
 assignment

Technical Data

General specifications

Manufacturer	Endress+Hauser
Instrument designation	Cerabar T PMP 131

Application

Measuring absolute and gauge pressure of gases, vapours and liquids

Function and system design

Measuring principle

With analogue output	The process pressure acting upon the metallic separating diaphragm of the sensor is transmitted to a resistance bridge via a fluid. The change in the output voltage of the bridge is proportional to the pressure and can be measured directly.				
With switch output	The process pressure acting upon the metallic separating 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 power amplifier and the LED.				
Design	<table border="0"> <tr> <td style="text-align: right;">Analogue output</td> <td>Pressure sensor is optionally supplied with DIN 43650 A/ ISO 4400 plug or cable</td> </tr> <tr> <td style="text-align: right;">Switch output</td> <td>Pressure transducer with plug DIN 43650 A/ISO 4400 (see page 3)</td> </tr> </table>	Analogue output	Pressure sensor is optionally supplied with DIN 43650 A/ ISO 4400 plug or cable	Switch output	Pressure transducer with plug DIN 43650 A/ISO 4400 (see page 3)
Analogue output	Pressure sensor is optionally supplied with DIN 43650 A/ ISO 4400 plug or cable				
Switch output	Pressure transducer with plug DIN 43650 A/ISO 4400 (see page 3)				

Input

Measured variable	Gauge or absolute pressure
Measuring ranges	Max. 400 bar/6000 psi (see »Product Structure« page 6)

Output

Analogue output 4...20 mA

Output signal	4...20 mA
Load	$R_B [\Omega] \leq (U_S - 12 \text{ V}) / 0.02 \text{ A}$, (U_S = power supply)

Switch output PNP

Output signal	Voltage (depends on power supply voltage)
Output current	Switch status ON: $I_a \leq 0.5 \text{ A}$ Switch status OFF: $I_a \leq 1 \text{ mA}$
Power	max. 6 W
Switch frequency	max. 10 Hz
Input resistance / Input current PLC	$R_i \leq 2 \text{ k}\Omega$ or $I_i \geq 10 \text{ mA}$
Note	To prevent electrical interference, inductive loads (relays, contactors or solenoid valves) may only be operated with directly connected to a protective circuit (free-wheeling diode or capacitor).

Accuracy

Terminal-based linearity including hysteresis and reproducibility (Limit point method to DIN IEC 770)	Analogue output: $\leq 0,5 \%$ FS				
Accuracy	Switch output $\leq 1 \%$ FS for the switch point				
Reproducibility	Switch output $\leq 0,5 \%$ FS for the switch output				
Settling time	2...5 ms				
Effect of ambient temperature	<table border="0"> <tr> <td style="text-align: right;">Analogue output</td> <td>– Zero: typical 0.2%/10 K, max. 0.5%/10 K of measuring span. Values are 0.1%/10 K higher for measuring spans $\leq 6 \text{ bar}$</td> </tr> <tr> <td style="text-align: right;">Switch output</td> <td>– Span: typical 0.2%/10 K, max. 0.5%/10 K of measuring span – Switch output: typical 0.2 %/10K of measuring span</td> </tr> </table>	Analogue output	– Zero: typical 0.2%/10 K, max. 0.5%/10 K of measuring span. Values are 0.1%/10 K higher for measuring spans $\leq 6 \text{ bar}$	Switch output	– Span: typical 0.2%/10 K, max. 0.5%/10 K of measuring span – Switch output: typical 0.2 %/10K of measuring span
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Switch output	– Span: typical 0.2%/10 K, max. 0.5%/10 K of measuring span – Switch output: typical 0.2 %/10K of measuring span				
Long-term stability	typical 0.15 % per year				

Operating conditions

Mounting conditions	Any position, flush-mounted for process connection G ½ (Code B); max. torque for mounting 40 Nm
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Environment

Normal operating temperature	-25...+70°C (-13...+158°F), Ex area: -25...+65°C (-13...149°F)
Storage temperature	-40...+85°C (-40...185°F)
Climate class	4 Z with Z=70 °C to VDI/VDE 3540
Ingress protection	With plug: IP 65, with cable: IP 68
Vibrational resistance	4M5 to DIN EN 60721-3
Electromagnetic compatibility	Interference emission to EN 61326 electrical device B, interference immunity to EN 61326 appendix A (industrial use) and NAMUR recommendation NE 21

Process

Normal process temperature	-25...+70°C (-13...+158°F)
Process pressure limits	Overload resistance see »Product Structure« page 6 Vacuum resistance to 10 mbar _{absolute}

Mechanical construction

Process connections	See Product Structure »Process Connection« page 6
Electrical connection	See Product Structure »Version« page 6 and »Electrical Connection« page 3
Cable	Material of outer covering: PUR, non-flammable to VDE 0472, External diameter: 5.8 mm, Wires: 4 x 0,22 mm ² , External diameter of air line: 2 mm
Connection	Plug to DIN 43650 A/ISO 4400, Material: PA

Materials for wetted parts

Process connection and housing	1.4301 (AISI 304)
Process diaphragm	1.4435 (AISI 316 L)
Fill fluid	Silicone oil AK3

Power

Power supply	Analogue output	Non-Ex: 12...30 V DC Ex: no-load voltage ≤ 26 V, short-circuit current ≤ 100 mA, power consumption ≤ 0.8 W 18...32 V DC, current consumption without load < 20 mA, with reverse polarity protection
	Switch output	
Ripple	Analogue output	5%
	Switch output	10 %

Certificates and approvals

Analogue output: EEx ib IIC T6 EEx ib IIC T6, Zone 0

Supplementary documentation

Cerabar T System Information SI 035P/00/en Cerabar T Operating Instructions KA 103P/00/a6 Cerabar T PMC 131 Technical Information TI 279P/00/en EMC test procedures Technical Information TI 241F/00/en
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Product Structure

Version, cable gland, protection

- A1 Plug (ISO 4400), Pg 11, IP 65
- A2 Plug (ISO 4400), ½ NPT, IP 65
- A3 5 m (16.4 ft) cable, IP 68
- 99 Special version

Process connection: type and material

- 1 G ½ (male), DIN 16 288, AISI 304
- 2 ½ NPT (male), ¼ NPT (female), AISI 304
- 3 ½ NPT (male), 4 mm (female), AISI 304
- 4 G ¼ (male), DIN 16 288, AISI 304
- 5 ¼ NPT (male), 3.5 mm (female), AISI 304
- B G ½ (male), DIN 3852-A, AISI 304, flush diaphragm
- 9 Special version

Output signal, certificate

- 0 Analogue 4...20 mA, 2-wire, for non-hazardous area
- 1 Analogue 4...20 mA, 2-wire, EEx ib IIC T6
- D Analogue 4...20 mA, 2-wire, EEx ib IIC Zone 0
- 2 Switch output, PNP-Transistor, 3-wire (with plug only)
- 9 Special version

Accessories

- 1 None
- 9 Special version

Measuring range, unit, pressure type

	Measuring range (bar)	Unit (kPa, MPa)	Overload
<i>Gauge pressure (bar)</i>			
A1G	0...1 bar	0...100 kPa	4 bar
A1H	0...1.6 bar	0...160 kPa	6.4 bar
A1N	0...2.5 bar	0...250 kPa	10 bar
A1Q	0...4 bar	0...400 kPa	16 bar
A1R	0...6 bar	0...600 kPa	24 bar
A1S	0...10 bar	0...1 MPa	40 bar
A1T	0...16 bar	0...1.6 MPa	64 bar
A1W	0...25 bar	0...2.5 MPa	100 bar
A1X	0...40 bar *	0...4 MPa *	160 bar
A1Z	0...60 bar *	0...6 MPa *	240 bar
A70	0...100 bar *	0...10 MPa *	400 bar
A71	0...160 bar *	0...16 MPa *	600 bar
A73	0...250 bar *	0...25 MPa *	600 bar
A74	0...400 bar *	0...40 MPa *	600 bar

	Measuring range (bar)	Unit (kPa, MPa)	Overload
<i>Absolute pressure (bar)</i>			
A2G	0...1 bar	0...100 kPa	4 bar
A2H	0...1.6 bar	0...160 kPa	6.4 bar
A2N	0...2.5 bar	0...250 kPa	10 bar
A2Q	0...4 bar	0...400 kPa	16 bar
A2R	0...6 bar	0...600 kPa	24 bar
A2S	0...10 bar	0...1 MPa	40 bar
A2T	0...16 bar	0...1.6 MPa	64 bar
A2W	0...25 bar	0...2.5 MPa	100 bar
A2X	0...40 bar	0...4 MPa	160 bar
A2Z	0...60 bar	0...6 MPa	240 bar
B70	0...100 bar	0...10 MPa	400 bar
B71	0...160 bar	0...16 MPa	600 bar
B73	0...250 bar	0...25 MPa	600 bar
B74	0...400 bar	0...40 MPa	600 bar

	Measuring range (psi)	Overload
<i>Gauge pressure (psi)</i>		
Q4H	0...15 psi g	60 psi
Q4K	0...30 psi g	150 psi
Q4N	0...50 psi g	240 psi
Q4R	0...150 psi g	600 psi
Q4S	0...300 psi g	1500 psi
Q4T	0...500 psi g *	2400 psi
Q4V	0...1000 psi g *	3600 psi
Q70	0...1500 psi g *	6000 psi
Q73	0...3000 psi g *	9000 psi
Q74	0...6000 psi g *	9000 psi

	Measuring range (psi)	Overload
<i>Absolute pressure (psi)</i>		
R4H	0...15 psi a	60 psi
R4K	0...30 psi a	150 psi
R4N	0...50 psi a	240 psi
R4R	0...150 psi a	600 psi
R4S	0...300 psi a	1500 psi
R4T	0...500 psi a	2400 psi
R4V	0...1000 psi a	3600 psi
R70	0...1500 psi a	6000 psi
R73	0...3000 psi a	9000 psi
R74	0...6000 psi a	9000 psi
999	Special range	

* = Absolute pressure sensors

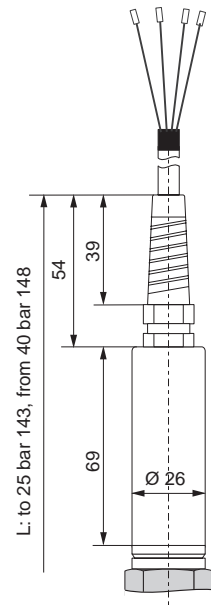
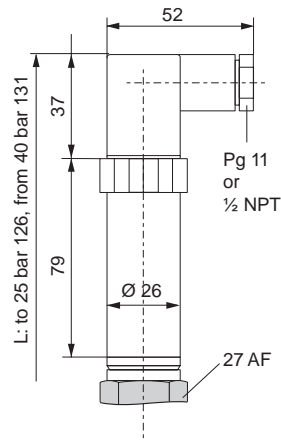
PMP 131

Product designation

Dimensions

Version
 Code A1: plug with Pg 11 gland
 Code A2: plug with 1/2 NPT gland

Code A3: cable



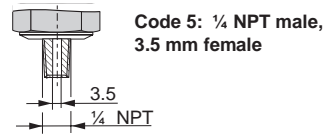
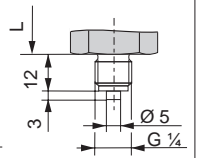
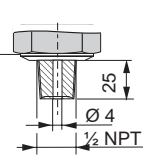
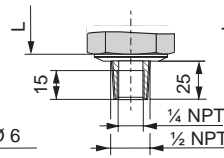
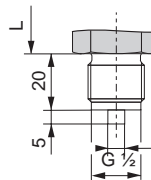
Optional with process connection

Code 1: G 1/2

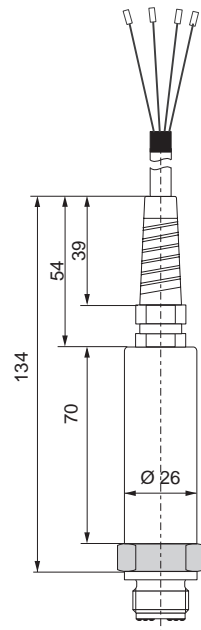
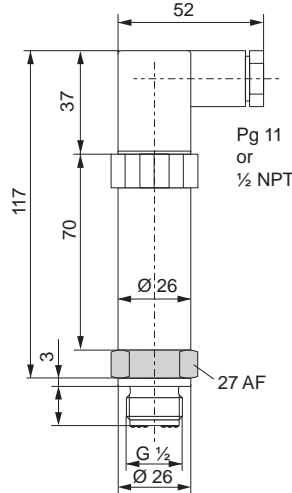
Code 2: 1/2 NPT male, 1/4 NPT female

Code 3: 1/2 NPT male, 4 mm female

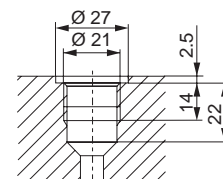
Code 4: G 1/4



Code B: G 1/2 flush diaphragm to DIN 3852-A-G 1/2



Threaded hole
 DIN 3852-X-G 1/2



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