

Pressure sensor with ceramic and metal sensors

Cerabar PMC21 / PMP21



PMC21

PMP21

Complete product information: www.e-direct.endress.com/pmx21

- High reproducibility and long-term stability
- Customized measuring ranges
- Flush-mounted process connection as option

i Specs at a glance:

- **Media:**
Gases, vapors, liquids and dust
- **Output:**
4 to 20 mA
- **Process temperature:**
-40 to +100 °C (-40 to +212 °F)
- **Measuring ranges:**
From -100 to +100 mbar (-1.5 to +1.5 psi) to -1 to +400 bar (-15 to +6000 psi)
- **Reference accuracy:**
±0.3 %

Application The Cerabar is a pressure sensor for the measurement of absolute and gauge pressure in gases, vapors, liquids and dust. The Cerabar can be used internationally thanks to a wide range of approvals and process connections.

Function

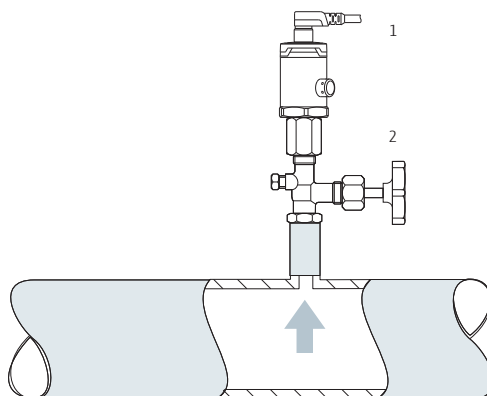
Ceramic process isolating diaphragm:

The ceramic sensor is an oil-free sensor, i.e. the process pressure acts directly on the robust ceramic process isolating diaphragm and causes it to deflect. A pressure-dependent change in capacitance is measured at the electrodes of the ceramic substrate and the process isolating diaphragm.

Metallic process isolating diaphragm:

The process pressure deflects the metal process isolating diaphragm of the sensor and a fill fluid transfers the pressure to a Wheatstone bridge (semiconductor technology). The pressure-dependent change in the bridge output voltage is measured and evaluated.

Application example



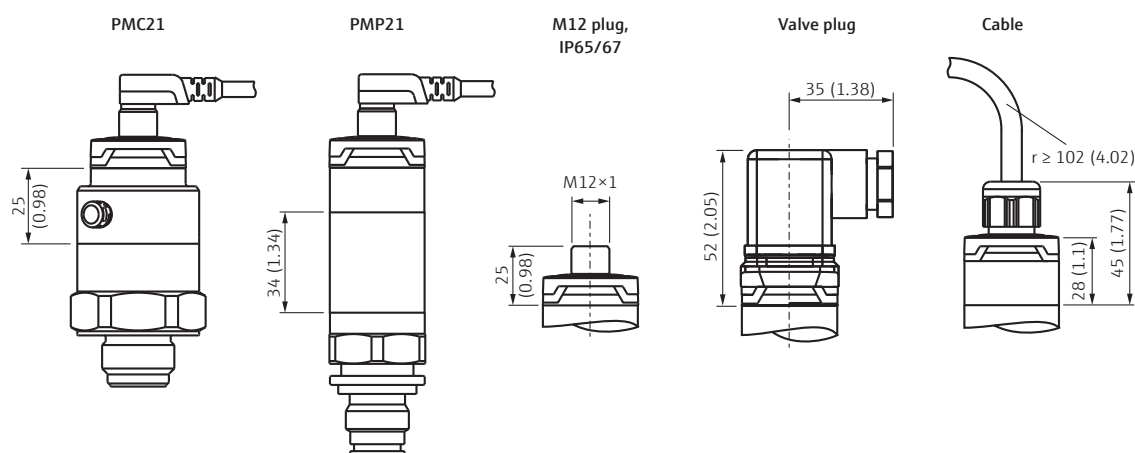
Pressure sensor Cerabar (1) with the shutoff device (2) in pipelines

Technical data

Output		Process	
Output signal	4 to 20 mA (two-wire)	Process temperature range	PMC21: -25 to +100 °C (-13 to +212 °F); for oxygen applications: -10 to +60 °C (+14 to +140 °F); PMP21: -40 to +100 °C (-40 to +212 °F)
Signal range 4 to 20 mA	3.8 to 20.5 mA		
Load 4 to 20 mA	$R_{Lmax} \leq (U_B - 6.5 V) / 22 mA^1$		
Signal on alarm 4 to 20 mA	max. alarm >21 mA; min. alarm current adjustable		
Dynamic behavior	Time constant (T ₉₀) 15 ms		
¹ R _{Lmax} : maximum load resistance; U _B : supply voltage			
Power supply		Materials PMC21	
Supply voltage	10 to 30 V DC	Materials not in contact with process	Housing: Stainless steel 316L (1.4404)
Current consumption	≤26 mA	Materials in contact with process	Process connections: 316L (1.4435); Ceramic process isolating diaphragm: Al ₂ O ₃ in accordance with FDA; TSE Certificate of Suitability for all device components in contact with the process; Seal: Viton FKM or EPDM
Degree of protection	Cable: IP66/68 NEMA Type 4X/6P Plug M12: IP65/67 NEMA Type 4X Valve plug: IP65 NEMA Type 4X		
Influence of power supply	≤0.005 % of URL/1 V		
Residual ripple	±5 %		
Performance characteristics		Materials PMP21	
Reference accuracy	±0.3 %	Materials not in contact with process	Housing: Stainless steel 316L (1.4404); Filling oil: NSF-H1 synthetic oil in accordance with FDA 21 CFR 178.3570
Thermal change of the zerooutput and the output span	<1 bar (15 psi): <1.2 %; ≥1 bar (15 psi): <1 %	Materials in contact with process	Process connections: 316L; Metallic process isolating diaphragm: AISI 316L (1.4435); TSE Certificate of Suitability for all device components in contact with the process; With flush-mounted process isolating diaphragm: Seal: Viton FKM
Long-term stability	1 year: ±0.2 %; 5 years: ±0.4 %; 8 years: ±0.45 %		
Switch-on time	≤2 s		
Environment		Approvals	
Ambient temperature range	-40 to +85 °C (-40 to +185 °F) Devices for hazardous areas: -40 to +70 °C (-40 to +158 °F)	Ex	ATEX II 1/2G Ex ia IIC T4 Ga/Gb ATEX II 3G EEx eC IIC T4 Gc CSA C/US IS Cl. I Div. 1 Gr. A-D FM IS Cl. I, Div.1 Gr. A-D T4 IEC Ex ia IIC T4 Ga/Gb NEPSI Ex ia IIC T4
Storage temperature range	-40 to +85 °C (-40 to +185 °F)		Pressure Equipment Directive
Climate class	Class 3K5		
Electromagnetic compatibility	- Interference emission as per EN 61326 equipment B - Interference immunity as per EN 61326 appendix A (industrial sector) - NAMUR recommendation EMC (NE21)		

Dimensions in mm (inches)

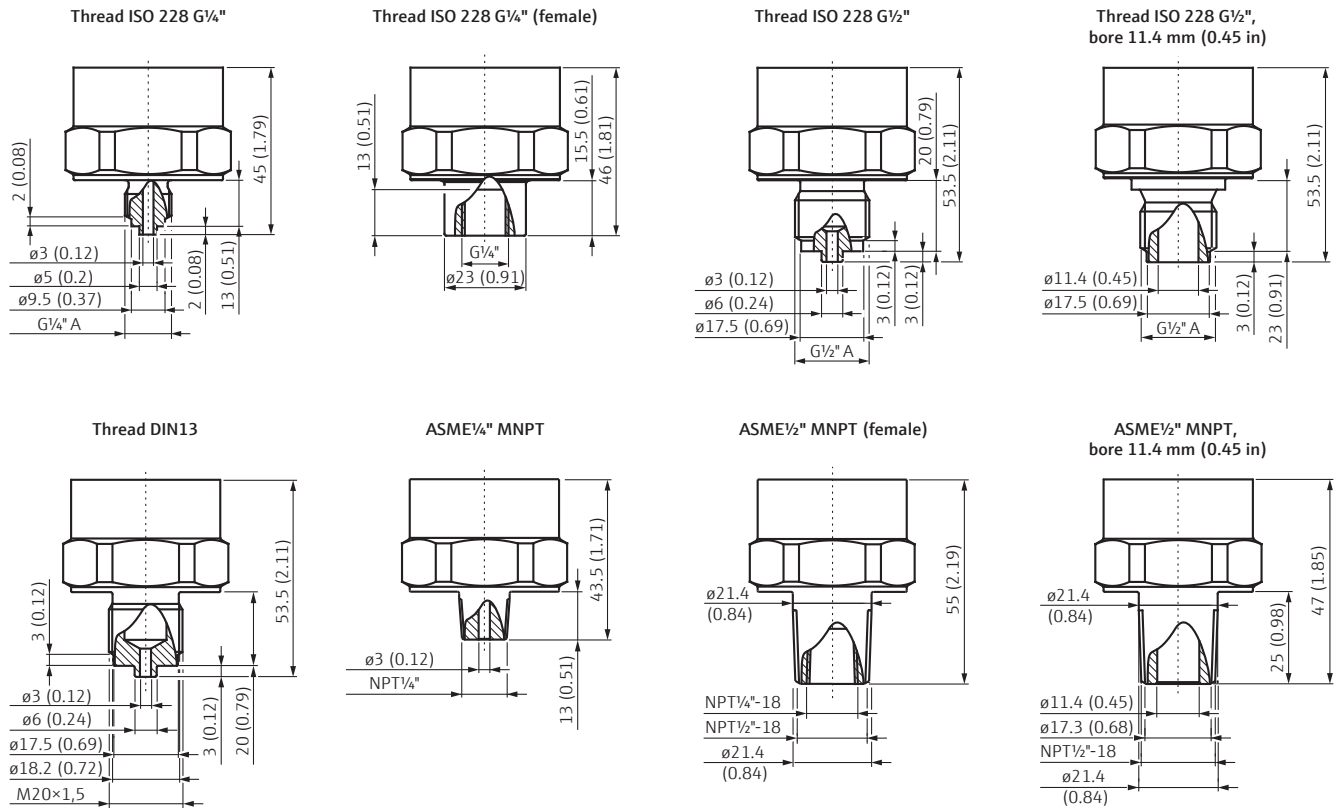
Housing



Installation according to instruction manual.

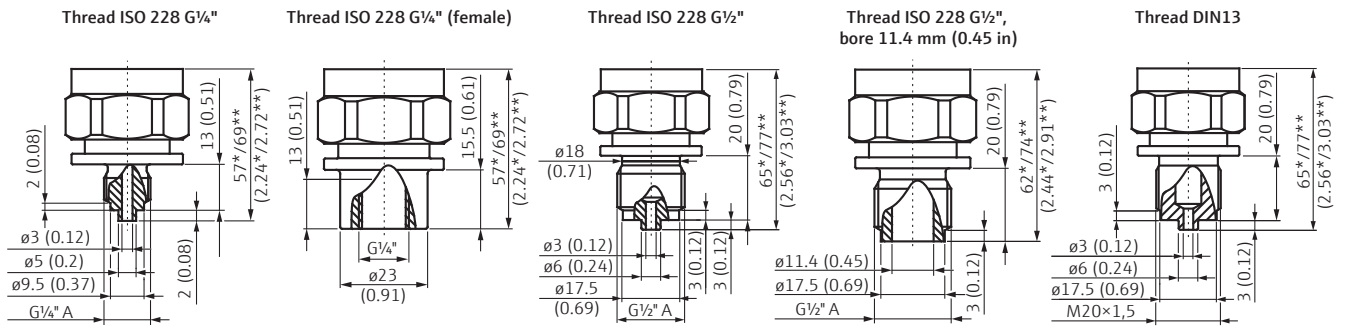
Dimensions process connections PMC21 in mm (inches)

Process connections with internal, ceramic process isolating diaphragm

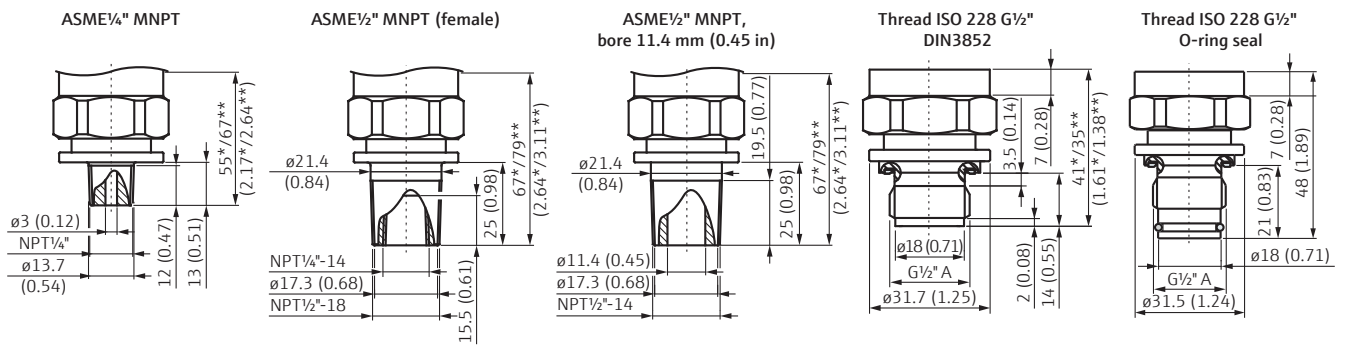


Dimensions process connections PMP21 in mm (inches)

Process connections with internal, metallic process isolating diaphragm



Process connections with flush-mounted, metallic process isolating diaphragm

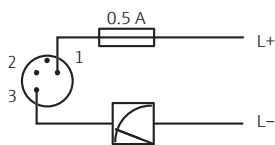


* to 100 bar (1500 psi) / ** 400 bar (6000 psi)

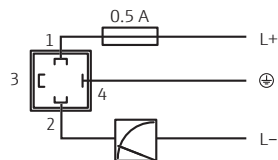
Electrical connection

4 to 20 mA output

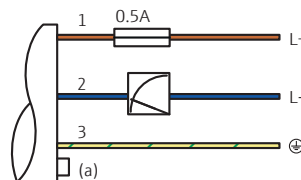
M12 plug



Valve plug



Cable



Cable:

- 1: brown = L+
- 2: blue = L-
- 3: green/yellow = ground connection
- (a): reference air hose

Price table

Electrical connection

Code	Plug
M	Plug M12
U	Valve plug M16
V	Valve plug NPT½"

Sensor range

Code	Range (relative)
1C	100 mbar/10 kPa/1.5 psi, overload: 4 bar/400 kPa/60 psi
1E	250 mbar/25 kPa/3.75 psi, overload: 5 bar/500 kPa/75 psi
1F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
1H	1 bar/100 kPa/15 psi, overload: 4 bar/400 kPa/60 psi
1K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
1M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
1N	6 bar/600 kPa/90 psi, overload: 40 bar/4 MPa/600 psi
1P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
1Q	16 bar/1.6 MPa/240 psi, overload: 60 bar/6 MPa/900 psi
1R	25 bar/2.5 MPa/375 psi, overload: 60 bar/6 MPa/900 psi
1S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi

Sensor range

Code	Range (absolute)
2C	100 mbar/10 kPa/1.5 psi, overload: 4 bar/400 kPa/60 psi
2E	250 mbar/25 kPa/3.75 psi, overload: 5 bar/500 kPa/75 psi
2F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
2H	1 bar/100 kPa/15 psi, overload: 4 bar/400 kPa/60 psi
2K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
2M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
2P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
2S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi

Calibration, unit

Code	Version
B	Sensor range; mbar/bar/psi
J	Customized; please specify measuring range in your order

Seal

Code	Version
A	FKM
J	EPDM

Cerabar PMC21

Approval	Electrical conn.	Process connection	Order no.	Price/pcs. in €			
				1 to 3	4 to 10	11 to 35	
Non hazardous area	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	229.-	206.-	188.-	
		Thread ISO228 G½" EN837	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	229.-	206.-	188.-	
		Thread ISO228 G¼" EN837	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	229.-	206.-	188.-	
		Thread ISO228 G½", bore 11.4 mm (0.45 in)	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ <input type="checkbox"/>	229.-	206.-	188.-	
		5 m cable	Thread ISO228 G¼" (internal)	PMC21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	249.-	224.-	204.-
			Thread ISO228 G½" EN837	PMC21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	249.-	224.-	204.-
	Thread ISO228 G¼" EN837		PMC21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	249.-	224.-	204.-	
	Ex	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	297.-	267.-	243.-
			Thread ISO228 G½" EN837	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	297.-	267.-	243.-
			Thread ISO228 G¼" EN837	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	297.-	267.-	243.-
		5 m cable	Thread ISO228 G½", bore 11.4 mm (0.45 in)	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ <input type="checkbox"/>	297.-	267.-	243.-
			Thread ISO228 G¼" (internal)	PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	317.-	286.-	260.-
Thread ISO228 G½" EN837			PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	317.-	286.-	260.-	
		Thread ISO228 G¼" EN837	PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	317.-	286.-	260.-	
		Thread ISO228 G½", bore 11.4 mm (0.45 in)	PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ <input type="checkbox"/>	317.-	286.-	260.-	

* Please add code for electrical connection, sensor range, calibration and seal.

Accessories

	Order no.	Price/pcs. in €		
Weld-in adapter G½, 316L	52002643		53.02	
Weld-in adapter G1, 316L	52010171		125.30	
5 m cable with M12×1 plug	52010285		7.25	
Straight plug, without cable (self wired)	52006263		15.55	
M12×1 plug angled	71114212		25.41	
Display PHX20 for Cerabar with analog output	52022914	144.-	134.-	127.-

Electrical connection

Code	Plug
M	Plug M12
U	Valve plug M16
V	Valve plug NPT½"

Sensor range

Code	Range (relative)
1F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
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1K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
1M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
1N	6 bar/600 kPa/90 psi, overload: 40 bar/4 MPa/600 psi
1P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
1Q	16 bar/1.6 MPa/240 psi, overload: 60 bar/6 MPa/900 psi
1R	25 bar/2.5 MPa/375 psi, overload: 60 bar/6 MPa/900 psi
1S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi
1U	100 bar/10 MPa/1500 psi, overload: 160 bar/16 MPa/2400 psi
1W	400 bar/40 MPa/6000 psi, overload: 600 bar/60 MPa/9000 psi

Sensor range

Code	Range (absolute)
2F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
2H	1 bar/100 kPa/15 psi, overload: 4 bar/400 kPa/60 psi
2K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
2M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
2P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
2S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi
2U	100 bar/10 MPa/1500 psi, overload: 160 bar/16 MPa/2400 psi
2W	400 bar/40 MPa/6000 psi, overload: 600 bar/60 MPa/9000 psi

Calibration, unit

Code	Version
B	Sensor range; mbar/bar/psi
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Cerabar PMP21			Order no.	Price/pcs. in €		
Approval	Electrical conn.	Process connection		1 to 3	4 to 10	11 to 35
Non hazardous area	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	225.-	202.-	184.-
		Thread ISO228 G½" EN837	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	225.-	202.-	184.-
		Thread ISO228 G½". flush-mounted	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	225.-	202.-	184.-
		Thread ISO228 G¼" EN837	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	225.-	202.-	184.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	225.-	202.-	184.-
	5 m cable	Thread ISO228 G¼" (internal)	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	245.-	220.-	201.-
		Thread ISO228 G½" EN837	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	245.-	220.-	201.-
		Thread ISO228 G½". flush-mounted	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	245.-	220.-	201.-
		Thread ISO228 G¼" EN837	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	245.-	220.-	201.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	245.-	220.-	201.-
Ex	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	293.-	263.-	240.-
		Thread ISO228 G½" EN837	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	293.-	263.-	240.-
		Thread ISO228 G½". flush-mounted	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	293.-	263.-	240.-
		Thread ISO228 G¼" EN837	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	293.-	263.-	240.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	293.-	263.-	240.-
	5 m cable	Thread ISO228 G¼" (internal)	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	313.-	282.-	257.-
		Thread ISO228 G½" EN837	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	313.-	282.-	257.-
		Thread ISO228 G½". flush-mounted	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	313.-	282.-	257.-
		Thread ISO228 G¼" EN837	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	313.-	282.-	257.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	313.-	282.-	257.-

* Please add code for electrical connection, sensor range and calibration.


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M12×1 plug angled	71114212		25.41	
Display PHX20 for Cerabar with analog output	52022914	144.-	134.-	127.-


Prices are applicable for Germany until 30/06/2020, in Euro per unit, net excluding value added tax (VAT), cost of packing and dispatch. Endress+Hauser retains the right to change or modify pricing at any time. The terms of sales and delivery of Endress+Hauser are applicable. Current prices and delivery times can be verified prior to ordering on www.e-direct.endress.com.

 Complete product information: www.e-direct.endress.com/pmx21

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Liquicap T FMI21

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iTHERM ModuLine TM101

 Process transmitter
RMA42