

PBMR

Fully welded pressure transmitter
for railway applications



Product highlights

- Excellent accuracy and long term stability up to $\leq 0.1\%$ FS
- Active temperature compensation over the entire operating temperature range
- Sensor element completely welded with stainless steel housing
- Tested for railway applications according to EN 50155:2007
- Vibration and shock resistant according to EN 61373:1999, 2010 (Category 2)

Application examples

- Testing and measuring equipment
- Pneumatic subsystems
- Cooling units for converters and transformers
- Pneumatic braking systems

EN 50155

Technical data	
Housing	
Style	■ Compact design
Overall size	■ Refer to section „Dimensional drawings“
Material	■ AISI 316L (1.4404)
Electrical connection	
Connector variants	■ M12, 4-pin ■ DIN EN 175301-803 A (DIN 43650 A), 4-pin
Ambient conditions	
Operating temperature range	■ $-40 \dots 85^\circ\text{C}$
Storage temperature range	■ $-40 \dots 85^\circ\text{C}$
Cold (EN 60068-2-1)	■ Ab: -40°C , 2 h (not in operation) ■ Ae: -40°C , 1 h (in operation)
Dry heat (EN 60068-2-2)	■ Be: 85°C , 6 h (in operation)
Damp heat, cyclic (EN 60068-2-30)	■ Db: 55°C , Variant 1, 2 cycles (2 · 24 h)
Vibration (sinusoidal) (EN 60068-2-6)	■ 1.5 mm p-p (10 ... 58 Hz), 10 g (58 Hz ... 2 kHz), 10 cycles (2.5 h) per axis
Shock (EN 60068-2-27)	■ 50 g / 11 ms, 100 g / 6 ms, 10 impulses per axis and direction ■ 5 g / 30 ms, 3 impulses per axis and direction
Bump (EN 60068-2-29)	■ 100 g / 2 ms, 5000 impulses per axis and direction
Vibration, broad-band random (EN 60068-2-64)	■ Life-time: $0.1188 \text{ g}^2 / \text{Hz}$, 4.25 gRMS (7 ... 250 Hz), 5 h per axis ■ Functional test: $0.00193 \text{ g}^2 / \text{Hz}$, 0.54 gRMS (7 ... 250 Hz), 10 min. per axis
Shock and vibration tests (EN 61373:1999, 2010)	■ Vibration: Category 2, Shock: Category 1, 2, 3 [1]
Degree of protection (IEC 60529)	■ IP67 (with connector M12) ■ IP65 (with connector DIN EN)
Insulation resistance	■ $> 100 \text{ M}\Omega$ (500 V DC)
Insulation voltage	■ 500 V AC (1 min.)
Leakage current	■ $< 2.5 \text{ mA}$
Process connection	
Connection variants	■ Refer to section „Dimensional drawings“
Wetted parts material	■ AISI 316L (1.4404) ■ AISI 316L (1.4435) (membrane) ■ NBR (optional) ■ FKM (Viton®) (optional)
Process conditions	
Process temperature	■ $-40 \dots 120^\circ\text{C}$
Process pressure	■ Refer to section „Process conditions“
Power supply	
Rated voltage [2]	■ 24 V
Interruption of power supply [2]	■ Class S1
Switching between two power supplies [2]	■ Class C1
Power input ($V_s = U_n$)	■ Current output: $\leq 500 \text{ mW}$ ■ Voltage output: $\leq 150 \text{ mW}$ (without load)
Reverse polarity protection	■ Yes
Output signal	
Current output	■ 4 ... 20 mA (2-wire)
Shunt resistance	■ $R_s \leq 270 \Omega$ ($V_s = 0.6 \cdot U_n$) ■ $R_s \leq (V_s - 8 \text{ V}) / 0.0205 \text{ A}$
Voltage output	■ 0 ... 10 V
Load resistance	■ $\geq 10 \text{ k}\Omega$
Short circuit protection	■ Yes

[1] The respective most demanding severity levels of the issues 1999 and 2010 are applied in each Category 2

[2] EN 50155:2007, 5.1 Power Supply

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Technische Daten	
Performance characteristics	
Measuring range	■ -1 ... 40 bar
Min. measuring span	■ 0.1 bar
Max. measuring span	■ 40 bar
Pressure type	■ Relative (gauged) ■ Absolute
Max. measuring error [3]	■ ± 0.1 % FS ■ ± 0.25 % FS ■ ± 0.5 % FS
Compensated temperature range	■ -40 ... 85 °C
Temperature coefficient	■ Zero point: ≤ ± 0.03 % FS / 10 K ■ Measuring span: ≤ ± 0.03 % FS / 10 K
Long term stability	■ ≤ 0.1 % FS / a
Rise time	■ ≤ 5 ms (10 ... 90 %)

Compliance and approvals	
EMV	■ EN 50121-3-2:2006 [4] ■ 2014/30/EU ■ EN 61000-6-2 ■ EN 61000-6-3 ■ EN 61326-2-3
Railway applications	■ EN 50155 [5]
RoHS	■ 2011/65/EU

Process conditions								Proof pressure (bar)	Burst pressure (bar)
Measuring range (bar)									
0 ... 0.1	0 ... 0.16	0 ... 0.25						1	2
0 ... 0.4	0 ... 0.6	0 ... 1		-0.1 ... 0.1	-0.2 ... 0.2	-1 ... 0	-1.0 ... 0.6	3	6
0 ... 1.6	0 ... 2	0 ... 2.5	0 ... 4	-1.0 ... 1.5	-1 ... 3	-1 ... 5		15	30
0 ... 6	0 ... 10	0 ... 16	0 ... 20	-1 ... 9	-1 ... 15			60	120
0 ... 25				-1 ... 24				70	140
0 ... 40				-1 ... 39				135	270

[3] Including zero-point and span error, nonlinearity (by terminal base line), hysteresis and non-repeatability (EN 61298-2) (Tamb = 20 °C)

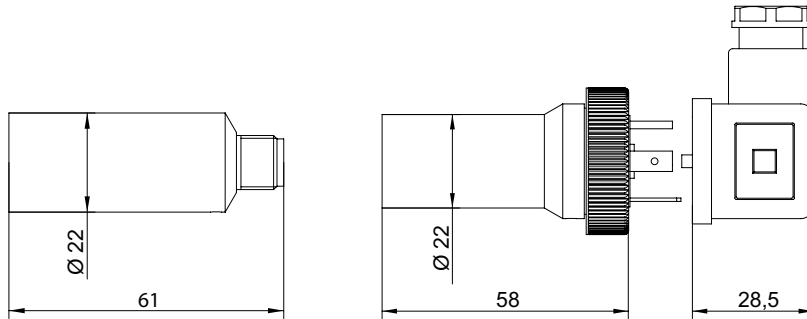
[4] With power supply unit acc. EN 61000-6-2:2005

[5] EN 50155:2007, 5 Electrical Conditions, 12 Test

Note: Information on product characteristics may relate to defined product options.

Dimensional drawings

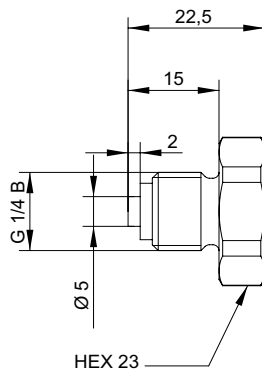
Housing



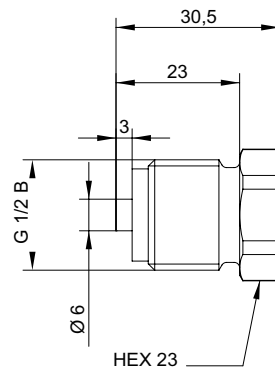
M12, 4-pin
X04-14

DIN EN 175301-803 A (DIN 43650 A), 4-pin
X14-44

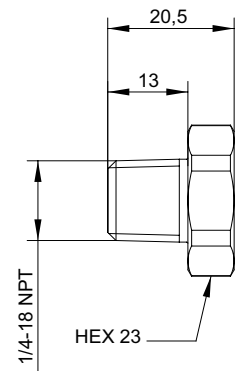
Process connection



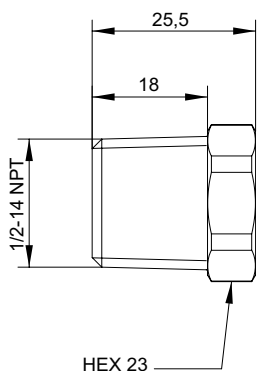
G 1/4 B EN 837
G30-02



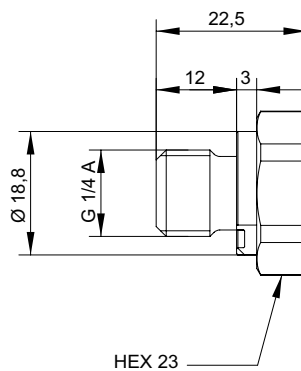
G 1/2 B EN 837
G31-03



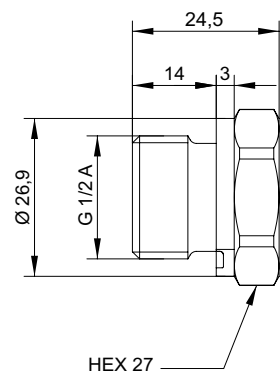
1/4-18 NPT
N01-04



1/2-14 NPT
N02-05



G 1/4 A DIN 3852-E
G50-06



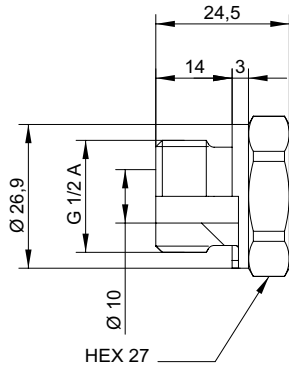
G 1/2 A DIN 3852-E
G51-09

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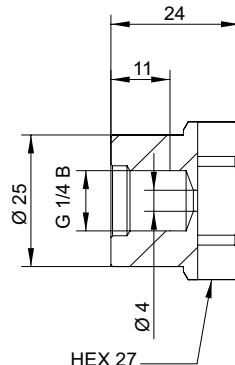
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Dimensional drawings

Process connection



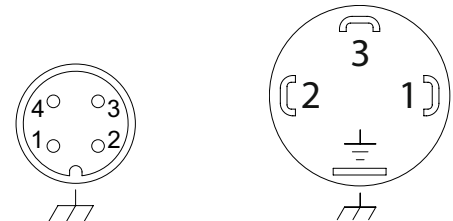
G 1/2 A DIN 3852-E, hole Ø 10 mm
G51-19

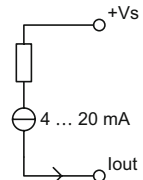
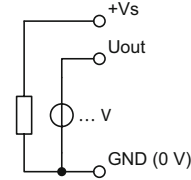


G 1/4 ISO 228-1 female thread
G21-12

Electrical connection

Pin assignment



Output signal	Equivalent circuit	Function	M12, 4-pin X04-14	DIN EN 175301-803 A (DIN 43650 A), 4-pin X14-44
4 ... 20 mA (2-wire)		+Vs	1	1
		Iout	3	2
		Frame ground	Plug thread	Earth pin
		n.c.	3, 4	3
0 ... 10 V		+Vs	1	1
		Uout	2, 4 [6]	3
		GND (0 V)	3	2
		Frame ground	Plug thread	Earth pin

[6] Internally connected

Note: Information in format AXX-X... relates to „Baumer Connection Identifier“ (BCID) and dedicated ordering code.

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Ordering information

	PBMR	-	2	.	x	xxx	x	.	xx	xx	.	xx	2	x	1	.	0	0	5
Product line																			
Fully welded pressure transmitter for railway applications	PBMR																		
Housing																			
Stainless steel, AISI 316L (1.4404)			2																
Max. measuring error																			
± 0.1 % FS						5													
± 0.25 % FS						4													
± 0.5 % FS						3													
Measuring range (bar)																			
-0.1 ... 0.1						B2H													
-0.2 ... 0.2						B4G													
-1 ... 0						B59													
-1.0 ... 0.6						B72													
-1.0 ... 1.5						B74													
-1 ... 3						B76													
-1 ... 5						B77													
-1 ... 9						B79													
-1 ... 15						B81													
-1 ... 24						B82													
-1 ... 39						B1L													
0 ... 0.1						B08													
0 ... 0.16						B09													
0 ... 0.25						B10													
0 ... 0.4						B11													
0 ... 0.6						B12													
0 ... 1						B15													
0 ... 1.6						B16													
0 ... 2.0						B17													
0 ... 2.5						B18													
0 ... 4						B19													
0 ... 6						B20													
0 ... 10						B22													
0 ... 16						B24													
0 ... 20						B25													
0 ... 25						B26													
0 ... 40						B27													
Pressure type																			
Relative (gauged)						R													
Absolute [7]						A													
Output signal																			
4 ... 20 mA (2-wire)															A1				
0 ... 10 V															A2				
Electrical connection	BCID																		
M12, 4-pin	X04																		14
DIN EN 175301-803 A (DIN 43650 A), 4-pin	X14																		44
Process connection	BCID																		
G 1/4 B EN 837	G30																		02
G 1/2 B EN 837	G31																		03
1/4-18 NPT	N01																		04
1/2-14 NPT	N02																		05
G 1/4 A DIN 3852-E	G50																		06
G 1/2 A DIN 3852-E	G51																		09
G 1/2 A DIN 3852-E, hole Ø 10 mm	G51																		19
G 1/4 ISO 228-1 female thread	G21																		12
Wetted parts material																			
AISI 316L (1.4404)																			2

[7] Available for „Measuring range“ B11 (0 ... 0.4 bar) ... B27 (0 ... 40 bar)

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Ordering information

	PBMR	-	2	.	x	xxx	x	.	xx	xx	.	xx	2	x	1	.	0	0	5
Gasket																			
Without															0				
NBR (available for „Process connection“ 06, 09, 19)															1				
FKM (Viton®) (available for „Process connection“ 06, 09, 19)															3				
Oil filling																			
Silicone oil															1				
Display																			
Without																	0		
Explosion protection																			
Without																		0	
Compliance and approvals																			
EN 50155																			5