

**Overview**

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



## EN 50155

**Technical data**

**Performance characteristics**

Measuring range	-1 ... 40 bar
Min. measuring span	0.1 bar
Max. measuring span	40 bar
Pressure type	Absolute Relative (gauged)
Standard error of measurement (BFSL)	$\pm 0.04\%$ FSR $\pm 0.1\%$ FSR $\pm 0.2\%$ FSR Including non-linearity, hysteresis and non-repeatability according BFSL For turndown, multiply this value by the applied turndown ratio
Max. measuring error	$\pm 0.1\%$ FSR $\pm 0.25\%$ FSR $\pm 0.5\%$ FSR Including zero-point and span error, non-linearity (by terminal base line), hysteresis and non-repeatability (EN 61298-2) For turndown, multiply this value by the applied turndown ratio
Temperature coefficient	$\leq 0.03\%$ FSR/10 K, measuring span $\leq 0.03\%$ FSR/10 K, zero point
Compensated temperature range	-40 ... 85 °C
Long term stability	$\leq 0.1\%$ FSR/a, measuring range > 1 bar $\leq 1$ mbar, measuring range $\leq 1$ bar
Rise time (10 ... 90 %)	$\leq 5$ ms

**Process conditions**

Process pressure	Refer to section "Operating conditions"
Process temperature	-40 ... 120 °C

**Process connection**

Connection variants	Refer to section "Dimensional drawings"
Wetted parts material	AISI 316L (1.4404)

**Process connection**

Wetted parts material, gasket	FKM (Viton®), optional FKM (Viton®) gaskets require a minimum ambient temperature of -20 °C and a minimum medium temperature of -25 °C NBR, optional
Wetted parts material, membrane	AISI 316L (1.4435)

**Ambient conditions**

Bump (EN 60068-2-27)	100 g / 2 ms, 5000 impulses per axis and direction
Cold (EN 60068-2-1)	Ab: -40 °C, 2 h (not in operation) Ae: -40 °C, 1 h (in operation)
Damp heat, cyclic (EN 60068-2-30)	Db: 55 °C, Variant 1, 2 cycles (2 · 24 h)
Dry heat (EN 60068-2-2)	Be: 85 °C, 6 h (in operation)
Free fall (EN 60068-2-32)	5 g / 30 ms, 3 impulses per axis and direction
Shock (EN 60068-2-27)	50 g / 11 ms, 100 g / 6 ms, 10 impulses per axis and direction
Shock and vibration tests (EN 61373:1999, 2010)	The respective most demanding severity levels of the issues 1999 and 2010 are applied in each Category 2 Vibration: Category 2, Shock: Category 1, 2, 3
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
Vibration, broad-band random (EN 60068-2-64)	Functional test: 0.00193 g <sup>2</sup> / Hz, 0.54 gRMS (7 ... 250 Hz), 10 min. per axis Life-time: 0.1188 g <sup>2</sup> / Hz, 4.25 gRMS (7 ... 250 Hz), 5 h per axis
Degree of protection (EN 60529)	IP 65, with connector DIN EN 175301-803 A (DIN 43650 A), 4-pin IP 67, with connector M12-A, 4-pin
Insulation resistance	> 100 M $\Omega$ , 500 V DC
Insulation voltage	500 V AC, 1 min.
Leakage current	< 2.5 mA

**Technical data**

**Ambient conditions**

Operating temperature range	-40 ... 85 °C
Storage temperature range	-40 ... 85 °C

**Output signal**

Current output	4 ... 20 mA , 2-wire 20 ... 4 mA , 2-wire
Voltage output	0... 10 V , 3-wire 0... 5 V , 3-wire 0.5 ... 4.5 V , 3-wire 1 ... 5 V , 3-wire 10 ... 0V , 3-wire
Load resistance	≥ 10 kΩ
Short circuit protection	Yes
Shunt resistance	$R_s \leq (V_s - 8 V)/0.0205 A$ $R_s \leq 270 \Omega$ , $V_s = 0.6 \cdot U_n$

**Housing**

Overall size	Refer to section "Dimensional drawings"
Style	Compact transmitter
Material	AISI 316L (1.4404)

**Electrical connection**

Connector	DIN EN 175301-803 A (DIN 43650 A), 4-pin M12-A, 4-pin
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**Power supply**

Compliant to	EN 50155:2007, 5.1 Power Supply
Interruption of power supply	Class S1
Switching between two power supplies	Class C1
Power input ( $V_s = U_n$ )	≤ 150 mW , with voltage output (without load) ≤ 500 mW , with current output
Rated voltage	24 V
Reverse polarity protection	Yes
Voltage supply range	13 ... 30 V DC , with voltage output 8 ... 30 V DC , with current output

**Compliance and approvals**

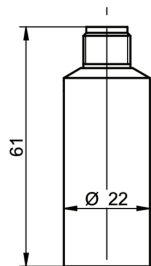
EMC	EN 50121-3-2:2006, with power supply unit acc. EN 61000-6-2:2005 EN 61000-6-2 EN 61000-6-3 EN 61326-2-3
Railway applications	EN 50155 EN 50155:2007, 5 electrical conditions, 12 tests

**Operating conditions**

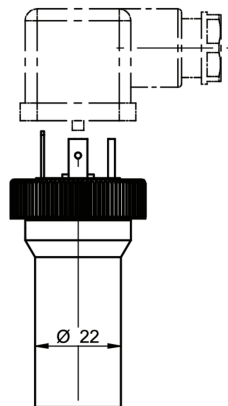
Measuring range (bar)								Proof pressure (bar)	Burst Pressure (bar)
0 ... 0,1    0 ... 0,16    0 ... 0,25								1	2
-0,1 ... 0,1	-0,2 ... 0,2	-1 ... 0	-1 ... 0,6	0 ... 0,4	0 ... 0,6	0 ... 1		3	6
	-1 ... 1,5	-1 ... 3	-1 ... 5	0 ... 1,6	0 ... 2	0 ... 2,5	0 ... 4	15	30
		-1 ... 9	-1 ... 15	0 ... 6	0 ... 10	0 ... 16	0 ... 20	60	120
			-1 ... 24	0 ... 25				70	140
			-1 ... 39	0 ... 40				135	270

**Dimensional drawings**

**Housing**

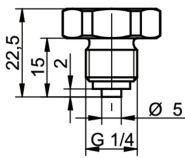


Housing with connector M12-A, 4-pin

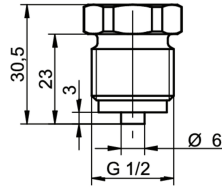


Housing with connector DIN EN 175301-803 A (DIN 43650 A), 4-pin

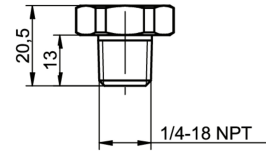
**Process connection**



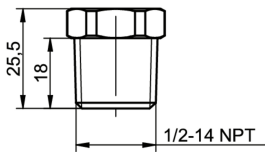
G30-02  
G 1/4 B EN 837-1 (BCID: G30)



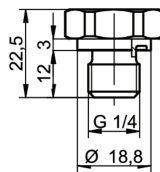
G31-03  
G 1/2 B EN 837-1 (BCID: G31)



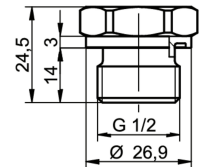
N01-04  
1/4-18 NPT (BCID: N01)



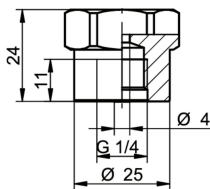
N02-05  
1/2-14 NPT (BCID: N02)



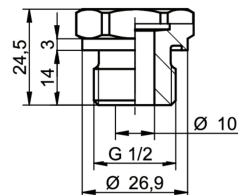
G50-06  
G 1/4 A DIN 3852-E (BCID: G50)



G51-09  
G 1/2 A DIN 3852-E (BCID: G51)



G21-12  
G 1/4 A ISO 228-1 female thread (BCID: G21)



G51-19  
G 1/2 A DIN 3852-E, hole  $\varnothing$  10 mm (BCID: G51)

**Electrical connection**

Output signal	Equivalent circuit	Electrical connection	Function	Pin assignment
4 ... 20 mA (2-wire)			+Vs	1
			Iout	3
0 ... 10 V (3-wire)			+Vs	1
			Uout	2, 4
			GND (0 V)	3
			Frame Ground	Plug thread
			n.c.	2, 4
			+Vs	1
			Iout	2
			Frame Ground	Grounding lug
			n.c.	3
			+Vs	1
			Uout	2, 4
			GND (0 V)	3
			Frame Ground	Plug thread
			+Vs	1
			Uout	3
			GND (0 V)	2
			Frame Ground	Grounding lug

**Ordering information**

Ordering key - Configuration possibilities see website

	PBMR	-	2	#	###	#	##	##	##	2	#	1	0	0	#
<b>Product</b>	PBMR														
<b>Housing material</b>	Stainless steel 1.4404 AISI 316L		2												
<b>Accuracy</b>	±0.5 % FS														
	±0.25 % FS														
	±0.10 % FS														
<b>Measuring range</b>	0...0,1 bar (EN)														B08
	0...0,16 bar (EN)														B09
	0 ... 0.25 bar (EN)														B10
	0...0,4 bar (EN)														B11
	0...0,6 bar (EN)														B12
	0...1 bar (EN)														B15
	0...1,6 bar (EN)														B16
	0...2 bar (EN)														B17
	0 ... 2.5 bar (EN)														B18
	0 ... 4 bar (EN)														B19
	0...12 bar (EN)														B1K
	-1...39 bar (EN)														B1L
	0 ... 6 bar (EN)														B20
	0 ... 10 bar (EN)														B22
	0 ... 16 bar (EN)														B24
	0...20 bar (EN)														B25
	0...25 bar (EN)														B26
	0...40 bar (EN)														B27
	-0,1...0,1 bar (EN)														B2H

**Ordering key - Configuration possibilities see website**

	PBMR	-	2	#	###	#	##	##	##	2	#	1	0	0	#	
-0,2...0,2 bar (EN)																B4G
-0,6...0 bar (EN)																B58
-1...0 bar (EN)																B59
-1...0,6 bar (EN)																B72
-1...1 bar (EN)																B73
-1...1,5 bar (EN)																B74
-1...2 bar (EN)																B75
-1...3 bar (EN)																B76
-1...5 bar (EN)																B77
-1...9 bar (EN)																B79
-1...15 bar (EN)																B81
-1...24 bar (EN)																B82
0...5 bar (EN)																B98
0...1.5 psi (ANSI)																H08
0...4 psi (ANSI)																H10
0...6 psi (ANSI)																H11
0...10 psi (ANSI)																H13
0...15 psi (ANSI)																H15
0...25 psi (ANSI)																H16
0...30 psi (ANSI)																H17
0...60 psi (ANSI)																H19
0...20 psi (ANSI)																H1C
0...500 psi (ANSI)																H1E
-30Hg...600 psi (ANSI)																H1L
0...100 psi (ANSI)																H21
0...160 psi (ANSI)																H22
0...200 psi (ANSI)																H23
0...250 psi (ANSI)																H24
0...300 psi (ANSI)																H25
0...400 psi (ANSI)																H26
0...600 psi (ANSI)																H27
-30HG...60 psi (ANSI)																H2C
0...5 psi (ANSI)																H2N
0...2 psi (ANSI)																H2Y
-30HG...0 psi (ANSI)																H59
-30HG...15 psi (ANSI)																H73
-30HG...30 psi (ANSI)																H75
-30HG...100 psi (ANSI)																H78
-30HG...150 psi (ANSI)																H79
-30HG...220 psi (ANSI)																H81
-30HG...300 psi (ANSI)																H82
0...3 psi (ANSI)																H93
0...1 mH2O (EN)																J08
0...1,6 mH2O (EN)																J09
0...2,5 mH2O (EN)																J10
0...4 mH2O (EN)																J11
0...6 mH2O (EN)																J12
0...10 mH2O (EN)																J15
0...16 mH2O (EN)																J16
0...20 mH2O (EN)																J17

**Ordering key - Configuration possibilities see website**

	PBMR	-	2	#	###	#	##	##	##	2	#	1	0	0	#
0...25 mH <sub>2</sub> O (EN)					J18										
0...40 mH <sub>2</sub> O (EN)					J19										
0...60 mH <sub>2</sub> O (EN)					J20										
0...100 mH <sub>2</sub> O (EN)					J22										
0...160 mH <sub>2</sub> O (EN)					J24										
0...200 mH <sub>2</sub> O (EN)					J25										
0...250 mH <sub>2</sub> O (EN)					J26										
<b>Kind of pressure</b>															
Relative (gauged)															R
Absolute															A
<b>Output signal</b>															
20...4 mA															A0
4...20 mA															A1
0...10 V															A2
1...5 V															A3
0...5 V															A4
0.5...4.5 V															A5
10...0 V															A7
<b>Output Connection</b>															
M12-A, 4-pin															14
DIN EN 175301-803 A (DIN 43650 A), 4-pin															44
<b>Process connection</b>															
G 1/4 B EN 837-1 (G30)															02
G 1/2 B EN 837-1 (G31)															03
1/4-18 NPT (N01)															04
1/2-14 NPT (N02)															05
G 1/4 A DIN 3852-E (G50)															06
M20 × 1.5 ISO 261 / ISO 965 (M08)															07
G 1/2 A DIN 3852-E (G51)															09
G 1/4 A ISO 228-1 female thread (G21)															12
G 1/2 A DIN 3852-E, hole Ø 10 mm (G52)															19
G 1/4 B EN 837-1 with integrated damping element (P ≤ 600 bar) (G30)															22
G 1/2 B EN 837-1 with integrated damping element (P ≤ 600 bar) (G31)															23
1/4-18 NPT with integrated damping element (P ≤ 1000 bar) (N01)															24
1/2-14 NPT with integrated damping element (P ≤ 1000 bar) (N02)															25
G 1/4 A DIN 3852-E, pressure channel 0.6 mm (G50)															26
G 1/2 A DIN 3852-E with integrated damping element (P ≤ 600 bar) (G51)															29
<b>Process connection material</b>															
Stainless steel 1.4404 AISI 316L															2
<b>Seal</b>															
None															0
NBR standard															1
FKM (Viton®)															3
<b>Oil filling</b>															
Standard oil															1
<b>Display</b>															
Without display															0

**Ordering key - Configuration possibilities see website**

	PBMR - 2 # ### # ## ## ## 2 # 1 0 0 #	
<b>ATEX</b>		
Standard safety		0
<b>Approvals</b>		
Railway (EN 50155)		5
EAC		7