

PP20R

Competitive pressure sensor for railway applications

PP20R-1.####R.####.###4#00.050

Overview

- Tested according EN 50155
- High dielectric strength of 1 kV AC exceeding the standard according EN 50155
- High accuracy over a wide temperature range (-40 ... 125 °C) due to active compensated temperature compensation
- Extended EMC immunity compared to EN 50121-3-2
- Traceability according GS1 standard
- Designed for a wide range of railway applications as e.g. pantograph pressure control, coolant recirculating pumps and pneumatic and hydraulic brake systems



EN 50155

Technical data

Performance characteristics

Pressure type	Relative (gauged)
Compensated temperature range	-10 ... 60 °C
Long term stability	≤ 0.2 % FSR/a
Max. measuring error	± 0.3 % FSR ± 0.5 % FSR ± 1.0 % FSR Including zero-point and span error, non-linearity (by terminal base line), hysteresis and non-repeatability (EN 61298-2)
Max. measuring span	400 bar
Measuring range	-1 ... 400 bar
Step response time	< 3 ms
Standard error of measurement (BFSL)	± 0.12 % FSR ± 0.2 % FSR ± 0.4 % FSR Including non-linearity, hysteresis and non-repeatability according BFSL
Min. measuring span	0.25 bar
Power-up time	< 50 ms
Temperature coefficient	≤ 0.05 % FSR/10 K, measuring span ≤ 0.05 % FSR/10 K, zero point

Process conditions

Process temperature	With NBR seal: -25 ... 100 °C @ -1 ... 400 bar With EPDM seal: -40 ... 125 °C @ -1 ... 160 bar -30 ... 100 °C @ 160 ... 400 bar With FKM (Viton®) seal: -10 ... 125 °C @ -1 ... 400 bar With FVMQ seal: -40 ... 125 °C @ -1 ... 160 bar
Process pressure	Refer to section "Operating conditions"

Process connection

Connection variants	Refer to section "Dimensional drawings"
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Process connection

Wetted parts material	AISI 304 (1.4301) Ceramic, 96% AL2O3 NBR, optional EPDM, optional FKM (Viton®), optional FVMQ, optional
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Ambient conditions

Operating temperature range	Connector M12-A, 4-pin: -40 ... 105 °C, with voltage output -40 ... 115 °C, with current output @ voltage supply range 26.4 ... 35 V DC -40 ... 125 °C, with current output @ voltage supply range 11 ... 26.3 V DC Class OT6 (EN 50155) Connector DIN EN 175301-803 A (DIN 43650 A), 4-pin: -40 ... 90 °C
Storage temperature range	-40 ... 125 °C
Degree of protection (EN 60529)	IP65, with connector DIN EN 175301-803 A (DIN 43650 A), 4-pin IP67, with connector M12-A, 4-pin IP69K, with connector M12-A, 4-pin
Insulation resistance	> 100 MΩ, 500 V DC
Insulation voltage	1 kV AC, EN 50155
Shock and vibration tests (EN 61373:1999, 2010)	Category 2 The respective most demanding severity levels of the issues 1999 and 2010 are applied in each Category 2

Output signal

Current output	4 ... 20 mA, 2-wire
Voltage output	0 ... 10 V 1 ... 5 V 0 ... 2 V
Load resistance	> 5 kΩ, with voltage output R ≤ (V DC - 11 V)/0.023 A, with current output

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Technical data

Output signal

Short circuit protection Yes

Housing

Style Compact transmitter

Overall size Refer to section "Dimensional drawings"

Material AISI 304 (1.4301)

Electrical connection

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

Power supply

Voltage supply range 11 ... 35 V DC , with current output
14 ... 35 V DC , with voltage output
24 V DC , according EN 50155, Class S1

Factory settings

Output lower limit 3.8 mA

Output upper limit 22 mA

Damping 0 s

Output at sensor fault 23 mA

Compliance and approvals

EMC EN 61326-1
EN 50121-3-2:2016
EN 55011:2009 (Class A)

Railway applications EN 50155

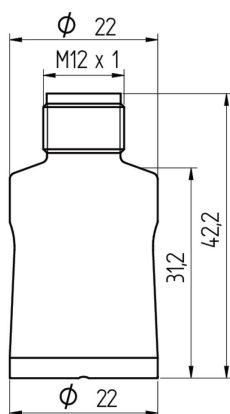
Fire protection EN 45545 HL 3

Operating conditions

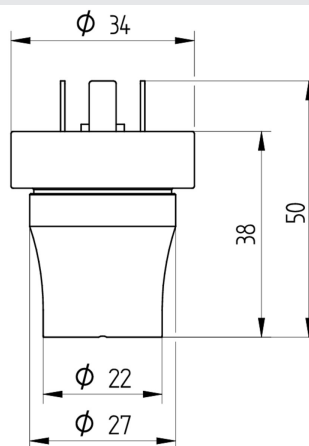
Measuring range (bar)				Proof pressure (bar)	Burst pressure (bar)
0 ... 0.25	0 ... 2.5	-1 ... 1		4	6
0 ... 4	0 ... 6			10	12
0 ... 10	0 ... 2.5 strengthened	0 ... 4 strengthened	0 ... 6 strengthened	15	20
0 ... 12 strengthened	0 ... 16			35	50
0 ... 40	0 ... 60			100	120
0 ... 100				150	200
0 ... 160				350	500
0 ... 250	0 ... 400			500	650

Dimensional drawings (mm)

Housing



M12-A, 4-pin



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

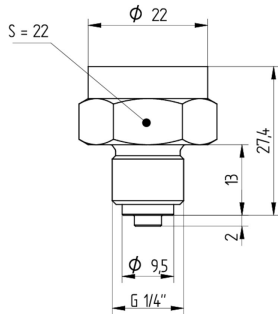
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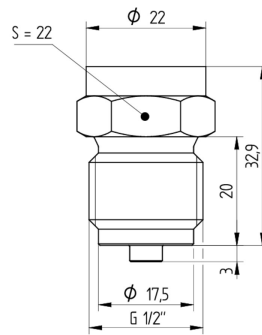
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Dimensional drawings (mm)

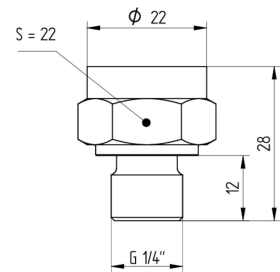
Process connection



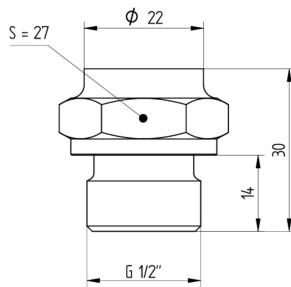
G 1/4 B EN 837-1 (G30)



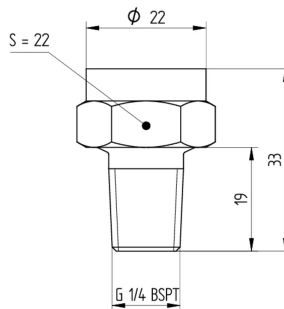
G 1/2 B EN 837-1 (G31)



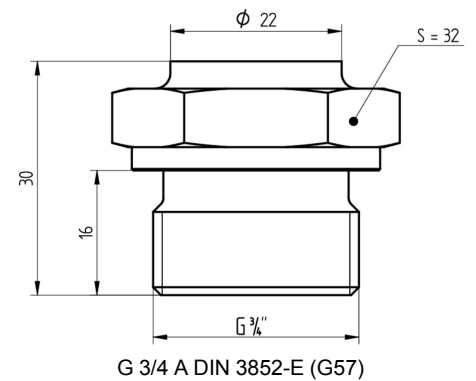
G 1/4 A DIN 3852-E (G50)



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



R 1/4 BSP - Tr (R03)



G 3/4 A DIN 3852-E (G57)

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Electrical connection

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

Product	PP20R	-	1	.	#	###	R	.	##	##	.	##	4	#	0	0	.	0	5	0
Housing material	SS 1.4301 AISI 304																			
Accuracy	±1.0 % FS																			
	±0.5 % FS																			
	±0.3 % FS																			
Measuring range	0 ... 0.25 bar (EN)																			
	0 ... 2.5 bar (EN)																			
	0 ... 2.5 bar (EN), strengthened																			
	0 ... 4 bar (EN)																			
	0 ... 4 bar (EN), strengthened																			
	0...12 bar (EN), strengthened																			
	0 ... 6 bar (EN)																			
	0 ... 6 bar (EN), strengthened																			
	0 ... 10 bar (EN)																			
	0 ... 16 bar (EN)																			
	0 ... 40 bar (EN)																			
	0 ... 60 bar (EN)																			
	0 ... 100 bar (EN)																			
	0 ... 160 bar (EN)																			
	0 ... 250 bar (EN)																			
	0 ... 400 bar (EN)																			
	-1...1 bar (EN)																			
Kind of pressure	Relative (gauged)																			

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Ordering information

Ordering key - Configuration possibilities see website

										PP20R	-	1	.	#	###	R	.	##	##	.	##	4	#	0	0	.	0	5	0										
Output signal																																							
4...20 mA																		A1																					
0...10 V																		A2																					
1...5 V																		A3																					
0...2 V																		A9																					
Output Connection																																							
M12-A, 4-pin																		14																					
DIN EN 175301-803 A (DIN 43650 A), 4-pin																		44																					
Process connection																																							
G 1/4 B EN 837-1 (G30)																						02																	
G 1/2 B EN 837-1 (G31)																						03																	
G 1/4 A DIN 3852-E (G50)																						06																	
G 1/2 A DIN 3852-E (G51)																						09																	
R 1/4 ISO 7-1 (R03)																						17																	
Process connection material																																							
Stainless steel 1.4301 AISI 304																						4																	
Seal																																							
NBR standard																								1															
EPDM																								2															
FKM (Viton®)																								3															
FVMQ																								6															
Oil filling																																							
Without																								0															
Display																																							
Without																										0													
ATEX																																							
Without																												0											
Approvals																																							
Railway (EN 50155)																														5									
Configuration																																							
No configuration																														0									

(1) Including female power connector