PP20R

Competitive pressure sensor for railway applications

PP20R-1.####R.####.####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
- Frontflush pressure connection available for requirements of water applicatons as e.g. fluid management, water pumps, level monitoring, lavatory equipment and high viscosity media

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"

Process connection	
Wetted parts material	AISI 304 (1.4301) AISI 316L (1.4404) Ceramic, 96% AL2O3 NBR, optional EPDM, optional FKM, optional, gaskets require a minimum ambient temperature of -20 °C and a minimum medium temperature of -25 °C FVMQ, optional
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 , 3-wire 1 … 5 V , 3-wire 0 … 2 V , 3-wire

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Technical data

Output signal	
Load resistance	> 5 kΩ, with voltage output R ≤ (V DC - 11 V)/0.023 A, with current output
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

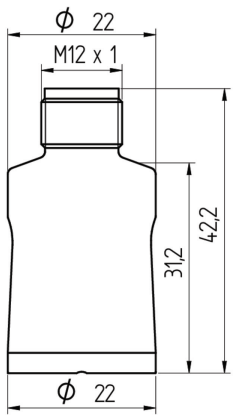
Factory settings	
Output lower limit	3.8 mA
Output upper limit	22 mA
Damping	0 s
Output at sensor fault	23 mA
Compliance and approvals	
EMC	EN 61326-1 EN 50121-3-2:2016 EN 55011:2009 (Class A)
Railway applications	EN 50155
Fire protection	EN 45545 HL 3

Operating conditions

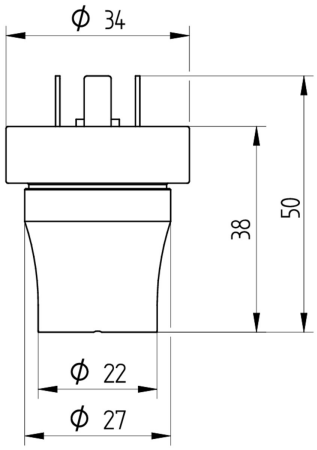
Measuring range (bar)				Proof pressure (bar)	Burst pressure (bar)
0 … 0.25	0 … 2.5	-1 … 1		4	6
0 … 4	0 … 6			10	12
0 … 10	0 … 2.5 strengthened	0 … 4 strengthened	0 … 6 strengthened	15	20
0 … 12 strengthened	0 … 16			35	50
0 … 40	0 … 60			100	120
0 … 100				150	200
0 … 160				350	500
0 … 250	0 … 400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

Dimensional drawings (mm)

Housing



M12-A, 4-pin



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

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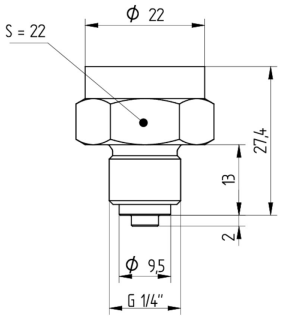
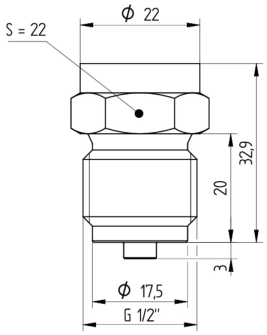
Dimensional drawings (mm)

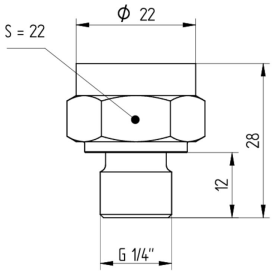
Process connection



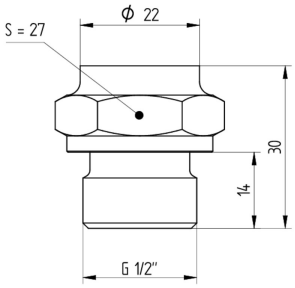
G 1/4 B EN 837-1 (G30)



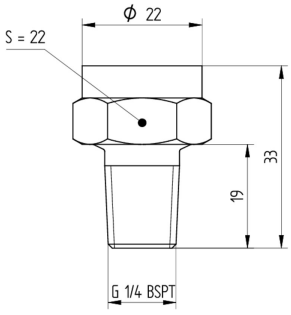
G 1/2 B EN 837-1 (G31)



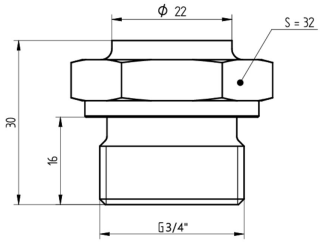
G 1/4 A DIN 3852-E (G50)



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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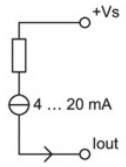
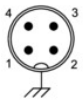
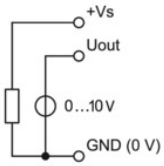
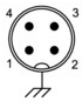
Electrical connection

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
			Frame Ground	Grounding lug
			n.c.	3
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

	PP20R	-	1	.	#	###	R	.	##	##	.	##	#	#	0	0	.	0	5	0
Product																				
	PP20R																			
Housing material																				
SS 1.4301 AISI 304			1																	
Accuracy																				
±1.0 % FS					1															
±0.5 % FS					3															
±0.3 % FS					B															
Measuring range																				
0 ... 0.25 bar (EN)						B10														
0 ... 2.5 bar (EN)						B18														
0 ... 2.5 bar (EN), strenghtened						BA8														
0 ... 4 bar (EN)						B19														
0 ... 4 bar (EN), strengthened						BA9														
0...12 bar (EN), strenghtened						BAK														
0 ... 6 bar (EN)						B20														
0 ... 6 bar (EN), strengthened						BA0														
0 ... 10 bar (EN)						B22														
0 ... 16 bar (EN)						B24														
0 ... 40 bar (EN)						B27														
0 ... 60 bar (EN)						B29														
0 ... 100 bar (EN)						B31														
0 ... 160 bar (EN)						B33														
0 ... 250 bar (EN)						B35														
0 ... 400 bar (EN)						B38														
-1...1 bar (EN)						B73														
Kind of pressure																				
Relative (gauged)							R													

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Ordering information

Ordering key - Configuration possibilities see website

	PP20R	-	1	.	#	###	R	.	##	##	.	##	#	#	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								
G3/4 DIN3852-E front flush (G57)												47								
Process connection material																				
Stainless steel 1.4404 AISI 316L													2							
Stainless steel 1.4301 AISI 304													4							
Seal																				
NBR standard														1						
EPDM														2						
FKM														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 with crimped terminals