

RAILWAY PRESSURE TRANSMITTER

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature.



Applications

- Railways

Features

- Measuring ranges from 100 mbar
- Relative or absolute pressure measurement
- Frontal membrane optional
- Dielectrical strength: 600 VAC / 710 VDC, meets EN 50155 (Railways)

08/2024

Data sheet H72337n

Technical Data			
Measuring principle	Thick-film-on-ceramic	Accuracy @ 25°C typ.	± 0.3 % FS typ. (± 0.5 % FS typ., ± 1 % FS typ.)
Measuring range	0 ... 0.1 to 0 ... 60 bar 0 ... 1.5 to 0 ... 1000 psi	Media temperature	-25°C ... +125°C
Output signal	4 ... 20 mA	Ambient temperature	-25°C ... +125°C
NLH @ 25°C (BSL) typ.	± 0.2 FS typ. (± 0.3 FS typ.)	Approval / conformity	EN 50155 (Railway) EN 45545-2 (Fire protection)

Subject to change

Ordering information/type code

				8478 .	XX	XX	XX	XX	XX
Measuring range ¹⁾	Pressure measurement range [bar]	Over pressure [bar]	Burst pressure [bar]						
	0 ... 0.1	1.2	2	66	0 ... 1.5	15	30	F6	
	0 ... 0.16	1.2	2	67	0 ... 2	15	30	F7	
	0 ... 0.2	1.2	2	68	0 ... 2.5	15	30	F8	
	0 ... 0.4	1.2	2	69	0 ... 5	15	30	F9	
	0 ... 0.6	1.2	2	70	0 ... 10	20	30	G0	
	0 ... 1.0	2	3	71	0 ... 15	30	45	G1	
	0 ... 1.6	3.2	4.8	73	0 ... 20	40	70	G3	
	0 ... 2.5	5	7.5	75	0 ... 30	60	90	G5	
	0 ... 4	8	12	76	0 ... 50	100	150	G6	
	0 ... 6	12	15	77	0 ... 100	200	250	G7	
	0 ... 10	20	25	78	0 ... 150	300	375	G8	
	0 ... 16	32	40	79	0 ... 200	400	600	GA	
	0 ... 25	50	75	80	0 ... 250	500	625	G9	
	0 ... 40	80	100	81	0 ... 400	800	1200	H0	
	0 ... 60	120	180	82	0 ... 500	1000	1250	H1	
					0 ... 1000	2000	3000	H2	
		Option 5P:	Fivefold overpressure						
		0 ... 2.5	12.5	18	55				
		0 ... 4	20	30	56				
		0 ... 6	30	48	57				
		0 ... 10	50	75	58				
		0 ... 16	80	120	59				
		0 ... 25 ⁹⁾	125	180	60				
	0 ... 40 ⁹⁾	200	300	61					
	0 ... 60 ⁹⁾	300	480	62					
Sensor	with temperature compensation				without temperature compensation				
	Relative pressure, Material pressure connection and housing: 1.4305 (AISI303) ^{3) 5)}			54	Relative pressure, Material pressure connection and housing: 1.4305 (AISI303) ^{4) 5)}			57	
	Relative pressure, Material pressure connection and housing: 1.4404/1.4435 (AISI316L) ³⁾			56	Relative pressure, Material pressure connection and housing: 1.4404/1.4435 (AISI316L) ⁴⁾			59	
	Absolute pressure, Material pressure connection and housing: 1.4305 (AISI303) ^{3) 5)}			84	Absolute pressure, Material pressure connection and housing: 1.4305 (AISI303) ^{4) 5)}			87	
	Absolute pressure, Material pressure connection and housing: 1.4404/1.4435 (AISI316L) ³⁾			86	Absolute pressure, Material pressure connection and housing: 1.4404/1.4435 (AISI316L) ⁴⁾			89	
Pressure connection	G1/4" male							17	
	G1/2" male DIN3852-E, with inner cone ^{2) 9) 10)}							59	
	G3/4" frontal membrane ^{2) 6)}							52	
Electrical connection	Male electrical connector EN 175301-803-A (DIN 43650-A), Mat. PA							05	
	Male electrical connector M12x1, 5-pole, Mat. PBT							35	
	Male electrical connector Packard Metri Pack, Mat. PBT ¹¹⁾							51	
Output signal	Signal output	Load resistance	I (supply)	U (supply)					
	4 ... 20 mA	(U _{supply} -9 V) / 20 mA		9 ... 30 VDC				19	

Accessories	Seal FKM (-20°C ... +125°C)	61
	Seal CR (-25°C ... +100°C)	62
	Seal EPDM (-25°C ... +125°C)	63
	Pressure peak damping element ø 1.0 mm, material 1.4305 ⁸⁾	40
	Pressure peak damping element ø 0.4 mm, material 1.4305 (sensors 54, 57, 84, 87) resp. 1.4404 (sensors 56, 59, 86, 89) ⁸⁾	44
	Female electrical plug EN 175301-803-A (DIN43650-A)/NBR, -40°C ... +90°C, for cable diameter 4 ... 9 mm, flammability standard UL94-V0	46
	Female electrical plug EN 175301-803-A (DIN 43650-A)/silicone, -40°C ... +125°C, for cable diameter 4 ... 9 mm, flammability standard UL94-V0	56
	Female electrical plug EN 175301-803-A (DIN43650-A)/NBR, -40°C ... +90°C, for cable diameter 4 ... 9.5 mm, flammability standard UL94-V2	58
	Female electrical plug M12x1, 5-pole	33
	Special electrical connection: Pin 1 +, Pin 2 - (for male electrical connector EN175301-803-A/ DIN43650-A)	92
	Special electrical connection: Pin 1 +, Pin 3 -, Pin 5 Ground (for male electrical connector 35, M12x1, 5-pole)	94
	Special electrical connection: Pin 1 +, Pin 3 -, Pin 4 Ground (only for output signals 19 and male electrical connector 35, M12x1, 5-pole)	G9
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 5 Ground (only for output signals 19 and male electrical connector 35, M12x1, 5-pole)	H1
	Special electrical connection: Pin 1 +, Pin 3 - (only for male electrical connector Packard Metri Pack 3-poles)	E4
	Housing nut for electrical connection EN175301-803-A (DIN43650-A) secured with Loctite (max. 85°C)	L9
	Multiple packaging ⁷⁾	VM

¹⁾ Extended overpressure as well as customized pressure ranges upon request

²⁾ Upon request

³⁾ Max. 40 bar or 500 psi

⁴⁾ ≥ 1 bar

⁵⁾ Only with pressure connection 17 (1.4305)

⁶⁾ Only with sensors 56, 86 (with temperature compensation) and for pressure ranges ≤ 25 bar or 400 psi

⁷⁾ The order quantity must be a multiple of 50, only for electrical connections 05 and 35

⁸⁾ Not for pressure connection 52

⁹⁾ Only for sensors without temperature compensation

¹⁰⁾ max. 16 bar / overpressure 32 bar

¹¹⁾ Do not use for new designs as this option will be phased out soon. Only limited quantities available.



Vacuum measuring ranges: Measuring ranges below 0 bar (e.g. -1 bar ... 0 bar) are available as special pressure ranges.



For absolute pressure sensors, the measuring range must include the point 1000 mbar (absolute).



Reversed calibration: A reversed calibration is also possible for measuring ranges below 0 bar, with the signals 4 ... 20 mA (code 19), 1 ... 6 VDC (code 16) and 0 ... 10 VDC (code 17). The signal zero point is at 0 bar, the signal end point at -1 bar. Additional configurations on request.

Customised measuring ranges for sensors without temperature compensation					
Min. pressure ¹⁾	Max. pressure ²⁾	Min. span	Max. span	Overpressure	Code
-1	1	≥ 0.5	≤ 1.2	2	21
-1	2	≥ 0.8	< 2	3.2	22
-1	4	≥ 2	≤ 4.5	8	24
-1	6	> 4.5	≤ 7	12	25
-1	10	> 7	≤ 11	20	26
-1	16	> 11	≤ 17	32	27
-1	25	> 17	≤ 26	50	28
-1	40	> 26	≤ 41	80	29
-1	60	> 41	≤ 61	120	30
-1	100	> 61	≤ 101	200	31
-1	160	> 101	≤ 161	320	35
-1	250	> 161	≤ 251	500	32
-1	400	> 251	≤ 401	800	34

All pressures in bar

- 1) Minimum pressure= lowest zero point, start of measuring range (relative)
- 2) Maximum pressure= highest pressure, end of measuring range (relative)

Customised measuring ranges for sensors with temperature compensation						
Min. pressure ¹⁾	Max. pressure ²⁾	Min. span	Max. span	Overpressure	Accuracy	Code
-0.4	0.6	≥ 0.1	< 0.2	1.2	1.0 %	21
-0.4	0.6	≥ 0.2	< 0.5	1.2	0.5 %	21
-1	1	≥ 0.5	≤ 1.2	2	0.3 %	21
-1	2	≥ 1.2	< 2	3.2	0.3 %	22
-1	4	≥ 2	≤ 4.5	8	0.3 %	24
-1	6	> 4.5	≤ 7	12	0.3 %	25
-1	10	> 7	≤ 11	20	0.3 %	26
-1	16	> 11	≤ 17	32	0.3 %	27
-1	25	> 17	≤ 26	50	0.3 %	28
-1	40	> 26	≤ 41	80	0.3 %	29

All pressures in bar

- 1) Minimum pressure= lowest zero point, start of measuring range (relative)
- 2) Maximum pressure= highest pressure, end of measuring range (relative)

Specifications		
Electrical Data	Output / supply voltage	4 ... 20 mA: 24 (9 ... 30) VDC
	Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure
	Power-on delay time	100 ms
	Inverse-polarity protection, short-circuit strength @ 25°C during 5 min.	4...20 mA: to $U_s = 30$ VDC
Environmental conditions	Media temperature	-25°C ... +125°C
	Ambient temperature	-25°C ... +125°C
	Protection ¹⁾	IP65, IP67
	Humidity	Max. 95 % relative
	Vibration	15 g RMS (20...2000 Hz) (EN60068-2-64) 25 g sin (80...2000 Hz), 1 oct./min, (1x @ 25°C) (EN60068-2-6)
	Shock	50 g / 11 ms 100 g / 6 ms Male electrical plug M12x1 (EN60068-2-27) ³⁾
EMC Protection	Emission	EN/IEC 61000-6-3 EN50121-3-2
	Immunity	EN/IEC 61000-6-2 EN50121-3-2 ²⁾
Mechanical Data	Sensor (wetted parts)	Ceramic, Al ₂ O ₃ (96 %)
	Pressure connection (wetted parts)	1.4404 (AISI316L)
	Housing	1.4404/1.4435 (AISI316L)
	Sealing	FKM 70 Sh, CR, EPDM
	Male electrical connector	See ordering information
	Weight	~ 110 g
	Mounting torque	15 ... 20 Nm

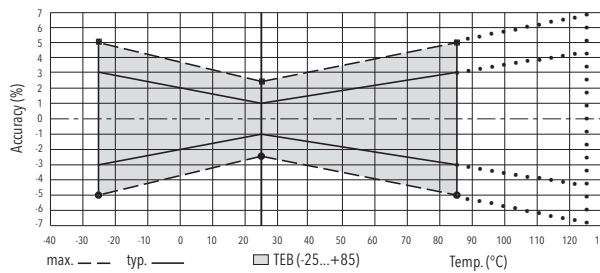
¹⁾ See electrical connection

²⁾ Surge voltage on shield, shield connected on both sides

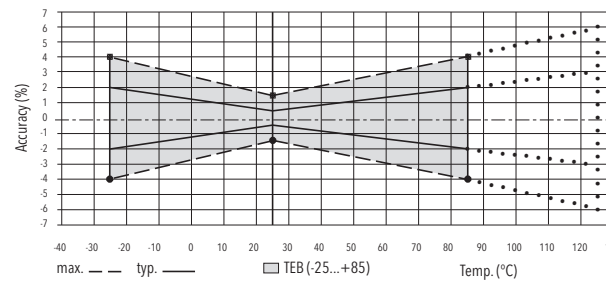
³⁾ For electrical connection 35

Accuracy					
		Sensors 57/87/59/89		Sensors 54/84/56/86	
Pressure measuring range	[bar]	≥ 0 ... 1	≥ 0 ... 0.3	≥ 0 ... 0.2 < 0 ... 0.3	≥ 0 ... 0.1 < 0 ... 0.2
	[psi]	≥ 0 ... 15	≥ 0 ... 5	Option 5P (Codes 55-59) ≥ 0 ... 2.5 < 0 ... 5	≥ 0 ... 1.5 < 0 ... 2.5
TEB @ -25 ... +85°C	[% FS typ.]	± 3.0	± 1.0	± 2.0	± 3.0
Accuracy @ +25°C	[% FS typ.]	± 0.5	± 0.3	± 0.5	± 1.0
NLH @ +25°C (BSL)	[% FS typ.]	± 0.2	± 0.2	± 0.3	± 0.3
TC zero point and span	[% FS/K typ.]	± 0.03	± 0.02	± 0.02	± 0.02
Long term stability 1 year @ +25°C	[% FS typ.]	± 0.3	± 0.2	± 0.2	± 0.2

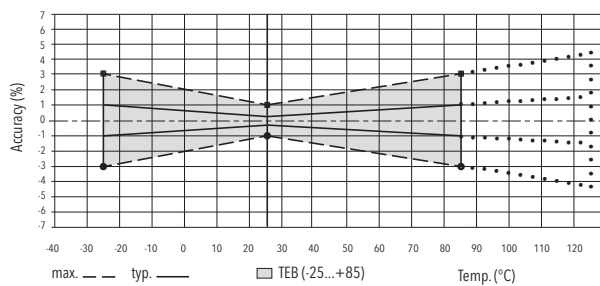
Sensors 54/84/56/86 0 ... 0.1 to 0 ... 0.16 bar



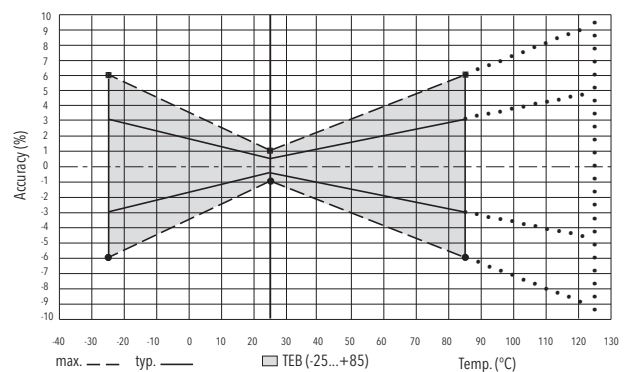
Sensors 54/84/56/86 0 ... 0.2 to 0 ... 0.4 bar



Sensors 54/84/56/86 > 0 ... 0.40 bar



Sensors 57/87/59/89 ≥ 0 ... 1 bar



Additional specifications railways

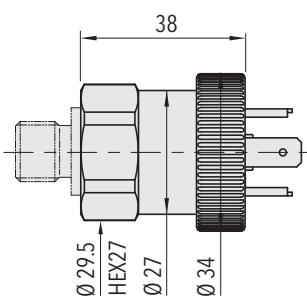
Environmental conditions	Cold	EN 60068-2-1	Ab: -25°C, 2 h (not in operation) Ae: -25°C, 1 h (in operation)
	Dry heat	EN 60068-2-2	Be: 85°C, 6 h (in operation)
	Damp heat, cyclic	EN 60068-2-30	Db: 55°C, variant 1, 2 cycles (2 x 24 h)
	Class of altitude	EN 50125-1	AX (max. 3500 m ASL)
	Class of air temperature	EN 50125-1	refer to the specified ambient temperature in table "Specification"
	Vibration and shock	EN 61373	Vibration: category 3 Shock: category 3 ^{1) 3)}
	Dielectric strength	EN 50155	600 VAC / 710 VDC
Resistance of insulation		EN 50155	>100 MΩ, 500 VDC
	Behavior in case of fire (electrical connections 01, 32, 35)	EN 45545-2	Weight: < 10 g Surface: < 0.2 m ²
Supply	Nominal voltage	EN 50155 ²⁾	24 V
	Interruptions of the voltage supply	EN 50155 ²⁾	Class S1
	Switching between two supply voltages	EN 50155 ²⁾	Class C1

¹⁾ In Category 3 the 2010 versions' higher severity levels apply in each case

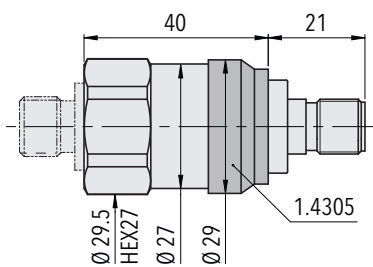
²⁾ Chapter 5.1 Voltage supply

³⁾ Male electrical plug EN 175301-803-A, cat. 2

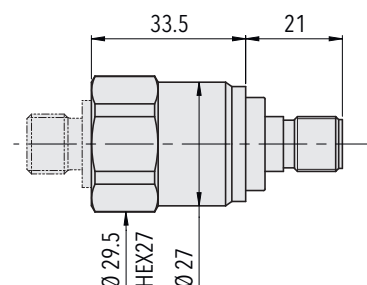
Dimensions



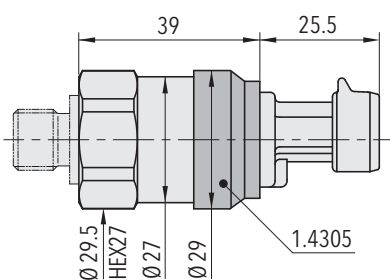
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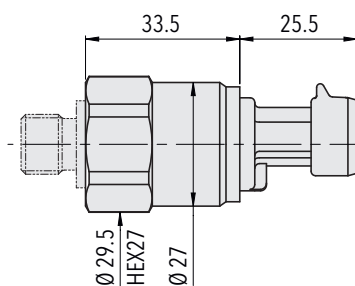
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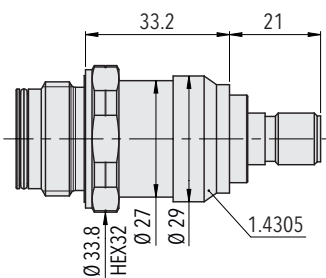
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 8478.XX.X617.35.XX.XX, ≥ 1.0 bar
 8478.XX.X717.35.XX.XX, ≥ 1.0 bar
 8478.XX.X917.35.XX.XX, ≥ 1.0 bar



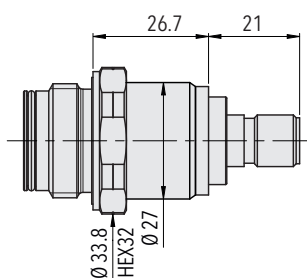
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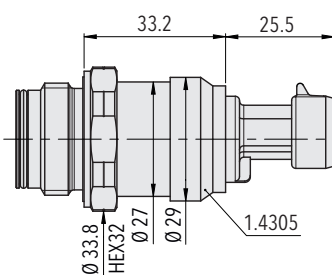
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 8478.XX.X617.51.XX.XX, ≥ 1.0 bar
 8478.XX.X717.51.XX.XX, ≥ 1.0 bar
 8478.XX.X917.51.XX.XX, ≥ 1.0 bar



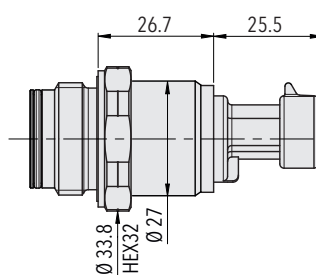
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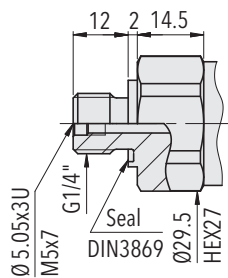


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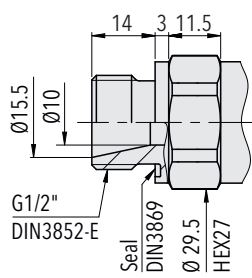


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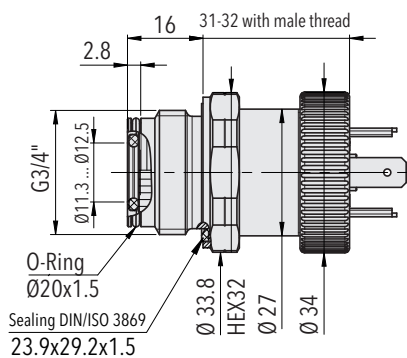
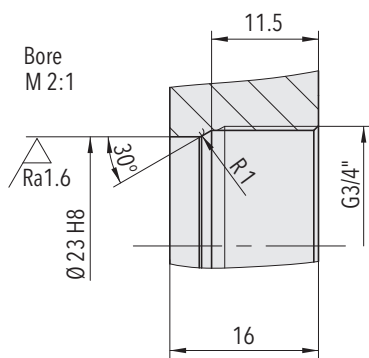
Dimensions



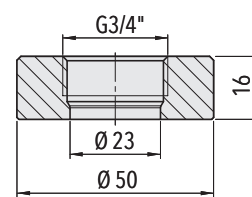
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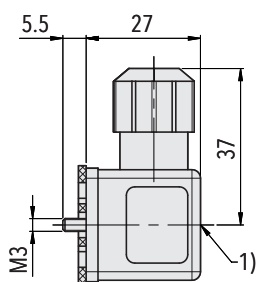
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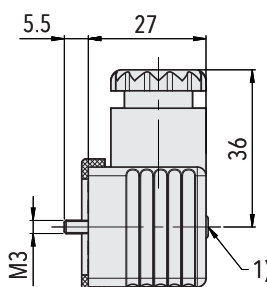


Welding flange (AISI 316L) for G3/4" frontal membrane
Ordering No. C27805



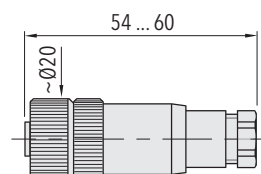
1) Tightening torque 50...60 Ncm

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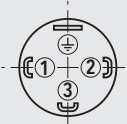
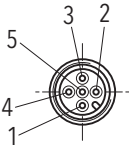
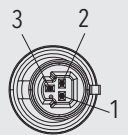
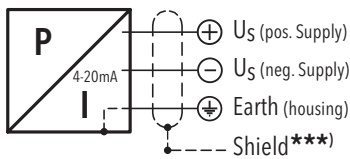
1) Tightening torque 50...60 Ncm

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8478.XX.XXXX.XX.XX.33

Electrical connection

		Protection / electrical connection							
		IP65*)		IP67*)			IP67*)		
		Industrial standard EN175301-803A		M12x1 5-pole			Packard Metri Pack **)		
		05		35			51		
									
Output signal		Standard	92	Standard	94	G9	H1	Standard	E4
		2	1	4	1	1	1	1	1
	U _S (pos. Supply)			1	3	3	2	2	3
	U _S (neg. Supply)	1	2	5	5	4			
	Earth (housing)	⊕	⊕						
	Shield ***)								
8478.XX.XXXX.XX.19									

*1) Provided female electrical plug is mounted according to instructions

**1) Ventilation via male electric plug/cable end

***1) Only cable versions or female electrical plug with shield connection

Additional information

Documents

Data sheet	www.trafag.com/H72337
Instructions	www.trafag.com/H73324
Flyer	www.trafag.com/H70603