

Hydrogen Pressure Transmitter



Product description

The NHT 8250 Hydrogen pressure transmitter features a thin-film-on-steel sensor based on a special hydrogen-compatible high-performance alloy for best-in-class signal stability. The robust mechanical design with fully welded housing is built to last in harsh environments.

Applications

- H₂-fuelling stations
- Hydrogen compressors
- Fuel cells
- Vehicles with H₂ drive
- Hydrogen tanks

Features

- EC79/2009 certified by the KBA Kraftfahrt-Bundesamt
- Wetted materials made of hydrogen-compatible steel
- Completely welded steel sensor system without additional seals
- Excellent long-term stability

 EMC: 2014/30/EU

 S.I. 2016 No. 1091

 RoHS/Reach compliant

 UL-listed version

 EC79/2009 certified

Technical Data

Measuring principle	Thin-film-on-steel
Measuring range	0 ... 1 to 0 ... 1050 bar 0 ... 15 to 0 ... 15000 psi
Output signal	4 ... 20 mA, 0.5 ... 4.5 VDC, 0 ... 5 VDC, 1 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, 0.1 ... 10.1 VDC, 0.5 ... 4.5 VDC ratiometric
Media temperature	-40°C ... +85°C
Ambient temperature	max. -40°C ... +125°C (UL-rated ambient temperature: -20°C ... +80°C) Details see section: Electrical Connection

Additional information

Data sheet	www.trafag.com/H72338
Flyer	www.trafag.com/H70606
Instructions	www.trafag.com/H73303
Safety instruction	www.trafag.com/H73174
Accessories	www.trafag.com/H72258

Ordering information/Type code

				8250	XX	XX	XX	XX	XX	XX
Measuring range ¹⁾	Pressure measurement range [bar]	Over pressure [bar]	Burst pressure [bar]	Pressure-measurement-range [psi]	Over pressure [psi]	Burst pressure [psi]				
	0 ... 1	2	25	71	0 ... 15	30	350	G1		
	0 ... 1.6	3.2	32	73	0 ... 30	60	700	G5		
	0 ... 2.5	5	50	75	0 ... 50	100	850	G6		
	0 ... 4	8	60	76	0 ... 100	200	1450	G7		
	0 ... 6	12	100	77	0 ... 150	300	2500	G8		
	0 ... 10	20	200	78	0 ... 200	400	2500	GA		
	0 ... 16	32	200	79	0 ... 250	500	2500	G9		
	0 ... 25	38	300	80	0 ... 300	600	4000	HA		
	0 ... 40	60	300	81	0 ... 400	600	4000	H0		
	0 ... 60	90	400	82	0 ... 500	750	4000	H1		
	0 ... 100	150	500	83	0 ... 1000	1500	5000	H2		
	0 ... 160 ²⁾	240	750	85	0 ... 1500 ²⁾	2250	7000	H3		
	0 ... 250 ²⁾	375	1000	74	0 ... 2000 ²⁾	3000	10000	H5		
	0 ... 400 ²⁾	600	1500	84	0 ... 3000 ²⁾	4500	14500	G4		
	0 ... 600 ²⁾	900	2000	86	0 ... 7500 ²⁾	11250	29000	H6		
	0 ... 700 ^{2) 3)}	1050	2200	87	0 ... 10000 ^{2) 3)}	19000	38000	H8		
	0 ... 1000 ^{2) 3)}	1300	2600	88						
	0 ... 1050 ^{2) 3)}	1300	2600	92						
Sensor	Relative pressure, accuracy: 0.3 %							33		
	Relative pressure, accuracy: 0.5 %							35		
Pressure connection	G1/4" male, Seal: DIN 3869								17	
	1/4" NPT male								30	
	1/8" NPT male								43	
	7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty) ⁴⁾								69	
	9/16"-18UNF-2A male, SAE J1926-2 (Heavy Duty) ⁴⁾								67	
	M12x1.5 male, DIN EN ISO 9974-2 ⁵⁾								49	
Electrical connection	Male electrical plug, industrial standard, contact distance 9.4 mm, Mat. PA								01	
	Male electrical plug M12x1, 4-pole, Mat. PA, IEC 61076-2-101								32	
	Male electrical plug M12x1, 5-pole, Mat. PA, IEC 61076-2-101								35	
	Male electrical connector MIL-C 26482, 6-pole, metal								02	
	Male electrical connector Deutsch DT04-3P, 3-pole								D3	
	Male electrical connector Deutsch DT04-4P, 4-pole								D4	
	3 Way male Delphi MetriPack 1.5 sealed connector, Material PA66 ⁶⁾								51	
	Cable IP67, Mat. PVC ⁷⁾								22	
	Cable IP67, Mat. PUR ⁷⁾								24	
	Cable IP67, Mat. EPD Raychem FDR25 ⁷⁾								08	
	Compact design: Cable Mat. PVC, IP40, 2 x 2 x 0.14 mm ² , shielded, max. traction on cable: 2 N ^{2) 8)}								A1	
	JST (or compatible) Board to Cable/Wire Disconnectable Crimp style connector, BM04B-SRSS-TB, IP20, 4-pole ²⁾								J4	

	8250	XX	XX	XX	XX	XX	XX
Output signal	Output signal	Load resistance	I (supply)	U (supply)			
		See graphic	(= signal output)	24 (9 ... 32) VDC	19		
	0.5 ... 4.5 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	20		
	0 ... 5 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	14		
	0.1 ... 4.1 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	28		
	0.1 ... 5.1 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	29		
	0.5 ... 5 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	22		
	1 ... 5 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	25		
	0.5 ... 5.5 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	24		
	1 ... 6 VDC ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 20 mA	24 (9 ... 32) VDC	16		
	0 ... 10 VDC	≥ 5.0 kΩ to U _s -	≤ 15 mA	24 (15 ... 32) VDC	17		
	1 ... 10 VDC	≥ 5.0 kΩ to U _s -	≤ 15 mA	24 (15 ... 32) VDC	26		
	0.1 ... 10.1 VDC	≥ 5.0 kΩ to U _s -	≤ 15 mA	24 (15 ... 32) VDC	13		
	0.5 ... 4.5 VDC ratiom. ⁹⁾	≥ 5.0 kΩ to U _s -	≤ 10 mA	5 (4.75 ... 5.25) VDC	23		
Accessories	Female electrical plug M12x1, 5-pole						33
	Female electrical plug industrial standard (for electrical connection 01)						34
	Female electrical plug M12x1, 5-pole, metallic housing						35
	Seal FPM, -18°C ... +125°C						61
	Seal EPDM, -40°C ... +125°C						63
	Seal NBR, -25°C ... +100°C						83
	Cable length 0.5 m						EM
	Cable length 1.0 m						1M
	Cable length 2.0 m						2M
	Multiple packaging ¹⁰⁾						VM
	Type label e1 (EC79) ^{11) 12)}						HC
	UL-listed, see table: Possible combinations for UL-listed variants ¹²⁾						UL
	Ex Zone conformity according EN 60079-0, EN 60079-7, see table: EX Zone 2-Possible combinations and requirements ^{12) 13)}						EX
	Enhanced condensation protection						CP
	Pin configuration, see table: Electrical connection						

⁰¹⁾ Customized pressure ranges upon request

⁰²⁾ Upon request, whereas minimum order quantities may apply

⁰³⁾ See separate table with maximum allowed load cycles

⁰⁴⁾ Measuring range max. 630 bar according to SAE J1926-2 (Heavy Duty)

⁰⁵⁾ Only for measurement ranges ≤ 16 bar (Codes 71, 73, 75, 76, 77, 78, 79)

⁰⁶⁾ Not part of the EC79 type certificate (code HC). Combination with code HC will be checked with KBA on request.

⁰⁷⁾ Cable length see Accessories

⁰⁸⁾ Cable length 2m only, with accessory 2M

⁰⁹⁾ Only measuring ranges > 16 bar

¹⁰⁾ The order quantity must be a multiple of 50

¹¹⁾ Pressure connection 17 only measuring ranges ≤ 350 bar

¹²⁾ Accessory options UL, EX and HC are mutually exclusive

¹³⁾ Customer-specific label not allowed

Specifications

Electrical data	Output / supply voltage	4 ... 20 mA: 24 (9 ... 32) VDC 0.5 ... 4.5 VDC: 24 (9 ... 32) VDC 0 ... 5 VDC: 24 (9 ... 32) VDC 1 ... 5 VDC: 24 (9 ... 32) VDC 1 ... 6 VDC: 24 (9 ... 32) VDC 0 ... 10 VDC: 24 (15 ... 32) VDC 0.1 ... 10.1 VDC: 24 (15 ... 32) VDC 0.5 ... 4.5 VDC ratiometric: 10 ... 90 % U_s : 5 ± 0.25 VDC
	Rise time of supply voltage	typ. 1 ms, 10 ... 90 % nominal pressure
	Power-on delay time pressure transmitters	100 ms
	Inverse-polarity protection, short-circuit strength @ 25°C during 5 min.	4 ... 20 mA: to $U_s = 32$ VDC 0.5 ... 4.5 VDC, 0 ... 5 VDC, 1 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, 0.1 ... 10.1 VDC: to $U_s = 28$ VDC 0.5 ... 4.5 VDC ratiometric: to $U_s = 14$ VDC
	Resistance of insulation	> 10 MΩ, 50 VDC
	Dielectric strength	50 VAC, 50 Hz
	Current limiting output signal	4 ... 20 mA: 24 mA (Overload)
Environmental conditions	Media temperature	-40°C ... +85°C
	Ambient temperature	max. -40°C ... +125°C (UL-rated ambient temperature: -20°C ... +80°C) Details see section: Electrical Connection
	Storage temperature	-20°C ... +40°C
	Protection	IP20, IP40, IP65, IP67, IP68 Details see section Electrical Connection
	Humidity	max. 95 % relative
	Vibration	15 g RMS (20...2000 Hz) (EN 60068-2-64) 25 g sin (80...2000 Hz), 1 oct./min, (1x @ 25°C) (EN 60068-2-6)
	Shock	50 g/11 ms 100 g/6 ms Male electrical plug M12x1 (EN 60068-2-27) ¹⁾
EMC protection ²	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
Mechanical data	Sensor (wetted parts)	Nitrogen-strengthened austenitic steel, hydrogen compatible
	Pressure connection (wetted parts)	1.4404 (AISI 316L)
	Housing	1.4301 (AISI 304)
	Sealing	FPM, EPDM, NBR
	Male electrical connector	See ordering information
	Weight	~ 50 g
	Mounting torque	25 Nm

¹⁾ For electrical connections 32 and 35

²⁾ Electrical connection J4 not EMC tested

Compatibility matrix pressure connection and accessories

Code	Pressure connection	Seal		
		FKM (Code 61)	EPDM (Code 63)	NBR (Code 83)
17	G1/4" male, Seal: DIN 3869	✓	✓	✓
30	1/4" NPT male			
43	1/8" NPT male			
69	7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty)	✓	✓	
67	9/16"-18UNF-2A male, SAE J1926-2 (Heavy Duty)	✓	✓	
49	M12x1.5 male, DIN EN ISO 9974-2	✓		

Ordering information: Possible type code combinations for UL-listed versions

	Combination with UL
Measuring range	All ranges on datasheet
Sensor	All codes on datasheet
Pressure connection	All codes on datasheet
Electrical connection	All codes on datasheet
Output signal	All codes except PS and T1
Accessories	All codes except GA, GS, GU, HC and EX

Ex Zone 2 - Possible combinations and requirements

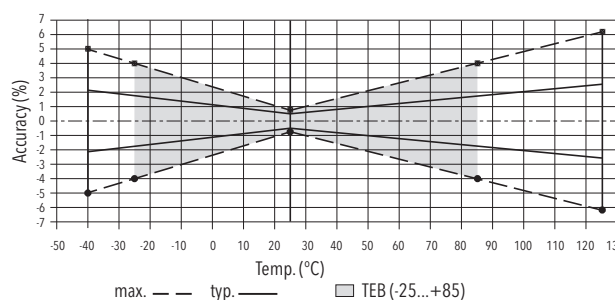
Conformity	EN60079-0, EN60079-7
Classification	II 3 G Ex ec IIC T5 Gc -25°C ≤ Ta ≤ 85°C
Electrical connections	Codes 32 and 35 (M12x1 4-pole and 5-pole)
Electrical outputs	Codes 19, 17 ¹⁾ , 26 ¹⁾ and 13 ¹⁾
Mandatory mating connector	Mating connector with metallic housing (accessory 35 fulfils the criteria)
Included accessory	Enhanced condensation protection (CP)

¹⁾ In combination with EX: on request

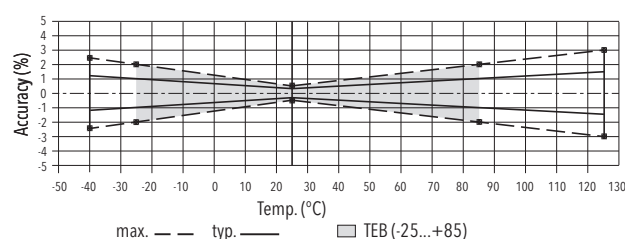
Analogue output

			Sensor 35 Accuracy 0.5 %	Sensor 33 Accuracy 0.3 %
Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 1.75	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.5	± 0.3
	NLH @ +25°C (BSL)	[% FS typ.]	± 0.2	± 0.2
	TC zero point and span	[% FS/K typ.]	± 0.03	± 0.01
	Long term stability 1 year @ +25°C	[% FS typ.]	± 0.75	± 0.75
Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure			

Measuring accuracy 0.5%



Measuring accuracy 0.3%



EC79/2009 Certificate

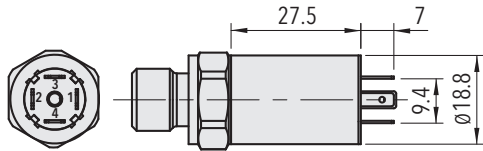
Nominal working pressure (NWP) @15°C	0.08 ... 70 MPa
Maximum allowable working pressure	0.1 ... 100 MPa
Classification	Class 0, Class 1 und Class 2 ¹⁾
Pressure codes	71 ... 88
Process connection	Code 17: Up to NWP 35 Mpa Codes 30, 42, 43, 68: Up to NWP 70 Mpa
Seal	Codes 61 and 63

¹⁾ The transmitters of class 0 were tested. Because the most highly loaded case was tested the results can be applied to the whole product family with pressure ranges from 0.8bar to 700bar

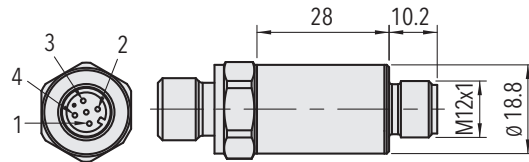
Maximum load cycles

Maximum allowed load cycles for measuring ranges ≥ 700 bar	
Amplitude for duty, ≤ 5 Hz	Maximum load cycles
0 ... 1000 bar	1 000 000
0 ... 1100 bar	100 000
0 ... 1300 bar	10 000

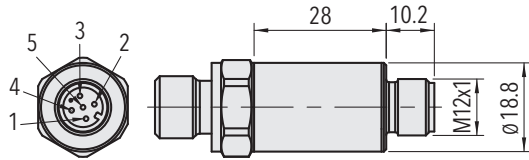
Dimensions



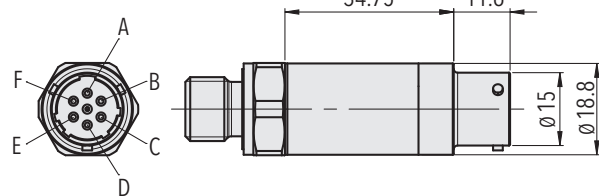
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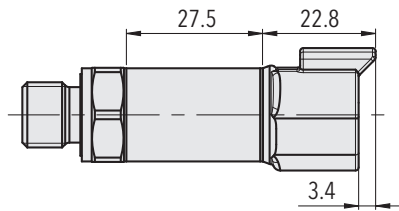
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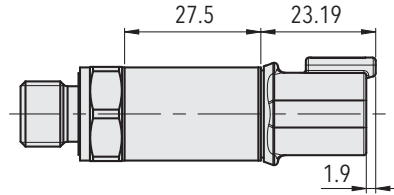
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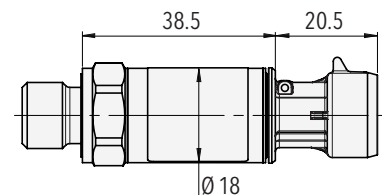
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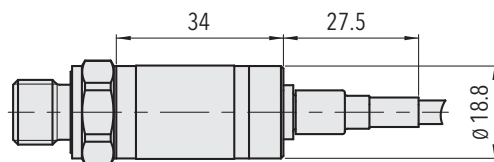
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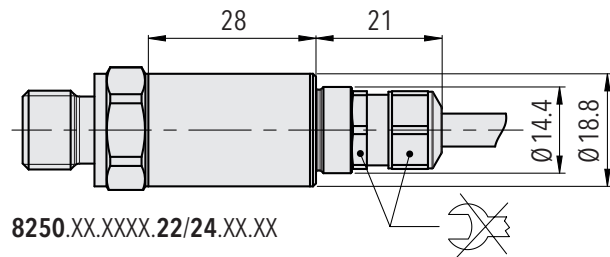
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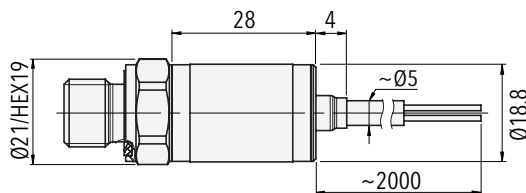
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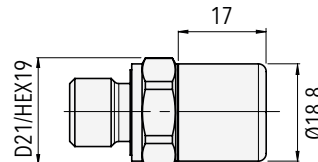
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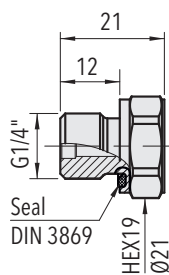
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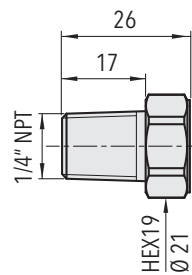
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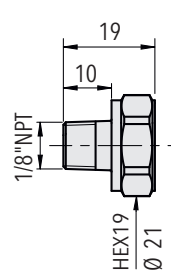
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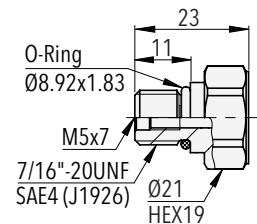
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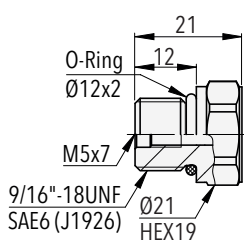
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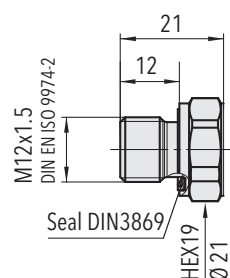
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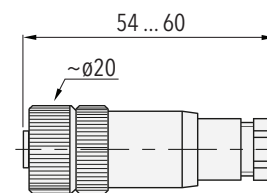
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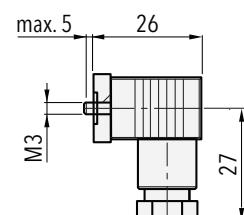
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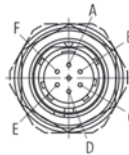
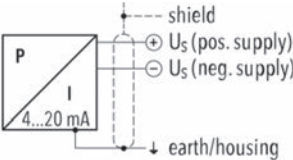
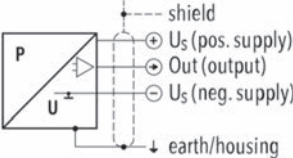


8250.XX.XXXX.XX.XX.33/35



8250.XX.XXXX.XX.XX.34

Electrical connection

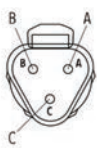
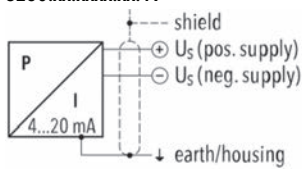
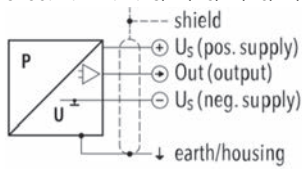
	Industrial standard, contact distance 9.4 mm				M12x1, 4-pole				M12x1, 5-pole				MIL-C 26482			
																
Electrical connection type code	01				32				35				02			
IP protection	IP65 ^{1) 2)}				IP67 ^{1) 2)}				IP67 ^{1) 2)}				IP67 ^{1) 2)}			
Ambient temperature	-40°C ... +80°C				-40°C ... +125°C				-40°C ... +125°C				-40°C ... +125°C			
UL-rated ambient temperature	-20°C ... +80°C				-20°C ... +80°C				-20°C ... +80°C				-20°C ... +80°C			
Pin assignment type code	90		92		E1	E6	F4	F5	G2	G5	G8					
Output signal 8250.xx.xxxx.xx.19																
	2 1 4	2 4 3	1 2 4	1 3 4 4	1 2 4 2	1 4 2 4	1 3 2/3 4 4	1 3 2/3 4 4	3 2 4 2	4 1 5	A B E					
Pin assignment type code	91		E3	E9	95	96	E2	F6	F7	G1			F3			
Output signal 8250.xx.xxxx.xx.13/14/16/17/20/22/23/24/25/26/28/29																
	1 2 3 4	2 1 4 3	3 1 2 4	1 3 2 4	1 2 3 4	1 3 4 2	1 4 3 2	1 3 2 4	1 2 4 3	2 4 3 5	A B C/D E	A C B/D E				

¹⁾ Provided female electrical plug is mounted according to instructions

²⁾ Ventilation via male electric plug/cable end

 Empty 'Pin Assignment Type Code' field: Default pinout

Electrical connection

	DT04-3P, 3-pole		DT04-4P, 4-pole		3 Way M MetriPack 1.5 seal.conn.		Cable	Cable
								
Electrical connection type code	D3		D4		51		22	24
IP protection	IP67, IP68 ^{1) 4)}		IP67, IP68 ^{1) 4)}		IP67 ¹⁾		IP67, IP68 ^{2) 3)}	IP67, IP68 ^{2) 3)}
Ambient temperature	-40°C ... +125°C		-40°C ... +125°C		-40°C ... +125°C		-30°C ... +80°C	-40°C ... +70°C
UL-rated ambient temperature	-20°C ... +80°C		-20°C ... +80°C		-20°C ... +80°C		-20°C ... +80°C	-20°C ... +70°C
Pin assignment type code		F0		G3		E4		
Output signal 8250.xx.xxxx.xx.19								
	A B	A C	2 1 3	2 3	1 2	1 3	White Brown Yellow	White Brown Yellow
Pin assignment type code		F1		G4		99		
Output signal 8250.xx.xxxx.xx.13/14/16/17/20/22/23/24/25/26/28/29								
	A C B	A B C	2 4 1 3	2 1 3	1 3 2	1 2 3	White Green Brown Yellow	White Green Brown Yellow

¹⁾ Provided female electrical plug is mounted according to instructions

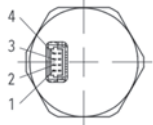
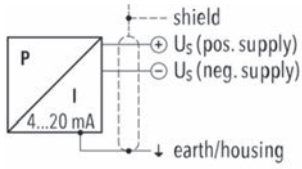
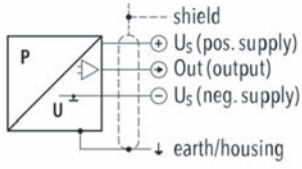
²⁾ Ventilation via male electric plug/cable end

³⁾ IP68, 20 bar, 30 min.

⁴⁾ IP68, 100 mbar, 4h

 Empty 'Pin Assignment Type Code' field: Default pinout

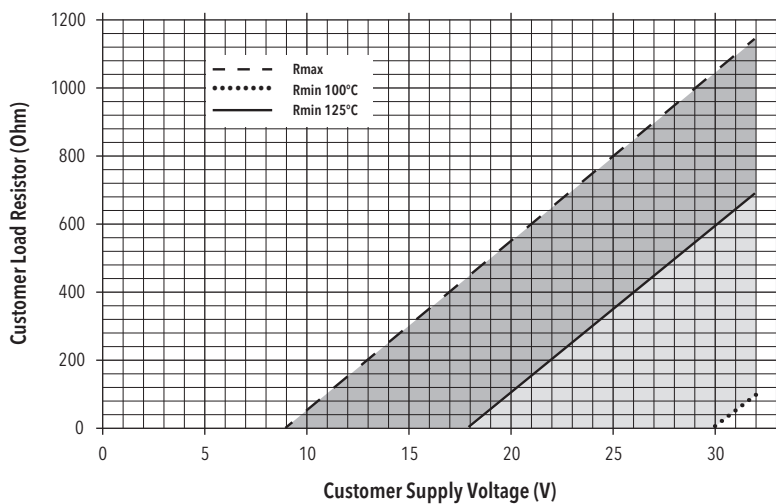
Electrical connection

	Cable	Cable	JST SH Series
			
Electrical connection type code	08	A1	J4
IP protection	IP67 ²⁾	IP40	IP20
Ambient temperature	-40°C ... +125°C	-30°C ... +80°C	-40°C ... +125°C
UL-rated ambient temperature	-20°C ... +80°C	-20°C ... +80°C	-20°C ... +80°C
Pin assignment type code			
Output signal 8250.xx.xxxx.xx.19 	Red Black Green	Brown White Yellow	1 2 4
Pin assignment type code			
Output signal 8250.xx.xxxx.xx.13/14/16/17/20/22/23/24/25/26/28/29 	Red White Black Green	Brown Green White Yellow	1 3 2 4

²⁾ Ventilation via male electric plug/cable end

i Empty 'Pin Assignment Type Code' field: Default pinout

4...20mA: min./max resistor vs. supply voltage @ Pmax = 100%



Reliable quality

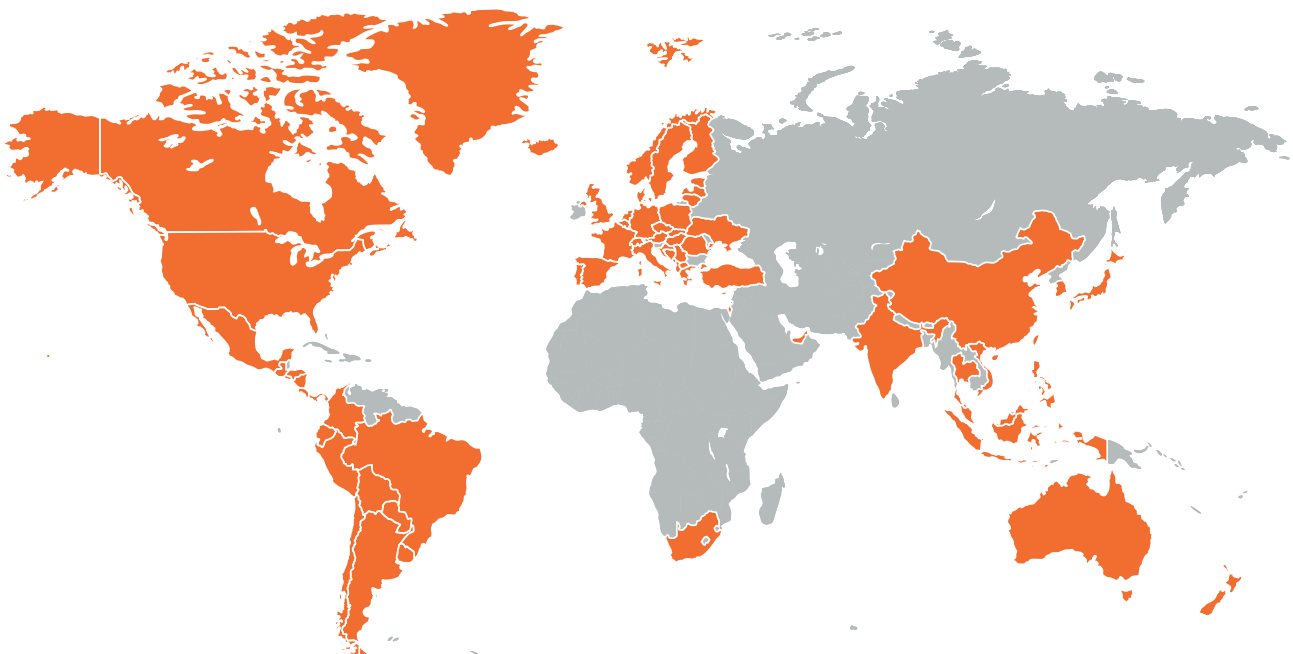
Worldwide represented, globally trusted, Swiss based

Trafag develops, produces and distributes robust, reliable and precise instruments for monitoring pressure, temperature and gas density.

The broad portfolio of pressure and temperature measuring instruments is tailored for use in test benches through to applications in harsh environments. The research and development departments in Switzerland and Germany develop all important components from the sensor to the application-specific microchip, which are

then manufactured in the production facilities in Switzerland, Germany, the Czech Republic, and India. Strict quality management according to ISO 9001 and ISO 14001 ensures that Trafag products meet the required quality and sustainability standards.

Trafag is headquartered in Switzerland, was founded in 1942 and has an extensive sales and service network in more than 40 countries worldwide.



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Pressure transmitters



Electronic pressure switches



Mechanical pressure switches



Pressure gauge



Thermostats



Temperature transmitters



Gas density