

HYDROGEN PRESSURE TRANSMITTER

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. 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 sensor system without additional seals
- Excellent long-term stability

Technical Data

Measuring principle	Thin-film-on-steel	Accuracy @ 25°C typ.	± 0.5 % FS typ. ± 0.3 % FS typ.
Measuring range	0 ... 1 to 0 ... 600 bar 0 ... 15 to 0 ... 7500 psi	Media temperature	-40°C ... +85°C
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	Ambient temperature	-40°C ... +85°C (Cable PVC 22: -5°C ... +60°C) (Cable PUR 24: -40°C ... +70°C)
NLH @ 25°C (BSL) typ.	± 0.2 % FS typ.	Approval / conformity	EC79/2009: e1*79/2009*406/2010*00047*00

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	240	750	85	0 ... 1500	2250	7000	H3				
	0 ... 250	375	1000	74	0 ... 2000	3000	10000	H5				
	0 ... 400	600	1500	84	0 ... 3000	4500	14500	G4				
	0 ... 600	900	2000	86	0 ... 7500	11250	29000	H6				
Sensor	Relative pressure, accuracy: 0.3 %			33	Relative pressure, accuracy: 0.5 %			35				
Pressure connection	G1/4" male, seal: DIN 3869 (accessories 61/63/83)							17				
	1/4" NPT male							30				
	1/8" NPT male							43				
	7/16"-20UNF-2A male, SAE J1926-3 (Light Duty), seal: accessory 61/63 ⁸⁾							42				
	7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty), seal: accessory 61/63 ⁹⁾							69				
	9/16"-18UNF-2A male, SAE J1926-2 (Heavy Duty), seal: accessory 61 ⁹⁾							67				
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				
	Cable IP67, Mat. PVC ³⁾							22				
	Cable IP67, Mat. PUR ³⁾							24				
	Cable IP67, Mat. EPD Raychem FDR25 ³⁾							08				
Output signal	Signal output	Load resistance	I (supply)	U (supply)								
	4 ... 20 mA	See graphic	(= signal output)	24 (9 ... 32) VDC				19				
	0.5 ... 4.5 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				20				
	0 ... 5 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				14				
	0.1 ... 4.1 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				28				
	0.1 ... 5.1 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				29				
	0.5 ... 5 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				22				
	1 ... 5 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				25				
	0.5 ... 5.5 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				24				
	1 ... 6 VDC ⁴⁾	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC				16				
	0 ... 10 VDC	≥ 5.0 kΩ to Us-	≤ 15 mA	24 (15 ... 32) VDC				17				
	1 ... 10 VDC	≥ 5.0 kΩ to Us-	≤ 15 mA	24 (15 ... 32) VDC				26				
	0.1 ... 10.1 VDC	≥ 5.0 kΩ to Us-	≤ 15 mA	24 (15 ... 32) VDC				13				
	0.5 ... 4.5 VDC ratiometric ⁴⁾	≥ 5.0 kΩ to Us-	≤ 10 mA	5 (4.75 ... 5.25) VDC				23				

Accessories	Female electrical plug M12x1, 5-pole ²⁾	33
	Female electrical plug industrial standard (for electrical connection 01)	34
	Seal FPM, -18°C ... +125°C	61
	Seal EPDM, -40°C ... +125°C	63
	Seal NBR, -25°C ... +100°C	83
	Special electrical connection: Pin 2 +, Pin 3 Ground, Pin 4 - (only for output signal 19 and male electrical connector 01, industrial standard)	90
	Special electrical connection: Pin 1 Out, Pin 2 +, Pin 3 Ground, Pin 4 - (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26 and male electrical connector 01, industrial standard)	91
	Special electrical connection: Pin 1 +, Pin 2 Ground, Pin 3 Out, Pin 4 - (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector 32, M12x1, 4-pole)	95
	Special electrical connection: Pin 1 +, Pin 2 Ground, Pin 3 -, Pin 4 Out (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26 and male electrical connector 32, M12x1, 4-pole)	96
	Special electrical connection: Pin 1 +, Pin 3 -, Pin 4 Out (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector 32, M12x1, 4-pole)	G1
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 Ground (only for output signal 19 and male electrical connector 01, industrial standard)	92
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 Ground (only for output signal 19 and male electrical connector 32, M12x1, 4-pole)	E1
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 3 Out, Pin 4 Ground (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26 and male electrical connector 32, M12x1, 4-pole)	E2
	Special electrical connection: Pin 1 Out, Pin 2 -, Pin 3 +, Pin 4 Ground (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector 01, industrial standard)	E3
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 3 Out, Pin 4 Ground (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector 01, industrial standard)	E9
	Special electrical connection: Pin 1 +, Pin 2 Ground, Pin 4 - (only for output signal 19 and male electrical connector 32, M12x1, 4-pole)	E6
	Special electrical connection: Pin A +, Pin C - (only for output signal 19 and male electrical connector Deutsch DT04-3P, 3-pole)	F0
	Special electrical connection: Pin A +, Pin B Out, Pin C - (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector Deutsch DT04-3P, 3-pole)	F1
	Special electrical connection: Pin 2 +, Pin 3 - (only for output signals 19 and male electrical connector Deutsch DT04-4P, 4-pole)	G3
	Special electrical connection: Pin 1 Out, Pin 2 +, Pin 3 - (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector Deutsch DT04-4P, 4-pole)	G4
	Special electrical connection: Pin A +, Pin C Out, Pin B/D -, Pin E Ground (Pin B and D are connected) (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector 02, MIL-C 26482)	F3
	Special electrical connection: Pin 1 +, Pin 2 - (only for output signal 19 and male electrical connector 32, M12x1, 4-pole)	F4
	Special electrical connection: Pin 1 +, Pin 3 - (only for output signal 19 and male electrical connector 32, M12x1, 4-pole)	F5
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 3 -, Pin 4 Ground (only for output signals 19 and male electrical connector 32, M12x1, 4-pole)	G2
	Special electrical connection: Pin 1 +, Pin 4 - (only for output signals 19 and male electrical connector 32, M12x1, 4-pole)	G5
	Special electrical connection: Pin 2 -, Pin 3 +, Pin 4 Ground (only for output signals 19 and male electrical connector 32, M12x1, 4-pole)	G8
	Special electrical connection: Pin 1 +, Pin 2 Out, Pin 3 Ground, Pin 4 - (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector 32, M12x1, 4-pole)	F6
	Special electrical connection: Pin 1 +, Pin 2 Out, Pin 3 - (only for output signals 13, 14, 16, 17, 20, 22, 23, 24, 25, 26, 28, 29 and male electrical connector 32, M12x1, 4-pole)	F7
	Cable length 0.5 m	EM
	Cable length 1.0 m	1M
	Cable length 2.0 m	2M
	Multiple packaging ⁵⁾	VM
	Type label e1 (EC79) ⁷⁾	HC

¹⁾ Customized pressure ranges upon request

²⁾ For electrical connections 32 and 35

³⁾ Cable length see accessories

⁵⁾ The order quantity must be a multiple of 50

⁶⁾ Only measuring ranges > 16 bar

⁷⁾ Pressure connection 17 only measuring ranges ≤ 350 bar

⁸⁾ Measuring range max. 350 bar according to SAE J1926-3 (Light Duty). Do not use for new designs, will be replaced by design according to SAE J1926-2 (Heavy Duty) in 2023

⁹⁾ Measuring range max. 630 bar according to SAE J1926-2 (Heavy Duty)

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 ratiom., 10 ... 90% U_{supply} : 5 ± 0.25 VDC
	Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure
	Power-on delay time pressure transmitters	100 ms
	Power-on delay time pressure switches	50 ms + switching delay time
	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
Environmental conditions	Media temperature	-40°C ... +85°C
	Ambient temperature	-40°C ... +85°C (Cable PVC 22: -5°C ... +60°C) (Cable PUR 24: -40°C ... +70°C)
	Protection ¹⁾	IP65, IP67, IP68
	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) ²⁾
EMC protection	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 (AISI316L)
	Housing	1.4301 (AISI304)
	Sealing	FPM/EPDM/NBR
	Male electrical connector	See ordering information
	Weight	appr. 50 g
	Mounting torque	25 Nm

¹⁾ See electrical connection

²⁾ For electrical connections 32 and 35

EC79/2009 Certificate

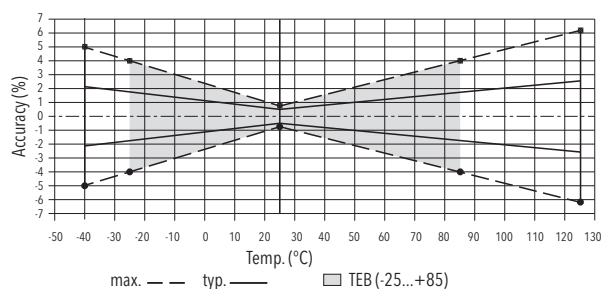
Nominal working pressure (NWP) @15°C	0.08 ... 70 MPa
Maximum allowable working pressure	0.1 ... 100 MPa
Classification	Class 0, Class 1 und Class 2*
Pressure codes	71 ... 88
Process connection	Code 17: Up to NWP 35 MPa Codes 30, 42, 43, 68: Up to NWP 70 MPa
Seal	Codes 61 and 63

* 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.

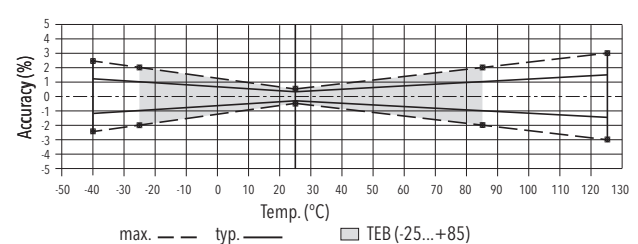
Analogue output

			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 %

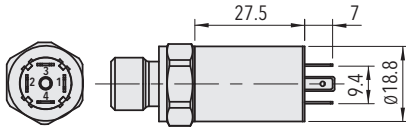


Additional information

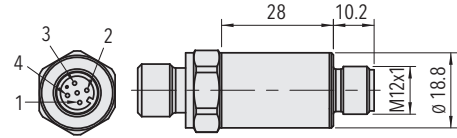
Documents

Data sheet	www.trafag.com/H72338
Instructions	www.trafag.com/H73303
Flyer	www.trafag.com/H70606

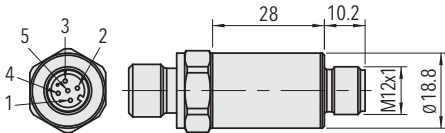
Dimensions



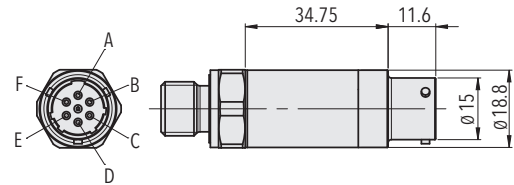
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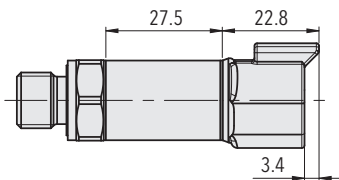
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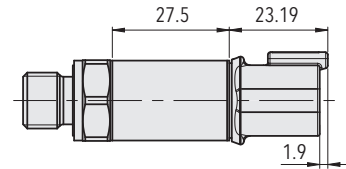
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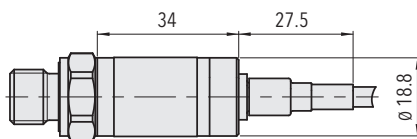
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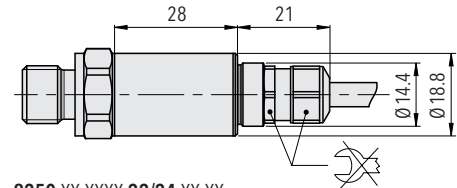
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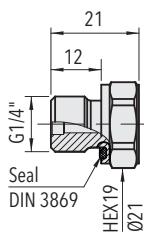
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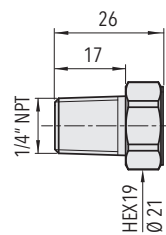
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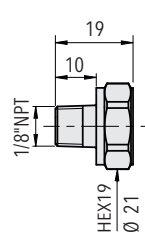
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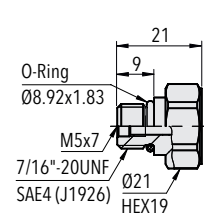
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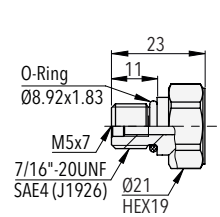
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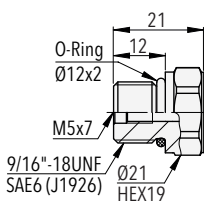
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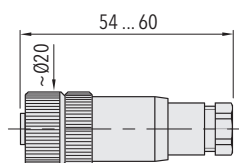
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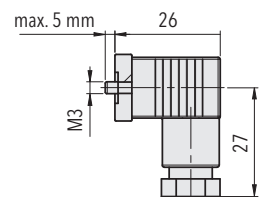
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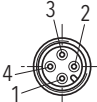
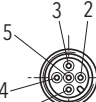

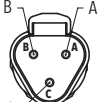
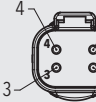
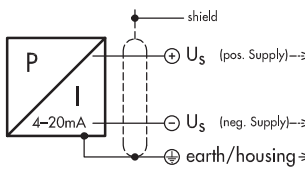
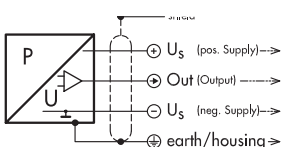


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Electrical connection

		Protection / electrical connection																	
		IP65 ^{1) 2)}			IP67 ^{1) 2)}								IP67 ^{1) 2)}		IP67, IP68 ^{1) 3)}		IP67, IP68 ^{1) 3)}		
		Industrial standard Contact distance 9.4 mm			M12x1								MIL-C 26482		DT04-3P 3-pole		DT04-4P 4-pole		
		01			32				35				02		D3		D4		
																			
Output signal		2	2	1	1	1	1	1	1	1	1	3	4	A	A	F0	2	G3	
	8250.XX.XXXX.XX.19	1	4	2	3	2	4	2	3	2/3	4	2	1	B	B	C	1	3	
		4	3	4	4	4	2			4	4	4	5	E			3		
		91	E3	E9		95	96	E2	F6	F7	G1			F3		F1		G4	
		1	2	3	1	1	1	1	1	1	1	1	2	A	A	A	A	2	2
		2	1	1	3	2	3	4	3	2	2	4	4	B	C	C	B	4	1
		3	4	2	2	3	4	3	2	4	3	3	3	C/D	B/D	B	C	1	3
		4	3	4	4	4	2	2	4	3			5	E	E			3	
8250.XX.XXXX.XX.13/14/16/17/20/22/23/24/25/26/28/29																			

¹⁾ Provided female electrical plug is mounted according to instructions

²⁾ Ventilation via male electric plug/cable end

³⁾ IP68, 100 mbar, 4h

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

