NHT 8250

Hydrogen Pressure Transmitter

Applications

- H_2-fuelling stations
- Hydrogen compressors
- Fuel cells
- Vehicles with H_2 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

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.

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 ... 100 bar 0 ... 15 to 0 ... 1000 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

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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**						
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) [2]									**69**				
	9/16"-18UNF-2A male, SAE J1926-2 (Heavy Duty) [2]									**67**				
	M12x1.5 male, DIN EN ISO 9974-2 [3]									**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, Mat. PA66 [4]										**51**			
	Cable IP67, Mat. PVC [5]										**22**			
	Cable IP67, Mat. PUR [5]										**24**			
	Cable IP67, Mat. EPD Raychem FDR25 [5]										**08**			
	Compact design: Cable Mat. PVC, IP40, 2 x 2 x 0.14 mm^2, shielded, max. traction on cable: 2 N [6] [7]										**A1**			
	JST (or compatible) Board to Cable/Wire Disconnectable Crimp style connector, BM04B-SRSS-TB, IP20, 4-pole [6]										**J4**			

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					8250	XX	XX	XX	XX	XX	XX
Output signal	**Output signal**	**Load resistance**	**I (supply)**	**U (supply)**							
	4 ... 20 mA	See graphic	(= signal output)	24 (9 ... 32) VDC							**19**
	0.5 ... 4.5 VDC [8]	≥ 5.0 kΩ to U_s –	≤ 20 mA	24 (9 ... 32) VDC							**20**
	0 ... 5 VDC [8]	≥ 5.0 kΩ to U_s –	≤ 20 mA	24 (9 ... 32) VDC							**14**
	0.1 ... 4.1 VDC [8]	≥ 5.0 kΩ to U_s –	≤ 20 mA	24 (9 ... 32) VDC							**28**
	0.1 ... 5.1 VDC [8]	≥ 5.0 kΩ to U_s –	≤ 20 mA	24 (9 ... 32) VDC							**29**
	0.5 ... 5 VDC [8]	≥ 5.0 kΩ to U_s –	≤ 20 mA	24 (9 ... 32) VDC							**22**
	1 ... 5 VDC [8]	≥ 5.0 kΩ to U_s –	≤ 20 mA	24 (9 ... 32) VDC							**25**
	0.5 ... 5.5 VDC [8]	≥ 5.0 kΩ to U_s –	≤ 20 mA	24 (9 ... 32) VDC							**24**
	1 ... 6 VDC [8]	≥ 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. [8]	≥ 5.0 kΩ to U_s –	≤ 10 mA	5 (4.75 ... 5.25) VDC							**23**

Accessories	Female electrical plug M12x1, 5-pole [9]	**33**
	Female electrical plug industrial standard (for electrical connection 01)	**34**
	Female electrical plug M12x1, 5-pole, metallic housing [9]	**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] Measuring range max. 630 bar according to SAE J1926-2 (Heavy Duty)
[03] Only for measurement ranges ≤16 bar (Codes 71, 73, 75, 76, 77, 78, 79)
[04] Not part of the EC79 type certificate (code HC). Combination with code HC will be checked with KBA on request.
[05] Cable length see Accessories
[06] Upon request, whereas minimum order quantities may apply
[07] Cable length 2m only, with accessory 2M
[08] Only measuring ranges > 16 bar
[09] For electrical connections 32 and 35
[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

		Seal		
Code	**Pressure connection**	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	EN 60079-0, EN 60079-7
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

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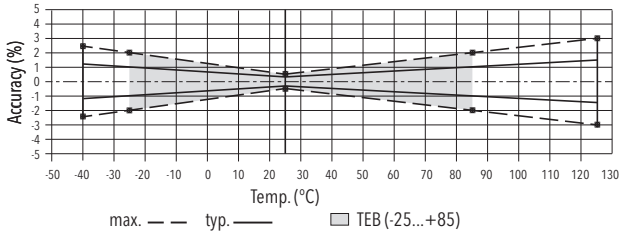
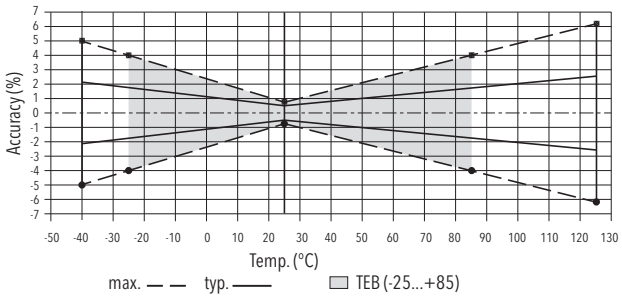
Analogue output

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

Accuracy class 0.3 %



Accuracy class 0.5 %



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 0.8 bar to 700 bar

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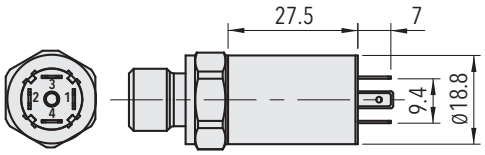
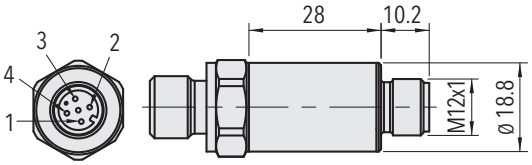
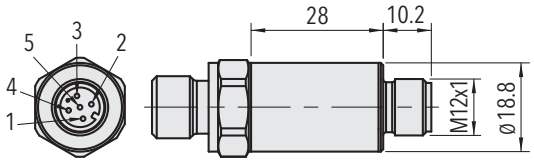
Dimensions



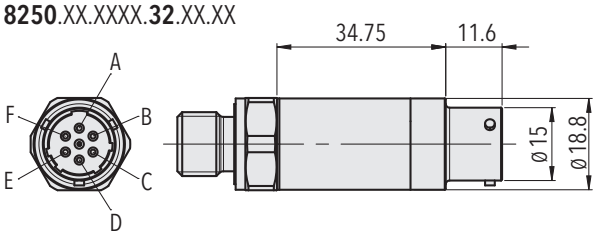
8250.XX.XXXX.**01**.XX.XX



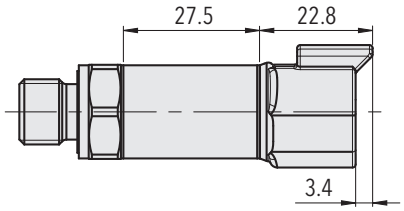
8250.XX.XXXX.**32**.XX.XX



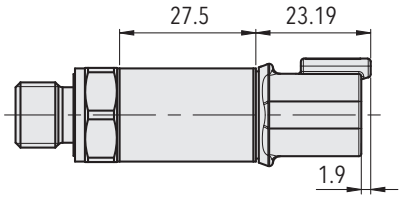
8250.XX.XXXX.**35**.XX.XX



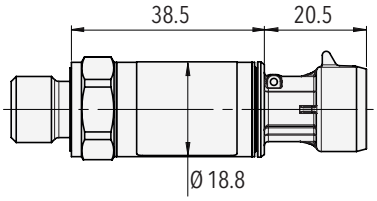
8250.XX.XXXX.**02**.XX.XX



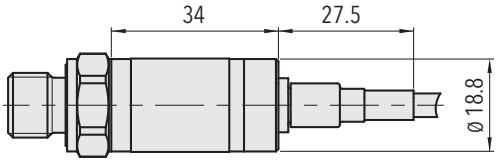
8250.XX.XXXX.**D3**.XX.XX



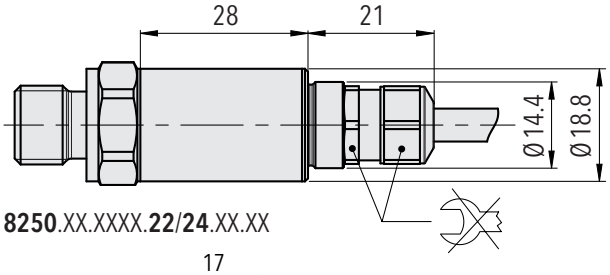
8250.XX.XXXX.**D4**.XX.XX



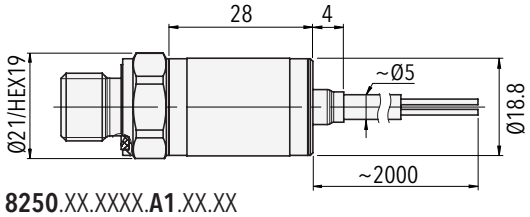
8250.XX.XXXX.51.XX.XX



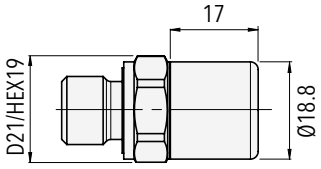
8250.XX.XXXX.**08**.XX.XX



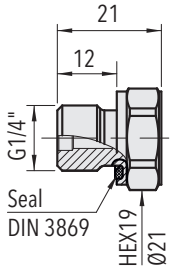
8250.XX.XXXX.**22/24**.XX.XX



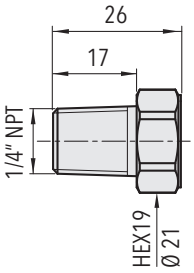
8250.XX.XXXX.**A1**.XX.XX



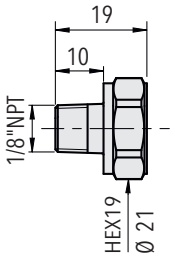
8250.XX.XXXX.**J4**.XX.XX



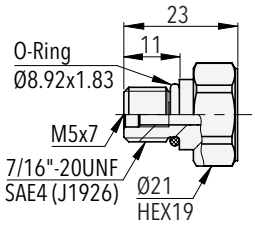
8250.XX.XX**17**.XX.XX.XX



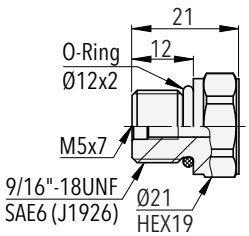
8250.XX.XX**30**.XX.XX.XX



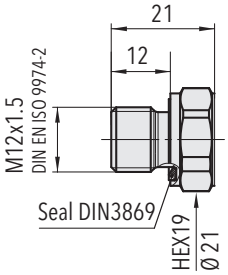
8250.XX.XX**43**.XX.XX.XX



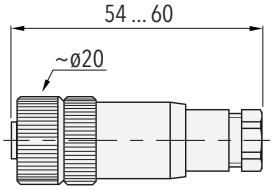
8250.XX.XX**69**.XX.XX.XX



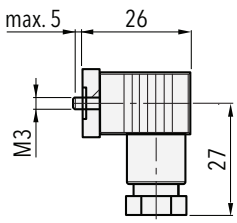
8250.XX.XX**67**.XX.XX.XX



8250.XX.XX**49**.XX.XX.**61**



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



8250.XX.XXXX.XX.XX.**34**

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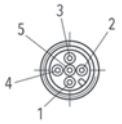
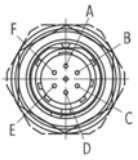
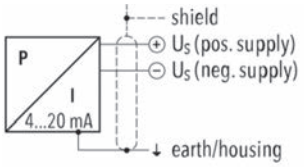
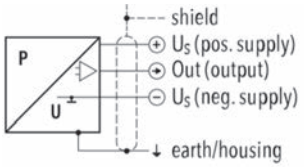
Electrical connection

	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	2 4	1 2	1 3	1 2	1 4	1 2	1 3	1 2/3	1 4	3 2	4 1	A B	
	4	3	4	4	4	2			4		4	5	E	

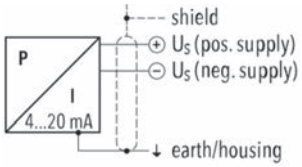
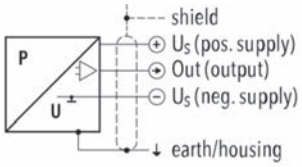
Pin assignment type code		**91**	**E3**	**E9**		**95**	**96**	**E2**	**F6**	**F7**	**G1**			**F3**
Output signal 8250.xx.xxxx.xx.13/14/16/17/20/22/23/24/25/26/28/29 	1 2 3	2 1 4	3 1 2	1 3 2	1 2 3	1 3 4	1 4 3	1 3 2	1 2 4	1 2 3	1 4 3	2 4 3	A B C/D	A C B/D
	4	3	4	4	4	2	2	4	3			5	E	E

[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

NHT 8250

Electrical connection

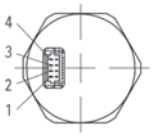
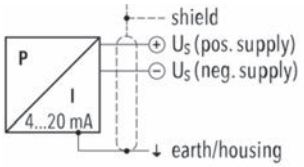
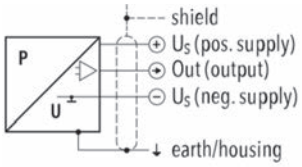
	DT04-3P, 3-pole	DT04-4P, 4-pole	3 Way M MetriPack 1.5 sealed connector	Cable	Cable
					
Electrical connection type code	D3	D4	51	22	24
IP protection	IP67, IP68 [1) 4)]	IP67, IP68 [1) 4)]	IP67 [1)]	IP67, IP68 [2) 3)]	IP67, IP68 [2) 3)]
Ambient temperature	-40°C … +125°C	-40°C … +125°C	-40°C … +125°C	-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

NHT 8250

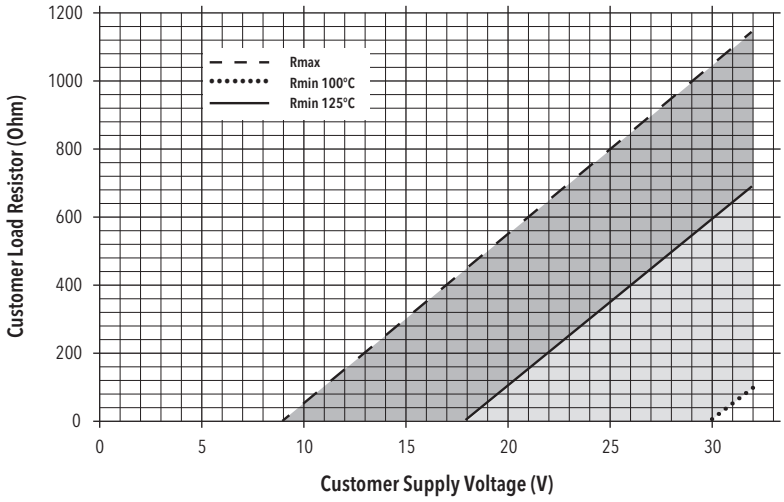
Electrical connection

	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

Empty 'Pin Assignment Type Code' field: Default pinout

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



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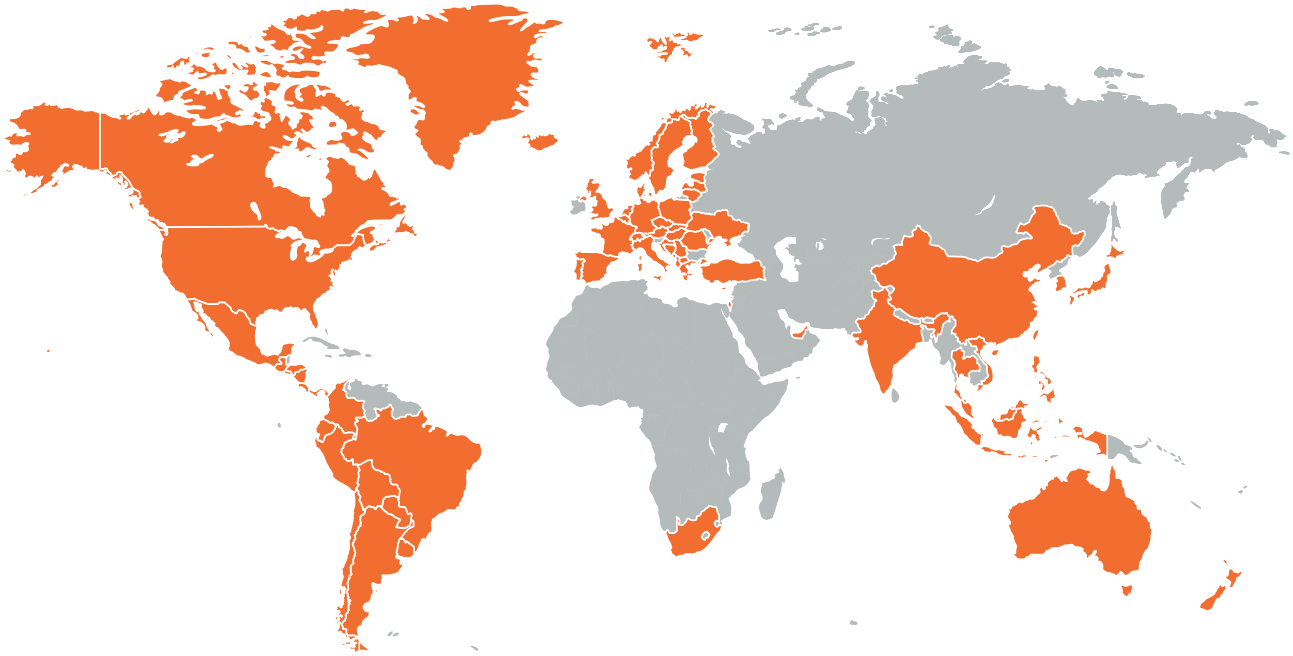

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