TTHA Intrinsic Safety Type Temperature Transmitter

- RTD, TC, Ohm, or mV input
- Extremely high measurement accuracy
- HART® communication
- Galvanic isolation
- For DIN form B sensor head mounting

Application

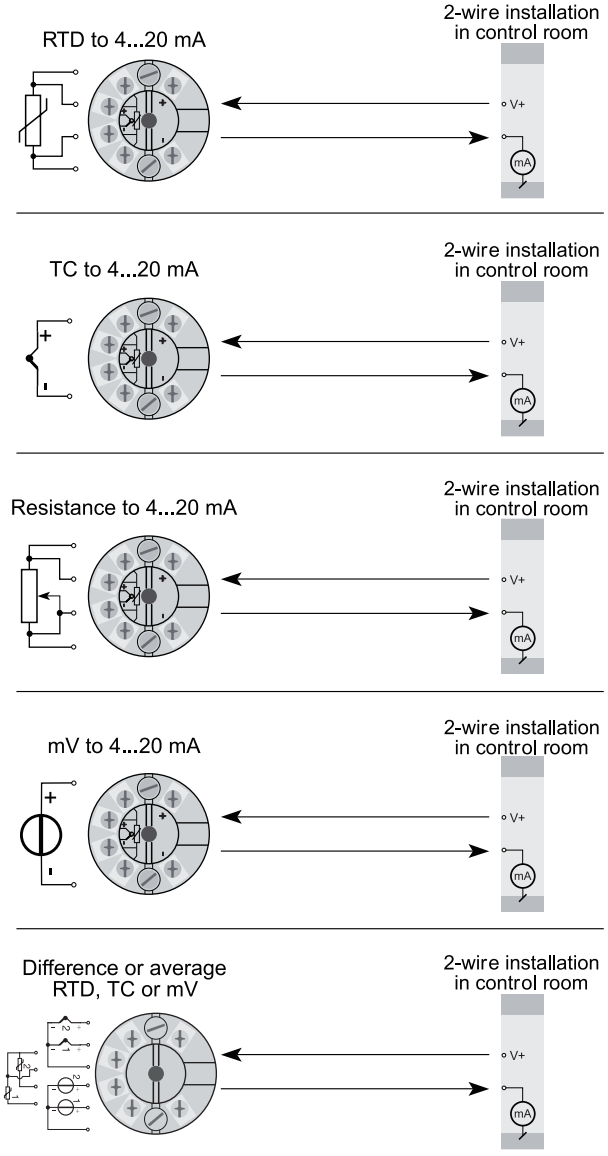
- Linearised temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Difference or average temperature measurement of 2 resistance or TC sensors.
- Conversion of linear resistance variation to a standard analogue current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.
- Connection of up to 15 transmitters to a digital 2-wire signal with HART® communication.

Technical characteristics

- Within a few seconds the user can program TTHA to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- The TTHA has been designed according to strict safety requirements and is thus suitable for application in SIL 2 installations.
- Continuous check of vital stored data for safety reasons.
- Sensor error detection according to the guidelines in NAMUR NE 89.

Mounting / installation

- For DIN form B sensor head mounting.



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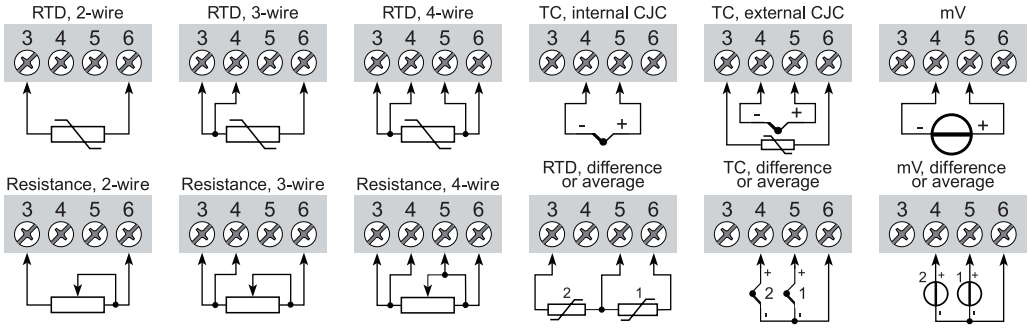
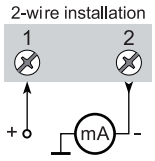
Connections

Input:



Output:



Electrical specifications

Specifications range:

-40°C to +85°C

Common specifications:

Supply voltage ..... 8.0...30 VDC
Voltage drop ..... 8.0 VDC
Isolation voltage, test / operation ..... 1.5 kVAC / 50 VAC
Communications interface ..... Loop Link & HART®
Signal / noise ratio ..... Min. 60 dB
Signal dynamics, input ..... 22 bit
Signal dynamics, output ..... 16 bit
Calibration temperature ..... 20...28°C
Accuracy, the greater of general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	≤ ±0.05% of span	≤ ±0.005% of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
Pt100 and Pt1000	≤ ±0.1°C	≤ ±0.005°C/°C
Ni100	≤ ±0.2°C	≤ ±0.005°C/°C
Lin. R	≤ ±0.1 Ω	≤ ±5 mΩ / °C
Volt	≤ ±10 µV	≤ ±0.5 µV / °C
TC type: E, J, K, L, N, T, U	≤ ±0.5°C	≤ ±0.025°C / °C
TC type: B, R, S, W3, W5	≤ ±1°C	≤ ±0.1°C / °C

EMC immunity influence ..... < ±0.1% of span
Extended EMC immunity:
NAMUR NE 21, A criterion, burst ..... < ±1% of span

Vibration ..... IEC 60068-2-6 Test FC
Lloyd's specification no. 1 ..... 4 g / 2...100 Hz
Humidity ..... < 95% RH (non-cond.)
Dimensions ..... Ø 44 x 20.2 mm
Protection degree (encl. / terminals) ... IP68 / IP00

Electrical specifications, input:

Max. offset ..... 50% of select. max. value
RTD and linear resistance input:

RTD type	Min. value	Max. value	Min. span	Standard
Pt100	-200°C	+850°C	10°C	IEC 60751
Ni100	-60°C	+250°C	10°C	DIN 43760
Lin. R	0 Ω	7000 Ω	10 Ω	-----

Cable resistance per wire (max.) ..... 5 Ω
Sensor current ..... Nom. 0.2 mA
Voltage input:
Measurement range ..... -800...+800 mV
Min. span ..... 2.5 mV
Input resistance ..... 10 MΩ

TC input:

Type	Min. temperature	Max. temperature	Min. span	Standard
B	+400°C	+1820°C	100°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	50°C	IEC584
R	-50°C	+1760°C	100°C	IEC584
S	-50°C	+1760°C	100°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	50°C	DIN 43710
W3	0°C	+2300°C	100°C	ASTM E988-90
W5	0°C	+2300°C	100°C	ASTM E988-90

Cold junction compensation ..... < ±1.0°C

Current output:

Signal range ..... 4...20 mA
Min. signal range ..... 16 mA
Updating time ..... 440 ms
Load resistance ..... ≤ (V_{supply} - 8) / 0.023 [Ω]

Sensor error detection:

Programmable ..... 3.5...23 mA
Ex / I.S. approval:
KEMA 03ATEX1537 ..... II 1 G Ex ia IIC T4 or T6
II 1 D Ex iaD
Max. ambient temp. for T1...T4 ..... 85°C
Max. ambient temp. for T5 and T6 .... 60°C
ATEX, applicable in zone ..... 0, 1, 2, 20, 21 or 22
ATEX Installation Drawing No. 5335QE01
FM, applicable in ..... IS, Class I, Div. 1, Group A, B, C, D
IS, Class I, Zone 0, AEx ia IIC
FM Installation Drawing No. 5300Q502
CSA, applicable ..... IS, Class I, Div. 1, Group A, B, C, D, Ex ia IIC
IS, Class I, Zone 0, AEx ia IIC
CSA Installation Drawing No. 533XQC03
INMETRO 09/UL-BRCO-0002 ..... BR-Ex ia IIC T4 or T6 or -40°C ≤Tamb.≤+85°C, or -40°C ≤Tamb.≤+60°C

Observed authority requirements:	**Standard:**
EMC 2004/108/EC	EN 61326-1
ATEX 94/9/EC	EN 60079-0, -11, -26 EN 61241-0, -11
FM	3600, 3611, 3610
CSA, CAN / CSA	C22.2 No. 157, E60079-11, UL 913
INMETRO	IEC 60079-0, -11

Of span = Of the presently selected range