

Temperature Head Transmitter TMT 182L



Universal head transmitter for resistance thermometers (RTD), thermocouples (TC), resistance and voltage transmitters, settable via HART-protocol, for installation in a sensor head (From B)

Application areas

- Temperature head transmitter with HART- protocol for converting various input signals into a scalable 4 to 20 mA analogue output signal
- Input
 - Resistance thermometer (RTD)
 - Thermocouple (TC)
 - Resistance transmitter (Ω)
 - Voltage transmitter (mV)
- HART-protocol for front end unit or panel unit operation using the hand operation module (DXR275) or PC

- Fault signal on sensor break or short circuit, presettable to NAMUR NE 43
- EMC to NAMUR NE 21, CE
- UL recognized component to UL 3111-1
- GL Germanischer Lloyd marine approval
- Ex-Certification
 - ATEX EX ia and dust zone 22 in compliance with EN 50281-1
 - FMIS
 - CSAIS

Performance

- Universal settings with HART-protocol for various input signals
- Operation, visualisation and maintenance via PC
- 2 wire technology, 4 to 20 mA analogue output
- High accuracy in total ambient temperature range

- Galvanic isolation
- Output simulation
- Min./max. Process value indication function
- Customer specific linearization
- Linearization curve match
- Customer specific measurement range settings or expanded SETUP

Technical data

Input

	Type	Measurement ranges	Min. measurement Range
Resistance thermometer(RTD)	Pt100 Pt500 Pt1000 acc.to IEC 751	-200°C to 850°C(-328°F to 1562°F) -200°C to 250°C(-328°F to 482°F) -200°C to 250°C(-328°F to 482°F)	10K(18°F) 10K(18°F) 10K(18°F)
	Ni100 Ni500 Ni1000 acc. To DIN 43760	-60°C to 180°C (-76°F to 482°F) -60°C to 150°C (-76°F to 302°F) -60°C to 150°C (-76°F to 302°F)	10K(18°F) 10K(18°F) 10K(18°F)
<ul style="list-style-type: none"> • Connection type: 2-, 3- or 4-wire connection • Software compensation of cable resistance possible in the 2 wire system (0 to 30Ω) • Sensor cable resistance max. 20Ω per cable in the 3 and 4 wire system • Sensor current: ≤0.2mA 			
Resistance transmitter	Resistance(Ω)	10 to 400 Ω 10 to 2000 Ω	10 Ω 100 Ω
Thermocouples(TC)	B (PtRh30-PtRh6) C (W5Re-W26Re) ¹ D (W3Re-W25Re) ¹ E (NiCr-CuNi) J (Fe-CuNi) K (NiCr-Ni) L (Fe-CuNi) ² N (NiCrSi-NiSi) R (PtRh13-Pt) S (PtRh10-Pt) T (Cu-CuNi) U (Cu-CuNi) ² accord. To IEC 584 Part 1	0 to 1820°C (32 to 3308°F) 0 to 2320°C (32 to 4208°F) 0 to 2495°C (32 to 4523°F) -270 to 1000°C(-454 to 1832°F) -210 to 1200°C(-346 to 2192°F) -270 to 1372°C(-454 to 2501°F) -200 to 900°C(-328 to 1652°F) -270 to 1300°C(-454 to 2372°F) -50 to 1768°C (-58 to 3214°F) -50 to 1768°C (-58 to 3214°F) -270 to 400°C(-454 to 752°F) -200 to 600°C(-328 to 1112°F)	500K(900°F) 500K(900°F) 500K(900°F) 50K(90°F) 50K(90°F) 50K(90°F) 50K(90°F) 50K(90°F) 50K(90°F) 500K(900°F) 500K(900°F) 50K(90°F) 50K(90°F)
	Cold junction: internal (Pt100) Cold junction accuracy: ±1K		
Voltage transmitters(mV)	Millivolt transmitter(mV)	-10 to 75mV	5 mV

[1] acc.to ASTM E988

[2] acc.to DIN 43710

Output

Output signal	Analogue 4 to 20 mA, 20 to 4 mA
Signal on alarm	Underranging Linear drop to 3.8 mA
	OVERRANGING linear rise to 20.5 mA
	Sensor break; sensor short-circuit(not for thermocouples TC): ≤ 3.6 mA or ≥ 21.0 mA
Load	Max. $(V_{\text{power supply}} - 11.5\text{V})/0.022\text{A}$ (current output)
Linearisation/transmission behaviour	Temperature linear, resistance linear, voltage linear
Filter	1st order digital filter: 0 to 100 s
Galvanic isolation	U=2 KV AC (input/output)
Input current required	≤ 3.5 mA
Current limit	≥ 23 mA
Switch on delay	4 s(during power up $I_a=3.8$ mA)

Power supply

Supply voltage	$U_b=11.5$ to 35 V, polarity protected
Residual ripple	Allowable ripple $U_{ss} \leq 3$ V at $U_b \geq 13\text{V}$, $f_{\text{max.}}=1$ KhZ

Performance characteristics

Response time	1 s
Reference operating conditions	Calibration temperature: $23^\circ\text{C}(73.4^\circ\text{F}) \pm 5\text{K}$

Maximum measured error		Type	Measurement accuracy ¹
	Resistance thermometer RTD	Pt100, Ni100 Pt500, Ni500 Pt1000, Ni1000	0.2K or 0.08% 0.5K or 0.20% 0.3K or 0.12%
	Thermocouple TC	K, J, T, E, L, U N, C, D S, B, R	typ. 0.5K or 0.08% typ. 1.0K or 0.08% typ. 2.0K or 0.08%
		Measurement range	Measurement accuracy ¹
	Resistance transmitter(Ω)	10 to 400 Ω 10 to 2000 Ω	$\pm 0.1\Omega$ or 0.08% $\pm 1.5\Omega$ or 0.12%
	Voltage transmitters(mV)	-10 to 75 mV	$\pm 20\mu V$ or 0.08%

1) % is related to the adjusted measurement range. The value to be applied is the greater.

Influence of supply voltage	$\leq \pm 0.01\%/V$ deviation from 24V Percentages refer to the full scale value.
Influence of ambient temperature (temperature drift)	<ul style="list-style-type: none"> Resistance thermometer (RTD): $T_d = \pm (15 \text{ ppm/K} * \text{max. meas. range} + 50 \text{ ppm/K} * \text{preset meas. range}) * \Delta t$ Resistance thermometer Pt100: $T_d = \pm (15 \text{ ppm/K} * (\text{range end value} + 200) + 50 \text{ ppm/K} * \text{preset meas. range}) * \Delta t$ Thermocouple (TC): $T_d = \pm (50 \text{ ppm/K} * \text{max. meas. range} + 50 \text{ ppm/K} * \text{preset meas. range}) * \Delta t$ Δt = Deviation of the ambient temperature according to the reference condition (+23°C(73.4°F) ± 5 K)
Influence of load	$\pm 0.02\%/100\Omega$ Values refer to the full scale value
Long-term stability	≤ 0.1 K/year or $\leq 0.05\%$ /year Values under reference operating conditions. % refer to the set span. The high value is valid.
Influence of cold junction	Pt100 DIN IEC 751 Cl. B (internal cold junction with thermocouples TC)

Installation conditions

Installation instructions	<ul style="list-style-type: none"> Installation angle: no limit Installation area: Connection head accord. To DIN 43 729 From B; TAF 10 field housing
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Environment conditions

Ambient temperature limits	-40 to 85°C(-40°F to 185°F)
Storage temperature	-40 to 100°C(-40°F to 212°F)

Climate class	As per EN 60 654-1, class C
Condensation	Allowable
Degree of protection	IP 00, IP 66 installed
Shock and vibration resistance	4g/2 to 150 Hz as per IEC 60 068-26
Electromagnetic compatibility (EMC)	Shock resistance and interference emission as per EN 61 326-1 (IEC 1326) and NAMUR NE 21

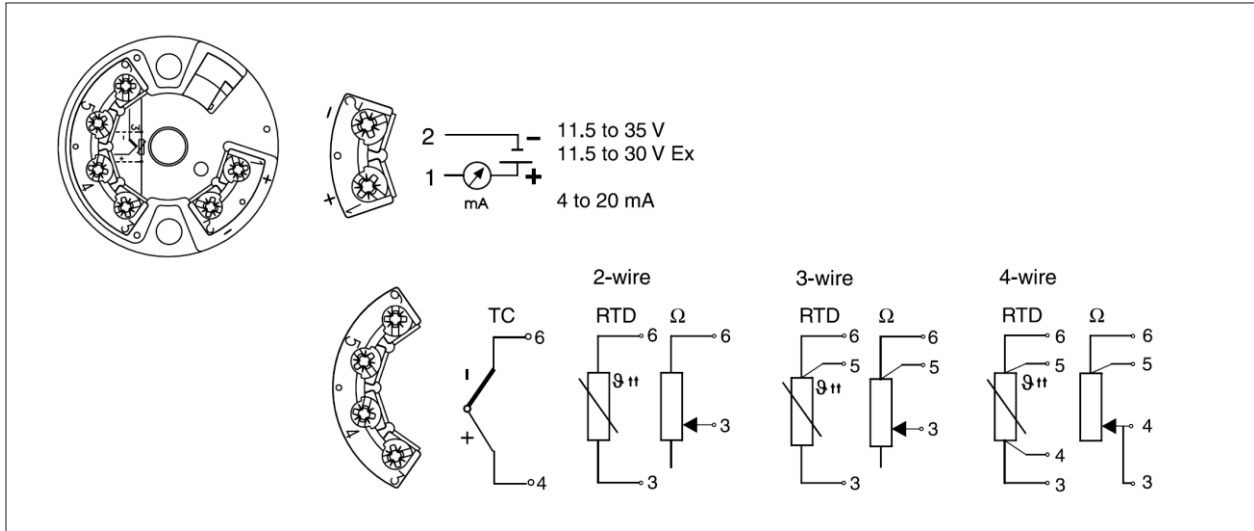
Certificates and approvals

CE-Mark	The measurement system fulfils the requirements demanded by the EU regulations
Ex approval	For further details on the available Ex versions (ATEX, CSA, FM, etc.), please contact us. All relevant data for hazardous areas can be found in separate Ex documentation. If required, please request copies from us.
Other standards and guidelines	EN 60529: Degrees of protection by housing (IP-Code) EN 61010: Safety requirements for electrical measurement, control and laboratory instrumentation. EN 61326 (IEC 1326): Electromagnetic compatibility (EMC requirements) NAMUR Standardization association for measurement and control in chemical and pharmaceutical industries.

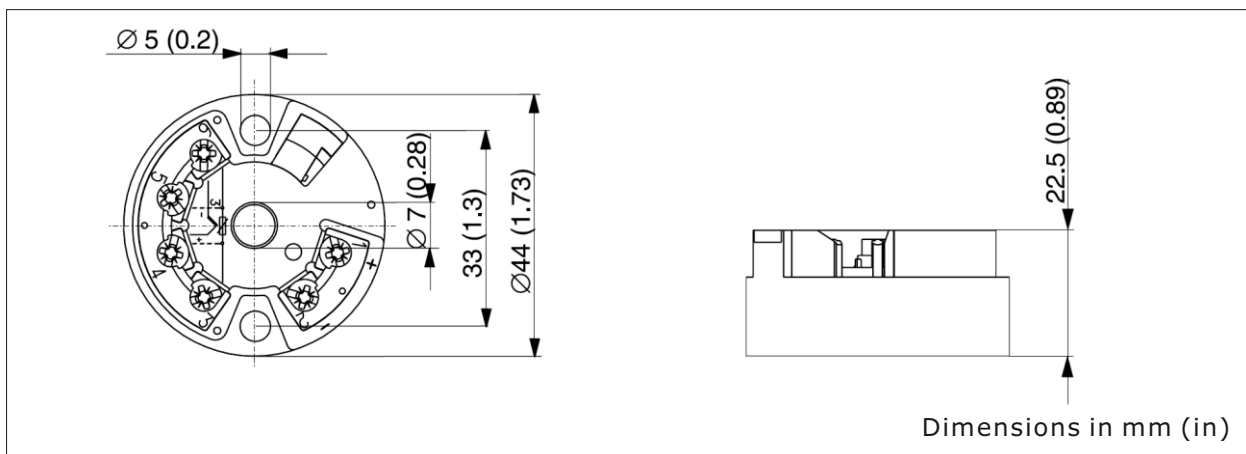
Others

Dimensions	44 mm X 22.5 mm
Weight	Approx. 40g
Material	Housing: PC Potting: PUR
Terminals	Cable up to max. 1.75 mm ² (secure screws)

Electrical connections



Demotions



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