Technical Information
TI 095R/09/en
No. 51004790

Temperature Transmitter
iTEMP® RTD DIN rail TMT 127

Temperature Transmitter for Pt100 Resistance Thermometer



Application

- Temperature transmitter with fixed measuring range for converting a Pt100 input signal into an analogue, scalable 4 to 20 mA output signal

Features and benefits

- Fixed measuring range for Pt100
- Two-wire technology, 4 to 20 mA analogue output
- High accuracy in complete ambient temperature range
- Failure information when sensor breaks or short-circuits as per NAMUR NE 43
- EMC as per NAMUR NE 21, CE
- Ex approval ATEX, CSA, FM
- Galvanic isolation

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Function and system design

Measuring principle

Electronic acquisition and conversion of input signals in industrial temperature measurement.

Measuring system

The iTEMP®RTD DIN rail TMT 127 DIN rail temperature transmitter is a 2-wire transmitter with analogue output, measuring input for Pt100 in 2, 3, or 4-wire connection.

Input values

Measured variable

Temperature

Measuring range

Depending on the application, different measuring ranges can be ordered (see 'Product structure').

Input type

Input	Designation	Measuring range limits	Min. span
Resistance thermometer (RTD)	Pt100 as per IEC 751	-200 to 850 C (-328 to 1562 F)	10 K
	• Type of connection: 2, 3 or 4-wire connection • Cable resistance: sensor cable resistance of max. 40 Ω per cable • Sensor current: ≤ 0.6 mA		

Output values

Output signal

Analogue 4 to 20 mA

Signal on alarm

- Undershooting measuring range: linear decrease to 3.8 mA
- Exceeding measuring range: linear increase to 20.5 mA
- Sensor break; Sensor short-circuit: ≥ 21.0 mA

Load

Max. ($V_{Power\ supply}$- 12V) / 0.022 A (current output)

Linearisation/transmission behaviour

Temperature linear

Galvanic isolation

U = 2 kV AC (input/output)

Induced current requirement

≤ 3.5 mA

Current limitation

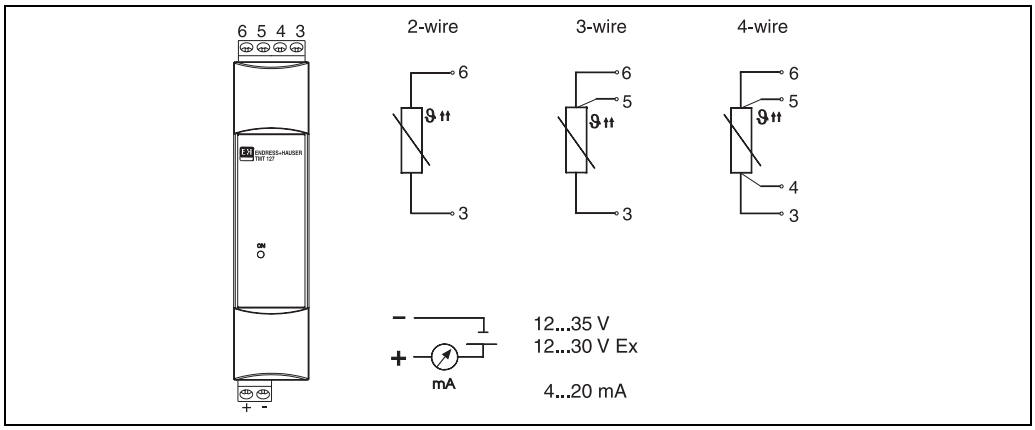
≤ 23 mA

Switch-on delay

4 s (during switch-on procedure I_a = 3.8 mA)

Power supply

Electrical connection



Temperature transmitter terminal assignment

Supply voltage

U_b= 12 to 35 V, reverse polarity protection

Residual ripple

Permitted residual ripple $U_{ss} \leq 3$ V at $U_b \geq 15$ V, $f_{max.} = 1$ kHz

Accuracy

Response time

1 s

Reference operating conditions

Calibration temperature: +23 °C (73.4 °F) ± 5 K

Measuring error

	Designation	Accuracy[1]
Resistance thermometer RTD	Pt100	0.2 K or 0.08%

1) % refer to the set span. The highest value is valid.

Influence of supply voltage

- ≤ ±0.01%/V deviation from 24 V
  Percentages refer to the full scale value.

Influence of ambient temperature (temperature drift)

- Pt100 resistance thermometer:
  T_d= ±(15 ppm/K * (full scale value + 200) + 50 ppm/K * of set measuring range) * $\Delta\,\vartheta$

$\Delta\,\vartheta$ = deviation of ambient temperature from the reference operating condition (+23 °C ± 5 K).

Influence of load

- ± 0.02%/100 Ω
  Values refer to the full scale value

Long-term stability

- ≤ 0,1 K/year or ≤ 0.05%/year
  Values under reference operating conditions. % refer to the set span. The highest value is valid.

Installation conditions

Installation instructions

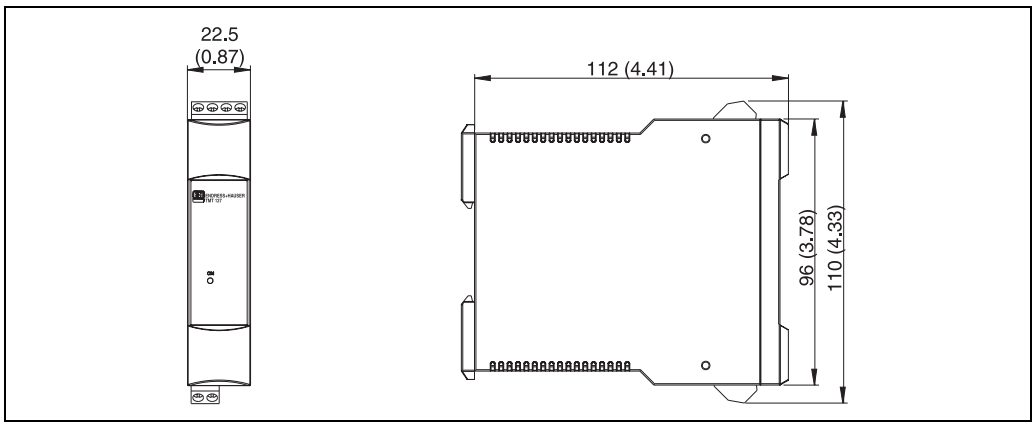
Installation location
No restrictions

Environmental conditions

Ambient temperature limits	-40 to +85 °C (-40 to 185 °F) for Ex-area, see Ex-certificate
Storage temperature	-40 to +100 °C (-40 to 212 °F)
Climate class	as per EN 60 654-1, class C
Ingress protection	IP 20
Shock resistance	4g / 2 to 150 Hz as per IEC 60 068-2-6
Vibration resistance	see “Shock resistance“
Electromagnetic compatibility (EMC)	Shock resistance and interference emission as per EN 61 326-1 (IEC 1326) and NAMUR NE 21
Condensation	permitted

Mechanical construction

Design, dimensions



Values in mm (inch)

Weight	approx. 90 g
Materials	Housing: PC/ABS, UL 94V0
Terminals	Pluggable screw terminal, max. 2.5 mm^2 (0.0039 in^2) solid, or strand with wire end sleeve

Display and operating system

Display elements

Illuminated yellow LED (2 mm, 0.08 in) signals device operation.

Operating elements

There are no operating elements available on the device.

Certificates and approvals

CE-Mark

The measurement system fulfils the requirements demanded by the EU regulations. Endress+Hauser acknowledges successful unit testing by adding the CE mark.

Ex approval

For further details on the available Ex versions (ATEX, CSA, FM, etc.), please contact your nearest E+H sales organisation. All relevant data for hazardous areas can be found in separate Ex documentation. If required, please request copies from us or your E+H sales organisation.

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.

Ordering information

Product structure

TMT127	iTEMP RTD DIN rail TMT 127
	for temperature measurement with Pt100; Analogue output 4 to 20 mA, 2-wire techn.; Galv. isol., fail. mode to NAMUR NE 43; 22.5 mm wide, for 35 mm top hat DIN rail according to EN 50022; UL recognized, ship building approval GL

	Certification
A	Version for non hazardous areas, UL recognized, ship building approval GL
B	ATEX II1G EEx ia IIC T4/T5/T6
C	FM IS, Class I, Div.1+2, Group A,B,C,D
D	CSA IS, Class I, Div.1+2, Group A,B,C,D
E	ATEX II3G EEx nA IIC T4/T5/T6

		Transmitter connection
2		Connection RTD 2-wire
3		Connection RTD 3-wire
4		Connection RTD 4-wire

			Temperature sensor
1			Configuration Pt100 (-200 to 850 °C, -328 to 1562 °F, min. sp. 10 K)

TMT127-				⇒ **Order code (Part 1)**

					Range		
					BA	Range -50 to 100 °C (-58 to 212 °F)
					CA	Range -40 to 60 °C (-40 to 140 °F)
					DA	Range -30 to 60 °C (-22 to 140 °F)
					DC	Range -30 to 70 °C (-22 to 158 °F)
					DB	Range -30 to 150 °C (-22 to 302 °F)
					EA	Range -20 to 20 °C (-4 to 68 °F)
					EB	Range -20 to 60 °C (-4 to 140 °F)
					EN	Range -10 to 40 °C (14 to 104 °F)
					FC	Range 0 to 50 °C (32 to 122 °F)
					FE	Range 0 to 100 °C (32 to 212 °F)
					FG	Range 0 to 150 °C (32 to 302 °F)
					FH	Range 0 to 200 °C (32 to 392 °F)
					FI	Range 0 to 250 °C (32 to 482 °F)
					FJ	Range 0 to 300 °C (32 to 575 °F)
					FK	Range 0 to 400 °C (32 to 752 °F)
					FL	Range 0 to 500 °C (32 to 932 °F)
					FN	Range 0 to 600 °C (32 to 1112 °F)

						Model	
						A	Standard model
						B	Works calibration certificate (6 test points)
TMT127			**1**			⇒ **Order code (complete)**	

Accessories

No accessories are required for this device.

Documentation

- ❑ System information 'Temperature measurement' (SI 008R/09/en)
- ❑ Short operating manual "iTEMP®RTD/TC DIN rail TMT 127/128" (KA 140R/09/a3)
- ❑ Ex Supplementary documentation: ATEX Safety instructions II1G (XA 013R/09/a3) and II3G (XA 018R/09/a3)

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