



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services

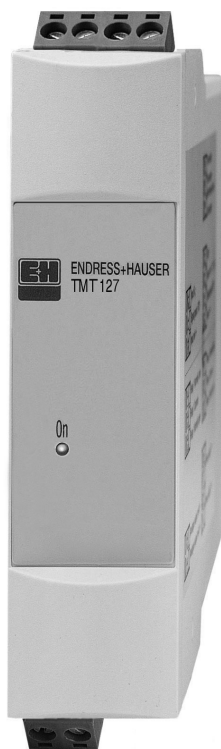


Solutions

Technical information

iTEMP[®] Pt100 TMT127

Pt100 Temperature Transmitter for DIN rail mounting



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 EEx ia, nA
 - CSA IS, NI
 - CSA GP
 - FM IS, NI
- GL Germanische Lloyd / marine approval
- UL recognized component
- Galvanic isolation



Function and system design

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

Measuring system The iTEMP® Pt100 TMT127 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 60751 | -200 to 850 °C (-328 to 1562 °F) | 10 K |
| | <ul style="list-style-type: none"> ■ 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 (failure signal is guaranteed > 21.5 mA)

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

Linearisation/transmission behaviour Temperature linear

Galvanic isolation U = 2 kV AC (input/output)

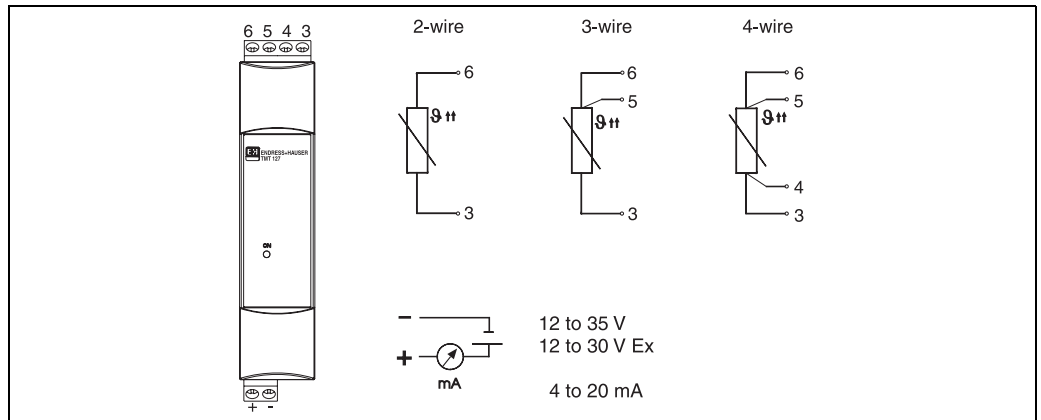
Induced current requirement ≤ 3.5 mA

Current limitation ≤ 23 mA

Switch-on delay 4 s (during switch-on procedure $I_a = 3.8 \text{ mA}$)

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: $+25$ °C (77 °F) ± 5 K (9 °F)

Measuring error

| | Designation | Accuracy ¹⁾ |
|----------------------------|-------------|--------------------------|
| Resistance thermometer RTD | Pt100 | 0.2 K (0.36 °F) or 0.08% |

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

Influence of supply voltage

- $\leq \pm 0.01\%/V$ deviation from 24 V
Percentages refer to the full scale value.

Influence of ambient temperature (temperature drift)

- Pt100 resistance thermometer:
 $T_d = \pm(15 \text{ ppm/K} * (\text{full scale value} + 200) + 50 \text{ ppm/K} * \text{of set measuring range}) * \Delta \vartheta$
 $\Delta \vartheta$ = deviation of ambient temperature from the reference operating condition.

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 highest value is valid.

Installation conditions

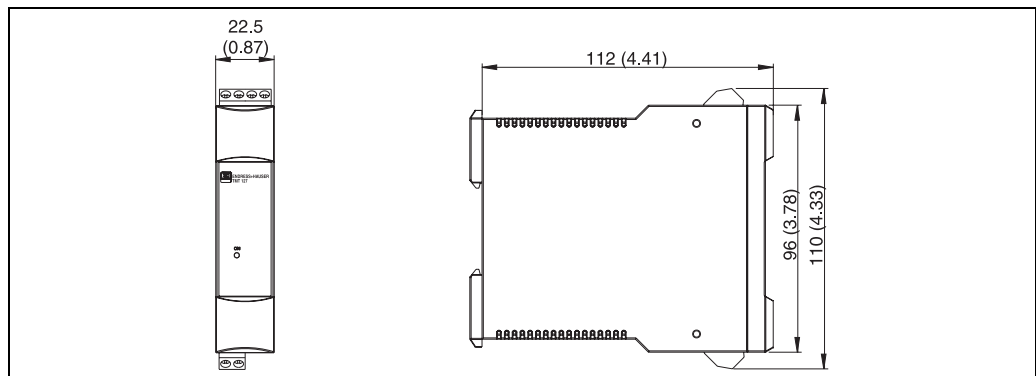
| | |
|----------------------------------|---|
| Installation instructions | Installation location No restrictions |
|----------------------------------|---|

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 IEC 60654-1, class C |
| Ingress protection | IP 20 |
| Shock resistance | 4g / 2 to 150 Hz as per IEC 60068-2-6 |
| Vibration resistance | see "Shock resistance" |
| Electromagnetic compatibility (EMC) | Shock resistance and interference emission as per EN 61326-1 (IEC 61326) and NAMUR NE 21 |
| Condensation | permitted |

Mechanical construction

Design, dimensions



Values in mm (inch)

| | |
|------------------|--|
| Weight | approx. 90 g (3.18 oz) |
| 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 device meets the legal requirements of the EC directives. Endress+Hauser confirms that the device has been successfully tested by applying the CE mark. |
| Hazardous area approvals | 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. |
| GL | Ship building approval (Germanischer Lloyd) |
| Other standards and guidelines | <ul style="list-style-type: none"> ■ IEC 60529: Degree of protection provided by housing (IP-Code) ■ IEC 61010: Safety requirements for electrical measurement, control and laboratory use. ■ IEC 61326: Electromagnetic compatibility (EMC requirements) ■ NAMUR Standards working group for measurement and control technology in the chemical industry. (www.namur.de) |
| UL | Recognized component to UL 3111-1 |

Ordering information

| | | |
|--------------------------|---|---|
| Product structure | TMT127 | iTEMP Pt100 TMT127 |
| | | for temperature measurement with Pt100; Analog 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 IEC 60715; UL recognized, ship building approval GL |
| | | Approval |
| | | A Non hazardous areas B ATEX II2(1)G EEx ia IIC T4/T5/T6 C FM IS, NI, Class I, Div. 1+2, Group ABCD D CSA IS, NI, Class I, Div. 1+2, Group ABCD E ATEX II3G EEx nA IIC T4/T5/T6 I FM+CSA IS, NI, Class I, Div. 1+2, Group ABCD J CSA General Purpose |
| | | Terminal Type |
| | 2 RTD 2-wire 3 RTD 3-wire 4 RTD 4-wire | |
| | Temperature sensor | 1 Pt100 (-200 to 850 °C, -328 to 1562 °F, min. span 10 K) |
| | Measuring Range | BA -50 to 100 °C (-58 to 212 °F) CA -40 to 60 °C (-40 to 140 °F) DA -30 to 60 °C (-22 to 140 °F) DB -30 to 150 °C (-22 to 302 °F) DC -30 to 70 °C (-22 to 158 °F) DE -10 to 200 °C (14 to 392 °F) EA -20 to 20 °C (-4 to 68 °F) EB -20 to 60 °C (-4 to 140 °F) |

| | | | | Measuring Range | |
|--------|--|--|---|-------------------|---|
| | | | | EC | -20 to 70 °C (-4 to 158 °F) |
| | | | | ED | -20 to 80 °C (-4 to 176 °F) |
| | | | | EN | -10 to 40 °C (14 to 104 °F) |
| | | | | FC | 0 to 50 °C (32 to 122 °F) |
| | | | | FE | 0 to 100 °C (32 to 212 °F) |
| | | | | FG | 0 to 150 °C (32 to 302 °F) |
| | | | | FH | 0 to 200 °C (32 to 392 °F) |
| | | | | FI | 0 to 250 °C (32 to 482 °F) |
| | | | | FJ | 0 to 300 °C (32 to 575 °F) |
| | | | | FK | 0 to 400 °C (32 to 752 °F) |
| | | | | FL | 0 to 500 °C (32 to 932 °F) |
| | | | | FN | 0 to 600 °C (32 to 1112 °F) |
| | | | | FO | 0 to 160 °C (32 to 320 °F) |
| | | | | LA | -40 to 140 °F |
| | | | | LB | -40 to 200 °F |
| | | | | MA | -20 to 400 °F |
| | | | | NA | 0 to 100 °F |
| | | | | NB | 0 to 200 °F |
| | | | | NC | 0 to 300 °F |
| | | | | ND | 0 to 500 °F |
| | | | | NE | 0 to 750 °F |
| | | | | NF | 0 to 900 °F |
| | | | | NH | 0 to 1200 °F |
| | | | | OA | 40 to 90 °C (104 to 194 °F) |
| | | | | Additional Option | |
| | | | | A | Basic version |
| | | | | B | Works calibration certificate (6 test points) |
| | | | | K | Standard model, North American region |
| TMT127 | | | 1 | | ⇒ Order code (complete) |

Accessories

No accessories are required for this device.

Documentation

- Brochure 'Temperature measurement' (FA006T/09/en)
- Short operating manual "iTEMP® RTD/TC DIN rail TMT 127/128" (KA140R/09/a3)
- ATEX Safety instructions II2(1)G (XA013R/09/a3) and II3G (XA018R/09/a3)