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71408677
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Technical Information
iTEMP TMT180

Temperature head transmitter
for resistance thermometers Pt100

Configurable using a PC, for installation in a terminal head, form B

Application

- PC-programmable (PCP) temperature head transmitter for converting a Pt100 input signal to an analog, scalable 4 to 20 mA output signal
- Input: Resistance thermometer Pt100
- Online configuration using a PC with configuration kit and PC software

Your benefits

- Universally PC-programmable for Pt100 input signal
- Two-wire technology, analog output 4 to 20 mA
- High level of accuracy over the entire operating temperature range
- Fault signal in the event of sensor break or sensor short circuit, presettable to NAMUR NE 43
- EMC according to IEC/EN 61326-1, CE
- Online configuration during operation with SETUP connector
- Customer-specific measuring range setting
- DNV GL marine approval
- UL approval
- CSA GP (General Purpose)

Endress+Hauser
People for Process Automation

Function and system design

Measuring principle

Electronic recording and conversion of Pt100 input signals in industrial temperature measurement.

Measuring system

The iTEMP TMT180 temperature head transmitter is a two-wire transmitter with an analog output and measurement input for Pt100 in 2-, 3-, or 4-wire connection. The device is set up using a configuration kit and the ReadWin 2000 operating software which is free-of-charge.

Input

Measured variable

Temperature (temperature-linear transmission behavior)

Measuring range

Description	Measuring range limits	Min. span
Pt100 as per IEC 60751	−200 to +650 °C (−328 to +1 202 °F)	10 K
	−50 to 250 °C (−58 to +482 °F)	10 K
▪ Connection type: 2-, 3- or 4-wire connection With 2-wire circuit, compensation of wire resistance possible (0 to 20 Ω) ▪ Cable resistance: Sensor cable resistance max. 11 Ω per cable ▪ Sensor current: ≤ 0.6 mA		

Output

Output signal

Analog, 4 to 20 mA, 20 to 4 mA

Transmission behavior

Temperature linear

Signal on alarm

- Sensor breakage; sensor short circuit:
  ≤ 3.6 mA or ≥ 21.0 mA (if setting is ≥ 21.0 mA an output current ≥ 21.5 mA is guaranteed)
- Underranging:
  Linear drop to 3.8 mA
- Overranging:
  Linear rise to 20.5 mA

Load

Max. ($V_{power\ supply}$ - 10 V) / 0.022 A (Current output)

Input current required

≤ 3.5 mA

Current limit

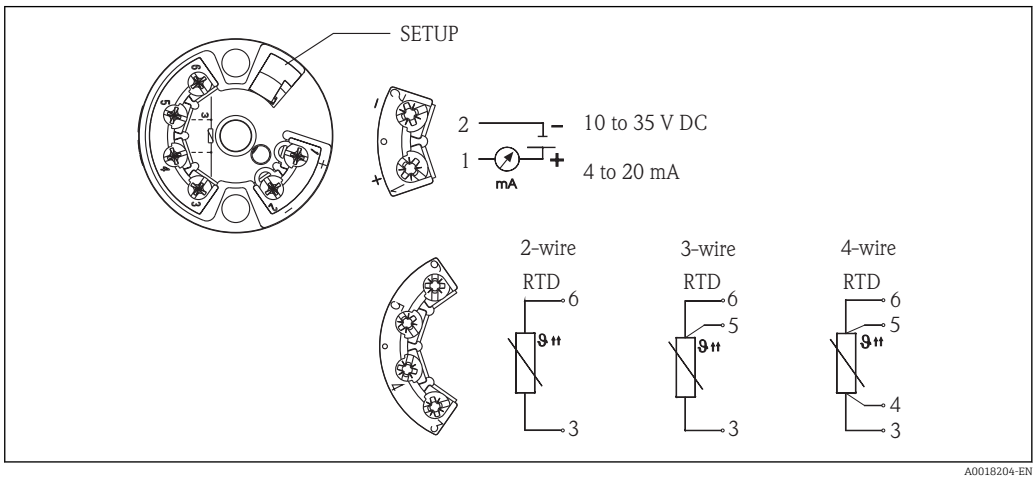
≤ 23 mA

Switch-on delay

4 s (during power up I_a = 3.8 mA)

Power supply

Terminal assignment



1 Head transmitter terminal assignment

Supply voltage

U_b = 10 to 35 V_{DC}, reverse polarity protection

Residual ripple

Permitted ripple $U_{ss} \leq 3$ V at $U_b \geq 13$ V, f max. = 1 kHz

Performance characteristics

Response time

1 s

Reference operating conditions

Calibration temperature: +25 °C (+77 °F) ± 5 K (9 °F)

Maximum measured error

The data relating to the measured error are typical values and correspond to a standard deviation of ± 3σ (normal distribution), i.e. 99.8% of all measured values achieve the specified values or better values. Percentage values refer to the set span. The larger value is valid.

	Description	Accuracy
RTD assembly RTD	Pt100 −200 to +650 °C (−328 to +1202 °F)	0.2 K or 0.08%
	Pt100 [1] −50 to 250 °C (−58 to +482 °F)	0.1 K or 0.08%
	Pt100 −200 to +250 °C (−328 to +482 °F)	0.2 K or 0.08%

1) optional

Influence of the supply voltage

≤ ±0.01%/V deviation from 24 V [1]

Long-term drift

≤ 0.1 K/Year [2] or ≤ 0.05%/Year [2] [3]

Influence of ambient temperature

Resistance thermometer (Pt100):

$T_d = \pm$ (15 ppm/K * (full scale value - measuring range start) + 50 ppm/K * preset measuring range) * Δθ

1) All data is related to a full scale value
2) Under reference operating conditions
3) % is related to the set span. The larger value is valid.

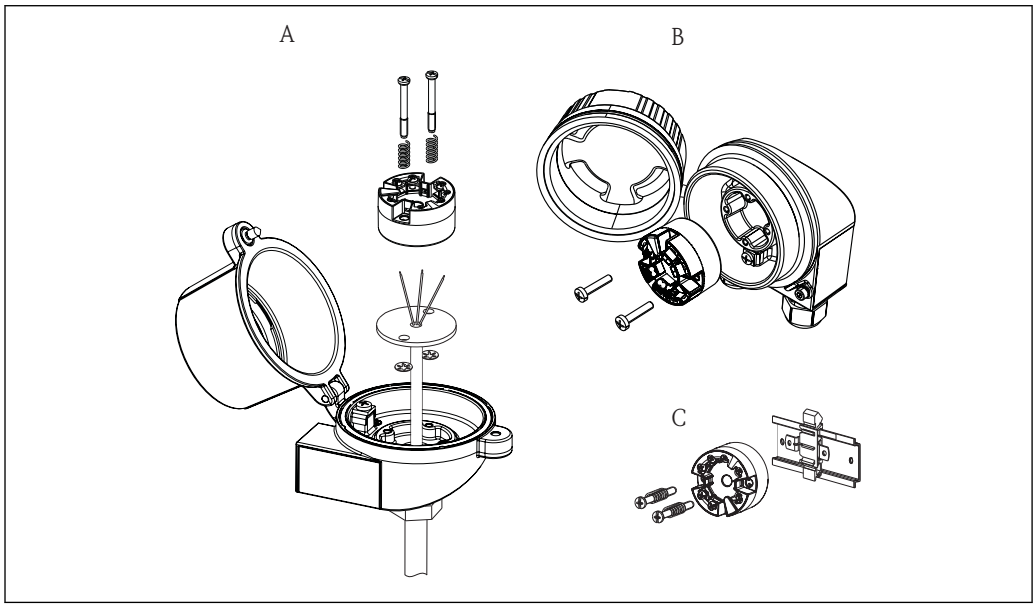
Δθ = Deviation of the ambient temperature from the reference operating condition (+25 °C (+77 °F) ± 5 K (9 °F)).

Influence of load

≤ ±0.02%/100 Ω [2)]

Installation

Mounting location



A Terminal head in accordance with DIN EN 50446 form B, direct installation onto insert with cable entry (middle hole 7 mm (0.28 in))
B Separate from process in field housing
C With clip on DIN rail as per IEC 60715 (TH35)

Orientation

No restrictions

Environment

Ambient temperature range

−40 to +85 °C (−40 to +185 °F)

Storage temperature

−40 to +100 °C (−40 to +212 °F)

Humidity

- Condensation permitted as per IEC 60068-2-33
- Max. rel. humidity: 95% as per IEC 60068-2-30

Climate class

As per IEC 60 654-1, Class C

Degree of protection

IP 00. Depends on the terminal head or field housing when installed.

Shock and vibration resistance

4 g / 2 to 150 Hz as per IEC 60 068-2-6

Electromagnetic compatibility (EMC)

CE conformity

EMC to all relevant requirements of the IEC/EN 61326-series and NAMUR Recommendation EMC (NE21). For details, refer to the Declaration of Conformity.

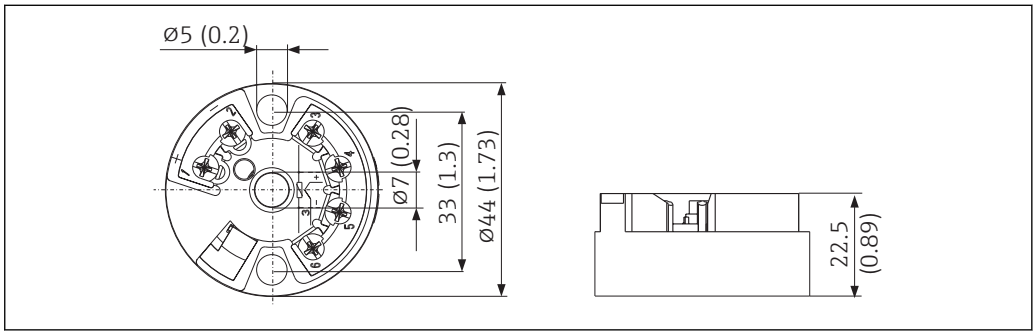
Maximum fluctuations during EMC-tests: <1% of measuring span.

Interference immunity to IEC/EN 61326-series, requirements for industrial areas.

Interference emission to IEC/EN 61326-series, electrical equipment Class B

Mechanical construction

Design, dimensions



2 Dimensions of the head transmitter in mm (in)

Weight

Approx. 40 g (1.41 oz)

Materials

- Housing: Polycarbonate (PC), complies with UL94 HB flammability standard (HB: Horizontal Burning Test). Terminals: Nickel-plated brass and gold-plated contact
- Potting: WEVO PU 403 FP/FL, approved in accordance with UL94 V0 flammability standard (V0: Vertical Burning Test)

Terminals

Screw terminals, wires up to max. 1.75 mm^2 (15 AWG) (secure screws) or 1.5 mm^2 (16 AWG) with wire end ferrules

Operability

Remote operation

Configuration using PC operating program ReadWin 2000

Menu	Configurable parameters
Standard settings	▪ Connection type (2-, 3- or 4-wire connection) ▪ Measuring unit (°C/°F) ▪ Measuring range limits
Advanced settings	▪ Compensation resistance (0 to 20 Ω) on 2-wire connection ▪ Failsafe mode ▪ Output (analog standard/inverse) ▪ Filter (0 to 60 s) ▪ Offset (–9.9 to +9.9 K) ▪ Measuring point identification/TAG
Service functions	Simulation (on/off)

Certificates and approvals

CE mark

The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EC directives. The manufacturer confirms successful testing of the product by affixing to it the CE-mark.

EAC mark

The product meets the legal requirements of the EEU guidelines. The manufacturer confirms the successful testing of the product by affixing the EAC mark.

UL approval	UL recognized component (see www.ul.com/database, search for Keyword "E225237")
CSA	The product meets the requirements as per "CLASS 2252 05 - Process Control Equipment"
Marine approvals	DNV GL
Other standards and guidelines	▪ IEC 60529: Degrees of protection provided by enclosures (IP code) ▪ IEC/EN 61010: Protection measures for electrical equipment for measurement, control, regulation and laboratory procedures ▪ NAMUR: International user association of automation technology in process industries (www.namur.de).

Ordering information

Detailed ordering information is available from the following sources:
- In the Product Configurator on the Endress+Hauser website: www.endress.com -> Click "Corporate" -> Select your country -> Click "Products" -> Select the product using the filters and search field -> Open product page -> The "Configure" button to the right of the product image opens the Product Configurator.
- From your Endress+Hauser Sales Center: www.addresses.endress.com

Product Configurator - the tool for individual product configuration
- Up-to-the-minute configuration data
- Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
- Ability to order directly in the Endress+Hauser Online Shop

Accessories

- Adapter for top-hat rail mounting, DIN rail clip according to IEC 60715
  Order No.: 51000856
- Configuration kit TXU10-
  Order No.: TXU10-AA (4-pin plug + ReadWin2000)
- Field housing TAF10 for Endress+Hauser head transmitter, aluminum, IP 66
  Order Code: TAF10-
- Spare parts kit for the head transmitter (4 screws, 6 springs, 10 fuses)
  Order No.: 51001112

Supplementary documentation

Brief Operating Instructions iTEMP TMT180 (KA00118R/09/)

www.addresses.endress.com

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