Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

iTEMP® Pt100 TMT187

Temperature head transmitter for Pt100 for installation in a sensor head form B

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 Ex ia and dust in compliance with EN 50281-1, CSA, FM
- Galvanic isolation

TI076R/09/en
No. 51001791

Endress+Hauser
People for Process Automation

Function and system design

Measuring principle

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

Measuring system

The iTEMP® Pt100 TMT187 temperature head 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 (18 °F)
	■ Type of connection: 2, 3 or 4-wire connection ■ Cable resistance: sensor cable resistance of max. 11 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 (> 21.5 mA is guaranteed)

Load

Max. ($V_{Power\ supply}$ - 8 V) / 0.025 A (current output)

Linearisation/transmission behaviour

Temperature linear

Galvanic isolation

U = 2 kV AC (input/output)

Induced current requirement

≤ 3.5 mA

Current limitation

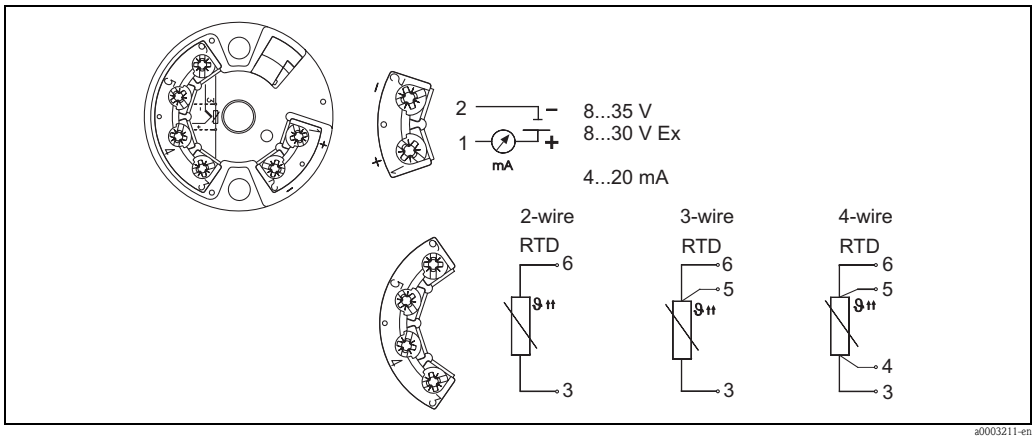
≤ 25 mA

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= 8 to 35 V, reverse polarity protection

Residual ripple

Permitted residual ripple $U_{ss} \leq 5$ V at $U_b \geq 13$ V, $f_{max.} = 1$ kHz

Accuracy

Response time

1 s

Reference operating conditions

Calibration temperature: +23 °C (73.4 °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

- ≤ ±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) * Δ ϑ

Δ ϑ = deviation of ambient temperature from the reference operating condition.

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

Orientation:
No restrictions

Installation location:
Connection head accord. to DIN 43 729 Form B; TAF 10 field housing

Environmental conditions

Ambient temperature

–40 to +85 °C (–40 to 185 °F) for Ex-area, see Ex-certification

Storage temperature

–40 to +100 °C (–40 to 212 °F)

Climate class

as per IEC 60 654-1, class C

Ingress protection

IP00/ IP66 installed

Shock and vibration resistance

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

Electromagnetic compatibility (EMC)

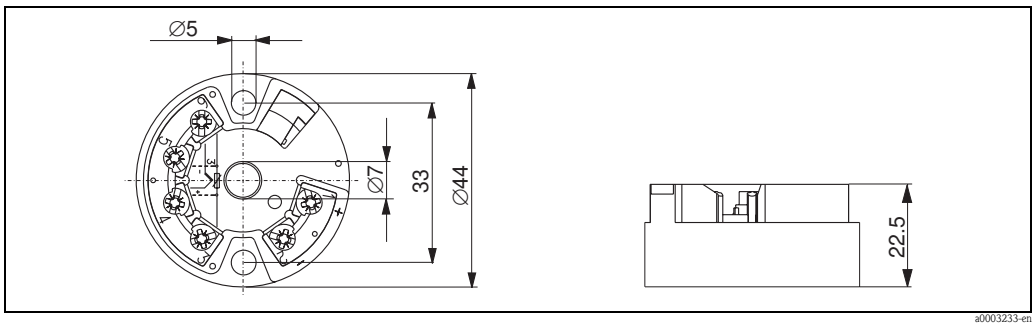
Interference immunity and interference emission according to EN 61 326-1 (IEC 1326) and NAMUR NE 21

Condensation

allowable

Mechanical construction

Design, dimensions



Values in mm (inches)

Weight

approx. 40 g (1.41 oz)

Materials

Housing: PC, Potting: PUR

Terminals

Cable up to max. 1.75 mm^2 (16 AWG), secure screws

Display and operating system

Display elements

There are no display elements available on the device.

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.

Other standards and guidelines

- IEC 60529:
  Degree of protection provided by housing (IP-Code)
- IEC 61010:
  Safety requirements for electrical measurement, control and laboratory use.
- IEC 1326:
  Electromagnetic compatibility (EMC requirements)
- NAMUR
  Standards working group for measurement and control technology in the chemical industry. (www.namur.de)

UL recognized

UL recognized component to UL 3111-1

GL approval

GL Germanische Lloyd ship building approval

Ordering information

Product structure

iTEMP® Pt100 TMT187 head transmitter

for temperature measurement; Analogue output 4 to 20 mA, 2-wire techn.; Galv. isol., fail. mode to NAMUR NE 43; For mounting in Form B head to DIN 43729; UL recognized, ship building approval GL

	Approval:	
	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 II T4/T5/T6
	F	ATEX II3D
	G	ATEX II1G EEx ia IIC T6, II3D
	H	ATEX II3G EEx nA IIC T6, II3D
	I	FM+CSA IS, NI, Class I, Div. 1-2, Group A, B, C, D
	J	CSA General Purpose

		Fitting 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. sp. 10 K, 18 °F)

TMT127-				**1**	⇒ **Order code (Part 1)**

				Measuring range:		
				BA	Range -50 to 100 °C (-58 to 212 °F)	
				BB	Range -50 to 200 °C (-58 to 392 °F)	
				CA	Range -40 to 60 °C (-40 to 140 °F)	
				DA	Range -30 to 60 °C (-22 to 140 °F)	
				DB	Range -30 to 150 °C (-22 to 302 °F)	
				DC	Range -30 to 70 °C (-22 to 158 °F)	
				DD	Range -30 to 170 °C (-22 to 338 °F)	
				DE	Range -10 to 200 °C (14 to 392 °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)	
				FO	Range 0 to 160 °C (32 to 320 °F)	
				OA	Range 40 to 90 °C (104 to 194 °F)	

					Additional option:	
					A	Basic version
					B	Works calib. certif., 6 point

TMT187			**1**			⇒ **Order code (complete)**

Accessories

No accessories are required for this device.

Documentation

- ❑ Brief operating manual "iTEMP® Pt100 & TC TMT187/188" (KA120R/09/a3)
- ❑ Ex Supplementary documentation: ATEX Safety instructions
  - II1G (XA004R/09/a3)
  - II3G (XA010R/09/a3)
  - II3D (XA026R/09/a3)

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People for Process Automation

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