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Technical Information
iTEMP TMT31

Temperature transmitter



4-20 mA temperature transmitter as head or DIN rail device with one RTD or one TC sensor input suitable for use in zone 2 (Ex ec) / Div. 2 areas

Field of application

- Reliability, long-term stability, high accuracy and diagnostic functions
- Installation in industrial and hygienic thermometers with terminal head form B
- DIN rail device for installation in control cabinets
- Available with input for either RTD thermometers or TC thermometers
- Configurable or pre-programmed at the factory

Your benefits

- Push-in terminals for fast, tool-free wiring during installation or maintenance
- Optimization of the accuracy of the measuring point through sensor-transmitter matching (CvD)
- Diagnostic information in accordance with NAMUR NE107
- Increased safety through Ex approvals

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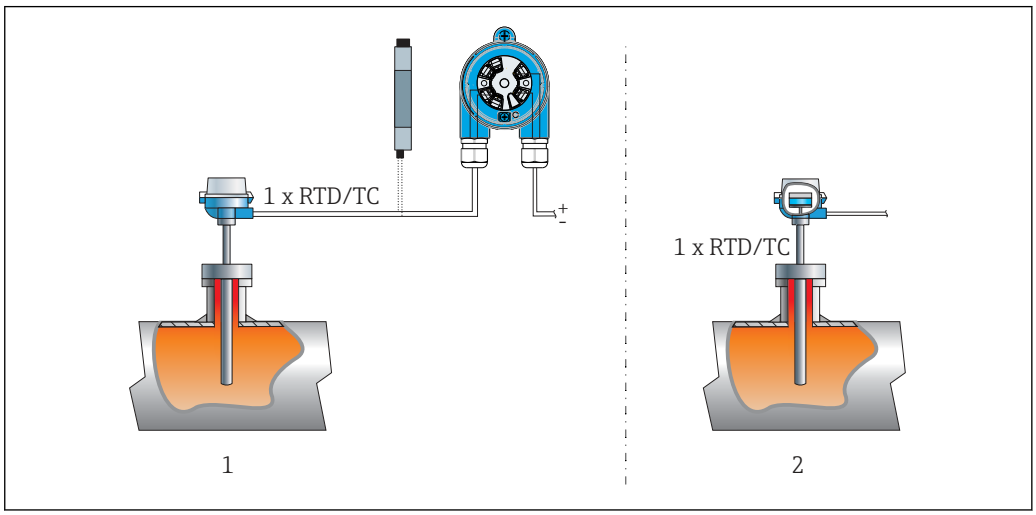
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Function and system design

Measuring system



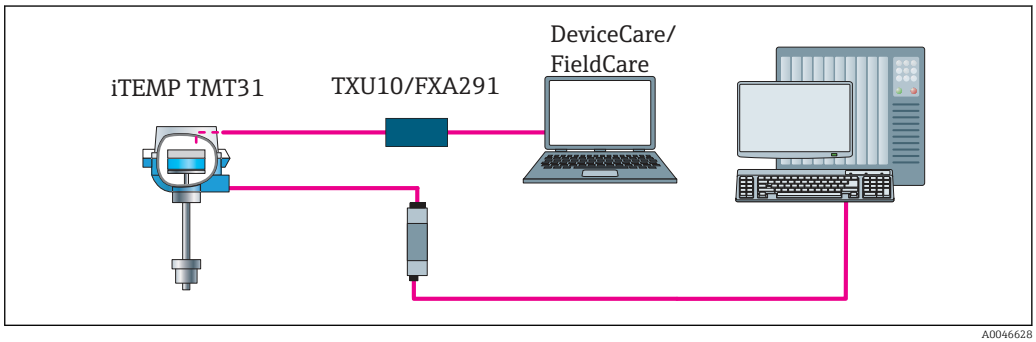
1 *Application examples*

1 A sensor (RTD or thermocouple) with transmitter in remote installation via DIN rail transmitter
2 Installed head transmitter – 1 x RTD/TC wired directly

Endress+Hauser offers a comprehensive range of industrial thermometers with resistance sensors or thermocouples.

When combined with the temperature transmitter, these components form a complete measuring point for a wide range of applications in the industrial sector.

The temperature transmitter is a 2-wire device with one measuring input and one analog output. It can be installed in a terminal head form B in accordance with DIN EN 50446 or as a DIN rail device for installation in a control cabinet on a TH35 DIN rail in accordance with EN 60715.



2 *Device architecture for PC-programmable transmitter*

Standard diagnostic functions

- Cable open-circuit, short-circuit of sensor wires
- Incorrect wiring
- Internal device errors
- Overrange and underrange detection
- Device temperature overrange/underrange detection
- Low voltage detection

Output simulation

Simulation of the 4 to 20 mA output signal

Input

Measured variable Temperature (temperature-linear transmission behavior)

Resistance thermometer (RTD) as per standard	Description	α	Measuring range limits	Min. measuring span
IEC 60751:2008	Pt100 (1) Pt1000 (4)	0.003851	−200 to 850 °C (−328 to 1 562 °F) −200 to 500 °C (−328 to 932 °F)	10 K (18 °F)
JIS C1604:1984	Pt100 (5)	0.003916	−200 to 510 °C (−328 to 950 °F)	10 K (18 °F)
GOST 6651-94	Pt100 (9)	0.003910	−200 to 850 °C (−328 to 1 562 °F)	10 K (18 °F)
-	Pt100 (Callendar Van Dusen)	-	The measuring range limits are specified by entering the limit values that depend on the coefficients A to C and R0.	10 K (18 °F)
	▪ Type of connection: 2-wire, 3-wire or 4-wire connection, sensor current: ≤ 0.3 mA ▪ With 2-wire circuit, compensation of the wire resistance possible (0 to 30 Ω) ▪ With 3-wire and 4-wire connection, sensor wire resistance up to max. 50 Ω per wire			

Thermocouples as per standard	Description	Measuring range limits		Min. measuring span
IEC 60584, Part 1	Type A (W5Re-W20Re) (30) Type B (PtRh30-PtRh6) (31) Type E (NiCr-CuNi) (34) Type J (Fe-CuNi) (35) Type K (NiCr-Ni) (36) Type N (NiCrSi-NiSi) (37) Type R (PtRh13-Pt) (38) Type S (PtRh10-Pt) (39) Type T (Cu-CuNi) (40)	0 to 2 500 °C (32 to 4 532 °F) 40 to 1 820 °C (104 to 3 308 °F) −250 to 1 000 °C (−418 to 1 832 °F) −210 to 1 200 °C (−346 to 2 192 °F) −270 to 1 372 °C (−454 to 2 502 °F) −270 to 1 300 °C (−454 to 2 372 °F) −50 to 1 768 °C (−58 to 3 214 °F) −50 to 1 768 °C (−58 to 3 214 °F) −200 to 400 °C (−328 to 752 °F)	Recommended temperature range: 0 to 2 500 °C (32 to 4 532 °F) 500 to 1 820 °C (932 to 3 308 °F) −150 to 1 000 °C (−238 to 1 832 °F) −150 to 1 200 °C (−238 to 2 192 °F) −150 to 1 200 °C (−238 to 2 192 °F) −150 to 1 300 °C (−238 to 2 372 °F) 200 to 1 768 °C (392 to 3 214 °F) 200 to 1 768 °C (392 to 3 214 °F) −150 to 400 °C (−238 to 752 °F)	50 K (90 °F) 50 K (90 °F) 50 K (90 °F) 50 K (90 °F) 50 K (90 °F) 50 K (90 °F) 50 K (90 °F) 50 K (90 °F) 50 K (90 °F)
IEC 60584, Part 1 ASTM E230-3 ASTM 988-96	Type C (W5Re-W26Re) (32)	0 to 2 315 °C (32 to 4 199 °F)	0 to 2 000 °C (32 to 3 632 °F)	50 K (90 °F)
ASTM 988-96	Type D (W3Re-W25Re) (33)	0 to 2 315 °C (32 to 4 199 °F)	0 to 2 000 °C (32 to 3 632 °F)	50 K (90 °F)
DIN 43710	Type L (Fe-CuNi) (41)	−200 to 900 °C (−328 to 1 652 °F)	−150 to 900 °C (−238 to 1 652 °F)	50 K (90 °F)
	▪ Internal cold junction (Pt1000) ▪ External preset value: Configurable value −40 to 85 °C (−40 to 185 °F) ▪ Maximum sensor wire resistance 10 kΩ (If the sensor wire resistance is greater than 10 kΩ, an error message is output in accordance with NAMUR NE89.)			

Output

Output signal

Analog output	4 to 20 mA, 20 to 4 mA (can be inverted)
Galvanic isolation (TC)	U = 1.5 kV AC for 1 minute (input/output)

Failure signal **Failure information as per NAMUR NE43:**

Failure information is created if the measuring information is missing or not valid. The error with the highest priority is displayed.

Underranging	Linear decrease from 4.0 to 3.8 mA
Overranging	Linear increase from 20.0 to 20.5 mA
Failure e.g. sensor failure; sensor short-circuit	≤ 3.6 mA ("low") or ≥ 21 mA ("high"), can be selected

Linearization/transmission behavior

Temperature linear

Filter

1st order digital filter: 0 to 120 s

Network frequency filter: 50/60 Hz (cannot be adjusted)

Protocol-specific data

DTM device description files	Information and files available at: www.endress.com

Switch-on delay

≤ 5 s, until the first valid measured value signal is present at the current output. While switch-on delay = I_a ≤ 3.8 mA

Electrical connection

Supply voltage

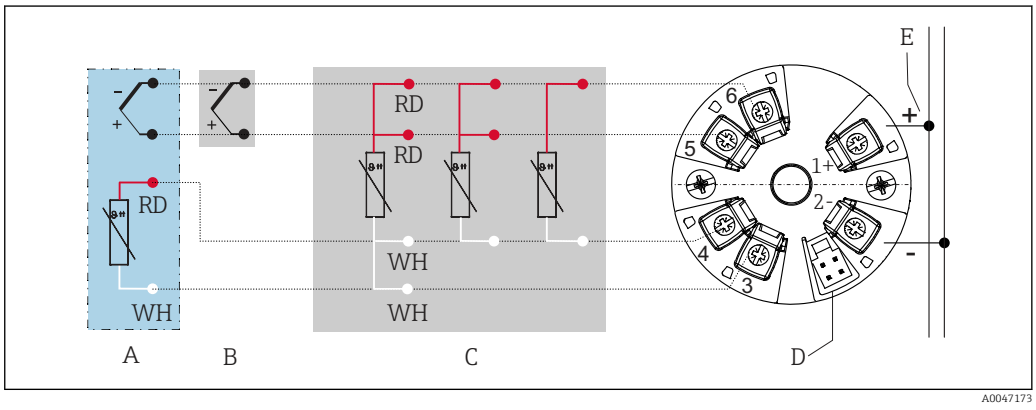
Values for non-hazardous areas, protected against polarity reversal:
10 V ≤ Vcc ≤ 36 V (standard)

Values for hazardous area, see Ex documentation.

Current consumption

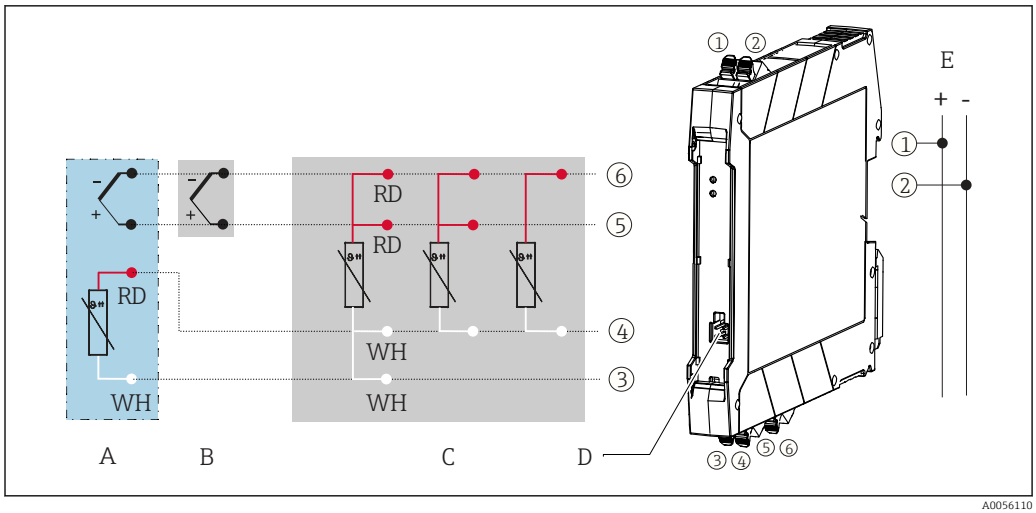
3.5 to 22.5 mA

Electrical connection



3 Terminal assignment for head transmitter

A TC sensor input, external cold junction (CJ) Pt1000
B TC sensor input, internal cold junction (CJ)
C RTD sensor input: 4-, 3- and 2-wire
D CDI interface
E Power supply



4 *Terminal assignment for DIN rail transmitter*

A TC sensor input, external cold junction (CJ) Pt1000
B TC sensor input, internal cold junction (CJ)
C RTD sensor input: 4-, 3- and 2-wire
D CDI interface
E Power supply

For the DIN rail version with an RTD input, shielded cables must be used. For the DIN rail version with TC input, a shielded cable must be used as of a sensor cable length of 30 m (98.4 ft). For a thermocouple measurement, a 2-wire RTD can be connected to measure the cold junction temperature. This is connected to terminals 3 and 4.

Terminals

Choice of screw terminals or push-in terminals for sensor and power supply cables:

Terminal design	Cable design	Cable cross-section
Screw terminals	Rigid or flexible	≤ 1.5 mm² (16 AWG)
Push-in terminals [1] (Cable design, stripping length = min. 10 mm (0.39 in)	Rigid or flexible	0.2 to 1.5 mm² (24 to 16 AWG)
	Flexible with wire end ferrules with/without plastic ferrule	0.25 to 1.5 mm² (24 to 16 AWG)

1) For push-in terminals, flexible conductors with a conductor cross-section ≤ 0.3 mm² must be fitted with ferrules.

Performance characteristics

Response time

Resistance thermometers (RTD)	0.5 s
Thermocouples (TC)	0.5 s
Cold junction (CJ)	2.0 s

Update time

Approx. 500 ms

Reference operating conditions

- Calibration temperature: 25 °C ±3 K (77 °F ±5.4 °F)
- Supply voltage: 24 V DC
- 4-wire circuit for resistance adjustment

Maximum measurement error

In accordance with EN IEC 62828 and the reference operating conditions specified above. The measurement error data corresponds to ±2 σ (Gaussian distribution). The data includes non-linearities and repeatability.

MV = Measured value

LRL = Lower range limit of relevant sensor

Measurement error for resistance thermometers (RTD)

	Measurement error (±)	
	Increased accuracy in limited measuring range, −50 to 250 °C (−58 to 482 °F)	in the entire measuring range
RTD	0.1 °C (0.18 °F) or 0.07 % of measuring span [1]	0.15 °C (0.27 °F) or 0.07 % of measuring span [1]

1) Whichever is greater

The measurement error data corresponds to ±2 σ (Gaussian distribution).

Measurement error for thermocouples (TC)

Standard	Description	Measuring range	Measurement error (±)	Measurement error (±)
			Measuring span ≤ 500 K	Measuring span > 500 K
IEC 60584-1 ASTM E230-3	Type A (30)	0 to 2 500 °C (32 to 4 532 °F)	1.63 °C (2.93 °F)	1.75 °C (3.15 °F) or 0.08% of the measuring span [1]
	Type B (31)	500 to 1 820 °C (932 to 3 308 °F)	1.55 °C (2.79 °F)	1.58 °C (2.84 °F) or 0.15 % of measuring span [1]
IEC 60584-1 ASTM E230-3 ASTM E988-96	Type C (32)	0 to 2 000 °C (32 to 3 632 °F)	0.88 °C (1.58 °F)	1.00 °C (1.80 °F) or 0.06 % of measuring span [1]
ASTM E988-96	Type D (33)		0.81 °C (1.46 °F)	0.92 °C (1.34 °F) or 0.06 % of measuring span [1]
IEC 60584-1 ASTM E230-3	Type E (34)	−150 to 1 000 °C (−238 to 1 832 °F)	0.30 °C (0.54 °F)	0.33 °C (0.59 °F) or 0.05 % of measuring span [1]
	Type J (35)	−150 to 1 200 °C (−238 to 2 192 °F)	0.33 °C (0.59 °F)	0.44 °C (0.79 °F) or 0.04 % of measuring span [1]
	Type K (36)		0.41 °C (0.74 °F)	0.50 °C (0.90 °F) or 0.05 % of measuring span [1]
	Type N (37)	−150 to 1 300 °C (−238 to 2 372 °F)	0.54 °C (0.97 °F)	0.60 °C (1.08 °F) or 0.06 % of measuring span [1]
	Type R (38)	200 to 1 768 °C (−392 to 3 214 °F)	0.91 °C (1.64 °F)	0.99 °C (1.78 °F) or 0.07 % of measuring span [1]
	Type S (39)	200 to 1 768 °C (392 to 3 214 °F)	0.97 °C (1.75 °F)	1.06 °C (1.91 °F) or 0.07 % of measuring span [1]
	Type T (40)	−150 to 400 °C (−238 to 752 °F)	0.42 °C (0.76 °F)	0.43 °C (0.77 °F)
DIN 43710	Type L (41)	−150 to 900 °C (−238 to 1 652 °F)	0.36 °C (0.65 °F)	0.41 °C (0.74 °F) or 0.05 % of measuring span [1]

1) Whichever is greater

Operating influences The measurement error data corresponds to ±2 σ (Gaussian distribution).

Operating influences of ambient temperature and supply voltage on resistance thermometers (RTD)

Description	Standard	Ambient temperature: Influence (±) per 1 °C (1.8 °F) change		Supply voltage: Influence (±) per V change	
		0 to 200 °C (32 to 392 °F)	Entire measuring range	0 to 200 °C (32 to 392 °F)	Entire measuring range
Pt100 (1)	IEC 60751:2008	0.02 °C (0.04 °F)	0.04 °C (0.07 °F)	0.01 °C (0.014 °F)	0.02 °C (0.04 °F)
Pt1000 (4)		0.01 °C (0.02 °F)	0.02 °C (0.03 °F)	0.01 °C (0.009 °F)	0.01 °C (0.02 °F)

Description	Standard	Ambient temperature: Influence (±) per 1 °C (1.8 °F) change		Supply voltage: Influence (±) per V change	
Pt100 (5)	JIS C1604:1984	0.01 °C (0.03 °F)	0.03 °C (0.05 °F)	0.01 °C (0.011 °F)	0.02 °C (0.03 °F)
Pt100 (9)	GOST 6651-94	0.02 °C (0.04 °F)	0.04 °C (0.07 °F)	0.01 °C (0.014 °F)	0.02 °C (0.04 °F)

Operating influences of ambient temperature and supply voltage on thermocouples (TC)

Description	Standard	Ambient temperature: Influence (±) per 1 °C (1.8 °F) change		Supply voltage: Influence (±) per V change	
		Measuring span ≤ 500 K	Measuring span > 500 K	Measuring span ≤ 500 K	Measuring span > 500 K
Type A (30)	IEC 60584-1 ASTM E230-3	0.07 °C (0.126 °F)	0.1 °C (0.18 °F)	0.04 °C (0.07 °F)	0.07 °C (0.13 °F)
Type B (31)		0.04 °C (0.072 °F)	0.07 °C (0.126 °F)	0.03 °C (0.05 °F)	0.05 °C (0.09 °F)
Type C (32)	IEC 60584-1 ASTM E230-3 ASTM E988-96				
Type D (33)	ASTM E988-96				
Type E (34)	IEC 60584-1 ASTM E230-3	0.02 °C (0.036 °F)	0.04 °C (0.072 °F)	0.02 °C (0.04 °F)	0.03 °C (0.05 °F)
Type J (35)					
Type K (36)		0.03 °C (0.05 °F)	0.05 °C (0.09 °F)	0.02 °C (0.04 °F)	0.04 °C (0.07 °F)
Type N (37)					
Type R (38)					
Type S (39)					
Type T (40)		0.02 °C (0.04 °F)	0.03 °C (0.05 °F)	0.01 °C (0.02 °F)	0.02 °C (0.04 °F)
Type L (41)	DIN 43710				

Long-term drift, resistance thermometers (RTD)

Long-term drift (±) [1]		
after 1 year	after 3 years	after 5 years
Based on measured value		
0.05 °C (0.09 °F) or 0.03 % of the measuring span	0.06 °C (0.11 °F) or 0.04 % of the measuring span	0.07 °C (0.13 °F) or 0.05 % of the measuring span

1) Whichever is greater

Long-term drift, thermocouples (TC)

Long-term drift (±) [1]			
	after 1 year	after 3 years	after 5 years
Type A	1.25 °C (2.25 °F) or 0.065 % of the measuring span	1.60 °C (2.88 °F) or 0.085 % of the measuring span	1.75 °C (3.15 °F) or 0.100 % of the measuring span
Type B	1.71 °C (3.078 °F)	2.24 °C (4.032 °F)	2.44 °C (4.392 °F)
Type C	0.85 °C (1.53 °F) or 0.055 % of the measuring span	1.08 °C (1.944 °F) or 0.070 % of the measuring span	1.20 °C (2.16 °F) or 0.070 % of the measuring span
Type D	0.97 °C (1.746 °F) or 0.070 % of the measuring span	1.27 °C (2.286 °F) or 0.085 % of the measuring span	1.38 °C (2.484 °F) or 0.100 % of the measuring span
Type E	0.35 °C (0.63 °F) or 0.050 % of the measuring span	0.45 °C (0.81 °F) or 0.055 % of the measuring span	0.50 °C (0.9 °F) or 0.060 % of the measuring span
Type J	0.4 °C (0.72 °F) or 0.050 % of the measuring span	0.53 °C (0.954 °F) or 0.055 % of the measuring span	0.57 °C (1.026 °F) or 0.065 % of the measuring span

Long-term drift (±) [1]			
Type K	0.48 °C (0.864 °F) or 0.045 % of the measuring span	0.55 °C (0.99 °F) or 0.070 % of the measuring span	0.61 °C (1.098 °F) or 0.070 % of the measuring span
Type N	0.62 °C (1.116 °F) or 0.055 % of the measuring span	0.80 °C (1.44 °F) or 0.070 % of the measuring span	0.86 °C (1.548 °F) or 0.080 % of the measuring span
Type R	1.02 °C (1.836 °F) or 0.080 % of the measuring span	1.31 °C (2.358 °F) or 0.115 % of the measuring span	1.48 °C (2.664 °F)
Type S	1.10 °C (1.98 °F)	1.42 °C (2.556 °F)	1.54 °C (2.772 °F)
Type T	0.41 °C (0.738 °F)	0.53 °C (0.954 °F)	0.58 °C (1.044 °F)
Type L	0.34 °C (0.612 °F) or 0.045 % of the measuring span	0.4 °C (0.72 °F) or 0.065 % of the measuring span	0.47 °C (0.846 °F) or 0.060 % of the measuring span

1) Whichever is greater

Calculation of the maximum measurement error for analog value (current output):
$\sqrt{(\text{Measurement error}^2 + \text{Influence of ambient temperature}^2 + \text{Influence of supply voltage}^2)}$

Influence of the cold junction

Pt1000 DIN IEC 60751 Cl. B (internal cold junction with thermocouples TC)

A 2-wire Pt1000 resistor must be used for external cold junction measurement. The Pt1000 must be positioned directly at the sensor terminals of the device, as the temperature difference between the Pt1000 and the terminal must be added to the measurement error of the sensor element and sensor input Pt1000.

Sensor adjustment

Sensor-Transmitter-Matching

The device enables the following method to improve the temperature measurement accuracy of RTD sensors significantly:

Callendar Van Dusen coefficient (Pt100 resistance thermometer)
The Callendar Van Dusen equation is described as:
$R_T = R_0[1+AT+BT^2+C(T-100)T^3]$

The coefficients A, B and C are used to match the sensor (platinum) and transmitter in order to improve the accuracy of the measuring system. The coefficients for a standard sensor are specified in IEC 60751. If no standard sensor is available or if greater accuracy is required, the coefficients for each sensor can be determined specifically with the aid of sensor calibration.

Sensor-transmitter matching using the method mentioned above significantly improves the temperature measurement accuracy of the entire system. This is because the transmitter uses the specific data pertaining to the connected sensor to calculate the measured temperature, instead of using the standardized sensor curve data.

1-point adjustment (offset)

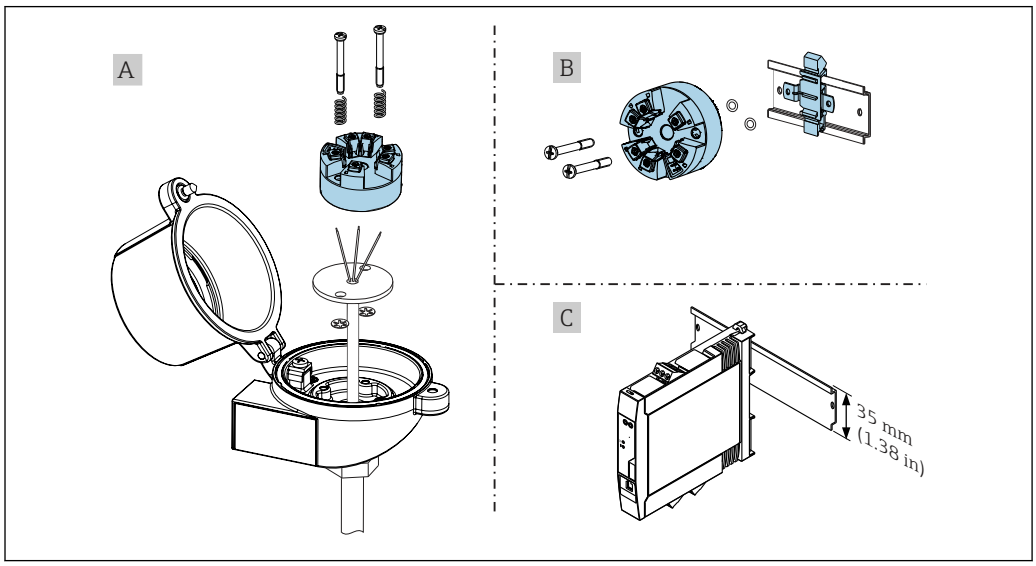
Offset adjustment of the sensor value

Current output adjustment

Correction of the 4 and/or 20 mA current output value

Installation

Installation location



A Terminal head form B in accordance with DIN EN 50446, direct installation onto insert with cable entry (middle hole 7 mm (0.28 in))
B DIN rail mounting in accordance with IEC 60715 (TH35) using a DIN rail clip (available as an accessory).
C DIN rail device for mounting on DIN rail as per IEC 60715 (TH35)

- The head transmitter must not be operated using the DIN rail clip and remote sensors as a substitute for a DIN rail device in a cabinet.
- When installing the head transmitter in a terminal head form B, make sure there is sufficient space in the terminal head.

Orientation

When the DIN rail device is used with a thermocouple measurement, increased measurement deviation may occur depending on the installation situation and ambient conditions. If the DIN rail device is mounted on the DIN rail without any adjacent devices, this may result in deviations of ±1.3 °C. Greater deviations may arise if the DIN rail device is mounted in series between other DIN rail devices.

Environment

Ambient temperature range

−40 to 85 °C (−40 to 185 °F)

Storage temperature

−50 to 100 °C (−58 to 212 °F)

Operating height

Up to 4000 m (13 123 ft) above sea level.

Relative humidity

Condensation:
- Permitted for head transmitters (95% r.h. according to IEC 60068-2-30)
- Not permitted for DIN rail transmitters (95% r.h. IEC 60068-2-78)

Climate class

- Head transmitter climate class: C1 (−5 to 45 °C, 5 to 95r.h.) according to IEC 60654-1
- DIN rail transmitter climate class: B2 (−5 to 45 °C, 5 to 95r.h.) according to IEC 60654-1

Degree of protection

- Head transmitter with screw terminals: IP 20, head transmitter with push-in terminals: IP 30. When the device is installed, the degree of protection depends on the terminal head or housing used for field mounting.
- DIN rail transmitter: IP 20

Vibration and shock resistance

Vibration resistance according to IEC 60068-2-6 (DNV):
- Head transmitter:
  - 2 to 10 Hz, 10 mm
  - 10 to 150 Hz at 4 g
- DIN rail transmitter:
  - 2 to 13.2 Hz, 1 mm
  - 13.2 to 100 Hz at 0.7 g

Vibration resistance according to IEC 60068-2-27:
- 30g, 18 ms
- 30g, 11 ms (KTA 3505)

Electromagnetic compatibility (EMC)

CE conformity

Electromagnetic compatibility in accordance with all the relevant requirements of the IEC/EN 61326 series and NAMUR Recommendation EMC (NE 21). For details, refer to the Declaration of Conformity.

Maximum measurement error <1% of measuring range.

Interference immunity as per IEC/EN 61326 series, industrial requirements

Interference emission as per IEC/EN 61326 series (CISPR 11), Class B equipment, Group 1

Overvoltage category

Overvoltage category II

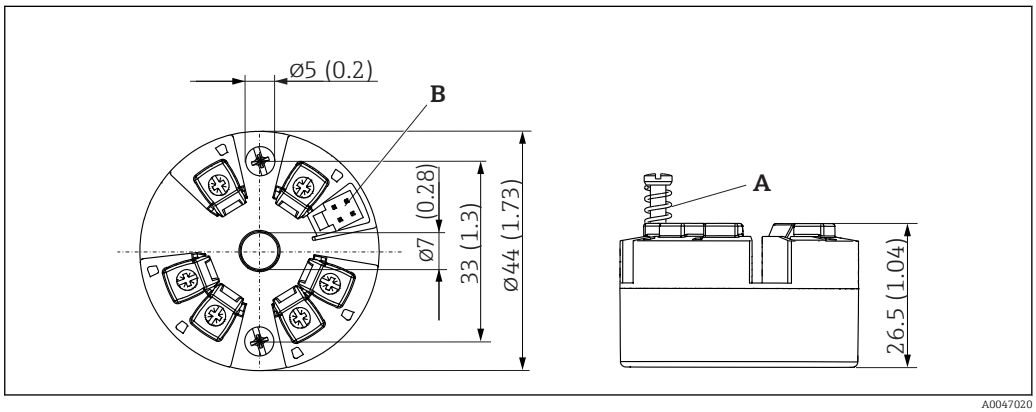
Pollution level

Pollution degree 2 as per IEC 61010-1

Mechanical construction

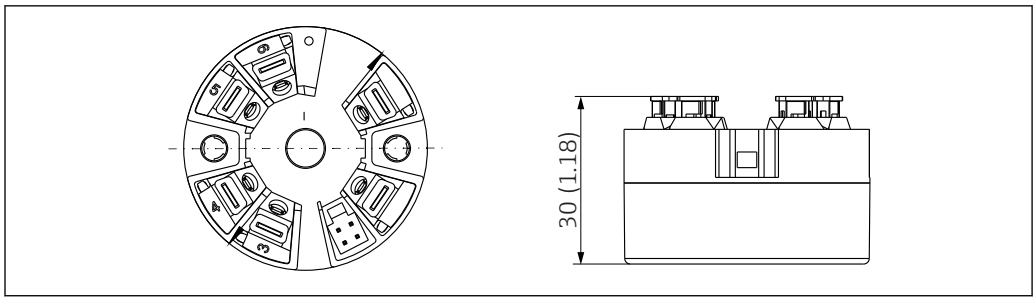
Design and dimensions

Dimensions in mm (in)



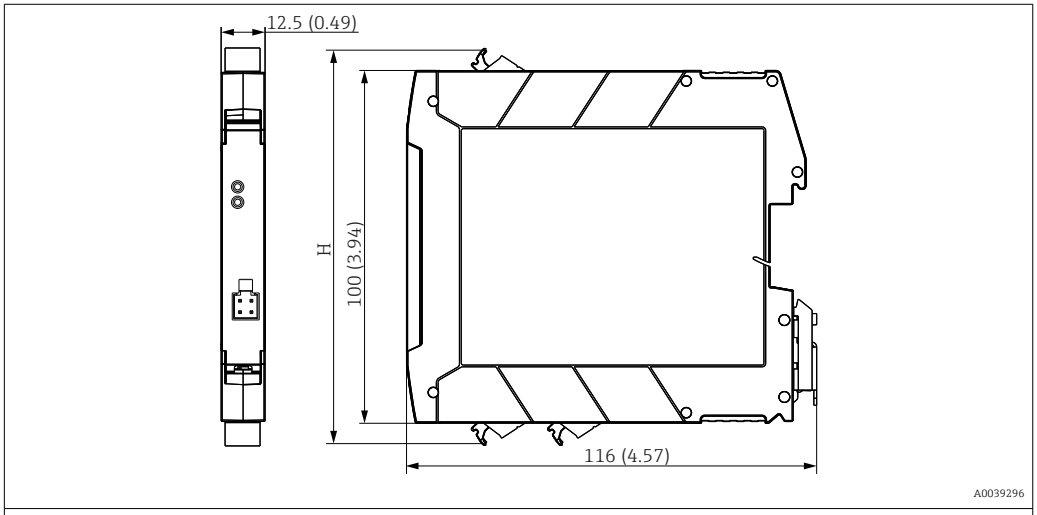
5 Version with screw terminals

A Spring travel L ≥ 5 mm (not for US - M4 securing screws)
B CDI interface for connecting a configuration tool



6 Version with push-in terminals. Dimensions are identical to the version with screw terminals, apart from housing height.

DIN rail transmitter



Height of housing H varies depending on the terminal version:
- Screw terminals: H = 114 mm (4.49 in)
- Push-in terminals: H = 111.5 mm (4.39 in)

Weight

Head transmitter:

40 to 50 g (1.4 to 1.8 oz)

DIN rail transmitter:

Approx. 100 g (3.53 oz)

Materials

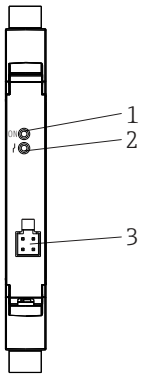
All the materials used are RoHS-compliant.

- Housing: polycarbonate (PC)
- Terminals:
  - Screw terminals: nickel-plated brass
  - Push-in terminals: tin-plated brass, contact springs 1.4310, 301 (AISI)
- Potting compound: SIL gel

Operability

Local operation

DIN rail transmitter



1:	Power LED	A green LED indicates that the voltage supply is correct
2:	Status LED	Off: no diagnostic message
		Red: Category F diagnostic message
		Red flashing: Category C, S or M diagnostic message
3:	Service interface	For connecting a configuration tool

Remote operation

device-specific parameters are configured via the CDI interface (service interface) of the device. There are special configuration tools from different manufacturers available for this purpose. Contact the manufacturer or sales department for further information.

Write protection for device parameters

Software: write protection using password user role concept (password assignment)

Certificates and approvals

Current certificates and approvals for the product are available at www.endress.com on the relevant product page:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Downloads**.

MTTF

- **RTD input:**
  418 years
- **TC input:**
  350 years

The mean time to failure (MTTF) denotes the theoretically expected time until the device fails during normal operation. The term MTTF is used for systems that cannot be repaired, e.g. temperature transmitters.

Ordering information

Detailed ordering information is available from your nearest sales organization www.addresses.endress.com or in the Product Configurator at www.endress.com:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Configuration**.

Accessories

The accessories currently available for the product can be selected at www.endress.com:

1. Select the product using the filters and search field.

2. Open the product page.
3. Select **Spare parts & Accessories**.

Device-specific accessories

Adapter for DIN rail mounting, DIN rail clip as per IEC 60715 (TH35) without securing screws
DIN mounting set (2 screws + springs, 4 lock washers and 1 CDI connector cover)
US mounting set (2 M4 screws and 1 CDI connector cover)

Communication-specific accessories

Configuration kit TXU10

Configuration kit for PC-programmable transmitter - FDT/DTM-based plant asset management tool, FieldCare/DeviceCare, and interface cable (4-pin connector) for PC with USB port.

For more information, please refer to: www.endress.com

Service-specific accessories

DeviceCare SFE100
DeviceCare is an Endress+Hauser configuration tool for field devices using the following communication protocols: HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, IO/Link, Modbus, CDI and Endress+Hauser Common Data Interfaces.

www.endress.com/sfe100

FieldCare SFE500
FieldCare is a configuration tool for Endress+Hauser and third-party field devices based on DTM technology.
The following communication protocols are supported: HART, WirelessHART, PROFIBUS, FOUNDATION Fieldbus, Modbus, IO-Link, EtherNet/IP, PROFINET and PROFINET APL.

www.endress.com/sfe500

Online tools

Product information about the entire life cycle of the device is available at:
www.endress.com/onlinetools

System components

RN series active barrier

Single- or two-channel active barrier for safe separation of 0/4 to -20 mA standard signal circuits with bidirectional HART transmission. In the signal duplicator option, the input signal is transmitted to two galvanically isolated outputs. The device has one active and one passive current input; the outputs can be operated actively or passively.

For more information, please refer to: www.endress.com

Process indicators from the RIA product family

Easily readable process indicators with various functions: loop-powered indicators for displaying 4-20 mA values, display of up to four HART variables, process indicators with control units, limit value monitoring, sensor power supply, and galvanic isolation.

Universal application thanks to international hazardous area approvals, suitable for panel mounting or field installation..

For more information, please refer to: www.endress.com

Documentation

The following document types are available in the Downloads area of the Endress+Hauser website (www.endress.com/downloads), depending on the product configuration:

Document type	Purpose and content of the document
Technical Information (TI)	**Planning aid** This document contains all the technical data on the product and provides an overview of everything that can be ordered with the product.
Brief Operating Instructions (KA)	**Quick guide to obtaining the first measured value** The Operating Instructions contain all the essential information about the product from incoming acceptance to initial commissioning.
Operating Instructions (BA)	**Reference** The Operating Instructions contain the information that is required in the various phases of the life cycle of the product: From product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.
Description of Device Parameters (GP)	**Reference for parameters** The document contains detailed explanations of readable or configurable parameters in the product. The description is aimed at those who work with the product over its entire life cycle and perform specific configurations.
Safety Instructions (XA)	Safety Instructions for electrical equipment in hazardous areas are supplied with the product depending on the approval. These are an integral part of the Operating Instructions. The nameplate indicates the Safety Instructions (XA) that are relevant to the product.
Supplementary device-dependent documentation (SD/FY)	Always comply strictly with the instructions in the relevant supplementary documentation. The supplementary documentation is an integral part of the product documentation.



www.addresses.endress.com

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