



Brief Operating Instructions 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



These Brief Operating Instructions are not a substitute for the Operating Instructions pertaining to the device. Detailed information can be found in the Operating Instructions and the additional documentation.

Available for all device versions via:

- Internet: www.endress.com/deviceviewer
- Smartphone/tablet: Endress+Hauser Operations app

Safety instructions

Manufacturer: Endress+Hauser Wetzlar GmbH + Co. KG, Obere Wank 1, D-87484 Nesselwang or www.endress.com

Requirements for the personnel

The personnel for installation, commissioning, diagnostics and maintenance must fulfill the following requirements:

- ▶ They must be trained, qualified specialists, with a relevant qualification for this specific function and task.
- ▶ They must be authorized by the plant owner/operator.
- ▶ They must be familiar with federal/national regulations.
- ▶ Before beginning work, the specialist staff must have read and understood the instructions in the Operating Instructions and supplementary documentation as well as in the certificates (depending on the application).
- ▶ Follow instructions and comply with basic conditions.

The operating personnel must fulfil the following requirements:

- ▶ Are instructed and authorized according to the requirements of the task by the plant operator.
- ▶ Follow the instructions in these Operating Instructions.

Intended use

The device is a configurable temperature transmitter with a sensor input for resistance thermometers (RTD) or thermocouples (TC). The head transmitter version of the device is intended for mounting in a terminal head (flat face) as per DIN EN 50446. It is also possible to mount the device on a DIN rail using the optional DIN rail clip. The device is also optionally available in a version suitable for DIN rail mounting as per IEC 60715 (TH35).



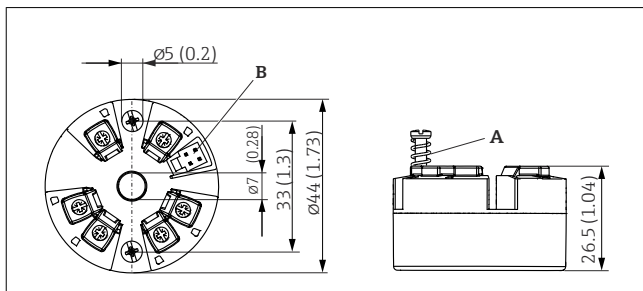
The head transmitter version of the device must not be operated using the DIN rail clip and remote sensors as a substitute for a DIN rail device in a cabinet.

Workplace safety

When working on and with the device:

- ▶ Wear the required personal protective equipment as per national regulations.

Mounting



1 Dimensions of head transmitter with screw terminals. Dimensions in mm (in)

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

Operational safety

Risk of injury!

- ▶ Operate the device only if it is in proper technical condition, free from errors and faults.
- ▶ The operator is responsible for trouble-free operation of the device.

Hazardous area

To eliminate a danger for persons or for the facility when the device is used in the hazardous area (e.g. explosion protection or safety instrumented system):

- ▶ Based on the technical data on the nameplate, check whether the ordered device is permitted for the intended use in the hazardous area. The nameplate can be found on the side of the transmitter housing.
- ▶ Comply with the instructions in the separate supplementary documentation, which is an integral part of this manual.

Electromagnetic compatibility

The measuring system complies with the general safety requirements as per EN 61010-1, the EMC requirements as per the IEC/EN 61326 series and the NAMUR recommendations NE 21.

NOTICE

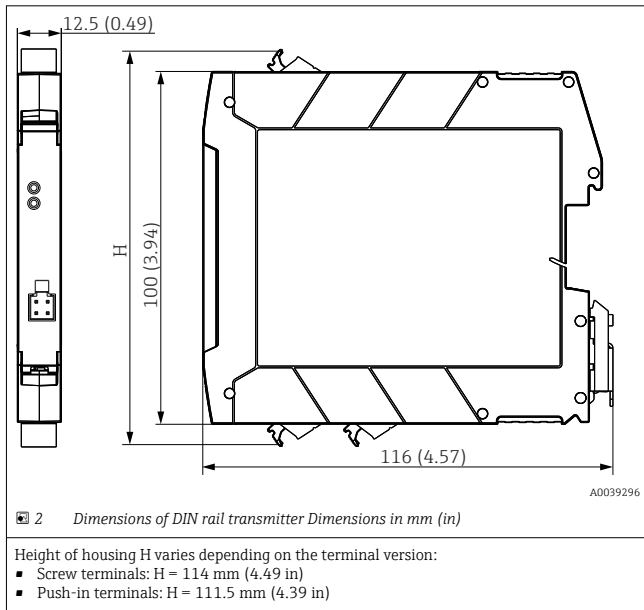
- ▶ Only power the device using a power unit that operates using an energy-limited electric circuit according to UL/EN/IEC 61010-1, Section 9.4 and the requirements in Table 18.

Product safety

This product is designed in accordance with good engineering practice to meet state-of-the-art safety requirements and has been tested and left the factory in a condition in which it is safe to operate.



The same dimensions apply to the version with push-in terminals. Exception: Height of housing $H = 30$ mm (1.18 in).

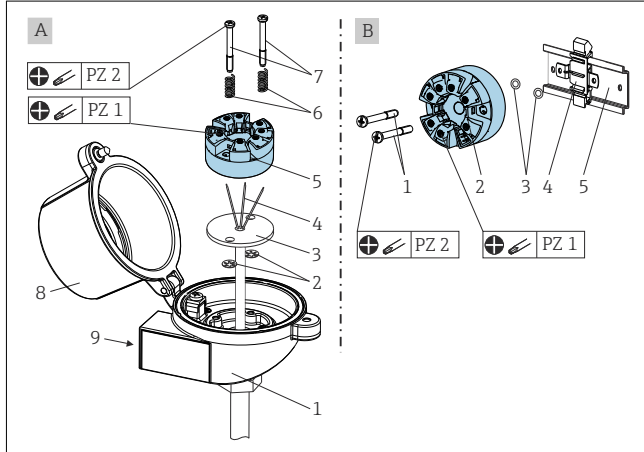


Mounting the device

Head transmitter version

- A Phillips head screwdriver is required to mount the head transmitter:
- Maximum torque for securing screws = 1 Nm (¾ foot-pound), screwdriver: Pozidriv Z2
 - Maximum torque for screw terminals = 0.35 Nm (¼ foot-pound), screwdriver: Pozidriv Z1

i When installing the device in a terminal head, make sure there is enough space in the terminal head!



A Terminal head in accordance with DIN EN 50446 form B, direct mounting onto insert with cable entry (middle hole 7 mm (0,28 in))
 B With DIN rail clip on DIN rail as per IEC 60715 (TH35)

Procedure for mounting in a terminal head, item A:

1. Open the terminal head cover (8) on the terminal head.
2. Guide the connection wires (4) of the insert (3) through the center hole in the head transmitter (5).
3. Fit the mounting springs (6) on the mounting screws (7).
4. Guide the mounting screws (7) through the side boreholes of the head transmitter and the insert (3).
5. Fix both mounting screws with the snap rings (2).
6. Tighten the head transmitter (5) along with the insert (3) in the terminal head.

Electrical connection

CAUTION

7. Seal the terminal head cover (8) once again after wiring (see "Electrical connection" section).

The head transmitter is mounted in the terminal head.

Procedure for mounting on a DIN rail, item B:

1. Press the DIN rail clip (4) onto the DIN rail (5) until it engages with a click.
2. Guide the mounting screws (1) through the side boreholes of the head transmitter (2) and secure with the retaining rings (3).
3. Screw the head transmitter (2) onto the DIN rail clip (4).

The head transmitter mounted on DIN rail.

DIN rail transmitter version

NOTICE

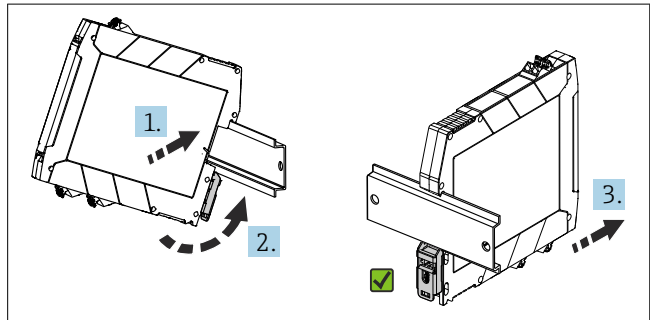
Wrong orientation

Measurement deviates from the maximum measurement accuracy when a thermocouple is connected and the internal reference junction is used.

- ▶ Mount the device vertically and ensure it is correctly oriented.

1. Position the top DIN rail groove at the top end of the DIN rail.
2. Slide the bottom of the device over the bottom end of the DIN rail until you can hear the lower DIN rail clip click into place on the DIN rail.
3. Pull gently on the device to check if it is correctly mounted on the DIN rail.

If it doesn't move, the DIN rail transmitter is correctly mounted.



3 Mounting the DIN rail transmitter

Important ambient conditions

Ambient temperature range	-40 to +85 °C (-40 to 185 °F)	Storage temperature	-50 to +100 °C (-58 to +212 °F)
Degree of protection	Head transmitter ¹⁾ with screw terminals and DIN rail transmitter: IP 20. Head transmitter with push-in terminals: IP 30.	Overvoltage category	II
Pollution degree	2	Humidity	Max. rel. humidity: 95 %

1) When the device is installed, the degree of protection of the head transmitter depends on the terminal head used.

Post-mounting check

After mounting the device, always perform the following checks:

Device condition and specifications	Notes
Are the device, the connections and connecting cables free of damage (visual inspection)?	--
Do the ambient conditions match the device specification (e.g. ambient temperature, measuring range, etc.)?	See Technical Information.
Have connections been established correctly?	--

- ▶ Switch off power supply before installing or connecting the device. Failure to observe this can result in damage to parts of the electronics.
- ▶ Do not occupy the CDI connection. Incorrect connections will cause damage to the electronics.

NOTICE

- ▶ ⚠ ESD - Electrostatic discharge. Protect the terminals from electrostatic discharge. Failure to observe this can result in damage to or malfunction of parts of the electronics.

Connecting requirements

A Phillips head screwdriver is required to wire the head transmitter with screw terminals. Use a flat blade screwdriver for the DIN rail housing version with screw terminals. The push-in terminal version can be wired without any tools.

Maximum torque for screw terminals = 0.35 Nm ($\frac{1}{4}$ lbf ft), screwdriver: Pozidriv Z1

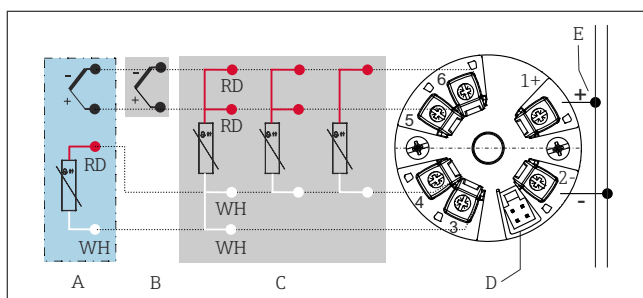
Proceed as follows to wire a mounted head transmitter:

1. Open the cable gland and the housing cover on the terminal head or the field housing.
2. Feed the cables through the opening in the cable gland.
3. Connect the cables as shown in the graphic.
4. Tighten the cable gland again and close the housing cover.

The head transmitter is wired in the terminal head.

Connecting the device

Supply voltage	Values for non-hazardous areas, protected against polarity reversal: $U = 10$ to $36 V_{DC}$
Current consumption	3.5 to 22.5 mA



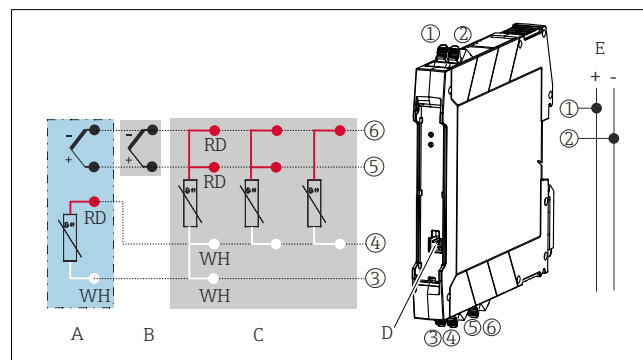
4 Terminal assignment of head transmitter

- A Sensor input TC, external cold junction (CJ) Pt1000
 B Sensor input TC, internal cold junction (CJ)
 C RTD sensor input: 4-, 3- and 2-wire

Maintenance and cleaning

No special maintenance work is required for the device.

- D CDI interface
 E Power supply



5 Terminal assignment of DIN rail transmitter

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

In the case of a thermocouple (TC) measurement, a 2-wire RTD can be connected to measure the cold junction temperature. This is connected to terminals 3 and 4.

Post-connection check

Device condition and specifications	Notes
Is the device or cable undamaged (visual check)?	--
Do the ambient conditions match the device specification (e.g. ambient temperature, measuring range, etc.)?	See Technical Information.
Electrical connection	Notes
Does the supply voltage match the specifications on the nameplate?	$U = \text{e.g. } 10$ to $36 V_{DC}$
Do the mounted cables have adequate strain relief?	--
Are the power supply and signal cables connected correctly?	--
Are all the screw terminals firmly tightened and have the push-in terminal connections been checked?	--
Are all cable entries mounted, firmly tightened and leak-tight?	--

A clean, dry cloth can be used to clean the device.
