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Brief Operating Instructions
iTHERM ModuLine thermometer

Universal, modular RTD/TC thermometers for a wide range of industrial applications

These are Brief Operating Instructions; they do not replace the Operating Instructions included in the scope of supply. 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

These instructions are only valid for the following thermometers in the Endress+Hauser iTHERM ModuLine product family:

Direct installation without a thermowell	Installation with thermowell
TM101	TM121
TM111	TM131
TM112	TM151
	TM152
	TST90

Safety instructions

Requirements for the personnel

The personnel must fulfill the following requirements for its tasks:
- ▶ Trained, qualified specialists must have a relevant qualification for this specific function and task.
- ▶ Are authorized by the plant owner/operator.
- ▶ Are familiar with federal/national regulations.
- ▶ Before starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- ▶ Follow instructions and comply with basic conditions.

Designated use

The thermometers described here are suitable for temperature measurement in industrial and hygienic applications. Depending on the version, the thermometers can be installed either in the process in direct contact with the medium, or in a thermowell. The thermowell designs can be configured. However, the process parameters (temperature, pressure, density and flow velocity) must be taken into account. It is the responsibility of the operator to select the thermometer and thermowell, in particular the material used, to ensure safe operation of the temperature measuring point.

Incorrect use

The manufacturer is not liable for damage caused by improper or non-designated use.

With regard to process media and media used for cleaning, Endress+Hauser will be happy to assist in clarifying the corrosion-resistant properties of wetted materials but gives no guarantee or warranty as to the suitability of the materials.

Workplace safety

⚠ CAUTION

Extreme temperatures (hot and cold) can occur at the thermometer and in the terminal head. There is a risk of burning and damage to property.
- ▶ Wear appropriate protective equipment.

⚠ CAUTION

There is an the increased risk of electric shock if working on and with the device with wet hands.
- ▶ Wear appropriate protective equipment.

Operational safety

Damage to the device!
- ▶ Operate the device only if it is in proper technical condition, free from errors and faults.
- ▶ The operator is responsible for ensuring that the device is in good working order.

Hazardous area

To avoid danger to individuals or the facility when the device is used in the approval-related area (e.g. explosion protection or safety instrumented systems):
- ▶ 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 device.
- ▶ Observe the specifications in the separate supplementary documentation included as an integral part of these instructions.

Temperature

NOTICE

During operation, heat conduction or heat radiation may cause the temperature in the terminal head to rise.
- ▶ Exceeding the operating temperature of the transmitter or housing must be prevented using appropriate heat insulation or a suitably long extension neck.

Product safety

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

It meets general safety standards and legal requirements. It also complies with the EU directives listed in the device-specific EU Declaration of Conformity. The manufacturer confirms this by affixing the CE mark to the device.

Endress+Hauser
People for Process Automation

Installation

Installing the thermometer

Pay attention to whether the thermometer may be installed directly in the process or whether a thermowell must be used.

See Technical Information for the relevant thermometer.

WARNING

Process pressure occurs. Risk of injury.

- Make sure that the device is installed and secured before applying the process pressure.
- Wear appropriate safety equipment during mounting.

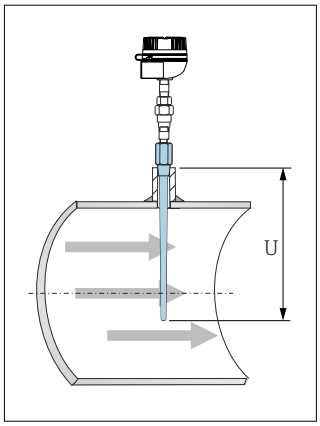
WARNING

Incorrectly designed, faulty or leaking welded seams. Risk of injury.

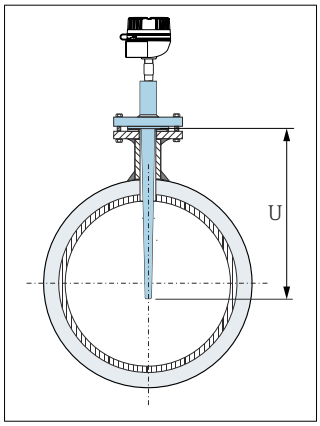
- Ensure that welding work is carried out by qualified specialists only.
- When designing the welded seam, the requirements arising from the process conditions must be taken into account.
- Wear appropriate protective equipment during welding.

To install, proceed as follows:

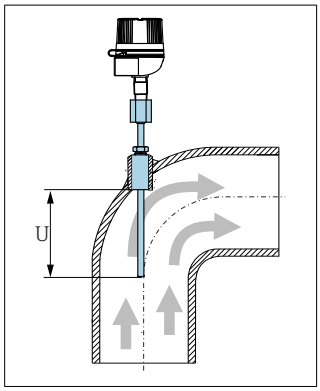
- The process connection and compression fitting must comply with the maximum specified process pressure.
- The permitted loading capacity of the process connections can be found in the relevant standards.
- Adjust the loading capacity of the thermowell in accordance with the process conditions. It may be necessary to calculate the static and dynamic loading capacity.



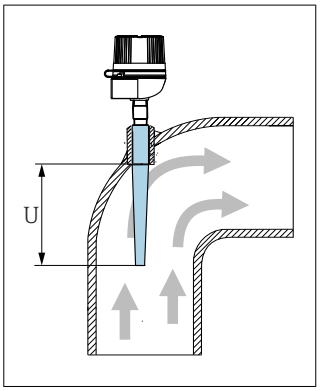
1 *Threaded installation, straight installation*



2 *Flanged installation, straight installation*



3 *Installation with weld-in adapter, angled installation*



4 *Installation with socket weld, angled installation*

Incorrect installation leads to inaccurate measurement. Observe the installation requirements.

Installation requirements

Important ambient conditions

Ambient temperature ▪ With mounted iTEMP head transmitter: −40 to +85 °C (−40 to 185 °F) ▪ With iTEMP head transmitter and display: −20 to 70 °C (−4 to 158 °F) ▪ iTHERM QuickNeck: −50 to +140 °C (−58 to +284 °F)
Storage temperature −50 to +140 °C (−58 to +284 °F)
Pollution degree 2
Operating altitude ≤ 2 000 m (6 561 ft)
Humidity Max. rel. humidity: 95% as per IEC 60068-2-30; condensation permitted as per IEC 60068-2-33.
Climate class Class C as per EN 60654-1
Degree of protection IP66. When installed, the degree of protection depends on the terminal head. Partly IP 68.
Process pressure Max. 20 bar for iTHERM ModuLine TM111/TM112, depends on process connection (as per CSA/UL/EN/IEC 61010-1).

Electrical connection

NOTICE

- ESD - Electrostatic discharge. Protect the terminals from electrostatic discharge. Failure to observe this may result in the destruction or malfunction of parts of the electronics.

Connecting requirements

A Phillips screwdriver is required to wire the iTEMP head transmitter with screw terminals, e.g. Pozidriv Z1. The push-in terminal version can be wired without any tools.

CAUTION

Risk associated with the uncontrolled activation of processes!

- Switch off the supply voltage before connecting the device.

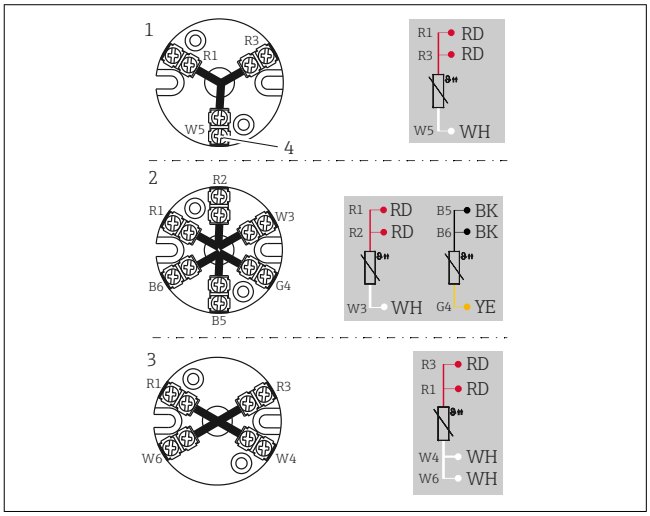
CAUTION

An incorrect connection compromises the electrical safety!

- Switch off the supply voltage before connecting the device.

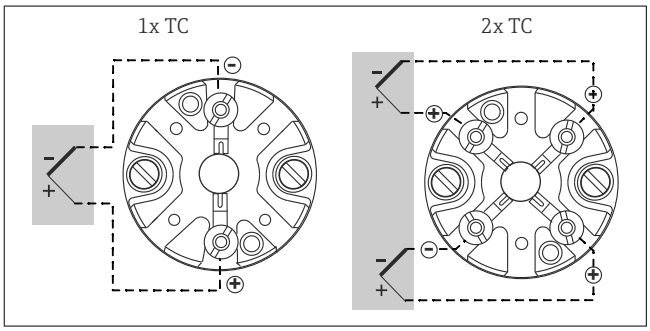
Please refer to the separate Ex documentation for all explosion protection data. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas.

For information on the electrical connection, see the technical documentation of the specific iTEMP transmitter.



5 *Installed ceramic terminal block for RTD*

1 3-wire
2 2x3-wire
3 4-wire
4 Outside screw



6 *Installed ceramic terminal block for thermocouples.*

Thermocouple wire colors

As per IEC 60584	As per ASTM E230
▪ Type J: black (+), white (-) ▪ Type K: green (+), white (-) ▪ Type N: pink (+), white (-)	▪ Type J: white (+), red (-) ▪ Type K: yellow (+), red (-) ▪ Type N: orange (+), red (-)

Power supply

Supply voltage

U = max. 9 to 42 V_{DC}, depending on the iTEMP temperature transmitter used.

Current consumption

I ≤ 23 mA, depending on the iTEMP temperature transmitter used.

Der iTEMP temperature transmitter may only be powered by a power unit with an energy-limited circuit in accordance with UL/EN/IEC 61010-1, Section 9.4 and the requirements of Table 18.

Commissioning

Switching on the device

After the electrical connection, switch on the supply voltage. During the switch-on procedure, the transmitter runs through internal test functions. Depending on the type of transmitter selected, the device operates after 5 to 33 s. Normal measuring mode commences as soon as the switch-on procedure is completed.

Configuring the device

See the technical documentation for the specific transmitter.

Maintenance and cleaning

Cleaning

WARNING

Explosion Hazard! Static charge in hazardous areas.

► Do not clean with a dry cloth in hazardous areas.

Cleaning of surfaces not in contact with the medium

- Recommendation: Use a lint-free cloth that is either dry or slightly dampened using water.
- Do not use any sharp objects or aggressive cleaning agents that corrode the surfaces (displays, housing, for example) and seals.
- Do not use high-pressure steam.
- Observe the degree of protection of the device.

The cleaning agent used must be compatible with the materials of the device configuration. Do not use cleaning agents with concentrated mineral acids, bases or organic solvents.

Cleaning of surfaces in contact with the medium

Note the following for cleaning and sterilization in place (CIP/SIP):

- Use only cleaning agents to which the materials in contact with the medium are sufficiently resistant.
- Observe the permitted maximum medium temperature.