

Operating Instructions

L20221

Temperature transmitter
with 4-20 mA analog output



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1 About this document

1.1 Document function

These Operating Instructions contain all the information required in the various life cycle phases of the device: from product identification, incoming acceptance and storage, to installation, connection, operation and commissioning, through to troubleshooting, maintenance and disposal.

1.2 Safety instructions

When using in hazardous areas, compliance with national regulations is mandatory. Separate Ex-specific documentation is provided for measuring systems that are used in hazardous areas. This documentation is an integral part of these Operating Instructions. The installation specifications, connection data and safety instructions it contains must be strictly observed! Make sure that you use the right Ex-specific documentation for the right device with approval for use in hazardous areas!

1.3 Symbols used

1.3.1 Safety symbols



This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.



This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.



This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.



This symbol contains information on procedures and other facts which do not result in personal injury.

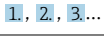
1.3.2 Electrical symbols

Symbol	Meaning
	Direct current
	Alternating current
	Direct current and alternating current
	Ground connection A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
	Potential equalization connection (PE: protective earth) Ground terminals that must be connected to ground prior to establishing any other connections. The ground terminals are located on the interior and exterior of the device: ■ Interior ground terminal: potential equalization is connected to the supply network. ■ Exterior ground terminal: device is connected to the plant grounding system.

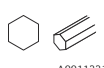
1.3.3 Symbols for certain types of information

Symbol	Meaning
	Permitted Procedures, processes or actions that are permitted.
	Preferred Procedures, processes or actions that are preferred.
	Forbidden Procedures, processes or actions that are forbidden.
	Tip Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
	Notice or individual step to be observed
	Series of steps
	Result of a step
	Help in the event of a problem
	Visual inspection

1.3.4 Symbols in graphics

Symbol	Meaning	Symbol	Meaning
1, 2, 3,...	Item numbers		Series of steps
A, B, C, ...	Views	A-A, B-B, C-C, ...	Sections
	Hazardous area		Safe area (non-hazardous area)

1.4 Tool symbols

Symbol	Meaning
 A0011220	Flat-blade screwdriver
 A0011219	Phillips head screwdriver
 A0011221	Allen key
 A0011222	Open-ended wrench
 A0013442	Torx screwdriver

1.5 Registered trademarks

Bluetooth®

The *Bluetooth*® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks is under license. Other trademarks and trade names are those of their respective owners.

2 Basic safety instructions

2.1 Requirements for the personnel

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

- ▶ 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
- ▶ They must have read and understood the instructions in the manual, supplementary documentation and certificates (depending on the application) prior to starting work
- ▶ Follow instructions and comply with basic conditions

The operating personnel must fulfill the following requirements:

- ▶ Must be suitably trained and authorized by the plant operator to meet the requirements of the task
- ▶ Follow the instructions in this manual

2.2 Intended use

The device is a universal and user-configurable temperature transmitter with one sensor input for resistance thermometers (RTD), thermocouples (TC), resistance and voltage transmitters. 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).

If the device is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.

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

2.3 Operational safety

- ▶ Operate the device only if it is in proper technical condition, free from errors and faults.
- ▶ The operator is responsible for the interference-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 equipment):

- ▶ 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.
- ▶ Observe the specifications in the separate supplementary documentation that is an integral part of these instructions.

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

- ▶ The device must only be powered by 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.

3 Incoming acceptance and product identification

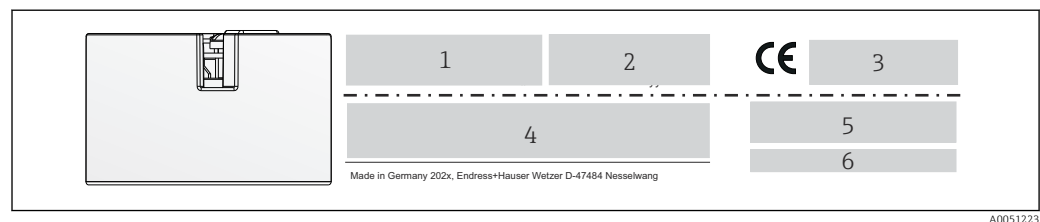
3.1 Incoming acceptance

1. Unpack the temperature transmitter carefully. Is the packaging or content free from damage?
 - ↳ Damaged components must not be installed as the manufacturer can otherwise not guarantee compliance with the original safety requirements or the material resistance, and can therefore not be held responsible for any resulting damage.
2. Is the delivery complete or is anything missing? Check the scope of delivery against your order.
3. Does the nameplate match the ordering information on the delivery note?
4. Are the technical documentation and all other necessary documents provided? If applicable: are the Safety Instructions (e.g. XA) for hazardous areas provided?

3.2 Nameplate

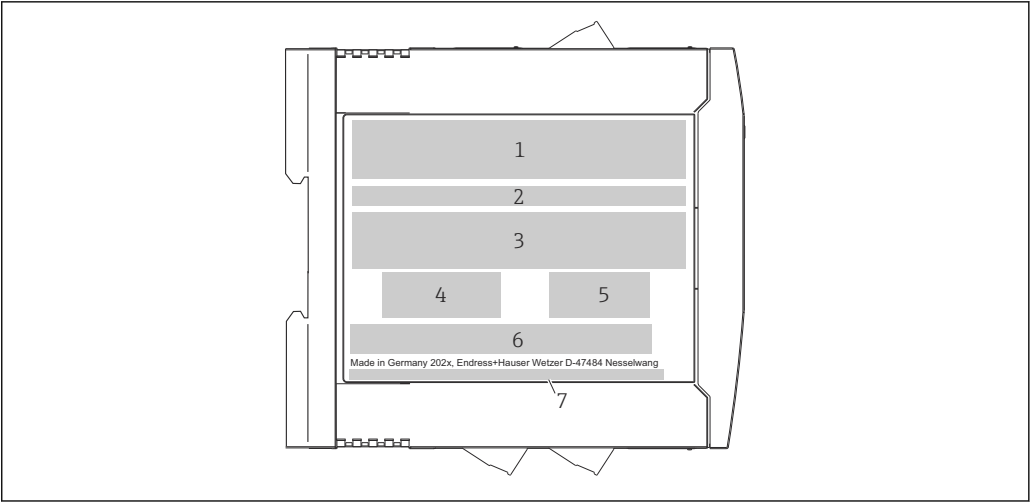
The right device?

Compare and check the data on the nameplate of the device against the requirements of the measuring point:



 1 Nameplate of the head transmitter (example)

- 1 Power supply, current consumption, serial number, device revision and hardware version
- 2 Radio approval (Bluetooth) and serial number
- 3 Approvals with symbols
- 4 Approval data and order code
- 5 Device name
- 6 Characters for tag name (TAG)



A0051224

 2 Nameplate of DIN rail transmitter (example)

- 1 Device name
- 2 Characters for tag name (TAG)
- 3 Approval data
- 4 Power supply and current consumption, output
- 5 Radio approval (Bluetooth)
- 6 Approvals with symbols
- 7 Serial number, device revision, order code

3.3 Name and address of manufacturer

Name of manufacturer:	Endress+Hauser Wetzer GmbH + Co. KG
Address of manufacturer:	Obere Wank 1, D-87484 Nesselwang

3.4 Scope of delivery

The scope of delivery of the device comprises:

- Temperature transmitter
- Mounting material (optional for head transmitter)
- Printed copy of the Brief Operating Instructions in English
- Additional documentation for devices which are suitable for use in the hazardous area (ATEX, FM, CSA).

3.5 Certificates and approvals

The device left the factory in a safe operating condition. The device complies with the requirements of the standards EN 61010-1 "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use" and with the EMC requirements as per the IEC/EN 61326 series.

3.5.1 CE/EAC mark, Declaration of Conformity

The device meets the legal requirements of the EU/EEU guidelines. The manufacturer confirms that the device is compliant with the relevant guidelines by applying the CE/EAC mark.

3.6 Storage and transport

Storage temperature

- Head transmitter: -50 to +100 °C (-58 to +212 °F)
- DIN rail device: -50 to +100 °C (-58 to +212 °F)
- Humidity: (device-specific): max. rel. humidity: 95 % as per IEC 60068-2-30



Pack the device for storage and transportation in such a way that it is reliably protected against impact and external influences. The original packaging offers the best protection.

Avoid the following environmental influences during storage:

- Direct sunlight
- Vibration
- Aggressive media

4 Mounting

4.1 Mounting requirements

4.1.1 Dimensions

The dimensions of the device are provided in the "Technical data" section .

4.1.2 Mounting location

- Head transmitter:
 - In the terminal head, flat face, as per DIN EN 50446, direct mounting on insert with cable entry (middle hole 7 mm)
 - In the field housing, separated from the process
- DIN rail transmitter:
 - Designed for mounting on a DIN rail (IEC 60715 TH35).

 It is also possible to mount the head transmitter on a DIN rail as per IEC 60715 using the DIN rail clip accessory.

Information about the conditions (such as the ambient temperature, degree of protection, climate class etc.) that must be present at the installation point so that the device can be mounted correctly is provided in the "Technical data" section →  47.

When using in hazardous areas, the limit values of the certificates and approvals must be observed (see Ex Safety Instructions).

NOTICE

When using a DIN rail transmitter with a thermocouple/mV measurement, increased measurement deviations may occur depending on the installation situation and ambient conditions.

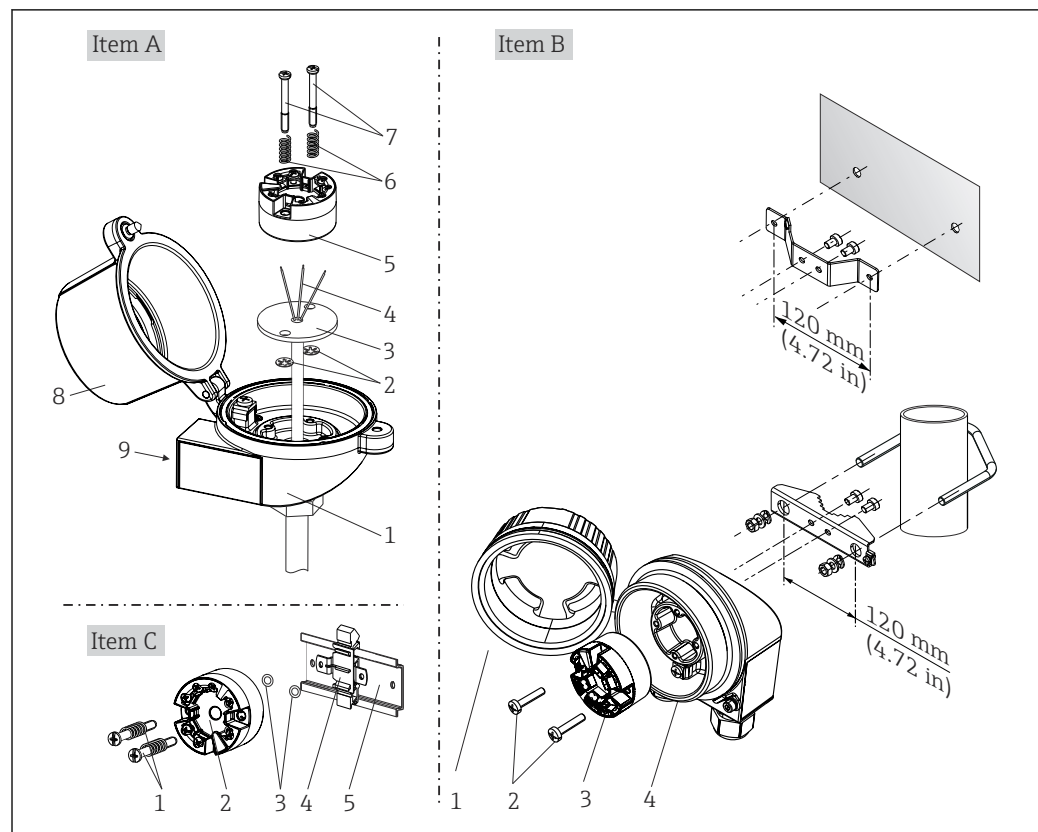
- If the DIN rail transmitter is mounted on the DIN rail without any adjacent devices, this may result in deviations of up to $\pm 1.34\text{ }^{\circ}\text{C}$. If the DIN rail transmitter is mounted in series between other DIN rail devices (reference operating conditions: 24 V, 12 mA), deviations of up to $+ 2.94\text{ }^{\circ}\text{C}$ may occur.

4.2 Mounting the device

A Phillips head screwdriver is required to mount the head transmitter:

- Maximum torque for securing screws = 1 Nm ($\frac{3}{4}$ foot-pound), screwdriver: Pozidriv Z2
- Maximum torque for screw terminals = 0.35 Nm ($\frac{1}{4}$ foot-pound), screwdriver: Pozidriv Z1

4.2.1 Mounting the head transmitter



A0039675-EN

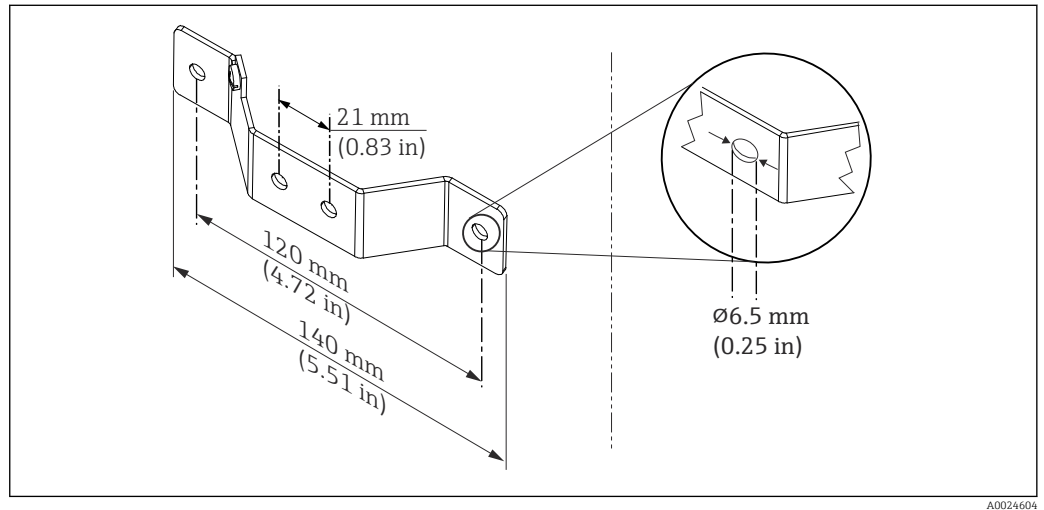
3 Head transmitter mounting (three versions)

Fig. A	Mounting in a terminal head (terminal head flat face as per DIN 43729)
1	Terminal head
2	Circlips
3	Insert
4	Connection wires
5	Head transmitter
6	Mounting springs
7	Mounting screws
8	Terminal head cover
9	Cable entry

Procedure for mounting in a terminal head, Fig. 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). Then fix both mounting screws with the snap rings (2).
5. Then tighten the head transmitter (5) along with the insert (3) in the terminal head.
6. After wiring → 17, close the terminal head cover (8) tightly again.

Fig. B	Mounting in a field housing
1	Field housing cover
2	Mounting screws with springs
3	Head transmitter
4	Field housing



4 Dimensions of angle bracket for wall mount (complete wall mounting set available as accessory)

Procedure for mounting in a field housing, Fig. B:

1. Open the cover (1) of the field housing (4).
2. Guide the mounting screws (2) through the lateral bores in the head transmitter (3).
3. Screw the head transmitter to the field housing.
4. After wiring → 17, close the field housing cover (1) again.

Fig. C	Mounting on DIN rail (DIN rail as per IEC 60715)
1	Mounting screws with springs
2	Head transmitter
3	Circlips
4	DIN rail clip
5	DIN rail

Procedure for mounting on a DIN rail, Fig. C:

1. Press the DIN rail clip (4) onto the DIN rail (5) until it engages with a click.
2. Fit the mounting springs on the mounting screws (1) and guide the screws through the side boreholes of the head transmitter (2). Then fix both mounting screws with the snap rings (3).
3. Screw the head transmitter (2) onto the DIN rail clip (4).

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