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# Safety Instructions
# **Temperature transmitter**

iTEMP TMT142, TMT162

0Ex ia IIC T6...T4 Ga X
1Ex d IIC T6...T4 Gb X
Ex tb IIIC T85°C...T105°C X

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Endress+Hauser
People for Process Automation

# Temperature transmitter

iTEMP TMT142, TMT162

## Table of contents

**Associated documentation**

This document is an integral part of the following Operating Instructions:

- TMT142:
  BA00191R/09/
- TMT162 HART®:
  Operating Instructions: BA00132R/09/
  Brief Operating Instructions: KA00250R/09/
- TMT162 FOUNDATION Fieldbus™:
  Operating Instructions: BA00224R/09/
  Brief Operating Instructions: KA00189R/09/
- TMT162 PROFIBUS® PA:
  Operating Instructions: BA00275R/09/
  Brief Operating Instructions: KA00276R/09/

The Operating Instructions which correspond to the device type apply.

**Supplementary Documentation**

The Explosion-protection brochure is available:
In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> "Brochures and catalogs" ->
Text Search: CP00021Z

**EAC certificate of conformity according to TR CU 012/2011**

The temperature transmitters meet the fundamental health and safety requirements for the design and construction of devices and protective systems intended for use in potentially explosive atmospheres.

Certification body: НАНИО "ЦСВЭ"

Certificate number: ЕАЭС RU C-DE.AA87.B.00330/20

Affixing the certificate number certifies conformity with the following standards:

GOST 31610.0-2014 (IEC 60079-0:2011)

GOST IEC 60079-1-2011

GOST 31610.11-2014 (IEC 60079-11:2011)

GOST 31610.26-2012/IEC 60079-26:2006

**Manufacturer address**

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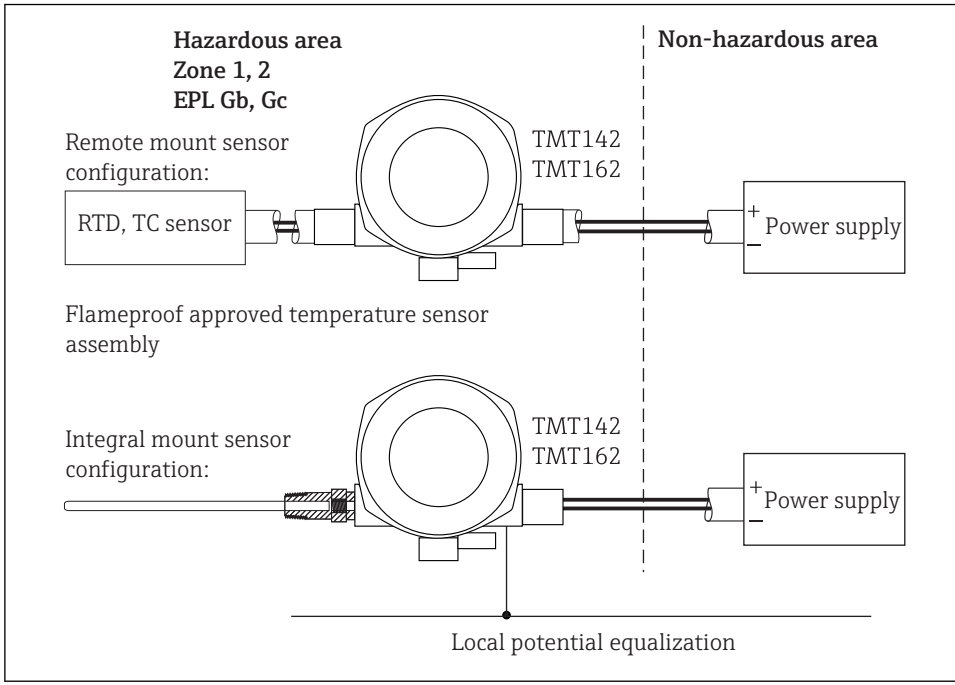
## Safety instructions: Ex d

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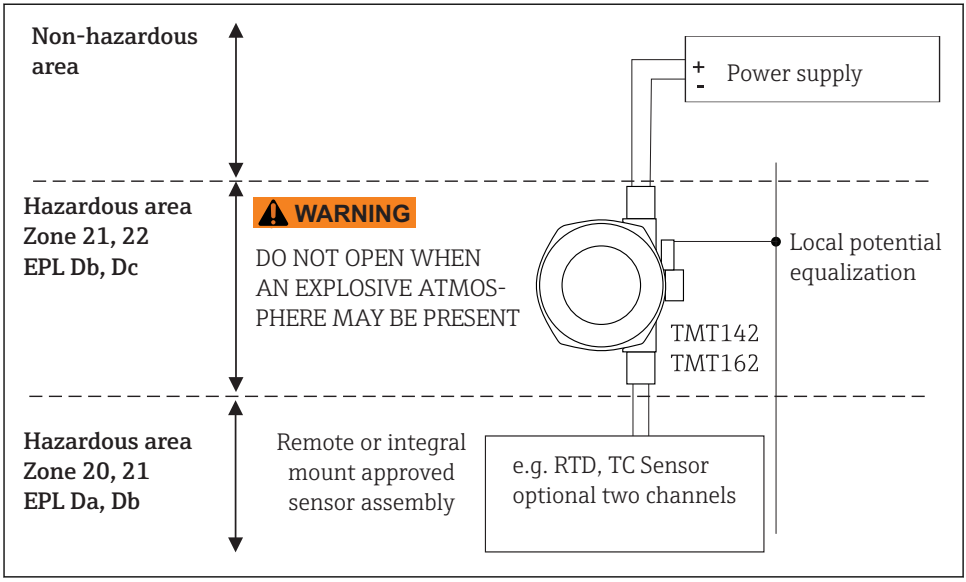



### Safety instructions: Installation

- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and any other valid standards and regulations (e.g. GOST 30852.13-2002 (IEC 60079-14:1996)).
- The housing of field transmitter must be connected to the potential matching line.
- Only the approved wire entries as specified in paragraph 10.4 of GOST 30852.13-2002 (IEC 60079-14:1996), paragraph 16 of GOST 52350.0-2002 (IEC 60079-0:1998), paragraph 13 of GOST 30852.1-2002 (IEC 60079-1:1998) must be used.
- For connection through a conduit entry approved for this purpose the associated sealing facility shall be mounted directly to the housing.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.
- For operating the transmitter housing at an ambient temperature under −20 °C, appropriate cables and cable entries permitted for this application must be used.

- For ambient temperatures higher than +70 °C, use suitable heat-resisting cables or wires, cable entries and sealing facilities for Ta +5 K above surrounding.
- During operation, the cover must be screwed all the way in and the cover's safety catch must be fastened.
- The remote or integral mounted temperature sensor must comply with the requirements according to GOST 30852.1-2002 (IEC 60079-1:1998).

### Safety instructions: Special conditions

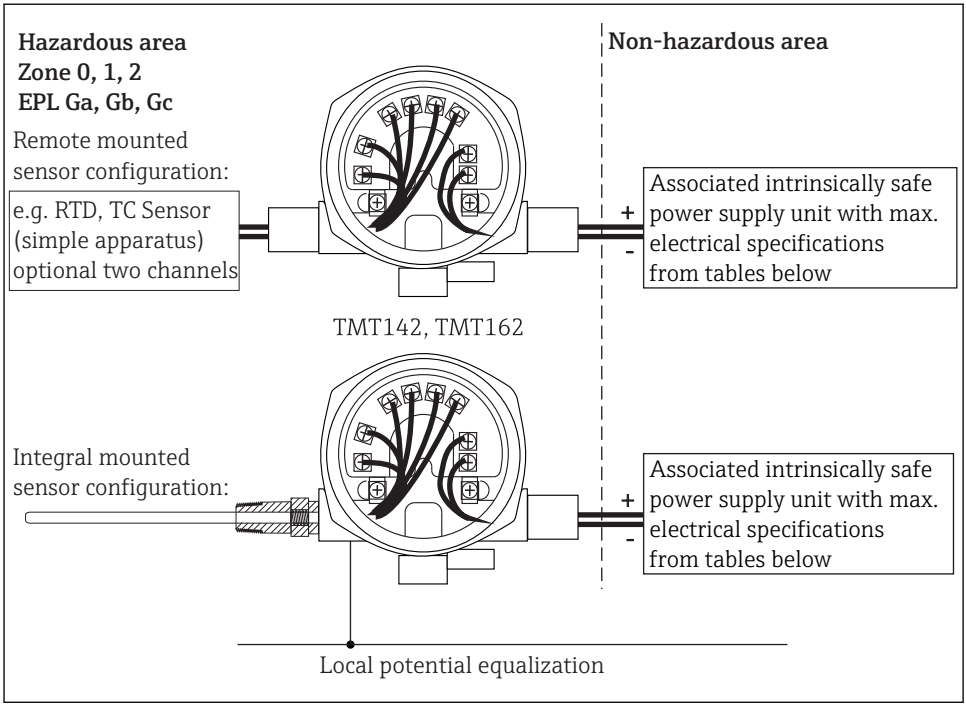
NOTICE

**Explosive atmosphere**

▶ Do not open the electrical connection of the power supply circuit in an explosive atmosphere.

- Use for remote temperature sensors only approved sensors certified for category 2G marked not less than II2G Ex d IIC T6...T4 Gb for use in Zone 1.
- Use for integral temperature sensors only approved sensors certified for category 1 marked not less than 1Ex d IIC T6...T4 Gb X for use in Zone 1.
- The temperature class specified for the certified temperature sensor shall be taken into account.
- The temperature transmitter must be installed so, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.

### Safety instructions: Ex ia




**Safety instructions: Installation**

- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and any other valid standards and regulations (e.g. GOST 30852.13-2002 (IEC 60079-14:1996)).
- The type of protection changes as follows when the devices are connected to certified intrinsically safe circuits of Category ib: Ex ib IIC. When connecting an intrinsically safe ib circuit, do not operate the sensor at Zone 0.
- When connecting two independent sensors make sure that the potential equalization cables are at the same potential.

### Safety instructions: Zone 0

- Only operate devices in potentially explosive vapour/air mixtures under atmospheric conditions:
  −20 °C ≤ Ta ≤ +60 °C
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, according to GOST 31438.1-2011 (EN 1127-1:2007),, the transmitters may be operated under other atmospheric conditions in accordance with the manufacturer's specifications.
- Associated apparatus with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits are preferred.

### Safety instructions: Special conditions

The temperature transmitter must be installed so, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.

## Temperature tables

| Type | Type of protection | Temperature class | Ambient temperature |
|---|---|---|---|
| TMT142, TMT162 | 0Ex ia IIC T6...T4 Ga X<br>1Ex d IIC T6...T4 Gb X | T6 | −40 °C ≤ Ta ≤ +55 °C |
| | | T5 | −40 °C ≤ Ta ≤ +70 °C |
| | | T4 | −40 °C ≤ Ta ≤ +80 °C |

| Type | Type of protection | Maximum surface temperature | Ambient temperature |
|---|---|---|---|
| TMT142, TMT162 | 1Ex d IIC T6...T4 Gb X<br>Ex tb IIIC T85°C... T105°C X | +105 °C | −40 °C ≤ Ta ≤ +80 °C |

## Electrical connection data

### For 1Ex d IIC T6...T4 Gb X

| Type | Electrical data |
|---|---|
| TMT142<br>TMT162 HART® - protocol | U ≤ 40 $V_{DC}$<br>P ≤ 3 W |
| TMT162 PROFIBUS® PA, TMT162 FOUNDATION Fieldbus™ | U ≤ 35 $V_{DC}$<br>P ≤ 3 W |

## For 0Ex ia IIC T6...T4 Ga X

| Type | Electrical data | | | |
|---|---|---|---|---|
| TMT142<br>TMT162 (HART®) | Supply (terminals + and -): | $U_i \leq 30\ V_{DC}$<br>$I_i \leq 300$ mA<br>$P_i \leq 1000$ mW<br>$C_i \leq 5$ nF<br>$L_i = 0$ | | |
| | Sensor circuit (terminals 1 to 6): | $U_o \leq 7.6\ V_{DC}$<br>$I_o \leq 29.3$ mA<br>$P_o \leq 55.6$ mW | | |
| | Maximum connection values: | | | |
| | Ex ia IIC<br>Ex ia IIB<br>Ex ia IIA | $L_o = 40$ mH<br>$L_o = 150$ mH<br>$L_o = 300$ mH | | $C_o = 10.4$ µF<br>$C_o = 160$ µF<br>$C_o = 1000$ µF |
| TMT162<br>▪ PROFIBUS® PA<br>▪ FOUNDATION Fieldbus™ | Supply (terminals + and -): | $U_i \leq 17.5\ V_{DC}$<br>$I_i \leq 500$ mA<br>$P_i \leq 5.32$ mW<br>$C_i \leq 5$ nF<br>$L_i = 10$ µH | or | $U_i \leq 24\ V_{DC}$<br>$I_i \leq 250$ mA<br>$P_i \leq 1.2$ mW |
| | Applicable for connection to a Fieldbus system according to FISCO/ FNICO-model | | | |
| | Sensor circuit (terminals 1 to 6): | $U_o \leq 8.6\ V_{DC}$<br>$I_o \leq 26.9$ mA<br>$P_o \leq 57.6$ mW | | |
| | Maximum connection values: | | | |
| | Ex ia IIC<br>Ex ia IIB<br>Ex ia IIA | $L_o = 48$ mH<br>$L_o = 180$ mH<br>$L_o = 380$ mH | | $C_o = 6.2$ µF<br>$C_o = 55$ µF<br>$C_o = 1000$ µF |

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