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Safety Instructions
iTHERM TM111, TM131

Ex d IIC T1...T6 Gb、Ex tD A20/A21 IP66/68 T*

Document: XA02114T
Safety instructions for electrical apparatus for explosion-hazardous areas → 2

Endress+Hauser
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iTHERM TM111, TM131

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Associated documentation

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

Associated documentation for iTHERM TM111
- Operating instructions: BA01915T
- Technical information: TI01445T

Associated documentation for iTHERM TM131
- Operating instructions: BA01915T
- Technical information: TI01373T

Supplementary documentation

Explosion-protection brochure: CP00021Z/11

The Explosion-protection brochure is available: In the download area of the Endress+Hauser website: www.endress.com → Download → Advanced → Documentation code: CP00021Z

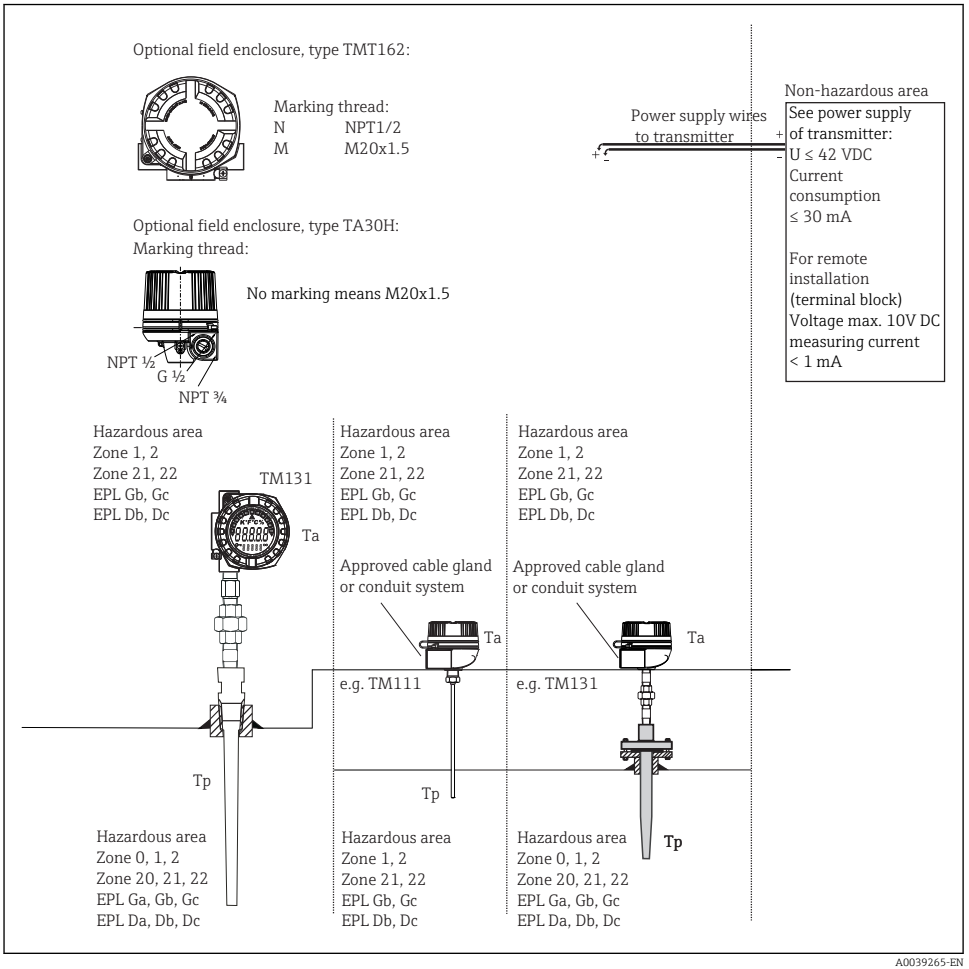
Manufacturer's certificates

NEPSI Certificate of Conformity

Certificate number: GYJ19.1378X

Affixing the certificate number certifies conformity with the following standards (depending on the device version).
- GB3836.1-2010
- GB3836.2-2010
- GB3836.4-2010
- GB12476.1-2013
- GB12476.5-2013

Safety instructions



A0039265-EN

Safety instructions: Installation of protection flameproof

- 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. IEC/EN 60079-14).
- The housing of the thermometer must be connected to the potential matching line.

- Only the approved wire entries as specified in paragraph 10 of IEC/EN 60079-14, paragraph 16 of IEC/EN 60079-0, paragraph 13 of IEC/EN 60079-1 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 the cable entries with certified cable glands and or blanking elements which have at least type of protection Ex db and Ex tb suitable for Group IIC and IIIC (degree of protection IP6X).
- The maximum specified ambient temperature Ta at terminal head not be exceeded.
- For operating the thermometer 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 which can be applied for temperatures +5 K above ambient temperature.
- During operation, the cover must be screwed all the way in and the cover's safety catch must be fastened.
- The thermometer 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.
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations
- the external earth connection facility should be connected reliably.
- As the flameproof product, suitable certified cable glands or blanking plugs for unused holes approved by ExTL according to GB3836.1-2010 and GB3836.2-2010 with Ex marking "Ex d II CGB" shall be used and correctly installed; as the dust product, suitable certified cable glands or blanking plugs for unused holes approved by ExTL according to GB 12476.1-2013 and GB 12476.5-2013 with Ex marking "Ex tD A21 IP66/IP68" shall be used and correctly installed, after installation, degree of protection of enclosure is at least IP66/IP68 according to GB/T 4208-2017. the cable glands and blanking plugs to be used shall suitable for the product working conditions.
- Any maintenance shall be performed only when the warning "Do not open when energized" is observed.

- Clean the surface of this product termly when using in combustible dust atmosphere.
- The user shall not change the configuration in order to maintain/ ensure the esxplosion protection performance of this product. Any change may impair safety.
- For installation, use and maintenance of this product, the end user shall observe the instruction manual and the following standards
  - GB 50257-2014 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
  - GB 3836.13-2013 "Explosive atmospheres- Part 13:Equipment repair, overhaul and reclamation".
  - GB/T 3836.15-2017 "Explosive atmospheres- Part 15:Electrical installations design, selection and erection".
  - GB/T 3836.16-2017 "Explosive atmospheres- Part 16:Electrical installations inspection and maintenance".
  - GB 15577-2007 "Safety regulations for dust explosion prevention and protection". (Only if installed in dust hazardous areas)

⚠ WARNING

Explosive atmosphere

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

Safety instructions: Installation of Dust ignition protection

- 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. IEC/EN 60079-14).
- Seal the cable entries tight with certified cable which have at least type of protection Ex tb suitable for Group IIIC (degree of protection IP6X).
- The housing of the thermometer must be connected to the potential matching line.
- For ambient temperatures higher than +70 °C use suitable heat-resisting cables or wires, cable entries and sealing facilities which can be applied for temperatures +5 K above ambient temperature.

⚠ WARNING

Explosive atmosphere

▶ In an explosive atmosphere, do not open the device when voltage is supplied (ensure that the IP6X housing protection is maintained during operation).

Safety instructions: Partition wall

- The provided thermowells are out of materials AISI316/W.1.4401, AISI316L/W.1.4404, AISI 316Ti/1.4571, Hastelloy® C-276, Alloy 600 or AISI446/W.1.4762.
- Install the thermometer in a partition wall which is in compliance with IEC/EN 60079-26 in reference to its ultimate application.
- Use only thermowells out of materials complying with IEC/EN 60079-0 chapter 8.3 (e.g. AISI316/W.1.4401, AISI316L/W.1.4404, AISI 316Ti/1.4571...).

Safety instructions: Specific conditions of use

- The flameproof joints are not intended to be repaired.
- Sensors of TM111 with a diameter smaller than 6 mm shall be protected by a thermowell.
- Following sensor options shall be protected by a thermowell:

TM111-a b c d e f.....
f Sensor Type; Measuring range; Material:
D 1xPT100 TF StrongSens; −50 to +500 °C; 316L
E 1xPT100 TF QuickSens; −50 to +200 °C; 316L
F 1xPT100 TF QuickSens; −50 to +400 °C; 316L

- TMT131 temperature sensors shall always be protected by a thermowell.
- It shall be verified, taking into account the worst case process and ambient temperatures,
  - that the temperature of the enclosure at the process connection point does not exceed the ambient temperature range of the assembly and
  - the temperature of the optionally used RBFF1NS union does not exceed the service temperature range of −50 to +150 °C for following option:

TM131-a b c.....

c Thermometer Design:

M Nipple-union connection NPT½"

N Nipple-union-nipple connection NPT½"

- Install only head transmitters not exceeding a maximum power dissipation of 2.2Wwith a temperature input rating not exceeding 10 V_{DC} and 1 mA.
- For assure that the temperature assembly has a degree of protection of IP6X the user shall provide a thermowell or equivalent component at the process side.

Thermal data

The relation between the type, electrical connection, temperature class, maximum surface temperature, ambient temperature range and process temperature range is shown in the following table.

Type	Electrical connection [1]	Temperature class/Maximum surface temperature	Ambient temperature range	Process temperature range Insert diameter 3 mm, 6 mm dual	Process temperature range Insert diameter 6 mm
TM111 TM131	Terminal block (1A) [2]	T6/T85 °C	−50 to +70 °C	−50 to +55 °C	−50 to +68 °C
		T5/T100 °C	−50 to +80 °C	−50 to +70 °C	−50 to +83 °C
		T4/T135 °C	−50 to +120 °C	−50 to +105 °C	−50 to +118 °C
		T3/T200 °C	−50 to +120 °C	−50 to +170 °C	−50 to +183 °C
		T2/T300 °C	−50 to +120 °C	−50 to +265 °C	−50 to +278 °C
		T1/T450 °C	−50 to +120 °C	−50 to +415 °C	−50 to +428 °C
	Flying leads (0A) or Transmitter TMT71 (2C) TMT72 (3A) TMT82 (3C, 3D) TMT84 (5A) TMT85 (4A) TMT180 (2A, 2B)	T6/T85 °C	−40 to +65 °C	−50 to +55 °C	−50 to +68 °C
		T5/T100 °C	−40 to +80 °C	−50 to +70 °C	−50 to +83 °C
		T4/T135 °C	−40 to +85 °C	−50 to +105 °C	−50 to +118 °C
		T3/T200 °C	−40 to +85 °C	−50 to +170 °C	−50 to +183 °C
		T2/T300 °C	−40 to +85 °C	−50 to +265 °C	−50 to +278 °C
		T1/T450 °C	−40 to +85 °C	−50 to +415 °C	−50 to +428 °C
TM131	Transmitter TMT162 (2D, 2E, 2F, 2G, 4B, 4C, 5B, 5C)	T6/T85 °C	−40 to +55 °C	−50 to +55 °C	−50 to +68 °C
		T5/T100 °C	−40 to +70 °C	−50 to +70 °C	−50 to +83 °C
		T4/T135 °C	−40 to +80 °C	−50 to +105 °C	−50 to +118 °C
		T3/T200 °C	−40 to +80 °C	−50 to +170 °C	−50 to +183 °C
		T2/T300 °C	−40 to +80 °C	−50 to +265 °C	−50 to +278 °C
		T1/T450 °C	−40 to +80 °C	−50 to +415 °C	−50 to +428 °C

1) TM111 suffix code h, TM131 suffix code l.
2) in an enclosure with a blind cover; TM111 suffix code i / TM131 suffix code m = A1, D1, H1, H3.

Electrical connection data

Type	Electrical data
TM111 TM131	$U_b \leq 42\ V_{DC}$ Current consumption ≤ 30 mA Remote installation: Voltage max. 10 V_{DC} Measuring current I < 1 mA

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