XA02695T/09/EN/03.26-00
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Safety Instructions
iTHERM TM1x1

1Ex d IIC T6...T1 Gb X
Ga/Gb Ex d IIC T6...T1 X
Ex tb IIIC 85°C...450°C Db X
Ex ta/tb IIIC 85°C...450°C Da/Db X

Endress+Hauser
People for Process Automation

iTHERM TM1x1

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About this document

The document number of these Safety Instructions (XA) must match the information on the nameplate.

Associated documentation

To commission the device, please observe the Operating Instructions pertaining to the device:
www.endress.com/<product code>, e.g. iTHERM TM111

Supplementary documentation

Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:
www.endress.com/Downloads

Certificates and declarations

EAC certificate

The device 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: ТОО/Ж ШС "Т-Стандарт"
- Certificate number: ЕАЭС KZ 7500525.05.01.01857

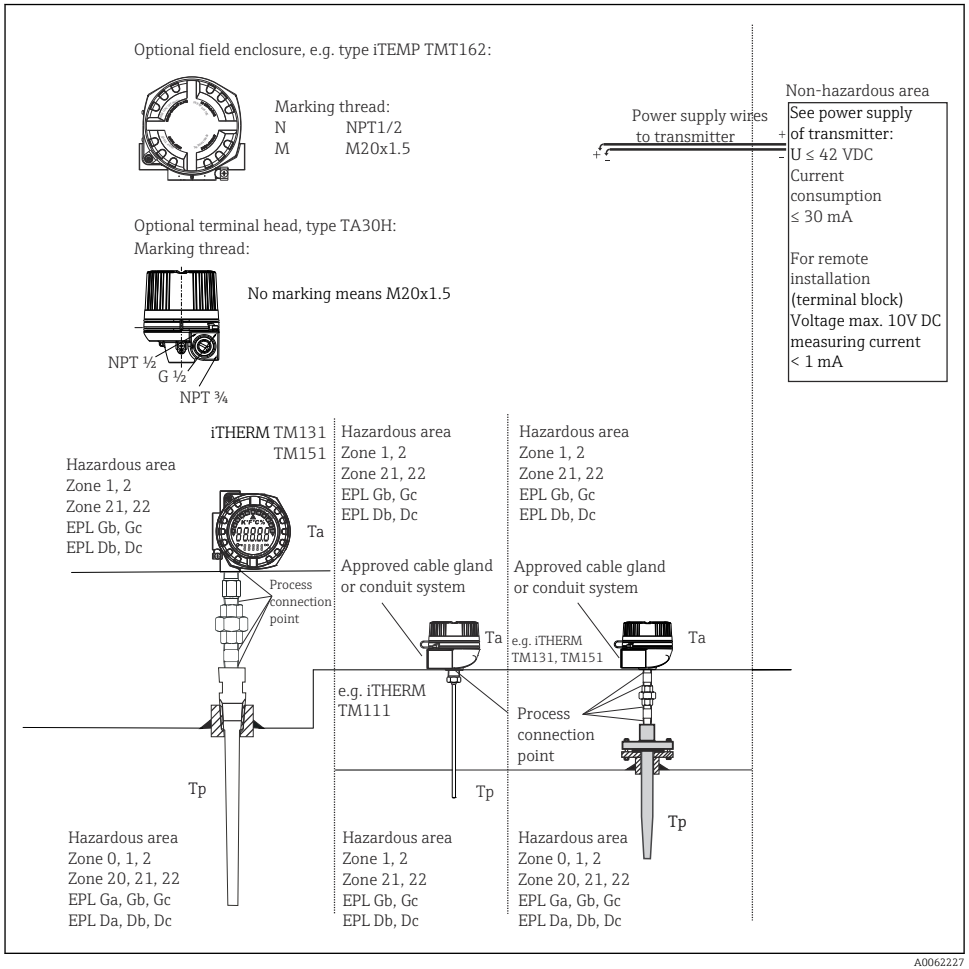
Affixing the certificate number certifies conformity with the following standards:

- GOST 31610.0-2019 (IEC 60079-0:2017)
- GOST IEC 60079-1-2013
- GOST IEC 60079-31-2013
- GOST 31610.26-2016 (IEC 60079-26:2014)

Manufacturer address

Endress+Hauser Wetzer GmbH + Co. KG
Obere Wank 1
87484 Nesselwang, Germany

Safety instructions



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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. EN/IEC 60079-14).
- The housing of the device 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 +65 °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 device must be installed and maintained 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.

⚠ WARNING

Potentially explosive atmospheres

▶ Do not open the electrical connection of the supply circuit when energized if there is a potentially 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. EN/IEC 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).
- In case of installation and repair apply a torque for process connection of 50 to 70 Nm for terminal heads suffix code i = A1, A2, D1 (TA30A, TA30D).
- 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
- The housing of the device must be connected to the potential matching line.
- For ambient temperatures higher than +65 °C, use suitable heat-resisting cables or wires, cable entries and sealing facilities for Ta +5 K above surrounding.

⚠ 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 to suffix code iTHERM TM131_e and TM151_d are made out of material as follows:

iTHERM TM131_e	iTHERM TM151_d	Material
B1, B2, B3, B4	AD, AE, AI	AISI316L/W.1.4404
C1, C2, C3, C4	AF	AISI 316Ti/1.4571
D1, D2	BB	Hastelloy® C-276
E1, E2	BA	Alloy 600
F1, F2	AC, AE, AI	AISI316/W.1.4401
G1		AISI446/W.1.4762
H1		AISI321/ W.1.4541
I1, I2		AISI 316Ti/1.4571 and Tantal
	AG	AISI 347/W.14550
	AH	AISI 310/W.1.4841
	CA	10CrMo9-10/A182 F22/W.1.7380
	CB	13CrMo4-5/A182 F11/W.1.7335
	CC	16Mo3/W.1.5415
	DA	A105/W.1.0402
	DB	C22.8/W.1.0460
	DC	P355NH/W.1.0565
	EA	Duplex S32205/W.1.4470
		AISI 304/304L/W.1.4301/W.1.4306
		A182 F91/W.1.4903
		316/316L/W.1.4401/W.14404 and Tantal
YY	YY	the thermowell material is listed in the manufacturer's website (CER viewer or Asset Central Viewer)

Instructions for option:

iTHERM TM131-ab...

b	**Thermowell:**
A	Thermometer to be assembled into existing thermowell

iTHERM TM151-ab...

b	**Thermowell:**
1	Thermometer to be assembled into existing thermowell

- 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 corrosion resistant materials complying with IEC/EN 60079-0 chapter 8.3 (e.g. AISI316/W.1.4401, AISI316L/W.1.4404, AISI 316Ti/1.4571...) with a wall thickness of at least 1 mm (for iTHERM TM131) or 1.35 mm (for iTHERM TM151).
- Use thermowells suitable for the process conditions.
- Providing a degree of protection of at least IP6X when assembled.

Safety instructions: Specific conditions of use

- The flameproof joints are not intended to be repaired.
- 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 RB**1NS union does not exceed the service temperature range as listed in Annex 1.
  - that the temperature of the optionally used Sensor Type TS21x with QuickNeck construction does not exceed the service temperature range as listed in Annex 1.
  - that the temperature of optional seal at connection points does not exceed the service temperature range as listed in Annex 1.
  - that the temperature of the thermowells type iTHERM TT151 for iTHERM TM151 does not exceed the service temperature range as listed in Annex 1 for some available materials.
- When provided with special varnishing (type iTHERM TM111 suffix code i = YY, type iTHERM TM131 suffix code m = YY, type iTHERM TM151 suffix code m = YY) refer to the instructions “Safety notes varnish XA01369T” for guidance to minimize the risk from electrostatic discharge

- Temperature assemblies with flying leads (type iTHERM TM111 suffix code h = 0A, type iTHERM TM131 suffix code l = 0A, type iTHERM TM151 suffix code l = 0A) shall be provided with a round transmitter of max. 2.2 W with a main diameter not exceeding 45 mm and a sensor signal of max 10 V_{DC} and 1 mA.
- The connection fittings, their joints, and their joints with the thermowell and the connection head or field temperature transmitter provide ingress protection of IP6x or, alternatively, IP66/67 (when fitted with at least 5 turns of PTFE tape or Loctite 270 spread on the entire circumference and for at least one thread) in the temperature range of −50 to +130 °C according to IEC 60079-0 and IEC 60529.
- Sensors with Quicksleeve construction shall always be protected by a metallic thermowell.

Type iTHERM TM111

Sensors with a diameter of 3 mm (suffix code b = A) shall be protected by a thermowell.

Type iTHERM TM111

Sensors with other diameters (suffix code b = Y) shall be protected by a thermowell unless excluded by the product information available on the manufacturer's website (CER viewer or Asset Central Viewer) and the safety instructions for optional thermocouples and RTDs (document 10000013456).
These safety instructions show, depending on the sensor details, when protection by a thermowell is required. The viewer on the website shows the sensor details for each serial number of the assembly.

Type iTHERM TM131, TM151

The sensor shall be protected by the thermowell as provided or by a thermowell as specified in the instructions.

Temperature tables

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.

Temperature assemblies with RTD temperature sensors				
Electrical connection [1]	**Temperature class/ Maximum surface temperature**	**Ambient temperature range**	**Process temperature range Insert diameter 3 mm (⅛ "), 6 mm (¼ ") dual**	**Process temperature range Insert diameter 6 mm (¼ ")**
Type iTHERM TM111				
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
Type iTHERM TM111 and Type iTHERM TM131, TM151				
Flying leads (0A) or Transmitter iTEMP TMT31 (2H, 2I) TMT36 (6U) TMT71 (2C) TMT72 (3A) TMT82 (3C, 3D, 3F, 3I) TMT84 (5A) TMT85 (4A) TMT86 (6B, 6C)	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
Type iTHERM TM131, TM151				
Terminal block (1A)	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 +90 °C	−50 to +105 °C	−50 to +118 °C
	T3/T200 °C	−50 to +90 °C	−50 to +170 °C	−50 to +183 °C
	T2/T300 °C	−50 to +90 °C	−50 to +265 °C	−50 to +278 °C
	T1/T450 °C	−50 to +90 °C	−50 to +415 °C	−50 to +428 °C

Temperature assemblies with RTD temperature sensors				
Electrical connection [1]	**Temperature class/ Maximum surface temperature**	**Ambient temperature range**	**Process temperature range Insert diameter 3 mm (⅛"), 6 mm (¼") dual**	**Process temperature range Insert diameter 6 mm (¼")**
Transmitter iTEMP TMT142: 7A iTEMP 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) iTHERM TM111 suffix code h, iTHERM TM131, TM151 suffix code l.
2) in an enclosure with a blind cover; iTHERM TM111 suffix code i / iTHERM TM131, TM151 suffix code m = A1, D1, H1, H3.

Temperature assemblies with thermocouple temperature sensors			
Electrical connection [1]	**Temperature class/ Maximum surface temperature**	**Ambient temperature range**	**Process temperature range**
Type iTHERM TM111			
Terminal block (1A) [2]	T6/T85 °C	−50 to +70 °C	−50 to +85 °C
	T5/T100 °C	−50 to +80 °C	−50 to +100 °C
	T4/T135 °C	−50 to +120 °C	−50 to +135 °C
	T3/T200 °C	−50 to +120 °C	−50 to +200 °C
	T2/T300 °C	−50 to +120 °C	−50 to +300 °C
	T1/T450 °C	−50 to +120 °C	−50 to +450 °C
Type iTHERM TM111 and Type iTHERM TM131, TM151			
Flying leads (0A) or Transmitter iTEMP TMT71 (2C) TMT72 (3A) TMT82 (3C, 3D, 3F, 3I) TMT84 (5A) TMT85 (4A) TMT86 (6B, 6C)	T6/T85 °C	−40 to +65 °C	−50 to +85 °C
	T5/T100 °C	−40 to +80 °C	−50 to +100 °C
	T4/T135 °C	−40 to +85 °C	−50 to +135 °C
	T3/T200 °C	−40 to +85 °C	−50 to +200 °C
	T2/T300 °C	−40 to +85 °C	−50 to +300 °C
	T1/T450 °C	−40 to +85 °C	−50 to +450 °C
Type iTHERM TM131, TM151			
Terminal block (1A)	T6/T85 °C	−50 to +70 °C	−50 to +85 °C
	T5/T100 °C	−50 to +80 °C	−50 to +100 °C

Temperature assemblies with thermocouple temperature sensors			
Electrical connection [1]	**Temperature class/ Maximum surface temperature**	**Ambient temperature range**	**Process temperature range**
	T4/T135 °C	−50 to +90 °C	−50 to +135 °C
	T3/T200 °C	−50 to +90 °C	−50 to +200 °C
	T2/T300 °C	−50 to +90 °C	−50 to +300 °C
	T1/T450 °C	−50 to +90 °C	−50 to +450 °C
Transmitter iTEMP TMT142: 7A iTEMP TMT162: 2D, 2E, 2F, 2G, 4B, 4C, 5B, 5C	T6/T85 °C	−40 to +55 °C	−50 to +85 °C
	T5/T100 °C	−40 to +70 °C	−50 to +100 °C
	T4/T135 °C	−40 to +80 °C	−50 to +135 °C
	T3/T200 °C	−40 to +80 °C	−50 to +200 °C
	T2/T300 °C	−40 to +80 °C	−50 to +300 °C
	T1/T450 °C	−40 to +80 °C	−50 to +450 °C

1) iTHERM TM111 suffix code h, TM131 suffix code l.
2) in an enclosure with a blind cover; iTHERM TM111 suffix code i / iTHERM TM131, TM151 suffix code m = A1, D1, H1, H3.

Electrical connection data

Type	Electrical data
iTHERM TM111 iTHERM TM131 iTHERM TM151	$U_b \leq 42\ V_{DC}$ Current consumption ≤ 30 mA Remote installation: Voltage max. 10 V_{DC} Measuring current I < 1 mA

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