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Safety Instructions
iTHERM MultiSens Flex TMS02

ATEX/IECEx: Ex ta/tb IIIC T85°C...T450°C Da/Db
Ex db IIC T6...T1 Ga/Gb
Ex ta/tb IIIC T85°C...T450°C Da/Db

Endress+Hauser
People for Process Automation

iTHERM MultiSens Flex TMS02

Table of contents

About this document

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

Associated documentation

All documentation is available on the Internet: www.endress.com/Deviceviewer (enter the serial number from the nameplate).

If not yet available, a translation into EU languages can be ordered.

To commission the device, please observe the Operating Instructions pertaining to the device: www.endress.com/<product code>, e.g. iTHERM TMS02

Supplementary documentation

Explosion protection brochure: CP00021Z

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
- On the CD for devices with CD-based documentation

Certificates and declarations

IECEx certificate

Certificate number: IECEx IMQ 24.0002X

Affixing the certificate number certifies conformity with the following standards (depending on the device version)

- IEC 60079-0: 2017
- IEC 60079-1: 2014
- IEC 60079-26: 2015
- IEC 60079-31: 2013

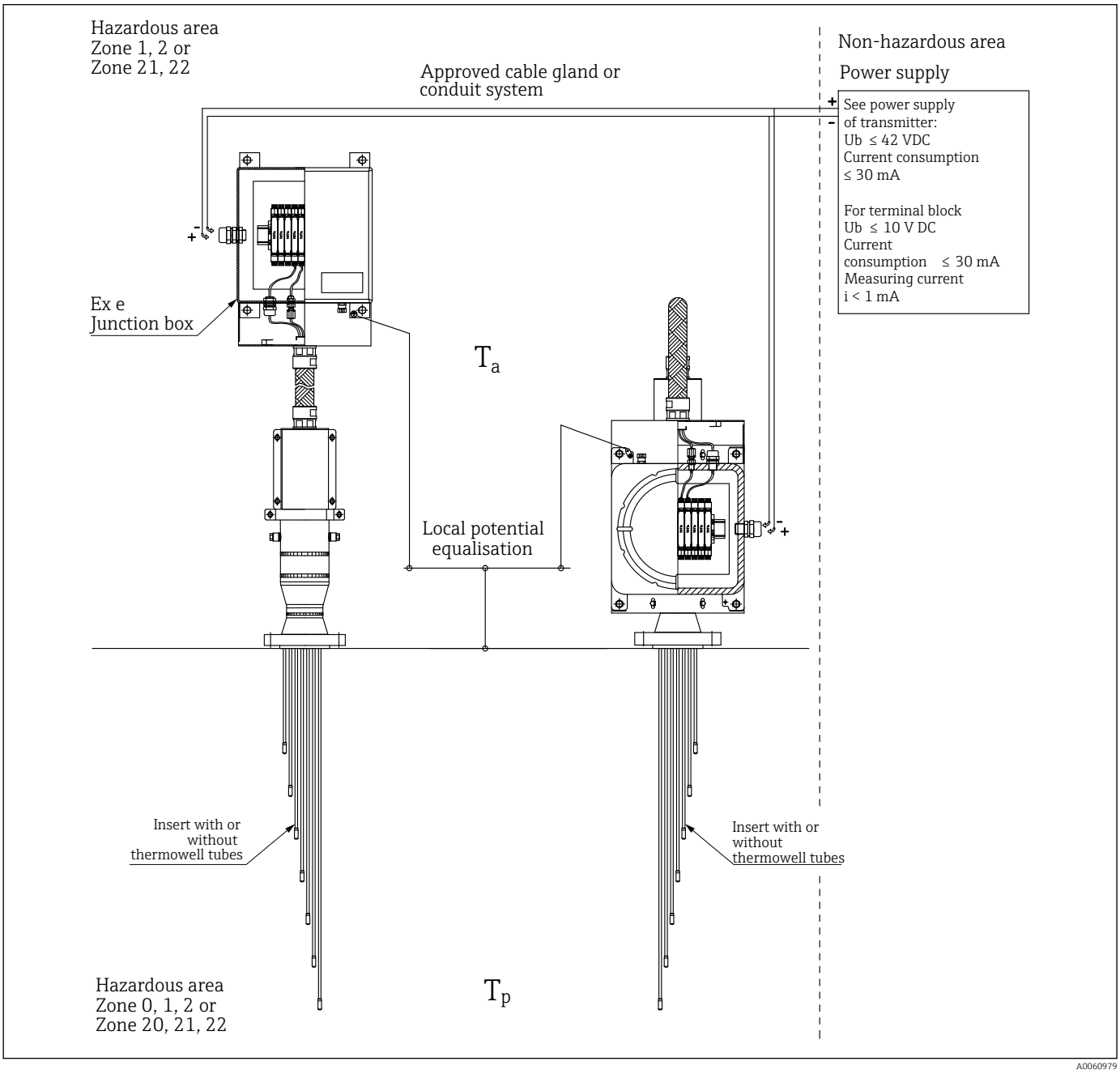
ATEX certificate

Certificate number: IMQ 24 ATEX 011X

Manufacturer address

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

Safety instructions



Safety instructions: General

- 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 or guidelines (e.g. IEC/EN 60079-14)
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- The relationship between the permitted ambient temperature for the electronics housing, dependent on the range of application, and the temperature classes is shown in next tables.
- Alterations to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

Safety instructions: Installation in equipment of Group III

- Refer to the enclosed Safety instructions of assembled Transmitters.
- Refer to the marked maximum ratings for assembled temperature transmitter's supply.

Safety instructions: Partition wall

- Install the equipment in a partition wall which is in compliance with IEC/EN 60079-26 in reference to its ultimate application.
- Do only use approved spare parts which are properly marked with the same type of protection and approval number as iTHERM TMS02.

⚠ 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 for dust ignition:

- 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 glands IP6X according to IEC 60529.
- The cable gland (or other accessories) chosen as ingress into junction box shall be certified accordingly to relevant Standards (IEC/EN 60079-0 and IEC/EN 60079-31).
- The provided cable glands according to option code are suitable ATEX/IECEx Ex-certified cable glands with a temperature range of −55 to +110 °C.
- The device must be connected to the local potential equalization.
- 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.
- User must regularly clean enclosure external surface due to avoid formation and deposition of dust layers on the surface itself (the maximum allowed thickness of dust is equal to 5 mm).
- Degree of protection IP66 is guaranteed only if the cover is provided with an appropriate O-ring gasket; after each opening integrity of such gasket shall be verified.
- For dust 'Ex t' applications, the compression fittings installed on junction box connection thread must have PTFE or graphite sealing tape applied to maintain the approval stated.

Potential equalization

The device must be connected to the local potential equalization.

Safety istruction for flameproof: 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. EN/IEC 60079-14).
- The device must be connected to the local potential equalization.
- Only certified cable glands (or other accessories) in accordance to IEC/EN 60079-0 and IEC/EN 60079-1 shall be used. Cable entry system shall be in compliance with IEC/EN 60079-14 and/or other Local Regulations and Laws.
- User's cable entries always assure at least 5 engaged threads.
- The thread of cover must be always sprinkled by silicone grease (LOCTITE_8104 or LOXEAL_GS9) or copper paste or similar.
- The ground terminal board in and out is preview for the conductor which must be placed between the anti-rotation washer and the flat washer. If the connection is made by means of lug, this must be with an anti-rotation pin, or must be provide on fitting to avoid the rotation of the cable.
- Any unused holes in the enclosure must be closed with conical or cylindrical plugs in such way that anti-explosion seal characteristics of the enclosure are preserved. These plugs must only be removed with special tools.
- For connection through a conduit entry approved for this purpose the associated sealing facility shall be mounted directly to the housing.
- 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.

- Degree of protection IP66 is guaranteed only if the cover is provided with an appropriate O-ring gasket; after each opening integrity of such gasket shall be verified.
- 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.
- The thermowell (if any) must be in compliance with IEC/EN 60079-26.
- Pay attention to the maximum process conditions according to the manufacturer's operating Instructions.
- Observe the safety instructions for the used transmitters.
- Install the device to exclude any mechanical damage or friction. The device Connection Head enclosures, when made in Aluminum light alloy, shall be mounted in a way to avoid an ignition hazard due to impact or friction. Pay particular attention to flow conditions and tank fittings.
- Any damaged parts may **only** be replaced or repaired by the manufacturer, unless of express authorization of itself. It is forbidden to machine further the junction box.
- As a general rule, whichever operations and maintenance on the electrical or mechanical parts or on the system, must be preceded from the interruption of the electrical supply system.

Compression Fitting for sensor side

- When assembling the compression fitting, tighten the nut by hand and ensure that the nut is in the finger-tight position and mark/scribe it for a visual reference.
- Tight the nut to the required setting using the following table:

Insert Diameter	Torque settings (No. of turns past finger-tight)
≤ 4.5 mm	1 full turn
4.76 to 9.53 mm	3/4 turn

- This equipment is not re-usable or repairable. Once installed it must be replaced if any damage is observed.
- For dust 'Ex t' applications, the compression fittings installed on junction box connection thread must have PTFE or graphite sealing tape applied to maintain the approval stated.

Safety instructions: Specific conditions of use

- 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.
- When installing and commissioning the device, make sure that an electrostatic charge of the connection cable is avoided.
- As a rule of the thumb, the whole length of each thermoelement installed within the device shall be limited to 200 m for single sensors, to 100 m for double and to 66.7 m for triple ones. For special applications (i.e. very long thermoelements), it shall always be verified the verification of total Capacitance and Inductance.
- When install the device, all the accessories used (e.g. cable glands, etc.) shall be certified according to IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-31, providing a degree of protection at least equal to the junction box one. For the correct choice of the cable entry system, please refer to IEC/EN 60079-14 (latest revision) and/or to National Regulations and Laws.
- Associated apparatus with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits are preferred.
- The separation between Zone 0/20 and Zone 1/21 shall be in compliance with requirements of IEC/EN 60079-26.
- The device shall be connected to the same local potential equalization in at least one point (alternatively through the junction box or at process connection). The user shall assess the functionality.
- For the use of the enclosures in environments with explosive atmosphere for the combustible dust presence, the following precautions must be taken: to avoid the accumulation of dust on the surfaces, the user must proceed with a regular cleaning of the enclosures; the dust layer shall always less than 5 mm.
- The width of the flameproof joints is superior to those specified in tables of IEC/EN 60079-1 standard.
- No battery is permitted within the device assemblies.
- The ambient temperature Ta shall not exceed the values given in tables into safety instructions.

- The ambient temperature range of the device, may vary depending on the number and the type of the transmitters mounted inside to the Connection Head. For a safe use of the products, the Safety Instructions shall be followed precisely.
- End user's additional electrical equipment connected to the device shall be covered by same mode of protection and connection shall follow prescriptions of IEC/EN 60079-14.
- For equipment iTHERM TMS02_010= -86 following limitations apply:
  - Inserts with sheath thickness ≥ 1 mm can be used in equipment without additional mechanical protection.
  - Inserts with sheath thickness < 1 mm can be used only if protected with a thermowell whose thickness is ≥ 1 mm.

Temperature tables

Ambient temperature:
Minimum ambient temperature is Ta ≥ −55 °C.

Permitted ambient temperatures (these conditions are valid for all possible thermometer configurations):

Type	Assembled Transmitters	Temperature class	Ambient temperature range
iTHERM TMS02_010= -8F iTHERM TMS02_010= -86	iTEMP TMT8x iTEMP TMT7x	T6/T85 °C	−52 °C ≤ Ta ≤ +65 °C
		T5/T100 °C	−52 °C ≤ Ta ≤+80 °C
		T4/T135 °C	−52 °C ≤ Ta ≤+85 °C
iTHERM TMS02_010= -8F iTHERM TMS02_010= -86	without electronic (terminal block)	T6/T85 °C	−55 °C ≤ Ta ≤ +70 °C
		T5/T100 °C	−55 °C ≤ Ta ≤+80 °C
		T4/T135 °C	−55 °C ≤ Ta ≤+110 °C
		T3/T200 °C	−55 °C ≤ Ta ≤+110 °C
		T2/T300 °C	−55 °C ≤ Ta ≤+110 °C
		T1/T450 °C	−55 °C ≤ Ta ≤+110 °C

For further information see tables below:

ENCLOSURE TYPE	MINIMUM AMBIENT TEMP.	TEMPERATURE CLASS T6/T85°C																																																	
		Max Ambient temperature °C																																																	
		Number of Terminal Blocks																																																	
		2	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**28**	**30**	**32**	**36**	**40**	**44**	**48**	**56**	**60**	**64**	**70**	**72**	**76**	**84**	**96**	**102**	**110**	**120**	**128**	**140**	**150**	**160**	**180**	**192**	**200**	**216**	**228**	**240**	**288**
GUB03	-40°C	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GUB05		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GUB06		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–
GUB07		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
		TEMPERATURE CLASS T5/T100°C																																																	
GUB03	-40°C	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GUB05		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GUB06		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	–	–
GUB07		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
		TEMPERATURE CLASS T4/T135°C																																																	
GUB03	-40°C	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GUB05		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GUB06		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–
GUB07		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60

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1 *Temperature class for Ex d*

ENCLOSURE TYPE	MINIMUM AMBIENT TEMP.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	27	28	30	32	35	36	40	44	48	56	60	64	70	72	76	84	96	102	110	120	128	140	150	160	180	200	216	228	240	260	270	288
		TEMPERATURE CLASS T6/T85°C – **Max Ambient temperature °C** – *Number of Terminal Blocks*																																																						
CSX302019	-40°C	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX303019		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX454519		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX594519		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSA 11	-40°C	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSA 13		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSA 35		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–
		TEMPERATURE CLASS T5/T100°C																																																						
CSX302019	-40°C	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	51	48	44	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX303019		55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	48	47	41	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX454519		55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	44	41	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX594519		55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	51	47	45	43	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSA 11	-40°C	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	51	48	45	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSA 13		55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	52	46	43	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSA 35		55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	53	50	46	43	–	–	–	–	–	–	–	–	–
		TEMPERATURE CLASS T4/T135°C																																																						
CSX302019	-40°C	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX303019		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX454519		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	54	43	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSX594519		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	60	54	48	42	–	–	–	–	–	–	–	–	–	–	–
CSA 11	-40°C	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	64	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CSA 13		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	59	54	–	–	–	–	–	–	–	–	–
CSA 35		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	61	55	51	47	40	–	–

A0059473

2 Temperature class for Ex e

Type	Temperature class/ Maximum surface temperature	Process temperature range [1]
iTHERM TMS02	T6/T85 °C	−55 °C ≤ Ta ≤ +55 °C
	T5/T100 °C	−55 °C ≤ Ta ≤ +70 °C
	T4/T135 °C	−55 °C ≤ Ta ≤ +105 °C
	T3/T200 °C	−55 °C ≤ Ta ≤ +170 °C
	T2/T300 °C	−55 °C ≤ Ta ≤ +265 °C
	T1/T450 °C	−55 °C ≤ Ta ≤ +415 °C

1) Maximum process pressure see relevant Technical Information.

Electrical connection data

Type	Assembled transmitters	Electrical data
iTHERM TMS02	iTEMP TMT7x	Ub ≤ 42 V_{DC} Current consumption ≤ 30 mA (see also transmitter ratings)
	iTEMP TMT82	
	iTEMP TMT84	
	iTEMP TMT85	
	without electronic (terminal block)	Ub ≤ 10 V_{DC} Current consumption ≤ 30 mA Measuring current i < 1 mA

Category	Type of protection (ATEX/IECEx)	Type	Assembled Transmitters
II1/2D	Ex ta/tb IIIC T85°C...T450°C Da/Db	iTHERM TMS02_010 = -8F	iTEMP TMT8x iTEMP TMT7x
II1/2G	Ex db IIC T6...T1 Ga/Gb	iTHERM TMS02_010 = -86	
II1/2D	Ex ta/tb IIIC T85°C...T450°C Da/Db		

Connection head data (Housing must not be placed in zone 0).

www.addresses.endress.com

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