XA02891T/09/EN/01.22-00
71575613
2022-06-27

Safety Instructions
iTHERM MultiSens Flex TMS02

Ex ia IIC T1...T6 Ga

Endress+Hauser
People for Process Automation

iTHERM MultiSens Flex TMS02

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About this document

This document has been translated into several languages. Legally determined is solely the English source text.

The document translated into EU languages is available:
- In the download area of the Endress+Hauser website: www.endress.com -> Downloads -> Manuals and Datasheets -> Type: Ex Safety Instruction (XA) -> Text Search: ...
- In the Device Viewer: www.endress.com -> Product tools -> Access device specific information -> Check device features

If not yet available, the document can be ordered.

Associated documentation

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

Associated documentation for iTHERM TMS02
- Operating instructions: BA01598T
- Technical information: TI01361T

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

CCC Certificate of Conformity

CCC certificate

Certificate number: CCC2022322315004754

Affixing the certificate number certifies conformity with the following standards (depending on the device version).
- GB/T 3836.1-2021
- GB/T 3836.4-2021

The product complies with the requirements of implementation rules for compulsory certification REFNO.CNCA-C23-01:2019.

Please refer to NEPSI/CCC certificates for conditions of safe use.

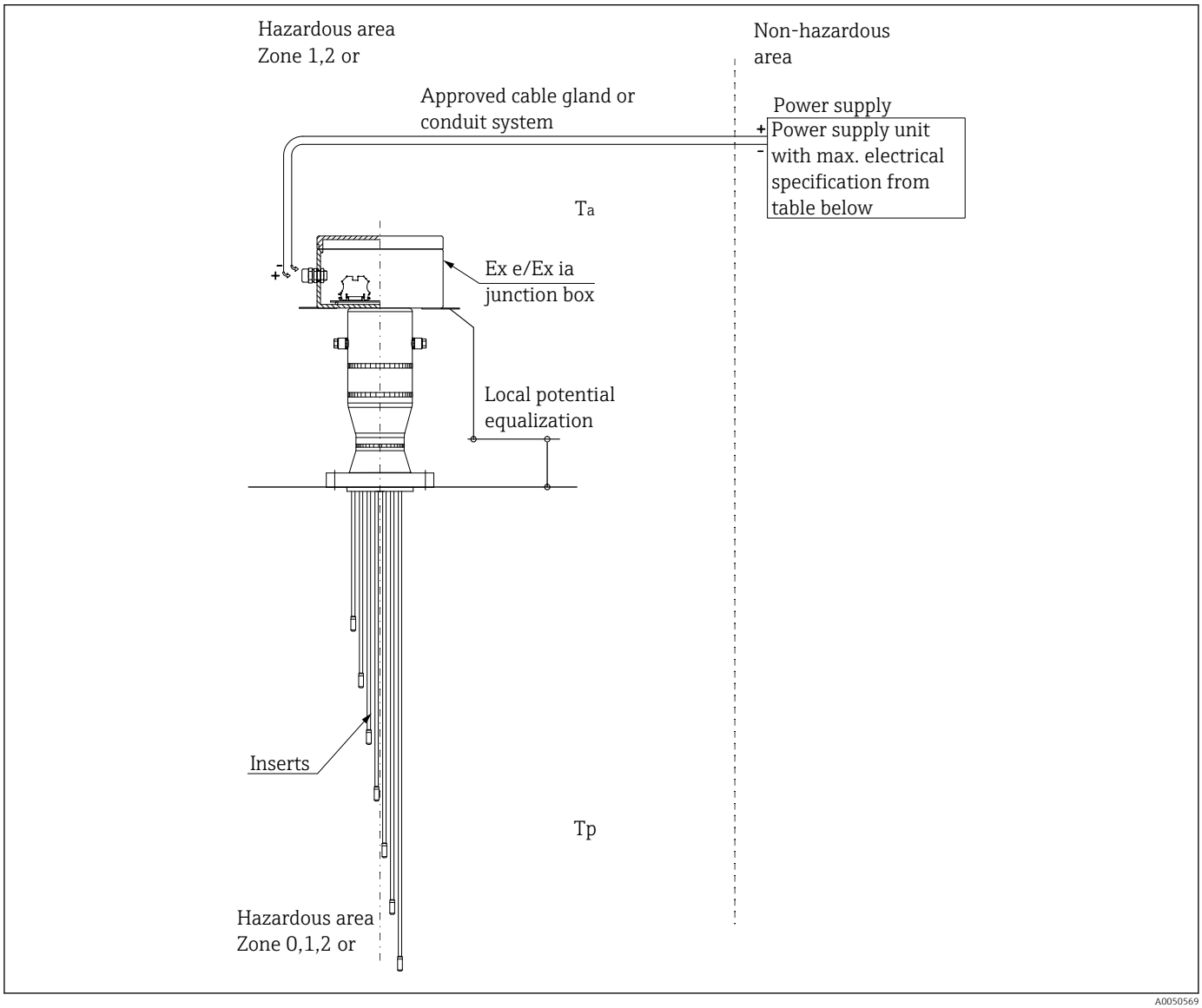
Manufacturer address

Endress+Hauser Sicestherm S.r.L.

Via Martin Luther King 7

20042 Pessano con Bornago(MI)

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. GB/T 3836.15-2017)
- 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.
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the electronics enclosure, depending on the range of application and the temperature class.
- 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: Partition wall

Install the thermometer in a partition wall which is in compliance with GB 3836.20-2010.

Safety instructions: Potential equalization

The electrical apparatus must be integrated into the local potential equalization.

Safety instructions: Intrinsic safety

- 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. GB/T 3836.15-2017, IEC/EN 60079-14).
- Observe the safety instructions for the used equipment.
- The TMS02 must be connected to the local potential equalization.
- Connect the device using suitable cable and wire entries of protection type **Intrinsic safety (Ex i)**.
- For sensor elements an intrinsically safe supply with galvanic isolation must be used.
- Associated apparatus with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits shall be preferred.
- Continuous duty temperature of the cable Ta +5 K.
- To maintain the ingress protection of the housing IP66 install correctly the housing cover and cable glands.
- Close unused entry holes with certified sealing plugs.
- The pertinent guidelines must be observed when intrinsically safe circuits are connected together acc. GB/T 3836.15-2017 (Proof of Intrinsic Safety).
- When connecting multiple sensors make sure that the potential equalizations are at the same local potential equalization.
- Pay attention to the maximum process conditions according to the manufacturer's operating Instructions.
- Respect the maximum ambient temperature permitted in case of using junction box.
- Install the device to exclude any mechanical damage or friction. The TMS02 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.

Safety instructions: Specific conditions of use

- The TMS02 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.
- When installing and commissioning the TMS02, 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 TMS02 shall be limited to 200 m for single sensors, to 100 m for double and to 66.7 mfor triple ones.
- When install the TMS02, all the accessories used (e.g. cable glands, etc.) shall be certified according to GB/T 3836.1-2021, GB/T 3836.4-2021, 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 GB/T 3836.15-2017 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 GB 3836.20-2010.
- The TMS02 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.
- No battery is permitted within the TMS02 assemblies.
- The ambient temperature Ta shall not exceed the values given in tables into safety instructions.
- The Ambient Temperature range of the TMS02 apparatus, may vary depending on the number and the type of the terminal blocks mounted inside to the Connection Head. For a safe use of the products, the Safety Instructions shall be followed precisely.

Temperature tables

The dependency of PROCESS temperatures upon the temperature class for TMS02 assembly. For RTD sensors:

Insert Diameter	Temperature class/ Maximum surface temperature	Maximum allowed process temperature (sensor) Tp (process)							
		Pi≤50 mW	Pi≤ 100 mW	Pi≤ 200 mW	Pi≤ 500 mW	Pi≤ 650 mW	Pi≤ 750 mW	Pi≤ 800 mW	Pi≤1 000 mW
1.5 mm 3.0 mm 4.8 mm 6.0 mm 8.0 mm	T1/T450 ℃	426 ℃	415 ℃	396 ℃	343 ℃	333 ℃	320 ℃	312 ℃	280 ℃
	T2/T300 ℃	276 ℃	265 ℃	246 ℃	193 ℃	183 ℃	170 ℃	162 ℃	130 ℃
	T3/T200 ℃	181 ℃	170 ℃	151 ℃	98 ℃	88 ℃	75 ℃	62 ℃	30 ℃
	T4/T135 ℃	116 ℃	105 ℃	86 ℃	33 ℃	23 ℃	10 ℃	2 ℃	−30 ℃
	T5/T100 ℃	81 ℃	70 ℃	51 ℃	−2 ℃	−12 ℃	−25 ℃	−33 ℃	-
	T6/T85 ℃	66 ℃	55 ℃	36 ℃	−17 ℃	−27 ℃	−40 ℃	-	-

For TC sensors:

Insert Diameter	Temperature class/ Maximum surface temperature	Maximum allowed process temperature (sensor) Tp (process)
0.5 mm ÷ 12.7 mm TS901	T1/T450 ℃	440 ℃
	T2/T300 ℃	290 ℃
	T3/T200 ℃	195 ℃
	T4/T135 ℃	130 ℃
	T5/T100 ℃	95 ℃
	T6/T85 ℃	80 ℃

Ambient temperature:

Minimum ambient temperature is Ta ≥−40 ℃ (depending on enclosure and equipment used)

Maximum ambient temperature depends on product configuration:
- The type of enclosure selected
- The type and the number of mounted terminal blocks as summarized in the following table:

Manuf.	Model	Temperature Class	Max Ambient temperature °C *Number of Terminal Blocks*																									
			2	4	6	8	10	12	14	16	18	20	22	24	28	30	32	36	40	44	48	56	60
WAROM	BXJ-S-I	T6 T85°C	60	54	41	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-II		60	60	60	60	60	60	60	60	60	60	58	56	–	–	–	–	–	–	–	–	–
	BXJ-S-III		60	60	60	60	60	60	60	60	59	57	54	52	47	45	–	–	–	–	–	–	–
	BXJ-S-IIIB		60	60	60	60	57	53	48	44	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IV		60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	56	54	51	–	–	–
	BXJ-S-IVB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–
	BXJ-S-V		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	57	56
	BXJ-S-VB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	58
	BXJ-S-VI		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	58	56
	BXJ-S-VIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	56	55
	BXJ-S-VII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
WAROM	BXJ-S-I	T5 T100°C	60	60	56	43	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-II		60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–
	BXJ-S-III		60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–
	BXJ-S-IIIB		60	60	60	60	60	60	60	59	54	50	45	41	–	–	–	–	–	–	–	–	–
	BXJ-S-IV		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–
	BXJ-S-IVB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–
	BXJ-S-V		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VI		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
WAROM	BXJ-S-I	T4 T135°C	60	60	60	60	60	52	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-II		60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–	–
	BXJ-S-III		60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–
	BXJ-S-IIIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–
	BXJ-S-IV		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–
	BXJ-S-IVB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	–	–	–
	BXJ-S-V		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VI		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIII		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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Manuf.	Model	Temperature Class	Max Ambient temperature °C																				
			Number of Terminal Blocks																				
			64	70	72	76	84	96	102	110	120	128	140	150	160	180	200	216	228	240	260	270	288
WAROM	BXJ-S-I	T6 T85°C	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-II		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-III		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IIIB		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IV		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IVB		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-V		54	52	51	49	46	41	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VB		56	54	54	52	49	45	43	40	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VI		55	52	51	50	47	42	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VIB		53	51	50	48	45	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VII		60	60	60	60	60	60	60	60	59	57	55	54	52	48	45	42	40	–	–	–	–
	BXJ-S-VIIB		60	60	60	60	60	60	60	60	60	59	57	56	54	51	48	45	44	42	–	–	–
	BXJ-S-VIII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	58
WAROM	BXJ-S-I	T5 T100°C	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-II		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-III		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IIIB		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IV		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IVB		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-V		60	60	60	60	60	56	54	51	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VB		60	60	60	60	60	60	58	55	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VI		60	60	60	60	60	57	55	52	48	45	40	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VIB		60	60	60	60	60	55	52	49	45	42	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	57	55	53	50	48	45
	BXJ-S-VIIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	57	54	52	49
	BXJ-S-VIII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
WAROM	BXJ-S-I	T4 T135°C	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-II		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-III		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IIIB		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IV		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-IVB		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-V		60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VB		60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–	–	–	–	–	–
	BXJ-S-VI		60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–	–
	BXJ-S-VIB		60	60	60	60	60	60	60	60	60	60	60	60	–	–	–	–	–	–	–	–	–
	BXJ-S-VII		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIIB		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	BXJ-S-VIII		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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Electrical connection data

Type	Assembled Transmitters	Electrical data
TMS02_010 = -NA	without electronic (flying leads or terminal blocks)	U_i = 30 V I_i = 140 mA P_i = 1 000 mW C_i ≤ 60 nF L_i ≤ 1 mH

Type	Type of protection (CCC)	Assembled Transmitters
TMS02_010 = -NA	Ex ia IIC T1...T6 Ga	None

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