XA01937T/09/EN/01.19
71445255
2019-12-31

Safety Instructions
Modular RTD assemblies for hygienic applications iTHERM® TM411

JPN: Ex ia IIC T4 Ga/Gb

Document: XA01937T
Safety instructions for electrical apparatus for explosion-hazardous areas according to JNIOSH-TR-46 JPNEx → 3

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Modular RTD assemblies for hygienic applications iTHERM® TM411

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Associated documentation

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

iTHERM® TM411: **TI01038T/09**

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

Manufacturer´s certificates

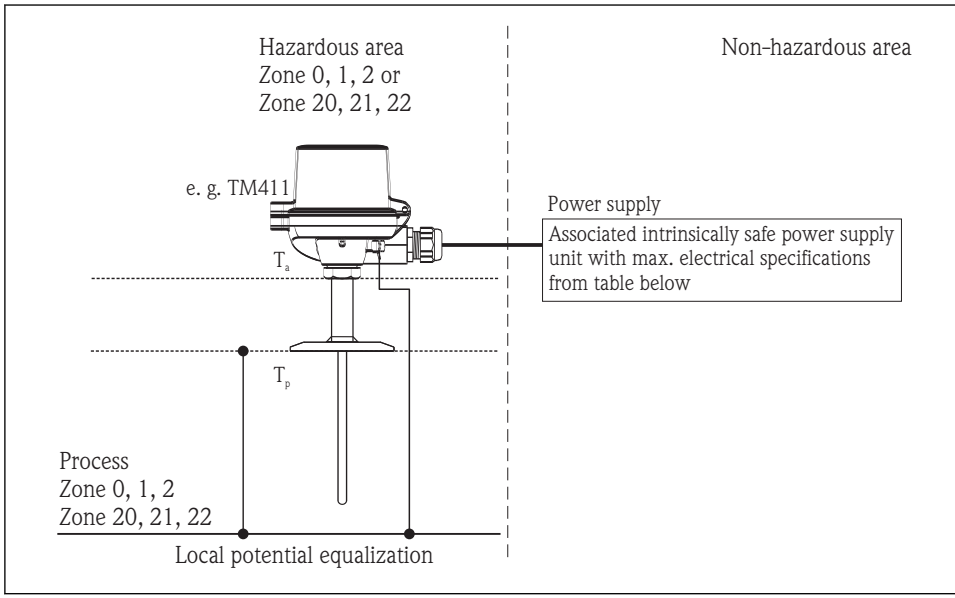
JPN certificate of conformity

Certificate number: CSAUK 19JPN065X

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

- JNIOSH-TR46-1:2015
- JNIOSH-TR46-6:2015

Safety instructions



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Safety Instructions: General

- 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. JNIOSH-TR-44).
- The housing of the thermometer must be connected to the local potential equalization or installed in a grounded metallic piping or tank respectively.
- It cannot be taken for granted that when using compression fittings (e.g. TK40) with non metallic olives that there is a secure grounding when installing in a metal system. This means that an additional safe connection to the local potential equalization needs to be used.
- For using of a plug-in connector (e.g. PA-connector by Weidmüller) is to be observed that the requirements for the respective category and the operating temperature are followed.

Safety instructions for intrinsic safety: 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. JNIOSH-TR-44).
- Install the sensor in a thermometer/enclosure suitable for its marking with a IP rating of at least IP20 according to IEC 60529.

- Observe the safety instructions for the used transmitters.
- The display, type TID10, may only be installed in Zone 1 (EPL Gb) or Zone 2 (EPL Gc).
- 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 to an intrinsically safe ib circuit, do not operate the sensor at Zone 0 without any thermowell according to IEC 60079-26.
- When connecting dual sensors make sure that the potential equalizations are at the same local potential equalization.
- Inserts with 3 mm diameter or grounded inserts, e.g. type TS111 must be connected to the local potential equalization.
- For inserts with 3 mm diameter or grounded inserts, e.g. type TS111 an intrinsically safe supply with galvanic isolation must be used.

Safety instructions: Zone 0

- Only operate devices in potentially explosive vapour/air mixtures under atmospheric conditions:
  - −20 °C ≤ Ta ≤ +60 °C
  - −0.8 bar ≤ p ≤ 1.1 bar
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, according to EN 1127-1, 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 thermometer must be installed so, that even in the event of rare incidents, an ignition source due to impact or friction between the housing and iron/steel is excluded.

Safety instructions: Partition wall

Install the thermometer in a partition wall which is in compliance with IEC 60079-26 in reference to its ultimate application.

Temperature tables

Associated intrinsically safe power supply unit with maximum electrical specifications below the characteristic values of the assembled transmitter:

Transmitter	Ui	Ii	Pi	Ci	Li
TMT82	30 V	130 mA	800 mW	0	0

Type of protection (IEC)	Type
Ex ia IIC T4 Ga/Gb	iTHERM® TM411

The dependency of the ambient and process temperatures upon the temperature class for assembly with transmitters:

Type	Assembled Transmitter	Temperature class	Ambient temperature range housing
iTHERM® TM411	TMT82	T4	−50 °C ≤ Ta ≤ +85 °C
	TMT82 with display	T4	−40 °C ≤ Ta ≤ +85 °C

Type	Assembled Transmitter	Insert diameter	Process temperature range Tp	Temperature class/ maximum surface temperature sensor
iTHERM® TM411	TMT82	3 mm, 3 mm dual or 6 mm dual	−50 °C ≤ Tp ≤ +116 °C	T4
		6 mm	−50 °C ≤ Tp ≤ +116 °C	T4

Determination of process temperature for Pi ≤ 50 mW:

Insert diameter	Thermal resistance (Rth) for Pi ≤ 50 mW	Formula for calculating process temperature (Tp)
3 mm, 3 mm dual or 6 mm dual	274K/W	$Tp < T_{class}$ [1)]-Tol. [2)]Tol.-(Rth x P_0 [3)]
6 mm	144K/W	

1) Inserting of temperature class, e.g. 85 °C (K) for T6
2) Inserting of Tolerances to IEC60079-0 chapter 26.5.1.3: 5 K for T6, T5, T4 and T3 10 K for T2 and T1
3) P0 of intrinsic safe temperature input (e.g. measurement circuit TMT182, P0 = 6.6 mW)

Calculation example for T6 and 6 mm insert: $Tp < T_{class}$ - Tol. - (Rth x P_0)

Tp < 85 °C(K) - 5K - (144K/W x 6.6 mW)

Tp < 79.04 °C

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