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Safety Instructions
iTEMP TMT86

PROFINET with Ethernet-APL

ATEX/IECEx: Ex ia IIC T6 Ga
Ex ia IIC T6 Gb
Ex ia [ia Ga] IIC T6 Gb

Endress+Hauser
People for Process Automation

iTEMP TMT86

PROFINET with Ethernet-APL

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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:

- Operating instructions: BA02144T
- Brief operating instructions: KA01529T
- Technical information: TI01605T

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

Manufacturer´s certificates

IECEx certificate

Certificate number: IECEx EPS 22.0027X

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

- IEC 60079-0 : 2017
- IEC 60079-11 : 2011

ATEX certificate

Certificate number: EPS 22 ATEX 1 193 X

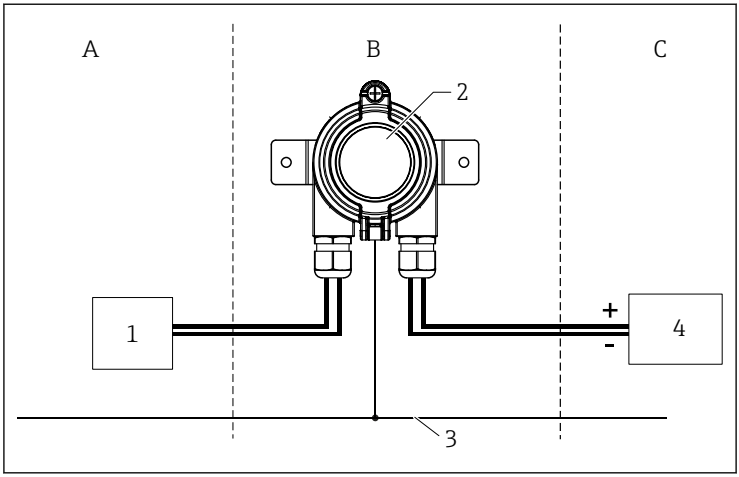
EU Declaration of Conformity

Declaration number: EU_01014

Manufacturer address

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

Safety instructions



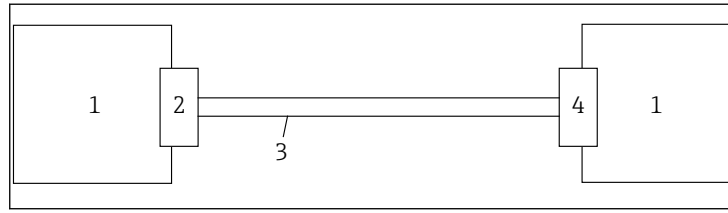
A Hazardous area; Zone 0, 1, 2; EPL Ga, Gb, Gc
B Hazardous area; Zone 1, 2; EPL Gb, Gc
C Non-hazardous area
1 Remote mount sensor configuration, e. g. RTD, TC Sensor (simple apparatus)
2 Temperature transmitter with field housing as option
3 Local potential equalization
4 Associated intrinsically safe devices with maximum connection values from the following table

Interconnection details see in transmitter installation grafics in the associated operating instructions.

Safety instructions: 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).
- When installing the unit note that the housing ingress protection classification IP20 according to EN/IEC 60529 is upheld.
- When connecting the device with a certified circuit of category “ib” into an IIC or IIB hazardous area the ignition class changes to: Ex ib IIC or Ex ib IIB.
- In hazardous areas it is not permitted to use the CDI interface for configuration.

Safety instructions: 2-WISE



A0049009

1 2-WISE device
2 2-WISE power source port
3 Cable
4 2-WISE power load port

Approved 2-WISE device (1) with intrinsically safe 2-WISE power source port (2)		Approved 2-WISE device (1) with intrinsically safe 2-WISE power load port (4)	
Uo (Voc) = 14 to 17.5 V	Ci ≤ 5 nF	Ui (Vmax) = 17.5 V	Ci ≤ 5 nF
Io (Isc) ≤ 380 mA	Li ≤ 10 µH	Ii (Imax) = 380 mA	Li ≤ 10 µH
Po (Pmax) ≤ 5.32 W		Pi (Pmax) = 5.32 W	
		Leakage current ≤ 1 mA	

Temperature transmitter with maximum connection values see table electrical data.

- The 2-WISE concept allows interconnection of intrinsically safe apparatus and associated apparatus not specially assessed for such a combination. For the acceptance of the interconnection of the different instrinsically safe circuits of these apparatus, the comparison of the voltage Ui (Vmax) with Uo (Voc), the current Ii (Imax) with Io (Ioc), and the power Pi (Pmax) with Po (Pmax) of the interconnected circuits must demonstrate that Ui (Vmax), Ii (Imax) and Pi (Pmax) are equal to or greater than Uo (Voc), Io (Isc) and Po (Pmax) of the connected circuits.
- In addition, the maximum internal capacitance (Ci) and maximum internal inductance (Li) of each apparatus (other than those from auxiliary devices) connected to a 2-WISE system must not exceed 5 nF and 10 µH respectively.
- In a powered 2-WISE system only 2 ports (power source and power load) are allowed to be connected at the opposite ends of a cable, with a maximum of two auxiliary devices connected in between. The power source port supplies DC power to the system, and the power load port consumes DC power from the system. Auxiliary device ports may also consume DC power from the system.

- The voltage Uo (Voc) of a power source port must be in the range of 14 to 17.5 V. Any other device connected to the cable shall be passive, meaning that it is not allowed to provide energy to the system, with the exception of a leakage current of 1 mA for a power load port and a leakage current of 50 µA for each auxiliary device port.
- The intrinsically safe circuit of a 2-WISE port shall be galvanically isolated from non-intrinsically safe circuits.
- The parameters of cable used to interconnect 2-WISE ports must be as follows:
  - Cable resistance Rc: 15 to 150 Ohm/km
  - Cable inductance Lc: 0.4 to 1 mH/km
  - Cable capacitance Cc [1]: 45 to 200 nF/km
  - Length of cable (not including cable stubs): ≤ 200 m
  - Length of cable stubs: ≤ 1 m

If the above rules are respected, the inductance and the capacitance of the cable will not impair the intrinsic safety of the installation.

Safety instructions: Head transmitter

- The device installed in a terminal head must be connected to the potential compensation cable.
- The certified TID10 display may only be installed in zone 1/EPL Gb or zone 2/EPL Gc.
- The permissable ambient temperatures for the TID10 display are to be observed.

Safety instructions: Field housing (as option)

- The housing of the field transmitter must be connected to the potential matching line.
- When connecting two independent sensors make sure that the potential equalisation cables are at the same potential.
- The circuits of an assembled head transmitter are isolated from its terminal head in conformance with EN/IEC 60079-11 chapter 6.3.13.

Safety instructions: Zone 0

These instructions are valid only if the device is to be installed directily in the zone 0 (category 1)/EPL Ga.

1) Cc = Cc line/line + 0.5 Cc line/screen, if both lines are floating, or Cc = Cc line/line + Cc line/screen if the screen is connected to one line

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
  - Temperature: −52 to +60 °C
  - Pressure: 80 to 110 kPa (0.8 to 1.1 bar)
  - Air with normal oxygen content, usually 21 % (V/V)
- If no potentially explosive mixtures are present, or if additional protective measures have been taken according to EN 1127-1, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.
- The restricted ambient temperatures as per EN 1127-1 6.4.2 must be observed (see table).
- The power circuit to be supplied must meet the specifications for explosion protection Ex ia IIC (EN/IEC 60079-14 12.3).
- The devices can only be used in fluids if the process-wetted materials are sufficiently resistant to such fluids.
- If the entire device is operated in Zone 0/EPL Ga, the compatibility of the device materials with the fluids has to be ensured. Housing: polycarbonate (PC), potting: silicone.
- It is not permitted to mount the TID10 display in zone 0/EPL Ga.
- The temperature transmitter must be installed so that electrostatic charge cannot occur, e.g. installation in grounded metallic head or grounded housing.

Safety instructions: Special conditions

- In hazardous areas it is not permitted to use the CDI interface of the device for configuration.
- The device must be protected against electrostatic charge/discharge.

Temperature tables

Type (order option)	Temperature class	Ambient temperature EPL Gb/Zone 1	Ambient temperature EPL Ga/Zone 0
TMT86-xxA1xxxx Head transmitter without display	T6	−52 °C ≤ Ta ≤ +55 °C	−52 °C ≤ Ta ≤ +40 °C
	T5	−52 °C ≤ Ta ≤ +70 °C	−52 °C ≤ Ta ≤ +60 °C
	T4	−52 °C ≤ Ta ≤ +85 °C	−52 °C ≤ Ta ≤ +60 °C
TMT86-xxA1xxxx Head transmitter with display (TID10)	T6	−40 °C ≤ Ta ≤ +55 °C	-
	T5	−40 °C ≤ Ta ≤ +70 °C	-
	T4	−40 °C ≤ Ta ≤ +85 °C	-
TMT86-xxA1xxxx Field housing without display	T6	−52 °C ≤ Ta ≤ +55 °C	-
	T5	−52 °C ≤ Ta ≤ +70 °C	-
	T4	−52 °C ≤ Ta ≤ +85 °C	-

Type (order option)	Temperature class	Ambient temperature EPL Gb/Zone 1	Ambient temperature EPL Ga/Zone 0
TMT86-xxA1xxxx Field housing with display (TID10)	T6	−40 °C ≤ Ta ≤ +55 °C	-
	T5	−40 °C ≤ Ta ≤ +70 °C	-
	T4	−40 °C ≤ Ta ≤ +85 °C	-

Electrical connection data

Type	Electrical data		
TMT86 Order option: TMT86-xxA1xxxx (Head transmitter)	Power supply (terminals + and -): Respectively as a field device appropriate for connection to a field bus system according to the FISCO-model	Ui ≤ 17.5 V_{DC} Ii ≤ 380 mA Ci = negligibly small Li = negligibly small	
	Sensor circuit (terminals 3 to 7):	Uo ≤ 3.71 V_{DC} Io ≤ 5.24 mA Po ≤ 4.86 mW	
	Display connection (as option)	Uo ≤ 3.9 V_{DC} Io ≤ 4 mA Ci = negligibly small Li = negligibly small	
	Max. combined connection values: Ex ia IIC Ex ia IIB Ex ia IIA	 Lo = 50 mH Lo = 100 mH Lo = 100 mH	 Co = 4 µF Co = 24 µF Co = 64 µF

Category	Type of protection (ATEX)	Type (order option)
II 1G	Ex ia IIC T6...T4 Ga	Without display
II 2G	Ex ia IIC T6...T4 Gb	With display
II 2(1)G	Ex ia [ia Ga] IIC T6...T4 Gb	With field housing

Type of protection (IEC)	Type
Ex ia IIC T6...T4 Ga	Without display
Ex ia IIC T6...T4 Gb	With display
Ex ia [ia Ga] IIC T6...T4 Gb	With field housing

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