

# Safety Instructions

## **iTEMP TMT86**

PROFINET with Ethernet-APL

Ex ia IIC T4...T6 Ga

Ex ia IIC T4...T6 Gb

Ex ia [ia Ga] IIC T4...T6 Gb





# iTEMP TMT86

PROFINET with Ethernet-APL

## Table of contents

Associated documentation .....	4
Supplementary documentation .....	4
Certificates and declarations .....	4
Manufacturer address .....	4
Safety instructions .....	5
Safety instructions: Installation .....	5
Safety instructions: 2-WISE .....	6
Safety instructions: Head transmitter .....	7
Safety instructions: Field housing (as option) .....	7
Safety instructions: Zone 0 .....	7
Safety instructions: Special conditions .....	8
Temperature tables .....	8
Electrical connection data .....	9

**Associated documentation**

To commission the device, please observe the Operating Instructions pertaining to the device:  
[www.endress.com/<product code>](http://www.endress.com/<product code>), e.g. TMT86

**Supplementary documentation**

Explosion protection brochure: CP00021Z  
The explosion protection brochure is available on the Internet:  
[www.endress.com/Downloads](http://www.endress.com/Downloads)

**Certificates and declarations****NEPSI certificate**

Certificate number: GYJ22.3605X

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

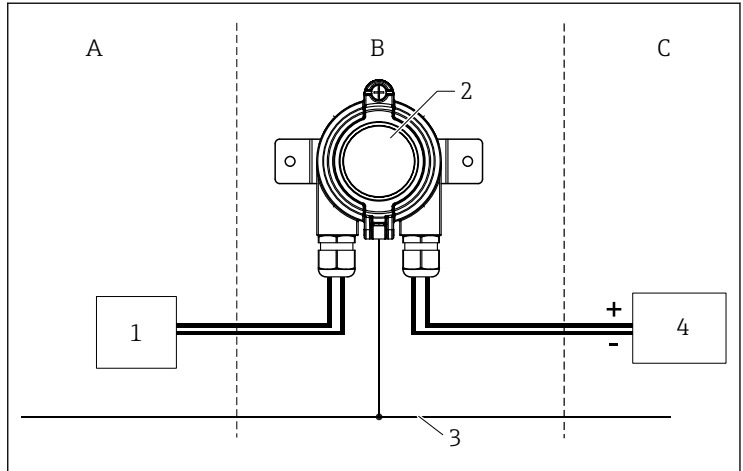


Please refer to NEPSI/CCC certificates for conditions of safe use.

**Manufacturer address**

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

## Safety instructions



A0048957

- 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

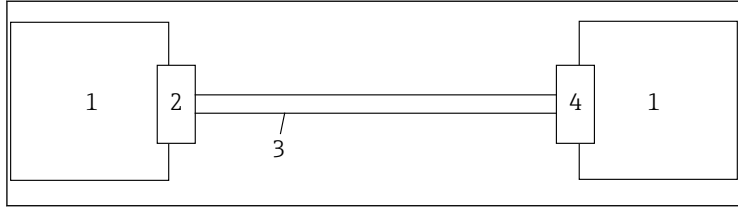


Interconnection details see in transmitter installation graphics in the associated operating instructions.

## 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)	
$U_o (V_{oc}) = 14 \text{ to } 17.5 \text{ V}$	$C_i \leq 5 \text{ nF}$	$U_i (V_{max}) = 17.5 \text{ V}$	$C_i \leq 5 \text{ nF}$
$I_o (I_{sc}) \leq 380 \text{ mA}$	$L_i \leq 10 \text{ }\mu\text{H}$	$I_i (I_{max}) = 380 \text{ mA}$	$L_i \leq 10 \text{ }\mu\text{H}$
$P_o (P_{max}) \leq 5.32 \text{ W}$		$P_i (P_{max}) = 5.32 \text{ W}$	
		Leakage current $\leq 1 \text{ mA}$	

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 intrinsically safe circuits of these apparatus, the comparison of the voltage  $U_i (V_{max})$  with  $U_o (V_{oc})$ , the current  $I_i (I_{max})$  with  $I_o (I_{sc})$ , and the power  $P_i (P_{max})$  with  $P_o (P_{max})$  of the interconnected circuits must demonstrate that  $U_i (V_{max})$ ,  $I_i (I_{max})$  and  $P_i (P_{max})$  are equal to or greater than  $U_o (V_{oc})$ ,  $I_o (I_{sc})$  and  $P_o (P_{max})$  of the connected circuits.
- In addition, the maximum internal capacitance ( $C_i$ ) and maximum internal inductance ( $L_i$ ) of each apparatus (other than those from auxiliary devices) connected to a 2-WISE system must not exceed 5 nF and 10  $\mu\text{H}$  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  $U_0$  ( $V_{oc}$ ) 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  $\mu$ A 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  $R_c$ : 15 to 150 Ohm/km
  - Cable inductance  $L_c$ : 0.4 to 1 mH/km
  - Cable capacitance  $C_c$ <sup>1)</sup>: 45 to 200 nF/km
  - Length of cable (not including cable stubs):  $\leq 200$  m
  - Length of cable stubs:  $\leq 1$  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 permissible 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 directly in the zone 0 (category 1)/EPL Ga.

---

1)  $C_c = C_c \text{ line/line} + 0.5 C_c \text{ line/screen}$ , if both lines are floating, or  $C_c = C_c \text{ line/line} + C_c \text{ line/screen}$  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 $\leq$ Ta $\leq$ $+55$ °C	$-52$ °C $\leq$ Ta $\leq$ $+40$ °C
	T5	$-52$ °C $\leq$ Ta $\leq$ $+70$ °C	$-52$ °C $\leq$ Ta $\leq$ $+60$ °C
	T4	$-52$ °C $\leq$ Ta $\leq$ $+85$ °C	$-52$ °C $\leq$ Ta $\leq$ $+60$ °C
TMT86-xxA1xxxx Head transmitter with display (TID10)	T6	$-40$ °C $\leq$ Ta $\leq$ $+55$ °C	-
	T5	$-40$ °C $\leq$ Ta $\leq$ $+70$ °C	-
	T4	$-40$ °C $\leq$ Ta $\leq$ $+85$ °C	-
TMT86-xxA1xxxx Field housing without display	T6	$-52$ °C $\leq$ Ta $\leq$ $+55$ °C	-
	T5	$-52$ °C $\leq$ Ta $\leq$ $+70$ °C	-
	T4	$-52$ °C $\leq$ Ta $\leq$ $+85$ °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	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$	-
	T5	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	-
	T4	$-40\text{ °C} \leq T_a \leq +85\text{ °C}$	-

## 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	$U_i \leq 17.5\text{ V}_{DC}$ $I_i \leq 380\text{ mA}$ $C_i = \text{negligibly small}$ $L_i = \text{negligibly small}$
	Sensor circuit (terminals 3 to 7):	$U_o \leq 3.71\text{ V}_{DC}$ $I_o \leq 5.24\text{ mA}$ $P_o \leq 4.86\text{ mW}$
	Display connection (as option)	$U_o \leq 3.9\text{ V}_{DC}$ $I_o \leq 4\text{ mA}$ $C_i = \text{negligibly small}$ $L_i = \text{negligibly small}$
	Max. combined connection values:	
	Ex ia IIC Ex ia IIB Ex ia IIA	$L_o = 50\text{ mH}$ $C_o = 4\text{ }\mu\text{F}$ $L_o = 100\text{ mH}$ $C_o = 24\text{ }\mu\text{F}$ $L_o = 100\text{ mH}$ $C_o = 64\text{ }\mu\text{F}$

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







71598538

[www.addresses.endress.com](http://www.addresses.endress.com)

---