

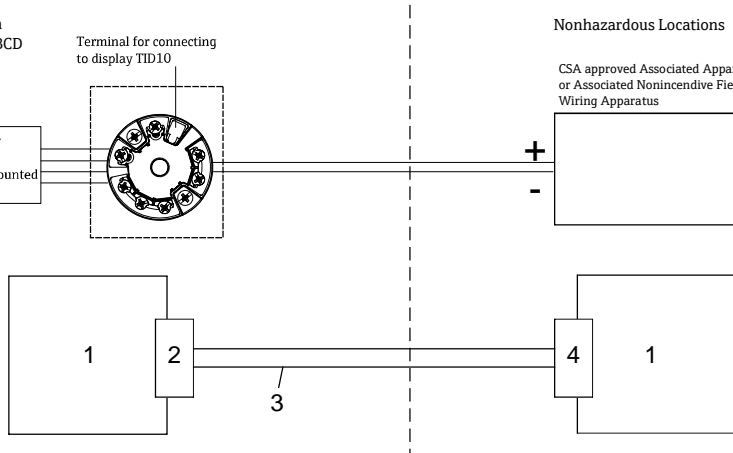
Hazardous (Classified) Location
Class I / Division 1 / Groups ABCD
Class I, Zone 0 (EPL Ga), IIC

Terminal for connecting
to display TID10

Nonhazardous Locations

CSA approved Associated Apparatus
or Associated Nonincendive Field
Wiring Apparatus

e.g. RTD or TC Sensor
(Simple Apparatus)
integral or remote mounted



- 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 (Voc) = 14 to 17.5 V	$C_i \leq 5$ nF	U_i (Vmax) = 17.5 V	$C_i \leq 5$ nF
I_o (Isc) ≤ 380 mA	$L_i \leq 10$ μ H	I_i (Imax) = 380 mA	$L_i \leq 10$ μ H
P_o (Pmax) ≤ 5.32 W		P_i (Pmax) = 5.32 W	
Leakage current ≤ 1 mA			

Temperature range

without display, TID10

T4	-52°C ... +85°C
T5	-52°C ... +70°C
T6	-52°C ... +55°C

with display, TID10

T4	-40°C ... +85°C
T5	-40°C ... +70°C
T6	-40°C ... +55°C

Sensor circuits (Terminals 3...7)

U_o or Voc or Vt = 3.71 V I_o or Isc = 5.24 mA $P_o = 4.86$ mW

Group A, B resp. IIC	C_o or $C_a = 4$ μ F	L_o or $L_a = 50$ mH
Group C, D resp. IIB	C_o or $C_a = 24$ μ F	L_o or $L_a = 100$ mH
Group C, D resp. IIA	C_o or $C_a = 64$ μ F	L_o or $L_a = 100$ mH

Applicable requirements see CSA certificate **70187832**



Installation Notes TMT86

- CSA approved apparatus must be installed in accordance with manufacturer's instructions.
- Install per Canadian Electrical Code or National Electrical Code (NFPA 70).
- Use supply wires suitable for 5°C above surroundings.
- Stating that only simple apparatus should be terminated to the sensor connection.
Simple apparatus is defined as a device that will neither generate nor store more than 1.2V, 0.1A, 0.25mW or 20 μ J. Examples are Thermocouples or RTDs.
- **WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS.**
AVERTISSEMENT: RISQUE POTENTIEL DE DÉCHARGES ELECTROSTATIQUES – VOIR CONSIGNES.

2-WISE

- 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 (Vmax) with U_o (Voc), the current I_i (Imax) with I_o (Ioc), and the power P_i (Pmax) with P_o (Pmax) of the interconnected circuits must demonstrate that U_i (Vmax), I_i (Imax) and P_i (Pmax) are equal to or greater than U_o (Voc), I_o (Isc) and P_o (Pmax) 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 μ 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_o (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 μ 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 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.

	Approved Pfanzelt	Date (yyyy-mm-dd) 2022-11-18	Drawing No. 10000013591	Dwg.rev. -	Revision no. -	Revision date (yyyy-mm-dd) -	Name -	Material 71614617 XA03121T/09/EN/01.23	Endress+Hauser
Volume (mm ³)	Designed Pfanzelt	Date (yyyy-mm-dd) 2022-11-17	Unit ITEMP TMT86	Scale 1:1	CONTROL DRAWING CSA Intrinsic Safety			Series	
Refer to protection notice ISO 16016	Edge of working parts ISO 13715	Geometrical tolerancing ISO 2768-mH-E	Part No. -	Format A4	Objekt version	Sheet 1 of 3	Endress + Hauser Wetzer GmbH+Co. KG Nesselwang / Germany		


INTRINSICALLY SAFE

Class I / Div. 1 / Groups ABCD Ex ia IIC/AEx ia IIC

- CSA Approved Associated Apparatus must meet the following parameters:
 $U_o \leq U_i$ $I_o \leq I_i$ $P_o \leq P_i$ $C_a \geq C_i + C_{cable}$ $L_a \geq L_i + L_{cable}$
 Transmitter entity parameters are as follows:
 U_i or $V_{max} \leq 17.5$ V DC $C_i = 0$
 I_i or $I_{max} \leq 380$ mA $L_i = 0$
- $V_{oc} + V_{oc}$ of Handheld device < V_{max} , $I_{sc} + I_{sc}$ of Handheld device < I_{max} ,
 $P_o + P_o$ of Handheld device < P_i , $C_a > C_i + C_{cable} + C_i$ of Handheld device,
 $L_a > L_i + L_{cable} + L_i$ of Handheld device, when Programming Handheld device is used.
- **WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**
AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE

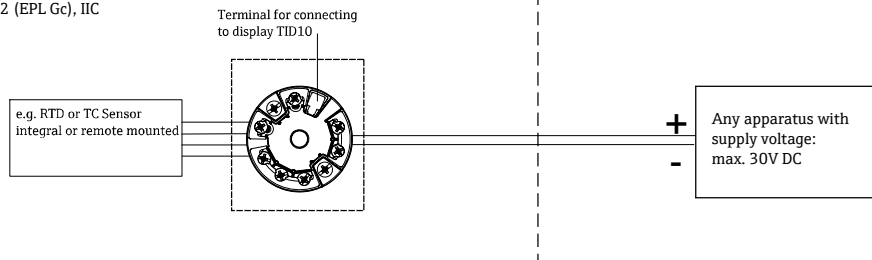
CONDITIONS OF ACCEPTABILITY

- Due to the risk of discharge the non-metallic parts of the equipment and of all non-metallic accessories have to be protected from electrostatic charging during installation and operation (e.g. only wipe with damp cloth and do not expose to high voltage fields).
- The equipment is for use under atmospheric conditions only, the permissible pressure range is to 1.1 bar (80 to 110 kPa) and the permissible normal oxygen content is typically 21 % v/v.
- The end user shall ensure appropriate earthing of the metallic field housing (optional) and all metallic accessories if used (wall or pipe mounting accessories for the field housing and the DIN rail clip for the head transmitter) upon installation.
- For the use as an intrinsically safe equipment, and for Zone 0 (EPL Ga), Zone 1 (EPL Gb) and Class I, Division 1 applications, the head transmitter TMT86 shall be installed completely inside an additional enclosure, providing a degree of protection of not less than IP20 according to CSA/UL 60079-0 and CSA/UL 60079-11. The ambient temperature within the end use enclosure shall not exceed the limits of the permissible ambient temperature range. Clearances, creepage distances and separations as defined in CSA/UL 60079-11 must be considered for the installation.
- If the head transmitter TMT86 was used in a Zone 1 (EPL Gb), Zone 2 (EPL Gc) or Class I, Division 2 application it is not allowed to use it in Zone 0 (EPL Ga) or Class I, Division 1 applications in the future.
- When connecting the head transmitter TMT86 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.
- The use of the display type TID10 with the head transmitter TMT86 by connecting display to the CDI interface of the head transmitter is only permitted for Zone 1 (EPL Gb), Zone 2 (EPL Gc) and Class I, Division 2 applications.
- The CDI interface is only allowed to be used for connecting the display type TID10. Irrespective of inside or outside the hazardous area, no other circuits/equipment is allowed to be connected to the CDI Interface.
- The use of the additional field housing (optional) with the head transmitter TMT86 is only permitted for Zone 1 (EPL Gb), Zone 2 (EPL Gc) and Class I, Division 2 applications.
- Final acceptance of this equipment when installed is subject to the jurisdiction of the local inspection authority.

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Volume (mm³)	Designed Pfanzelt	Date (yyyy-mm-dd) 2022-11-17	Unit ITEMP TMT86	Scale 1:1	Title CONTROL DRAWING CSA Intrinsic Safety		Series		
Refer to protection notice ISO 16016	Edge of working parts ISO 13715	Geometrical tolerancing ISO 2768-mH-E	Part No. -	Format A4	Objekt version 2 of 3	Sheet 2 of 3	Endress + Hauser Wetzer GmbH+Co. KG Nesselwang / Germany		

Hazardous (Classified) Location
Class I / Division 2 / Groups ABCD
Class I, Zone 2 (EPL Gc), IIC

Nonhazardous Locations



Temperature range for option field housing

AA, AB and AC (head transmitter as component only):

without display, TID10		with display, TID10	
T4	-50°C ... +85°C	T4	-40°C ... +85°C
T5	-50°C ... +70°C	T5	-40°C ... +70°C
T6	-50°C ... +55°C	T6	-40°C ... +55°C

Temperature range for option field housing

A1, A3, D1, D2, H1, H3, H5, H7: A2, A4, H2, H4, H6, H8:

T4	-50°C ... +85°C	T4	-40°C ... +85°C
T5	-50°C ... +80°C	T5	-40°C ... +80°C
T6	-50°C ... +70°C	T6	-40°C ... +70°C

Applicable requirements see CSA certificate **70187832**

Installation Notes TMT86

- CSA approved apparatus must be installed in accordance with manufacturer's instructions.
- Install per Canadian Electrical Code or National Electrical Code (NFPA 70).
- Use supply wires suitable for 5°C above surroundings.
- Terminal specification:

	Torque	Cable version	Cable cross-section
Screw terminals	0.5Nm	Solid or flexible	= 2.5 mm ² (14 AWG)
Push-in terminals (cable version, stripping length = min. 10 mm (0.39 in))	-	Solid or flexible	0.2 to 1.5 mm ² (24 to 16 AWG)
	-	Flexible with wire end ferrules with/without plastic ferrule	0.25 to 1.5 mm ² (24 to 16 AWG)

- **WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS.**
AVERTISSEMENT: RISQUE POTENTIEL DE DÉCHARGES ELECTROSTATIQUES – VOIR CONSIGNES.

INCREASED SAFETY

Applicable for option field housing AA, AB and AC (Component):

Ex ec IIC Gc
Class I, Zone 2, AEx ec IIC
Class I, Division 2, Groups A, B, C, D

Applicable for option field housing A1, A2, A3, A4, D1, D2, H1, H2, H3, H4, H5, H6, H7 and H8:

Ex ec IIC T6...T4 Gc
Class I, Zone 2, AEx ec IIC T6...T4 Gc
Class I, Division 2, Groups A, B, C, D; T6...T4



- Intrinsic safety barrier is not required. $V_{max} \leq 30$ V DC.
- **WARNING: EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT WHILE CIRCUITS ARE LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.**
- **AVERTISSEMENT: RISQUE EXPLOSIF- NE JAMAIS BRANCHEZ OU DECONNECTEZ QUAND LES CIRCUITS INTERNES SONT SOUS TENSION À MOINS QUE LA ZONE SOIT PAS À RISQUES.**

Functional ratings

These ratings do not supersede Hazardous Location values
 $U_{nom} \leq 30$ DC $P \leq 0.7$ W

CONDITIONS OF ACCEPTABILITY

- Due to the risk of discharge the non-metallic parts of the equipment and of all non-metallic accessories have to be protected from electrostatic charging during installation and operation (e.g. only wipe with damp cloth and do not expose to high voltage fields).
- For the use as an equipment in type of protection increased safety, and for Zone 2 (EPL Gc), and Class I, Division 2 applications, the head transmitter TMT86 shall be installed completely inside an additional enclosure, providing a degree of protection of not less than IP54 according to CSA/UL 60079-0 and CSA/UL 60079-7. The ambient temperature within the end use enclosure shall not exceed the limits of the permissible ambient temperature range. Clearances, creepage distances and separations as defined in CSA/UL 60079-7 must be considered for the installation.
- For the use as an equipment in type of protection increased safety, and for Zone 2 (EPL Gc), and Class I, Division 2 applications, the head transmitter TMT86 shall not be connected or disconnected unless the area is known to be non-hazardous. The same applies for the connection and disconnection of the display type TID10.
- If the head transmitter TMT86 was used in a Zone 2 (EPL Gc) or Class I, Division 2 application it is not allowed to use it in Zone 1 (EPL Gb), Zone 0 (EPL Ga) or Class I, Division 1 applications in the future.
- The use of the display type TID10 with the head transmitter TMT86 by connecting display to the CDI interface of the head transmitter is only permitted for Zone 2 (EPL Gc) and Class I, Division 2 applications.
- The CDI interface is only allowed to be used for connecting the display type TID10. Irrespective of inside or outside the hazardous area, no other circuits/equipment is allowed to be connected to the CDI Interface.
- The use of the additional field housing (optional) with the head transmitter TMT86 is only permitted for Zone 2 (EPL Gc) and Class I, Division 2 applications.
- If the head transmitter TMT86, in type of protection increased safe and for use in Zone 2 (EPL Gc) and Class I, Division 2 applications, is mounted in an optional field housing the field housing must be equipped with suitable cable glands, certified according to CSA/UL 60079-0 and CSA/UL 60079-7, providing a degree of ingress protection of not less than IP54.

Applicable for option field housing A1, A2, A3, A4, D1, D2, H1, H2, H3, H4, H5, H6, H7 and H8:

- Final acceptance of this equipment when installed is subject to the jurisdiction of the local inspection authority.
- The end user shall ensure appropriate earthing of the field housing.

Applicable for option field housing AA, AB and AC (head transmitter as component only):

- The end user shall ensure appropriate earthing of the metallic field housing (optional) and all metallic accessories if used (wall or pipe mounting accessories for the field housing and the DIN rail clip for the head transmitter) upon installation.
- These components do not have any surface that achieves a temperature greater than 135°C/100°C/85°C with a 5K safety factor when operated under full load conditions at an ambient of range of 85°C/70°C/55°C respectively.

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Pfanzelt	2022-11-18	10000013591	-	-	-	-	71614617 XA03121T/09/EN/01.23
Volume (mm ³)	Designed	Date (yyyy-mm-dd)	Unit	Scale	Title	Series	
	Pfanzelt	2022-11-17	iTEMP TMT86	1:1	CONTROL DRAWING CSA Increased Safety	Objekt version	Sheet
Refer to protection notice ISO 16016	Edge of working parts ISO 13715	Geometrical tolerancing ISO 2768-mH-E	Part No.	Format			
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