Safety Instructions
Prosonic M
FMU40, FMU41, FMU42, FMU44
PROFIBUS PA, FOUNDATION Fieldbus

Ex ia IIC T* Ga/Gb
Ex ia IIC T* Gb
TÜV 13.0899 X

Segurança
INMETRO TÜVRheinland OCP 0004

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Safety instructions for electrical apparatus for explosion-hazardous areas

Endress+Hauser
People for Process Automation

Prosonic M
FMU40, FMU41, FMU42, FMU44

PROFIBUS PA, FOUNDATION Fieldbus

Associated Documentation

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

- PROFIBUS PA: BA00238F/00
- FOUNDATION Fieldbus: BA00239F/00

The Operating Instructions which are supplied and correspond to the device type apply.

Supplementary Documentation

Explosion-protection brochure:
CP00021Z/11

Designation

Explanation of the labelling and type of protection can be found in the explosion protection brochure.

Designation of type of protection

Ex ia IIC T* Ga/Gb
Ex ia IIC T* Gb

* → 📄 6 (Temperature tables)

Applied standards

ABNT NBR IEC 60079-0 :2008
ABNT NBR IEC 60079-11:2009
ABNT NBR IEC 60079-26:2008
IEC 60079-27 :2008

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
- Install the device according to the manufacturer's instructions and national regulations.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. housing, sensor element, special varnishing , attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)

Safety instructions: Special conditions

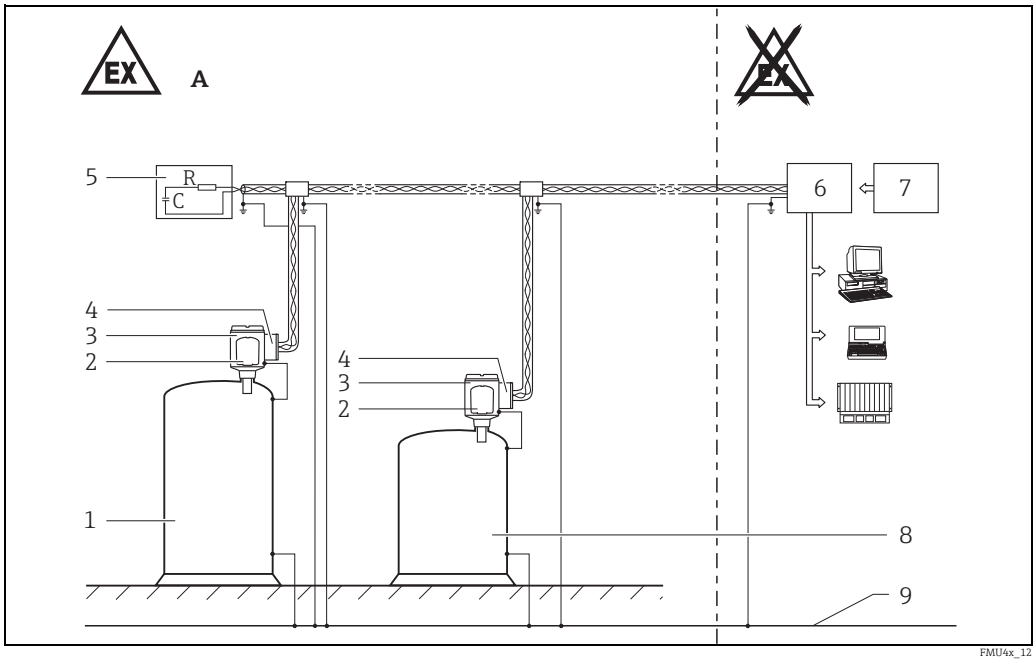
Permitted ambient temperature range at the electronics housing: $-40\ °C \leq T_a \leq +80\ °C$.
Observe the information in the temperature tables.

- In the event of additional or alternative special varnishing on the housing or other metal parts:
  - Observe the danger of electrostatic charging and discharge.
  - Do not rub surfaces with a dry cloth.

FMU42, FMU44

- Avoid electrostatic charging of the sensor (e.g. do not rub dry and install outside the filling flow).

Safety instructions: Installation



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A *Zone 1*

1 *Tank, hazardous area Zone 0*
2 *Electronic insert*
3 *Housing:*
- *F12*
- *T12-OVP*

Optionally with or without VU331 display and operating module
4 *only T12-OVP: Terminal module with integrated overvoltage protector*
5 *Permitted terminating resistor Ex ia IIC*
6 *Certified associated apparatus (e.g. FISCO model)*
7 *Power supply*
8 *Tank, hazardous area Zone 1*
9 *Potential equalization*

Optional for F12 housing; T12-OVP housing (only for service purposes!):
- *Service interface: Commubox with associated ToF cable (Observe Safety Instructions)*

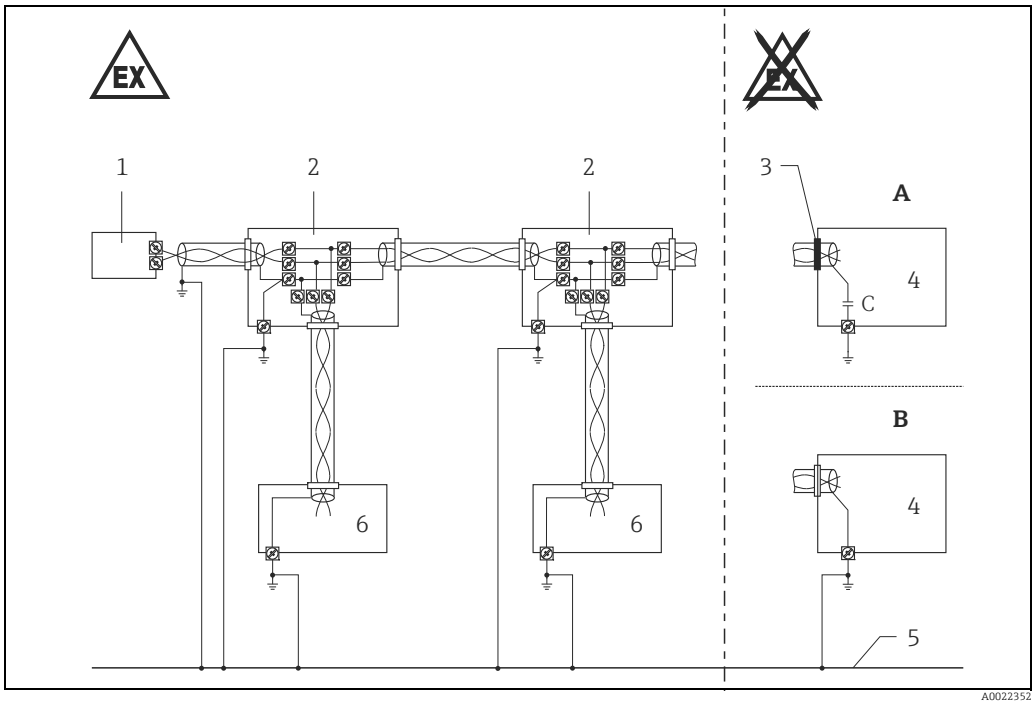
- The relationship between the permitted ambient temperature for the electronics housing, dependent on the range of application and the temperature classes is shown in the tables (→ 🖹 6).
- Continuous duty temperature of the cable ≥ T_a +5 K.
- When the device is connected to an intrinsically safe circuit Ex ib, the level of protection changes to Ex ib. Do not operate intrinsically safe circuits Ex ib in zone 0.
- The pertinent guidelines must be observed when intrinsically safe circuits are connected together. (E.g. when using Commubox or handheld terminal DXR375 or other certified apparatus).

F12 housing
- The intrinsically safe input power circuit of the device is isolated from ground potential and has a dielectric strength of at least 500 V_{rms} with respect to it.

T12-OVP housing
- The intrinsically safe input power circuit of the device is isolated from ground potential. The dielectric strength to earth is limited by 600 V electrode arresters.

Potential equalization

- For grounding the screen, → 🖻 2.



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A *Version 1*
Use small capacitors (e.g. 1 nF, 1500 V, dielectric strength, ceramic).
Total capacitance connected to the screen may not exceed 10 nF.
B *Version 2*

1 *Terminating resistor*
2 *Distributor/T box*
3 *Screen insulated*
4 *Supply unit/Segment coupler*
5 *Potential equalization (secured in high degree)*
6 *Field device*

Safety instructions: Zone 0

- Only operate devices in potentially explosive vapour/air mixtures under atmospheric conditions:
  −20 °C ≤ T ≤ +60 °C
  800 hPa ≤ p ≤ 1100 hPa
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, the transmitters may be operated under other atmospheric conditions in accordance with the manufacturer's specifications.
- Only install the devices in media for which the wetted materials have sufficient durability.
- Associated apparatus with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits are preferred.

Temperature tables

Zone 1 - Application

Note!
Observe the permitted temperature range.

Housing	Temperature class	Ambient temperature	Process temperature
F12, T12-OVP	T6	−40...+60 °C	max. 80 °C
	T5	−40...+75 °C	
	T4	−40...+80 °C	

Connection data

- Power supply and signal circuit in protection type intrinsic safety: Intrinsic safety Ex ia IIC/IIB.

With electronic insert for PROFIBUS PA or FOUNDATION Fieldbus Ex ia IIC:
as per FISCO-Modell or ENTITY concept (individual interconnection) with the following maximum values:

Housing	Power supply:			
F12	U_o = 17.5 V I_o = 500 mA P_o = 5.5 W	or	U_o = 24 V I_o = 250 mA P_o = 1.2 W	L_i = 10 µH C_i = 5 nF Leakage current ≤ 50 µA
T12-OVP	U_i = 17.5 V I_i = 273 mA P_i = 1.2 W	or	U_i = 24 V I_i = 250 mA P_i = 1.2 W	L_i = 10 µH C_i = 5 nF Leakage current ≤ 50 µA

Optional for F12 housing; T12-OVP housing (only for service purposes)

- For connecting the Commubox service interface with the associated ToF cable:

Commubox output + ToF cable:						
U_o = 3.74 V I_o = 9.9 mA P_o = 9.2 mW effective inner inductance L_i = negligible effective inner capacitance C_i = negligible Characteristic curve: linear						
For material group IIC: permitted outer inductance L_o ≤ 340 mH permitted outer capacitance C_o ≤ 100 µF						
When interconnected to a Prosonic M, the following results apply:						
	L_o =	0.15 mH	0.5 mH	1 mH	2 mH	5 mH
For material group IIC	C_o =	≤ 8 µF	≤ 7 µF	≤ 5.5 µF	≤ 5 µF	≤ 4 µF
For material group IIB	C_o =	10 µF				

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