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Safety Instructions
Prosonic M
FMU40, FMU41, FMU42, FMU44

4-20 mA HART

II 1/2 G Ex ia IIC Ga/Gb
II 2 G Ex ia IIC Gb

Endress+Hauser
People for Process Automation

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Table of contents

Associated documentation

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

BA00237F/00

Supplementary documentation

Explosion-protection brochure: CP00021Z/11

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

UK Declaration of Conformity

Declaration Number:
UK_00202

The UK Declaration of Conformity is available:
In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Declaration -> Type: UKCA Declaration -> Product Code: ...

UKCA type-examination certificate

Certificate number:
CML 21UKEX2456X

List of applied standards: See UK Declaration of Conformity.

Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

Other standards

Among other things, the following standards shall be observed in their current version for proper installation:
- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

Extended order code

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

Structure of the extended order code

FMU4x	–	**********	+	A*B*C*D*E*F*G*..
(Device type)		*(Basic specifications)*		*(Optional specifications)*

* = Placeholder
At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

Basic specifications

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available.
The selected option of a feature can consist of several positions.

Optional specifications

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available. The features have a 2-digit structure to aid identification (e.g. JA). The first digit (ID) stands for the feature group and consists of a number or a letter (e.g. J = Test, Certificate). The second digit constitutes the value that stands for the feature within the group (e.g. A = 3.1 material (wetted parts), inspection certificate).

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

Extended order code: Prosonic M

The following specifications reproduce an extract from the product structure and are used to assign:
- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

Device type

FMU40, FMU41, FMU42, FMU44

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
FMU4x	1	ATEX II 1/2 G Ex ia IIC T6...T4 Ga/Gb ATEX II 2 G Ex ia IIC T6...T4 Gb

Position 3 (Power Supply, Output)		
Selected option		**Description**
FMU4x	B, J, P	2-wire; 4-20 mA HART

Position 4 (Operation)		
Selected option		**Description**
FMU4x	1	W/o display, via communication
	2	4-line display VU331, Envelope curve display on site
	3 [1)]	Prepared for FHX40, remote display (accessory)

1) Only in connection with Position 5 = 1

Position 5 (Housing)		
Selected option		**Description**
FMU4x	1	F12 Alu, coated, IP68 NEMA6P + UK marking
	3	T12 Alu, coated, IP68 NEMA6P + OVP + UK marking, separate conn. compartment, OVP = overvoltage protection

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

- The device is intended to be used in explosive atmospheres as defined in the scope of EN IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- 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. enclosure, sensor element, special varnishing, attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the electronics enclosure, depending on the range of application and the temperature class.

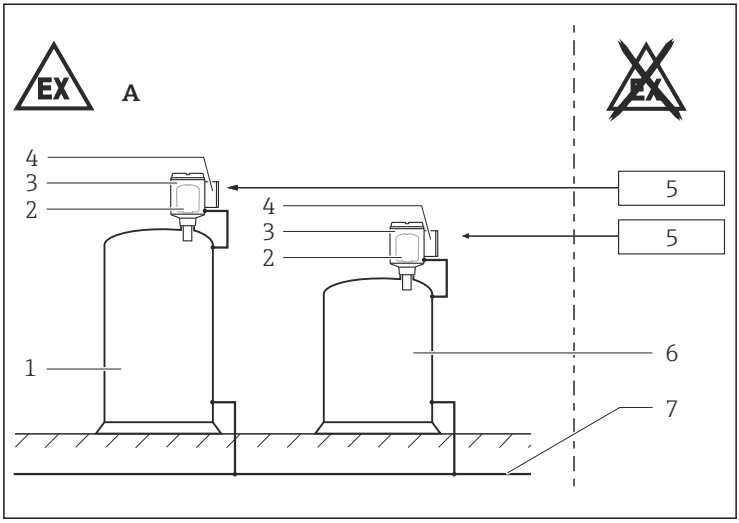
Safety instructions: Special conditions

Permitted ambient temperature range at the electronics enclosure:
$-40\ °C \leq T_a \leq +80\ °C$

- Observe the information in the temperature tables.
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
  - Observe the danger of electrostatic charging and discharge.
  - Do not install in the vicinity of processes (≤ 0.5 m) generating strong electrostatic charges.

Device type 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 Enclosure
4 only Basic specification, Position 5 = 3:
Terminal module with integrated overvoltage protector
5 Certified associated apparatus
6 Tank, hazardous area Zone 1
7 Local potential equalization

- Continuous service temperature of the connecting cable: ≥ T_a +5 K.
- When the device is connected to an intrinsically safe circuit Ex ib, the type of protection changes to Ex ib. Do not operate intrinsically safe circuits Ex ib in Zone 0.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.

Basic specification, Position 5 = 1

- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{rms}.
- Option:
  - Remote display, e.g. FHX40 (Observe Safety Instructions)
  - Service interface: Commubox with associated ToF cable (Observe Safety Instructions)

Basic specification, Position 5 = 3

- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength to earth is limited by 600 V electrode arresters.
- Option (only for service purposes):
  Service interface: Commubox with associated ToF cable (Observe Safety Instructions)

Temperature tables

Zone 1 - Application

Observe the permitted temperature range.

Basic specification, Position 5 = 1

Temperature class	Ambient temperature T_a (ambient)	Process temperature T_p (process)
T6	−40 to +60 °C	max. 80 °C
T5, T4	−40 to +80 °C	

Basic specification, Position 5 = 3

Temperature class	Ambient temperature T_a (ambient)	Process temperature T_p (process)
T6	−40 to +60 °C	max. 80 °C
T5	−40 to +75 °C	
T4	−40 to +80 °C	

Connection data

Power supply and signal circuit with protection type: intrinsic safety Ex ia IIC, Ex ia IIB.

Certified intrinsically safe circuit with the following maximum values

Basic specification, Position 5 = 1

Power supply
U_i = 30 V I_i = 300 mA P_i = 1 W L_i = negligible C_i = 13 nF

Basic specification, Position 5 = 3

Power supply
U_i = 30 V I_i = 273 mA P_i = 1 W L_i = negligible C_i = 13 nF

Option

Remote display, e.g. FHX40:
Power supply and signal circuit with protection type: intrinsic safety Ex ia IIC, Ex ia IIB.

Basic specification, Position 5 = 1

Power supply
U_o = 4.2 V I_o = 34 mA P_o = 36 mW effective inner inductance L_i = negligible effective inner capacitance C_i = negligible Characteristic curve: linear

Connecting the Commubox service interface with the associated ToF cable

Basic specification, Position 5 = 1 and Basic specification, Position 5 = 3 (only for service purposes)

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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