

Safety Instructions

Prosonic M

FMU40, FMU41, FMU42, FMU44

4-20 mA HART, PROFIBUS PA,
FOUNDATION Fieldbus

ATEX, IECEx: Ex ta/tb IIIC Da/Db
Ex tb IIIC Db
Ex ta/tc IIIC Da/Dc
Ex tc IIIC Dc



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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:

HART:

BA00237F/00

PROFIBUS PA:

BA00238F/00

FOUNDATION Fieldbus:

BA00239F/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

EU Declaration of Conformity

Declaration Number:

EG02007

The EU Declaration of Conformity is available:

In the download area of the Endress+Hauser website:

www.endress.com -> Downloads -> Declaration ->

Type: EU Declaration -> Product Code: ...

EU type-examination certificate

Certificate number:

KEMA 02ATEX1006 X

List of applied standards: See EU Declaration of Conformity.

IEC Declaration of Conformity

Certificate number:
IECEX DEK 11.0014X

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

- IEC 60079-0 : 2017
- IEC 60079-31 : 2013
- IEC 60529 : 2013

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*..
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

* = 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	2	ATEX II 1/2 D Ex ta/tb IIIC T104°C Da/Db ATEX II 2 D Ex tb IIIC T95°C Db
	5	ATEX II 1/3 D Ex ta/tc IIIC T104°C Da/Dc ATEX II 3 D Ex tc IIIC T95°C Dc
	Z	IECEX Ex ta/tb IIIC T104°C Da/Db
	X	IECEX Ex ta/tc IIIC T104°C Da/Dc

Position 3 (Power Supply, Output)		
Selected option		Description
FMU4x	B, J, P	2-wire; 4-20 mA HART
	D, K, Q	2-wire; PROFIBUS PA
	F, L, R	2-wire; FOUNDATION Fieldbus

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 = A

Position 5 (Housing)		
Selected option		Description
FMU4x	A	F12 Alu, coated, IP68 NEMA6P
	C	T12 Alu, coated, IP68 NEMA6P, separate conn. compartment
	D	T12 Alu, coated, IP68 NEMA6P + OVP, 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 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.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.

- Only use the device in media to which the wetted materials have sufficient durability.
- 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.

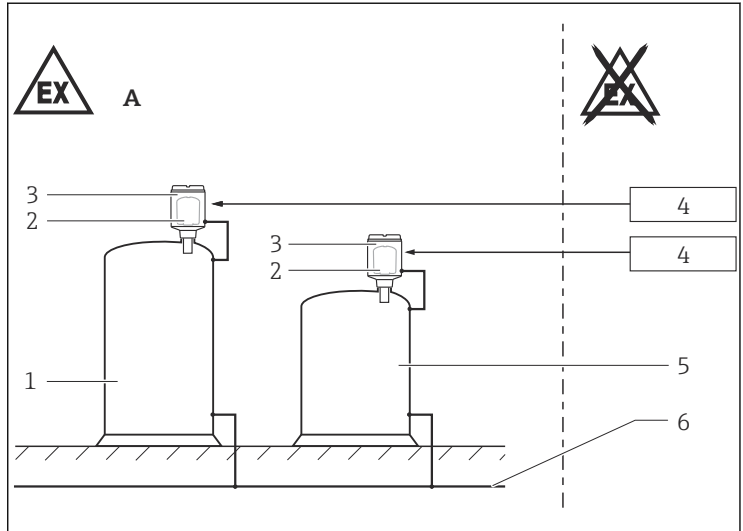
**Safety
instructions:**

Special conditions

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

- 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 ($\leq 0.5\text{ m}$) generating strong electrostatic charges.

Safety instructions: Installation



A0027586



- 1
- A Zone 21 or Zone 22
- 1 Tank, hazardous area Zone 20
- 2 Electronic insert
- 3 Enclosure
- 4 Associated apparatus
- 5 Tank, hazardous area Zone 21
- 6 Local potential equalization

- Only use certified cable entries suitable for the application. Observe national regulations and standards.
- Continuous service temperature of the connecting cable: $\geq T_a + 5 \text{ K}$.
- Configuring the device: The electronics compartment can be opened when energized.
- When the electronics compartment is opened make sure that no dust may deposit. After configuration screw the cover down to limit stop.
- In potentially explosive atmospheres: Do not open the connection compartment cover when energized.

- Connection compartment cover and electronics compartment cover:
Torque ≥ 40 Nm.
- The maximum voltage U_m of the power circuit or the signal circuit must not be exceeded if an external display (e.g. FHX40) or a service adapter (e.g. Commubox FXA193) is connected to the device.
- The following components of the device correspond to the low risk of mechanical danger. Mount in a protected position if installed within a hazardous location area rated Zone 21 or Zone 22 if mechanical danger is expected:
 - Cover with inspection window
 - Plug connectors of devices for supply/communication (e.g. PROFIBUS PA or FOUNDATION Fieldbus) not supplied with a type of protection Ex ia Da circuit. This circuit may not be disconnected in energized state.

Only Zone 22

Option:

- Remote display, e.g. FHX40 (Observe Safety Instructions)
- Service interface: Commubox with associated ToF cable (Observe Safety Instructions)

Potential equalization

- Integrate the device into the local potential equalization.
- The input circuit is galvanically connected to the enclosure.

Temperature tables

Zone 21 - Application



Observe the permitted temperature range.

Max. permitted ambient temperature and medium temperature: sensor (process connection) and electronics enclosure	Process temperature T _p (process)
-40 to +80 °C	max. 80 °C

Thermal data

Device type FMU40, FMU41

Maximum temperature	Sensor	Sensor	Electronics enclosure
	in Zone 20, Da	in Zone 21, Db or Zone 22, Dc	in Zone 21, Db or Zone 22, Dc
Max. ambient temperature	-20 to +80 °C	-20 to +80 °C	-20 to +80 °C
Max. surface temperature at an ambient temperature of 40 °C	+55 °C	+55 °C	+44 °C
Max. surface temperature at an ambient temperature of 80 °C	+104 °C	+95 °C	+84 °C

Device type FMU42, FMU44

Maximum temperature	Sensor	Sensor	Electronics enclosure
	in Zone 20, Da	in Zone 21, Db or Zone 22, Dc	in Zone 21, Db or Zone 22, Dc
Max. ambient temperature	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C
Max. surface temperature at an ambient temperature of 40 °C	+55 °C	+55 °C	+44 °C
Max. surface temperature at an ambient temperature of 80 °C	+104 °C	+95 °C	+84 °C

Connection data

Power supply		
	<i>Basic specification, Position 3 =</i>	
	<i>B, J, P</i>	<i>D, K, Q, F, L, R</i>
Supply voltage	30 V _{DC}	32 V _{DC}
Max. power consumption	0.8 W	0.8 W
U _m	250 V _{AC}	250 V _{AC}

Option

Remote display, e.g. FHX40:

Power supply and signal circuit: certified for II 3 D / Dc

Service/Display-Output
$U_{\max} = 4.2 \text{ V}$ $I_{\max} = 34 \text{ mA}$ $P_{\max} = 36 \text{ mW}$

Connecting the Commubox service interface with the associated ToF cable

Commubox output + ToF cable
$U_{\max} = 3.74 \text{ V}$ $I_{\max} = 9.9 \text{ mA}$ $P_{\max} = 9.2 \text{ mW}$



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