XA00179F-G/00/EN/16.22-00
71557905
2022-06-20

Safety Instructions
Prosonic M
FMU40/41/42/43/44

4-20 mA HART, PROFIBUS PA,
FOUNDATION Fieldbus

ATEX: II 3 G Ex ec IIC Gc
II 3 D Ex tc IIIC Dc
IECEx: Ex ec IIC Gc

Endress+Hauser
People for Process Automation

Prosonic M FMU40/41/42/43/44

4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus

Table of contents

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:
EG04007

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:
EG 04 007 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 60079-7 : 2015
- 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*..
(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	G	ATEX II 3 G Ex ec IIC T6...T4 Gc
	6	ATEX II 3 D Ex tc IIIC Txxx°C Dc
	B	IECEx Ex ec IIC T6...T4 Gc

Position 3 (Power Supply, Output)		
Selected option		**Description**
FMU4x	B, J, P	2-wire; 4-20mA HART
	D, K, Q	2-wire; PROFIBUS PA
	F, L, R	2-wire; FOUNDATION Fieldbus
	G, M, S	4-wire 90-250VAC; 4-20 mA HART
	H, N, T	4-wire 10,5-32VDC; 4-20mA 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 = 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.

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

FMU43

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
FMU43	6	ATEX II 3 D Ex tc IIIC Txxx°C Dc

Position 3 (Power Supply, Output)		
Selected option		**Description**
FMU43	D, K, Q	2-wire; PROFIBUS PA
	F, L, R	2-wire; FOUNDATION Fieldbus
	G, M, S	4-wire 90-250VAC; 4-20 mA HART
	H, N, T	4-wire 10,5-32VDC; 4-20mA HART

Position 4 (Operation)		
Selected option		**Description**
FMU43	1	W/o display, via communication
	2	4-line display VU331, Envelope curve display on site
	3	Prepared for FHX40, remote display (accessory)

Position 5 (Housing)		
Selected option		**Description**
FMU43	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

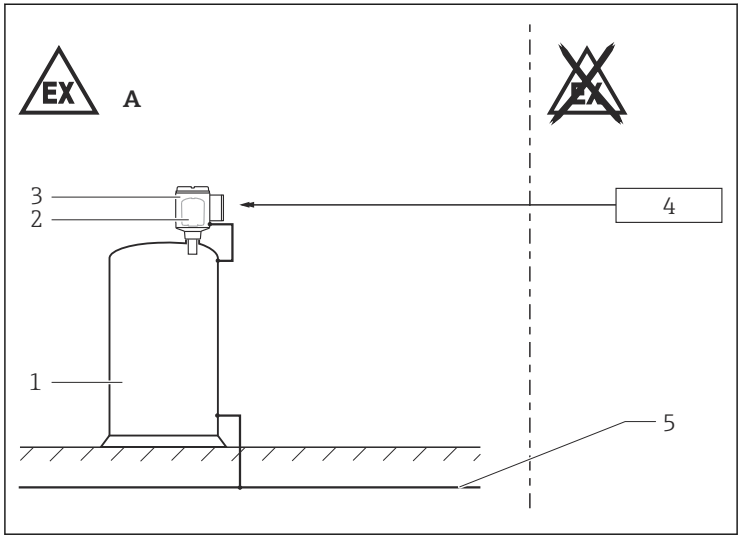
- The device is intended to be used in explosive atmospheres as defined in the scope of IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- 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.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. enclosure, 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 enclosure:
Zone 2: $-25\ ^{\circ}C \leq T_a \leq +70\ ^{\circ}C$
Zone 22: $-40\ ^{\circ}C \leq T_a \leq +80\ ^{\circ}C$

- 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.

Safety instructions: Installation



1

A Zone 2
1 Tank, hazardous area Zone 2
2 Electronic insert
3 Enclosure
4 Supply depending upon equipment version
5 Local potential equalization

- Continuous service temperature of the connecting cable: ≥ T_a +5 K.
- In potentially explosive atmospheres: Do not disconnect electrical connections when energized.
- Devices which are supplied by a plug (e.g. PROFIBUS PA or FOUNDATION Fieldbus): Do not loosen or detach the plug as long as power is switched on.
- 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 2 or Zone 22 if mechanical danger is expected:
  - Cover with inspection window
  - Plug connectors of devices for supply/communication

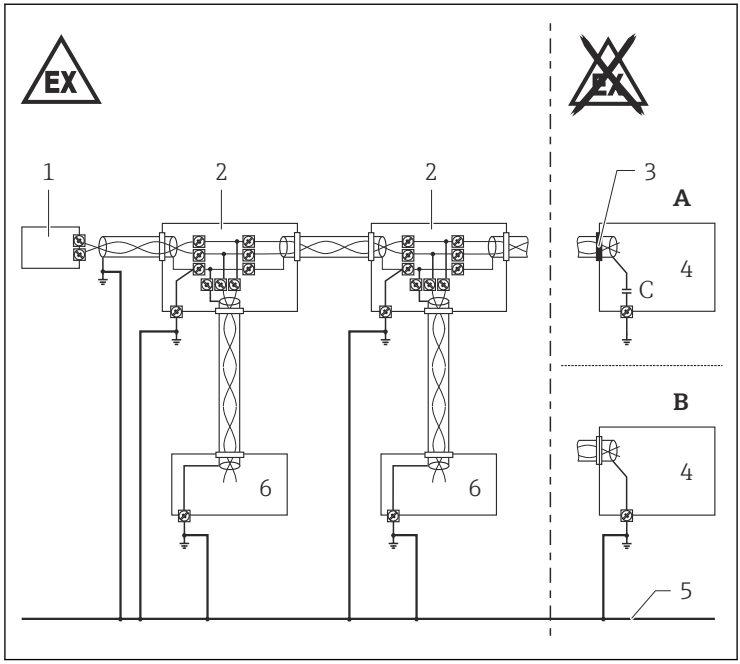
Basic specification, Position 5 = A

- The input power circuit or the signal circuit in case of 4-wire versions of the device is isolated from ground and has a dielectric strength of 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 = C, D

- Do not open the terminal compartment when energized.
- Option:
  Service interface: Commubox with associated ToF cable (Observe Safety Instructions)

PROFIBUS PA, FOUNDATION Fieldbus



2

A Version 1: Use small capacitors (e.g. 1 nF, 1 500 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

Temperature tables

Application in gas

Device type FMU40

Temperature class	Ambient temperature T_a (ambient)		
	Basic specification, Position 3 =		
	B, J, P with Position 5 = A	*B, J, P with Position 5 = C, D*	*D, K, Q, F, L, R*
T6	–20 to +50 °C	–20 to +50 °C	–20 to +50 °C
T5	–20 to +70 °C	–20 to +65 °C	–20 to +65 °C
T4	–20 to +70 °C	–20 to +70 °C	–20 to +70 °C

Device type FMU41, FMU42, FMU44

Temperature class	Ambient temperature T_a (ambient)		
	Basic specification, Position 3 =		
	B, J, P with Position 5 = A	*B, J, P with Position 5 = C, D*	*D, K, Q, F, L, R*
T6	–25 to +50 °C	–25 to +50 °C	–25 to +50 °C
T5	–25 to +70 °C	–25 to +65 °C	–25 to +65 °C
T4	–25 to +70 °C	–25 to +70 °C	–25 to +70 °C

Application in dust

Device type FMU40, FMU41

Basic specification, Position 3 = G, H, M, N, S, T
Ex tc IIIC T100°C Dc

An irreversible thermal fuse with a switch-off temperature of 115 °C is implemented in the transmitter.

Maximum temperature	Sensor	Electronics enclosure
Max. ambient temperature	–20 to +80 °C	–20 to +80 °C
Max. surface temperature at an ambient temperature of 40 °C	60 °C	44 °C
Max. surface temperature at an ambient temperature of 80 °C	100 °C	84 °C

Device type FMU42, FMU44

Basic specification, Position 3 = G, H, M, N, S, T
Ex tc IIIC T100°C Dc

An irreversible thermal fuse with a switch-off temperature of 115 °C is implemented in the transmitter.

Maximum temperature	Sensor	Electronics enclosure
Max. ambient temperature	–40 to +80 °C	–40 to +80 °C
Max. surface temperature at an ambient temperature of 40 °C	60 °C	44 °C
Max. surface temperature at an ambient temperature of 80 °C	100 °C	84 °C

Device type FMU43

Basic specification, Position 3 = G, H, M, N, S, T
Ex tc IIIC T84°C Dc

An irreversible thermal fuse with a switch-off temperature of 115 °C is implemented in the transmitter.

Maximum temperature	Sensor	Electronics enclosure
Max. ambient temperature	–40 to +80 °C	–40 to +80 °C
Max. surface temperature at an ambient temperature of 40 °C	40 °C	44 °C
Max. surface temperature at an ambient temperature of 80 °C	80 °C	84 °C

Device type FMU40, FMU41

Basic specification, Position 3 = B, D, F, J, K, L, P, Q, R
Ex tc IIIC T95°C Dc

Maximum temperature	Sensor	Electronics enclosure
Max. ambient temperature	–20 to +80 °C	–20 to +80 °C
Max. surface temperature at an ambient temperature of 40 °C	55 °C	44 °C
Max. surface temperature at an ambient temperature of 80 °C	95 °C	84 °C

Device type FMU42, FMU44

Basic specification, Position 3 = , D, F, J, K, L, P, Q, R
Ex tc IIIC T95°C Dc

Maximum temperature	Sensor	Electronics enclosure
Max. ambient temperature	−40 to +80 °C	−40 to +80 °C
Max. surface temperature at an ambient temperature of 40 °C	55 °C	44 °C
Max. surface temperature at an ambient temperature of 80 °C	95 °C	84 °C

Connection data

- Tightening torque of the terminal screws: 0.3 to 0.4 Nm.
- Strip the insulation of the connection wires with suitable length. Bare parts of the wires must not emerge from the terminal.
- Ensure that the wires are securely clamped.

Power supply			
Basic specification, Position 3 =			
G, M, S	*H, N, T*	*B, J, P*	*D, K, Q, F, L, R*
90 to 253 V_{AC} 4 VA 50/60 Hz	10.5 to 32 V_{DC} 1 W	U = 30 V_{DC} I ≤ 22 mA P_i ≤ 726 mW	U = 32 V_{DC} I ≤ 15 mA P_i ≤ 528 mW

Signal circuit	
4 to 20 mA	active or passive

www.addresses.endress.com

Endress+Hauser

People for Process Automation