

Safety Instructions

Micropilot M

FMR230/231/240/244/245

4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus

Ex nA nL IIC T1...T6 Gc
GYJ14.1446X



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Safety instructions for electrical apparatus for explosion-hazardous areas

Micropilot M

FMR230, FMR231, FMR240, FMR244, FMR245

4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus

Associated Documentation

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

- 4-20 mA HART:
BA00218F/00 (FMR230), BA00219F/00 (FMR231), BA00220F/00 (FMR240),
BA00248F/00 (FMR244), BA00251F/00 (FMR245)
- PROFIBUS PA:
BA00225F/00 (FMR230), BA00226F/00 (FMR231), BA00227F/00 (FMR240),
BA00249F/00 (FMR244), BA00252F/00 (FMR245)
- FOUNDATION Fieldbus:
BA00228F/00 (FMR230), BA00229F/00 (FMR231), BA00230F/00 (FMR240),
BA00250F/00 (FMR244), BA00253F/00 (FMR245)

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 nA nL IIC T1...T6 Gc

Applied standards

GB 3836.1-2010
GB 3836.8-2003

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)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the electronics housing, depending on the range of application, and the temperature class.

Safety instructions: Special conditions

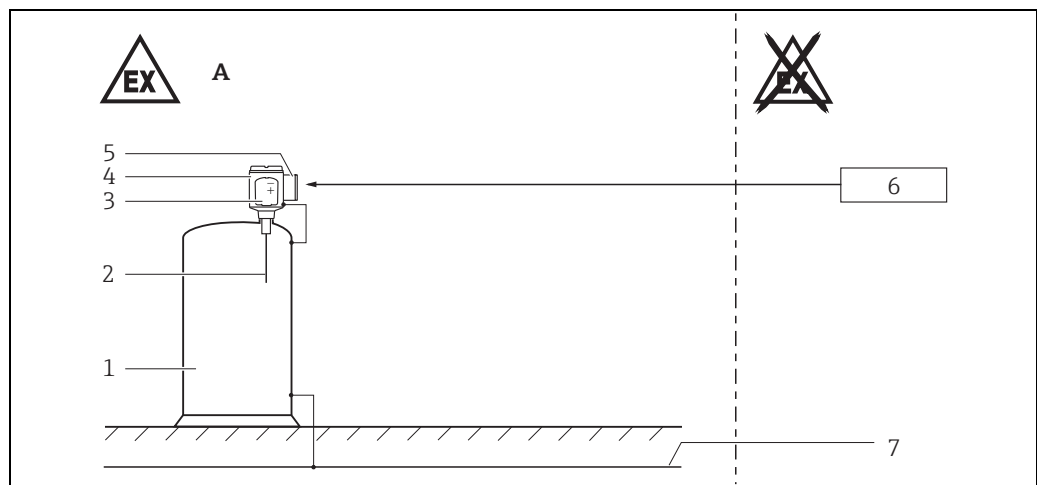
Permitted ambient temperature range at the electronics housing: $-40\text{ °C} \leq T_a \leq +80\text{ °C}$.
Observe the information in the temperature tables.

- The antenna on the device contain surfaces, which can become electrostatically charged: these antenna must not be arranged such that they can become dangerously charged from a flowing medium (e.g. filling curtain).
- Avoid electrostatic charging when cleaning the antenna (e.g. do not rub dry).
- 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.

Option

- Cover with viewing window corresponds to the "low" mechanical strain level (glass window 2 Joule).
- Devices with plug connector (e.g. PROFIBUS PA or FOUNDATION Fieldbus):
 - The connectors have to be protected against mechanical load.
 - Plug connector may not be disconnected in the energised state.

Safety instructions: Installation



1

A Zone 2

- 1 Tank, hazardous area Zone 2
- 2 Antenna (→ "Safety instructions: Special conditions")
- 3 Electronic insert
- 4 Housing:
 - F12 (aluminium coated)
 - F23 (stainless steel)
 - T12-OVP (aluminium coated with integrated overvoltage protector)
optionally with or without VU331 display and operating module
- 5 Only T12-OVP: Terminal compartment
- 6 Supply depending upon equipment version
- 7 Local potential equalization

Optional:

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

- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
 - GB50257-1996: "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
 - GB3836.13-2013: "Electrical apparatus for explosive gas atmospheres, Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres".
 - GB3836.15-2000: "Electrical apparatus for explosive gas atmospheres, Part 15: Electrical installations in hazardous area (other than mines)".
 - GB3836.16-2006: "Electrical apparatus for for explosive gas atmospheres, Part 16: Inspection and maintenance of electrical installation (other than mines)".
- After aligning (rotating) the housing, retighten the fixing screw (Allen screw on the threaded neck).
- Continuous duty temperature of the cable $\geq T_a + 5$ K.
- If antenna extensions over 3 m-long are used, they should be fixed mechanically (using guy ropes).
- Electronics compartment may be opened for configuration via display VU331 or via the address switches at fieldbus PROFIBUS PA, FOUNDATION Fieldbus devices.
- Except of the display plug connector no other connections may be disconnected in the energised state.
- After configuration close the housing by the cover.
- Cover of terminal compartment or cover of electronics compartment: Torque ≥ 40 Nm.
- The housing of transmitter is equipped with a ground terminal; users must ensure that it is reliably connected to ground during installation and use.
- In a potentially explosive atmosphere: Do not disconnect electrical connections when energized.

FMR2xx with shut-off mechanism

- The entire arrangement must at least meet the requirements as per IP67.
If the device needs to be disassembled for e.g. service purposes, we recommend securing the shut-off mechanism against opening or closing it with an additional blind flange.
The operator is entirely responsible for ensuring that the complete arrangement is permissible for the respective application.

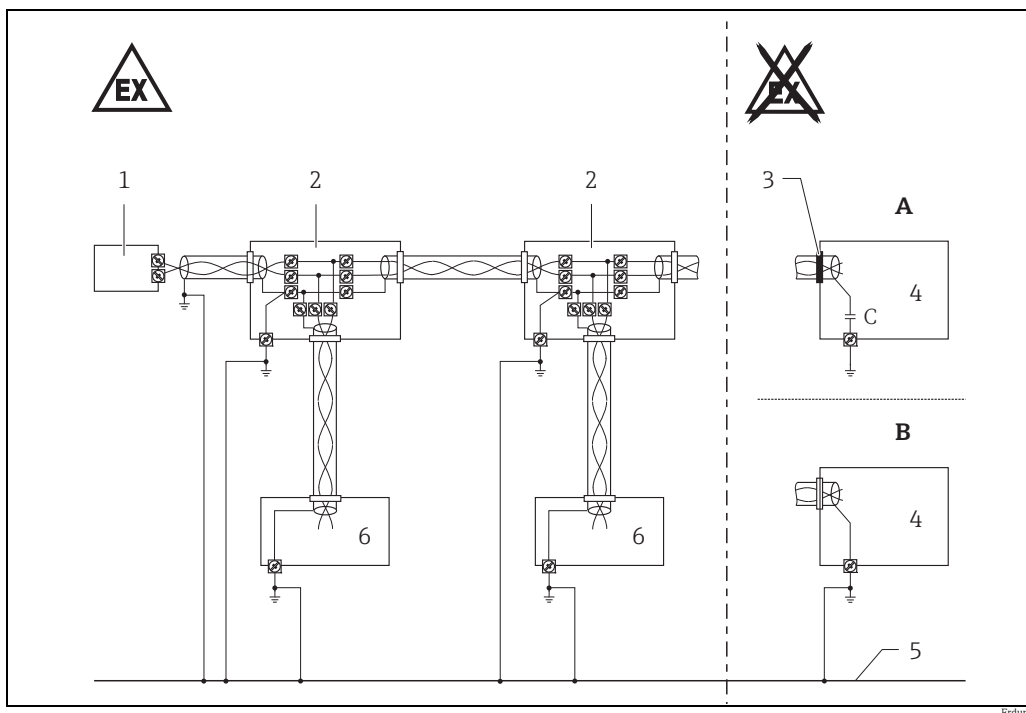
F12, F23 housing

- The input power circuit of the device is isolated from ground.
The dielectric strength is at least $500 V_{\text{rms}}$.

T12-OVP housing

- The input power circuit of the device is isolated from ground.
The dielectric strength is at least 410 V DC.
- In potentially explosive atmospheres: Do not open the connection compartment cover when energized.

Installation of fieldbus system: PROFIBUS PA, FOUNDATION Fieldbus



2

- 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

Temperature tables

F12 housing

Temperature class	Maximum permitted medium temperature at the antenna	Max. permitted ambient temperature at the electronics housing				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+ 80 °C + 60 °C	+60 °C +60 °C	+55 °C +60 °C	+60 °C +60 °C	+60 °C +60 °C	+60 °C +60 °C
T5	+ 95 °C + 75 °C	+75 °C +75 °C	+70 °C +75 °C	+75 °C +75 °C	+75 °C +75 °C	+75 °C +75 °C
T4	+130 °C + 80 °C	+75 °C +80 °C	+65 °C +80 °C	+75 °C +80 °C	+70 °C +80 °C	+70 °C +80 °C
T3	+195 °C + 80 °C	+70 °C +80 °C	-	+75 °C +80 °C	-	-
T2	+295 °C + 80 °C	+65 °C +80 °C	-	-	-	-
T1	+400 °C + 80 °C	+55 °C +80 °C	-	-	-	-

F23 housing

Temperature class	Maximum permitted medium temperature at the antenna	Max. permitted ambient temperature at the electronics housing				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+ 80 °C + 60 °C	+55 °C +60 °C	+50 °C +60 °C	+60 °C +60 °C	+55 °C +60 °C	+55 °C +60 °C
T5	+ 95 °C + 75 °C	+70 °C +75 °C	+65 °C +75 °C	+75 °C +75 °C	+70 °C +75 °C	+70 °C +75 °C
T4	+130 °C + 80 °C	+70 °C +80 °C	+55 °C +80 °C	+70 °C +80 °C	+65 °C +80 °C	+65 °C +80 °C
T3	+195 °C + 80 °C	+65 °C +80 °C	-	+65 °C +80 °C	-	-
T2	+295 °C + 80 °C	+55 °C +80 °C	-	-	-	-
T1	+400 °C + 80 °C	+45 °C +80 °C	-	-	-	-

T12-OVP housing

Temperature class	Maximum permitted medium temperature at the antenna	Max. permitted ambient temperature at the electronics housing				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+ 80 °C + 60 °C	+55 °C +60 °C	+50 °C +60 °C	+60 °C +60 °C	+55 °C +60 °C	+55 °C +60 °C
T5	+ 95 °C + 75 °C	+70 °C +75 °C	+65 °C +75 °C	+75 °C +75 °C	+70 °C +75 °C	+70 °C +75 °C
T4	+130 °C + 80 °C	+75 °C +80 °C	+65 °C +80 °C	+75 °C +80 °C	+75 °C +80 °C	+70 °C +80 °C
T3	+195 °C + 80 °C	+70 °C +80 °C	-	+75 °C +80 °C	-	-
T2	+295 °C + 80 °C	+65 °C +80 °C	-	-	-	-
T1	+400 °C + 80 °C	+55 °C +80 °C	-	-	-	-

Connection data

Electronic insert	Power supply
4-20 mA HART	$U_n \leq 30 \text{ V DC}$
PROFIBUS PA, FOUNDATION Fieldbus	$U_n \leq 32 \text{ V DC}$ (specified in the respective standard)



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