

Safety Instructions

Micropilot M

FMR230/231/240/244/245

HART, PROFIBUS PA, FOUNDATION Fieldbus

Ex nAL IIC T1...T6

Ex NEPSI GYJ04357X

XC007F-A

Safety Instructions for electrical apparatus for explosion-hazardous areas.
爆炸环境中电气仪表的安全指南。

Micropilot M

FMR230/231/240/244/245

Safety Instructions XC007F-A

Associated Documentation

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

–HART: BA218F/00, BA219F/00, BA220F/00, BA248F/00, BA251F/00

–PROFIBUS PA: BA225F/00, BA226F/00, BA249F/00, BA252F/00

–FOUNDATION Fieldbus: BA228F/00, BA229F/00, BA250F/00, BA253F/00

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

Designation

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

Designation of explosion protection

Ex nAL IIC T1...T6

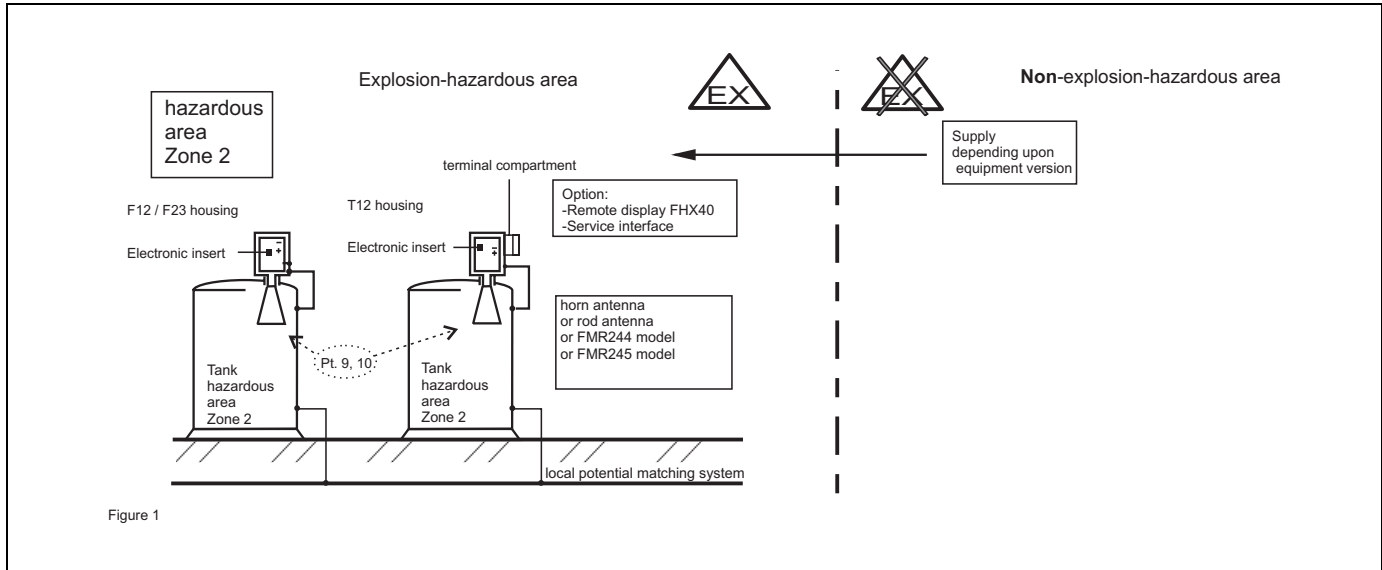


Figure 1

Installation of fieldbus system: PROFIBUS PA or FOUNDATION Fieldbus FF :

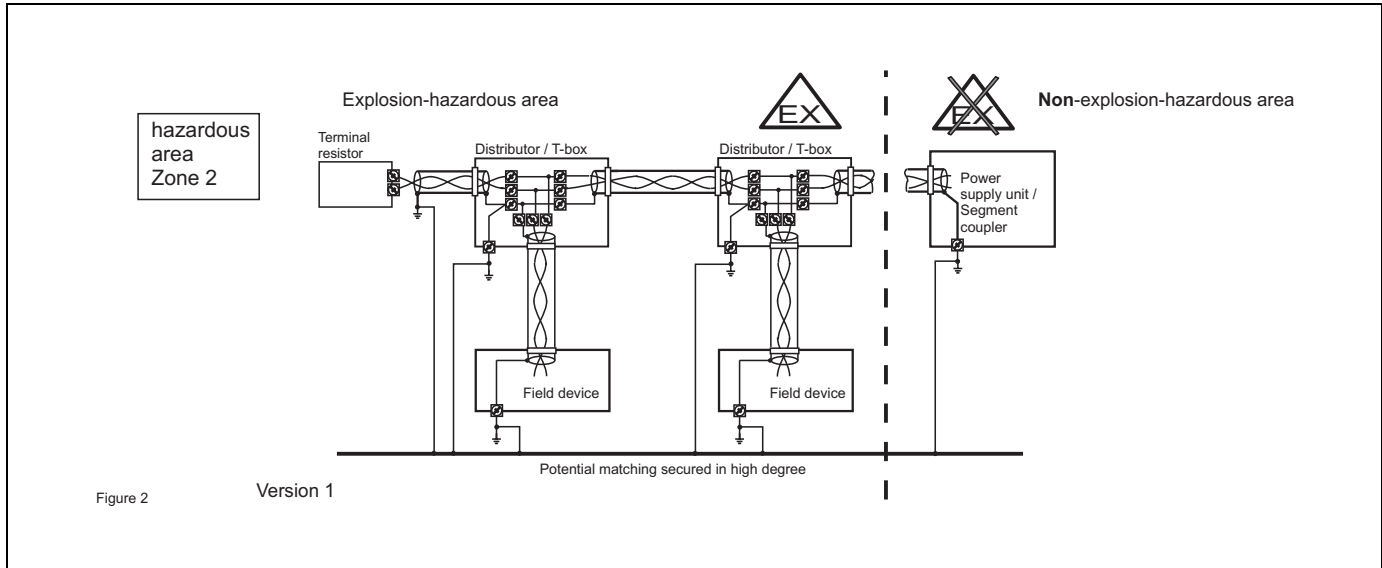


Figure 2

Version 1

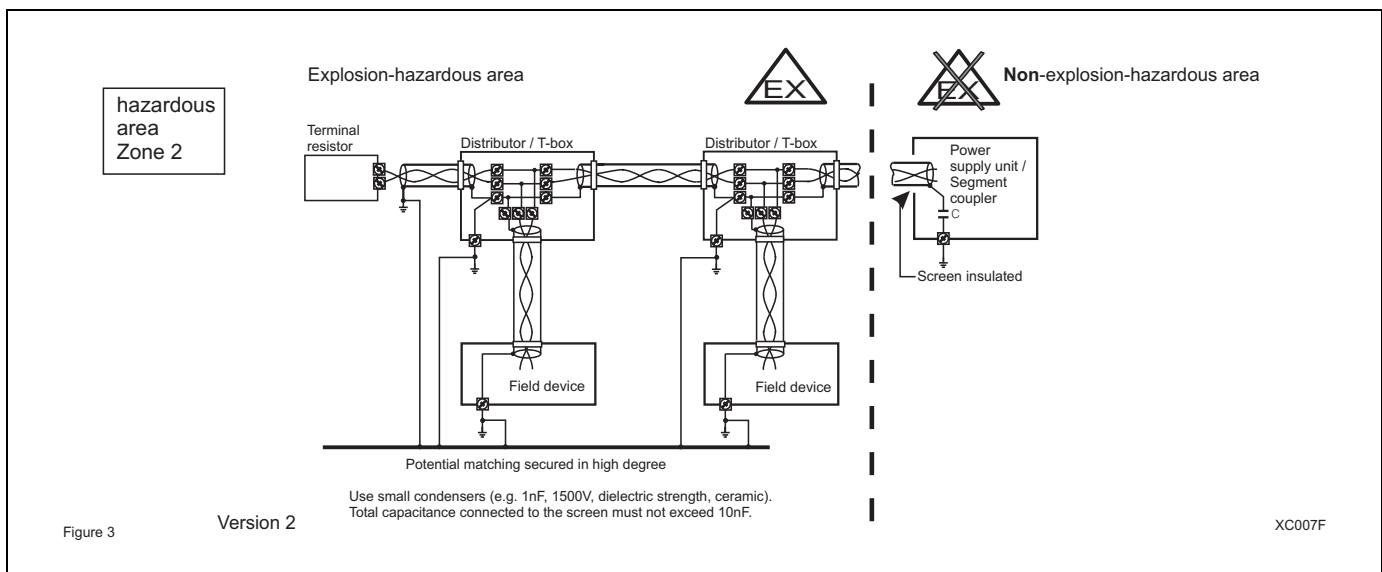


Figure 3

Version 2

XC007F

Power supply	4..20 mA HART	U = 30 VDC	Electronic insert: 4..20 mA HART
	PROFIBUS PA, or FOUNDATION Fieldbus	specified in the respective standard (U = 32 VDC)	Electronic insert: PROFIBUS PA or FOUNDATION Fieldbus

Type of protection	Ex nAL IIC T6..T1	for antistatic antennas	Antenna and housing Zone 2
		for electrostatically chargeable antennas and/or options	see Pt. 9, 10
Typ	FMR230, FMR231, FMR240, FMR244, FMR245		
Max. operating pressure	depending on type of antenna or device		refer to the respective operating instructions
max. temperature at process connection	depending on type of antenna or device		refer to the respective operating instructions
electrostatic charging	depending on type of antenna		marking on device

Housing	- F12 (Aluminium, coated)	-40 °C ≤ Tu ≤ 80 °C	optionally with or without VU331 display and operating module
	- F23 (stainless steel)	-40 °C ≤ Tu ≤ 80 °C	optionally with or without VU331 display and operating module
	- T12-OVP (Aluminium, coated)	-40 °C ≤ Tu ≤ 80 °C	with integrated overvoltage protection; optionally with or without VU331 display and operating module

Safety-relevant instructions for installation in explosion-hazardous areas:

- 1.) Install the device according to the manufacturer's instructions and any other valid standards and regulations.
- 2.) The input power circuit of the Micropilot M FMR2xx is isolated from ground potential up to a voltage of:
 - min. 500 Vrms for housing F12 or F23, and
 - min. 410 VDC for housing T12-OVP.
- 3.) 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 (Tab. 1, Tab 2 and Tab. 3).
- 4.) After aligning (rotating) the housing, retighten the fixing screw (Allen screw on the threaded neck).
- 5.) Continuous duty temperature of the cable ≥ Tamb + 5 K
- 6.) If antenna extensions over 3 m-long are used, they should be fixed mechanically (using guy ropes)
- 7.) Micropilot M FMR2xx with shut-off mechanism: the entire arrangement must at least meet the requirements as per IP 67 in accordance with EN / IEC 60529.

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.
- 8.) Housing:
 - T12: If an explosive atmosphere is present, do not open the housing under voltage
 - F12 / F23 / T12: Electronics compartment may be opened for configuration via display VU331 or via the address switches at fieldbus PA/FF instruments; 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
- 9.) Electrostatic charging (X marking):

The antennae of the Micropilot M type FMR231 with white PTFE, FMR245 contain surfaces, which can become electrostatically charged. For this reason, these antennae 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 antennae (e.g. do not rub dry).
- 10.) Special conditions (X marking):

Option: - cover with viewing window corresponds to the "low" mechanical strain level.

 - for devices with plug connectors (e.g. PROFIBUS PA or FOUNDATION Fieldbus FF): the connectors have to be protected against mechanical load;
 - instruments with plug connector e.g. PROFIBUS PA or FOUNDATION Fieldbus FF: plug connector may not be disconnected in the energised state.
- 11.) For installation, use and maintenance of the product, users must also observe the requirements stated in the Product User's Manual and in the standards GB3836.15-2000: "Electrical Equipment for Use in Explosive Gas Atmospheres, Section 15: Installation of Electrical Apparatus in Hazardous Areas (except in coal mines)", and GB50058-1992: "Design of the installation of Electrical Equipment in Explosive and Fire Hazardous Environments".
- 12.) The housing of the microwave level transmitter is equipped with a ground terminal; users must ensure that it is reliably connected to ground during installation and use.

Table 1 (Equipped with F12 Electrical Component Housing)

Temperature class	Maximum Permissible Medium Temperature (Antenna)	Maximum Permissible Ambient Temperature (Electrical Component Housing)				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+80°C	+60°C	+55°C	+60°C	+60°C	+60°C
	+60°C	+60°C	+60°C	+60°C	+60°C	+60°C
T5	+95°C	+75°C	+70°C	+75°C	+75°C	+75°C
	+75°C	+75°C	+75°C	+75°C	+75°C	+75°C
T4	+130°C	+75°C	+65°C	+75°C	+70°C	+70°C
	+80°C	+80°C	+80°C	+80°C	+80°C	+80°C
T3	+195°C	+70°C	/	+75°C	/	/
	+80°C	+80°C	/	+80°C	/	/
T2	+295°C	+65°C	/	/	/	/
	+80°C	+80°C	/	/	/	/
T1	+400°C	+55°C	/	/	/	/
	+80°C	+80°C	/	/	/	/

Table 2 (Equipped with F23 Electrical Component Housing)

Temperature class	Maximum Permissible Medium Temperature (Antenna)	Maximum Permissible Ambient Temperature (Electrical Component Housing)				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+80°C	+55°C	+50°C	+60°C	+55°C	+55°C
	+60°C	+60°C	+60°C	+60°C	+60°C	+60°C
T5	+95°C	+70°C	+65°C	+75°C	+70°C	+70°C
	+75°C	+75°C	+75°C	+75°C	+75°C	+75°C
T4	+130°C	+70°C	+55°C	+70°C	+65°C	+65°C
	+80°C	+80°C	+80°C	+80°C	+80°C	+80°C
T3	+195°C	+65°C	/	+65°C	/	/
	+80°C	+80°C	/	+80°C	/	/
T2	+295°C	+55°C	/	/	/	/
	+80°C	+80°C	/	/	/	/
T1	+400°C	+45°C	/	/	/	/
	+80°C	+80°C	/	/	/	/

Table 3 (Equipped with T12 Electrical Component Housing)

Temperature Class	Maximum Permissible Medium Temperature (Antenna)	Maximum Permissible Ambient Temperature (Electrical Component Housing)				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+80°C	+55°C	+50°C	+60°C	+55°C	+55°C
	+60°C	+60°C	+60°C	+60°C	+60°C	+60°C
T5	+95°C	+70°C	+65°C	+75°C	+70°C	+70°C
	+75°C	+75°C	+75°C	+75°C	+75°C	+75°C
T4	+130°C	+75°C	+65°C	+75°C	+75°C	+70°C
	+80°C	+80°C	+80°C	+80°C	+80°C	+80°C
T3	+195°C	+70°C	/	+75°C	/	/
	+80°C	+80°C	/	+80°C	/	/
T2	+295°C	+65°C	/	/	/	/
	+80°C	+80°C	/	/	/	/
T1	+400°C	+55°C	/	/	/	/
	+80°C	+80°C	/	/	/	/

Micropilot M

FMR230/231/240/244/245

安全指南 XC007F-A

相关资料

该文件是下列操作手册的组成部分：

-HART: BA218F/00、BA219F/00、BA220F/00、BA248F/00、BA251F/00

-PROFIBUS PA: BA225F/00、BA226F/00、BA249F/00、BA252F/00

-FOUNDATION Fieldbus (基金会现场总线): BA228F/00、BA229F/00、BA250F/00、BA253F/00

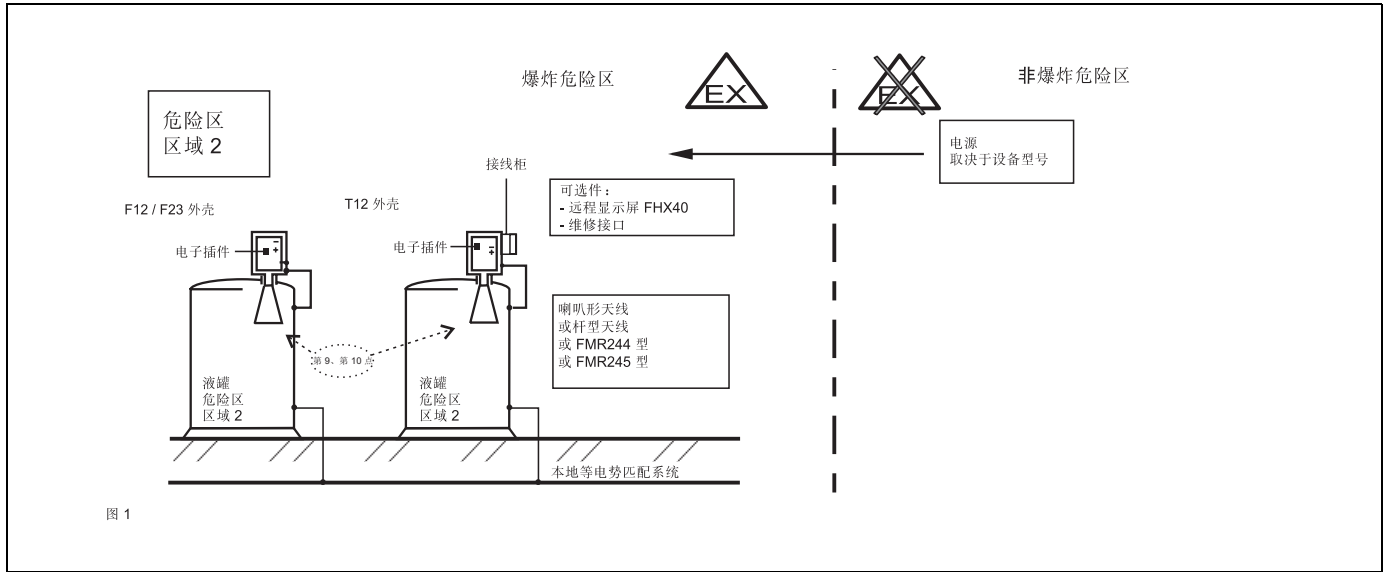
根据用户订购仪表的具体型号所提供的相应操作手册。

名称

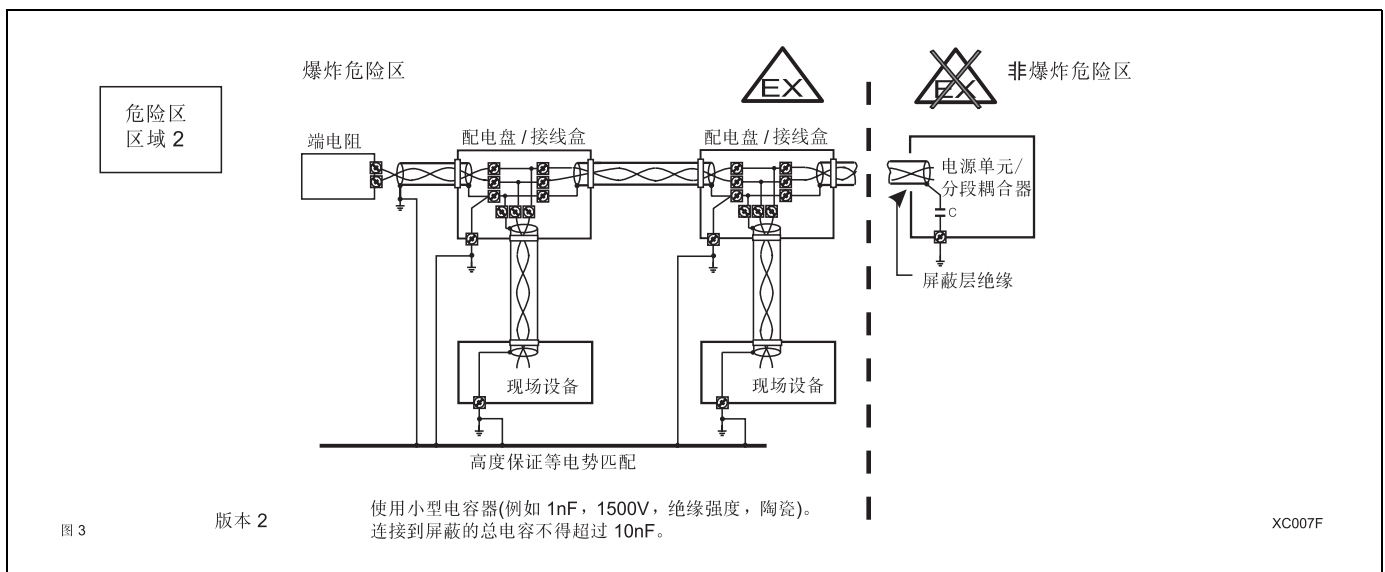
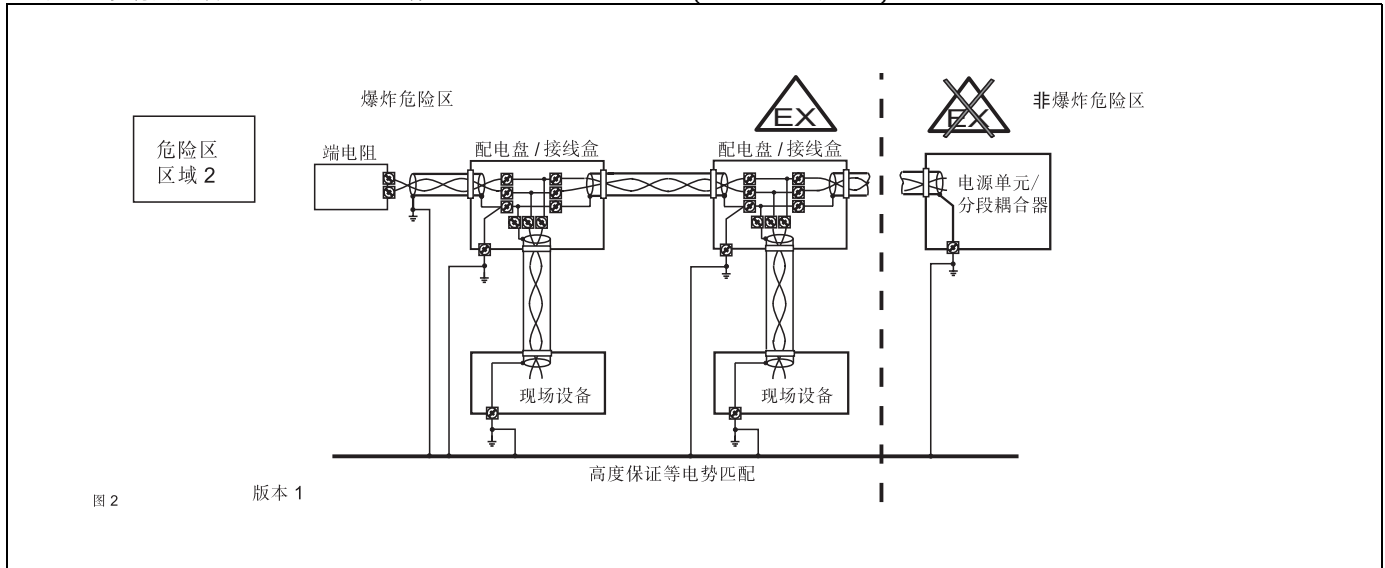
防爆标志和防护类型的说明请查询防爆手册。

防爆代号

Ex nAL IIC T1...T6



现场总线系统的安装：PROFIBUS PA 或 FOUNDATION Fieldbus (基金会现场总线) FF：



电源	4..20 mA HART	U = 30 VDC	电子插件：4..20 mA HART
	PROFIBUS PA 或 FOUNDATION Fieldbus (基金会现场总线)	在各标准中规定 (U = 32 VDC)	电子插件：PROFIBUS PA 或 FOUNDATION Fieldbus (基金会现场总线)

防护类型	Ex nAL IIC T6..T1	用于防静电天线 用于会静电积聚的天线和 / 或可选件	天线和外壳区域 2 参见第 9 点、第 10 点
典型	FMR230、FMR231、FMR240、FMR244、FMR245		
最大工作压力	根据天线或设备类型		参考各操作说明
工艺连接件处的最大温度	根据天线或设备类型		参考各操作说明
静电积聚	根据天线类型		设备上的标记

外壳	- F12 (铝, 涂层)	-40 °C ≤ Tu ≤ 80 °C	可选带有或不带有 VU331 显示屏和操作模块
	- F23 (不锈钢)	-40 °C ≤ Tu ≤ 80 °C	可选带有或不带有 VU331 显示屏和操作模块
	- T12-OVP (铝, 涂层)	-40 °C ≤ Tu ≤ 80 °C	带集成过电压保护； 可选带有或不带有 VU331 显示屏和操作模块

在爆炸环境中安装的安全相关说明：

- 按照制造商的说明及其它有效标准和规定来安装设备。
- Micropilot M FMR2xx 的输入电源电路与地电势隔离电压最高为：
 - 外壳 F12 或 F23，最小 500 Vrms，
 - 外壳 T12-OVP，最小 410 VDC。
- 电子部件外壳的允许环境温度 (取决于应用范围) 与温度等级之间的关系如下表所示 (表 1、表 2 和表 3)。
- 在对齐 (旋转) 外壳后，重新拧紧固定螺丝 (带螺纹螺栓颈上的内六角螺丝)。
- 电缆持续工作温度 ≥ Tamb + 5 K。
- 如果使用超过 3 米长的天线延伸件，则必须用机械方式固定 (使用牵索)。
- Micropilot M FMR2xx 带闭锁机械装置：根据 EN / IEC 60529，整个装置必须至少满足 IP 67 的要求。
如果设备需要拆卸，如出于维护目的等，则建议固定闭锁机械装置以避免打开，或者用附加的盲板将其闭合。
操作员应确保整个装置可用于各种应用，并对此负全责。
- 外壳：
 - T12：如果存在爆炸性气体，则请勿在加载电压的情况下打开外壳
 - F12 / F23 / T12：电子接线柜可被打开，以通过显示屏 VU331 或现场总线 PA/FF 仪器处的地址开关进行配置；
除了显示屏插头连接器，其它连接不得在加电状态下断开；在配置后，关闭外壳盖板。
接线柜盖罩或电子接线柜的盖罩，扭矩 ≥ 40 Nm
- 静电积聚 (X 标记)：
 - 在 Micropilot M 类型 FMR231 (带白色 PTFE) 和 FMR245 上的天线包含有可静电积聚的表面。
因此，这些天线的装配方式不得导致设备从流体介质 (例如填料板) 获取电荷，这会带来危险。
在清洁天线时请避免静电积聚 (如不要干擦)。
- 特殊条件 (X 标记)：
 - 可选件：- 符合“低”机械应变水平的带观察孔的盖罩。
 - 用于带插头连接器的设备 (如 PROFIBUS PA 或 FOUNDATION Fieldbus (基金会现场总线) FF)：
连接器必须防止受到机械载荷；
 - 带有插头连接器的仪器，如 PROFIBUS PA 或 FOUNDATION Fieldbus (基金会现场总线) FF：
插头连接器不可在加电情况下断开。
- 在仪表安装、使用和维护过程中，用户必须遵守产品用户手册和标准 GB3836.15-2000：“爆炸性气体环境中使用的电子设备，第 15 节：防爆区中电子仪器的安装 (除煤矿之外)”以及 GB50058-1992：“爆炸性和火灾危险环境中电子设备的安装设计”中陈述的要求。
- 微波液位变送器的外壳配备有一个接地端子；在安装和使用的过程中，用户应确保该端子可靠接地。

表 1 (装配有 F12 电子组件外壳)

温度等级	最大允许的 介质温度 (天线)	最大允许的环境温度 (电子组件外壳)				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+80 °C	+60 °C	+55 °C	+60 °C	+60 °C	+60 °C
	+60 °C	+60 °C	+60 °C	+60 °C	+60 °C	+60 °C
T5	+95 °C	+75 °C	+70 °C	+75 °C	+75 °C	+75 °C
	+75 °C	+75 °C	+75 °C	+75 °C	+75 °C	+75 °C
T4	+130 °C	+75 °C	+65 °C	+75 °C	+70 °C	+70 °C
	+80 °C	+80 °C	+80 °C	+80 °C	+80 °C	+80 °C
T3	+195 °C	+70 °C	/	+75 °C	/	/
	+80 °C	+80 °C	/	+80 °C	/	/
T2	+295 °C	+65 °C	/	/	/	/
	+80 °C	+80 °C	/	/	/	/
T1	+400 °C	+55 °C	/	/	/	/
	+80 °C	+80 °C	/	/	/	/

表 2 (装配有 F23 电子组件外壳)

温度等级	最大允许的 介质温度 (天线)	最大允许的环境温度 (电子组件外壳)				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+80 °C	+55 °C	+50 °C	+60 °C	+55 °C	+55 °C
	+60 °C	+60 °C	+60 °C	+60 °C	+60 °C	+60 °C
T5	+95 °C	+70 °C	+65 °C	+75 °C	+70 °C	+70 °C
	+75 °C	+75 °C	+75 °C	+75 °C	+75 °C	+75 °C
T4	+130 °C	+70 °C	+55 °C	+70 °C	+65 °C	+65 °C
	+80 °C	+80 °C	+80 °C	+80 °C	+80 °C	+80 °C
T3	+195 °C	+65 °C	/	+65 °C	/	/
	+80 °C	+80 °C	/	+80 °C	/	/
T2	+295 °C	+55 °C	/	/	/	/
	+80 °C	+80 °C	/	/	/	/
T1	+400 °C	+45 °C	/	/	/	/
	+80 °C	+80 °C	/	/	/	/

表 3 (装配有 F12 电子组件外壳)

温度等级	最大允许的 介质温度 (天线)	最大允许的环境温度 (电子组件外壳)				
		FMR230	FMR231	FMR240	FMR244	FMR245
T6	+80 °C	+55 °C	+50 °C	+60 °C	+55 °C	+55 °C
	+60 °C	+60 °C	+60 °C	+60 °C	+60 °C	+60 °C
T5	+95 °C	+70 °C	+65 °C	+75 °C	+70 °C	+70 °C
	+75 °C	+75 °C	+75 °C	+75 °C	+75 °C	+75 °C
T4	+130 °C	+75 °C	+65 °C	+75 °C	+75 °C	+70 °C
	+80 °C	+80 °C	+80 °C	+80 °C	+80 °C	+80 °C
T3	+195 °C	+70 °C	/	+75 °C	/	/
	+80 °C	+80 °C	/	+80 °C	/	/
T2	+295 °C	+65 °C	/	/	/	/
	+80 °C	+80 °C	/	/	/	/
T1	+400 °C	+55 °C	/	/	/	/
	+80 °C	+80 °C	/	/	/	/

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