



Level



Pressure



Flow



Temperature



Liquid  
Analysis



Registration



Systems  
Components



Services



Solutions

Safety Instructions

# Levelflex M

# FMP41C

## 4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus

Ex nA IIC T6...T1 Gc

NEPSI GYJ12.1453X



**en** - Document: XA00388F-B  
Safety instructions for electrical apparatus for explosion-hazardous areas  
→ 3

**zh** - 文档: XA00388F-B  
爆炸环境中电气仪表的安全指南  
→ 7



# Levelflex M FMP41C

english

## 4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus

**Associated Documentation**

This document is an integral part of the following Operating Instructions:  
 HART: BA00276F/00  
 PROFIBUS PA: BA00277F/00  
 FOUNDATION Fieldbus: BA00278F/00

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

**Designation**

**Designation of explosion protection** **Ex nA IIC T6...T1 Gc**

**Applied standards**

**GB 3836.1-2010**  
**GB 3836.8-2003**

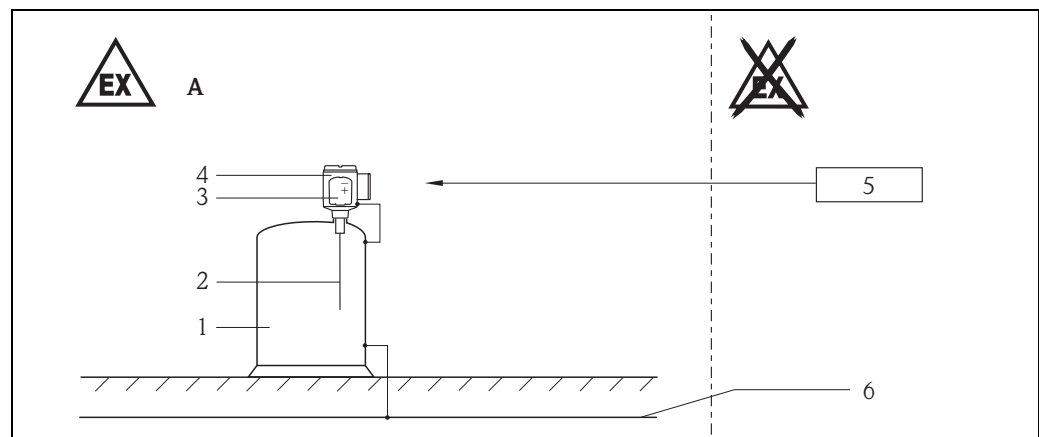
**Safety instructions:  
Special conditions**

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.

- For flange plating with plastic surfaces  $> 100\text{ cm}^2$  and all non-metallic surfaces: Avoid electrostatic charging (do not rub dry).
- Cover with viewing window corresponds to the "low" mechanical strain level.

Devices with plug connectors (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 Rod or rope probe
- 3 Electronic insert
- 4 Housing, optionally with or without VU331 display and operating module:
  - F12, aluminium coated
  - F23, stainless steel
  - T12-OVP, aluminium coated; with integrated overvoltage protector
  - T12, aluminium coated; with separate connection compartment
- 5 Supply depending upon equipment version
- 6 Local potential equalization

- Install the device according to the manufacturer's instructions and any other valid standards and regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- 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. 1a FMP40, Tab. 1b FMP45).
- After aligning (rotating) the housing, retighten the fixing screw (see Operating Instructions).
- Continuous duty temperature of the cable  $\geq T_a + 5\text{ K}$ .
- Cover of terminal compartment or cover of electronics compartment: Torque  $\geq 40\text{ Nm}$ .
- Changes in electrical and mechanical parts of the equipment could harm the type of explosion protection and are not allowed for the user.
- The housing of transmitter is equipped with a ground terminal; users must ensure that it is reliably connected to ground during installation and use.
- 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".
  - GB3836.13-1997: "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)".

Option

- Remote display, e.g. FHX40  
Input power circuit complies to [Ex ic IIC] (EN/IEC 60079-15). Observe associated Safety Instructions.

F12, F23

- The input power circuit of the device is isolated from ground potential and has a dielectric strength of at least 500 V<sub>rms</sub> with respect to it.
- Do not open while circuit is alive where explosive gas exists.  
Electronic compartment may be opened, when area is known to be non-hazard.

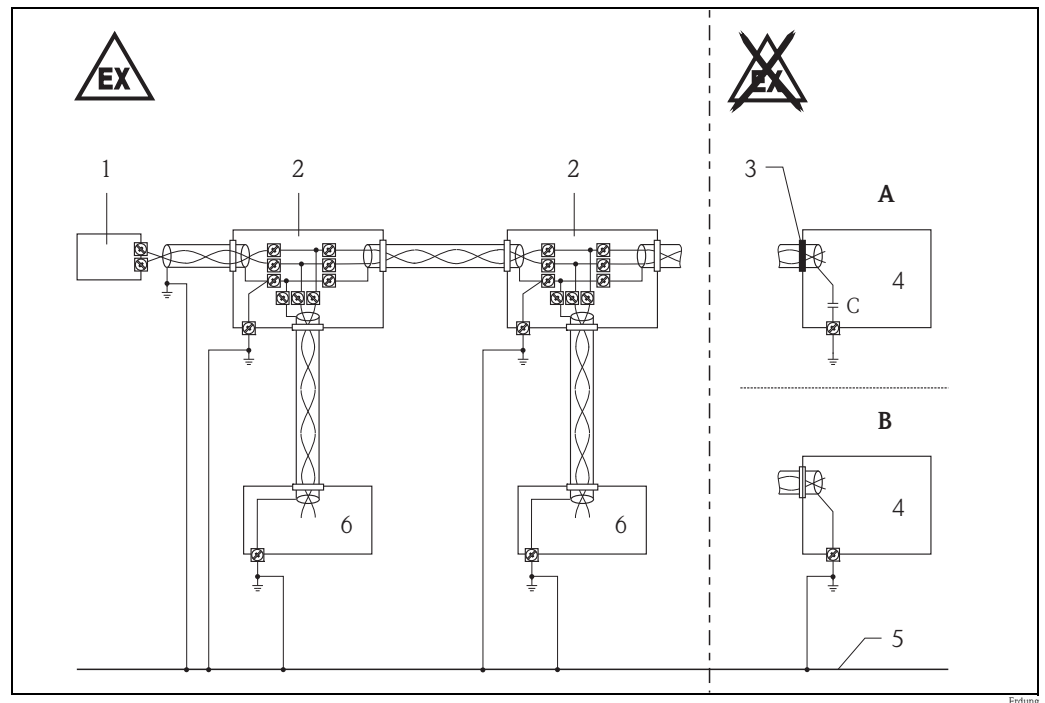
T12-OVP

- The input power circuit of the device is isolated from ground potential. The dielectric strength to earth is limited by 600 V electrode arresters.
- Do not open while circuit is alive where explosive gas exists.  
Electronic compartment may be opened, when area is known to be non-hazard.

T12

- The electrical apparatus must be integrated into the local potential equalisation line. The input circuit is galvanically connected to the housing.
- Terminal compartment: Do not open while circuit is alive where explosive gas exists.  
Electronic compartment may always be opened.

**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**

Observe the permitted probe temperature range!

\*<sup>1</sup> = Functional

limited by maximum permitted probe temperature

**FMP41C****F12, T12-OVP, T12**

Temperature class	Maximum permitted medium temperature (process connection)	Max. permitted ambient temperature at the electronics housing dependent on the medium temperature		
		FMP41C	with remote electronics / spacer tube	with remote electronics / spacer hose
T6	+ 85 °C + 70 °C	68 °C 70 °C	69 °C 70 °C	80 °C 80 °C
T5	+100 °C + 80 °C	76 °C 80 °C	79 °C 80 °C	80 °C 80 °C
T4	+135 °C + 80 °C	71 °C 80 °C	78 °C 80 °C	80 °C 80 °C
T3, T2, T1 (functional) * <sup>1</sup>	+200 °C + 80 °C	61 °C 80 °C	75 °C 80 °C	80 °C 80 °C

**F23**

Temperature class	Maximum permitted medium temperature (process connection)	Max. permitted ambient temperature at the electronics housing dependent on the medium temperature		
		FMP41C	with remote electronics / spacer tube	with remote electronics / spacer hose
T6	+ 85 °C + 70 °C	67 °C 70 °C	69 °C 70 °C	80 °C 80 °C
T5	+100 °C + 80 °C	75 °C 80 °C	78 °C 80 °C	80 °C 80 °C
T4	+135 °C + 80 °C	66 °C 80 °C	77 °C 80 °C	80 °C 80 °C
T3, T2, T1 (functional) * <sup>1</sup>	+200 °C + 80 °C	49 °C 80 °C	73 °C 80 °C	80 °C 80 °C

**Connection data**

Electronic insert	Power supply
4-20 mA HART	U = 30 V DC
PROFIBUS PA, FOUNDATION Fieldbus	Specified in the respective standard (U = 32 V DC)

# Levelflex M FMP41C

中文

## 4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus (基金会现场总线)

### 相关资料

本文档是下列操作手册的组成部分：

HART：BA00276F/00

PROFIBUS PA：BA00277F/00

FOUNDATION Fieldbus (基金会现场总线)：BA00278F/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

防爆代号

Ex nA IIC T6...T1 Gc

### 适用标准

GB 3836.1-2010

GB 3836.8-2003

**安全指南：  
特殊条件**

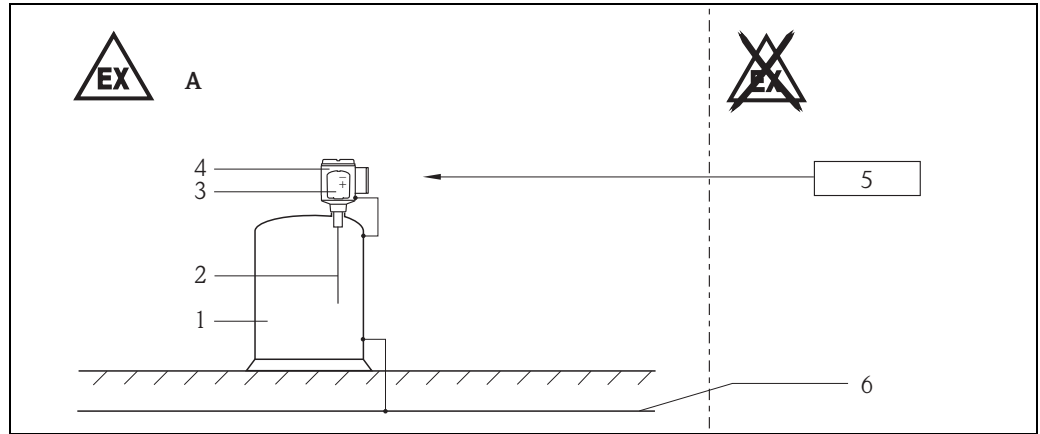
电子部件外壳处的允许环境温度范围： $-40\text{ °C} \leq T_a \leq +80\text{ °C}$ 。  
遵守温度表中的信息。

- 对于塑料表面  $> 100\text{ cm}^2$  的法兰镀层和所有非金属表面：避免产生静电（不要干擦）。
- 符合“低”机械应变水平的带观察孔的盖罩。

带插头连接器的设备（如 PROFIBUS PA 或 FOUNDATION Fieldbus（基金会现场总线））：

- 必须防止连接器承受机械负载。
- 插头连接器不可在加电情况下断开。

**安全指南：  
安装**



1

**A 区域 2**

- 1 液罐：危险区 区域 2
- 2 杆或绳型探针
- 3 电子插件
- 4 外壳，可选带有或不带有 VU331 显示屏和操作模块：
  - F12，铝涂层
  - F23，不锈钢
  - T12-OVP，铝涂层：带有集成过电压保护装置
  - T12，铝涂层：带独立接线室
- 5 根据设备型号供电
- 6 本地电势平衡

- 按照制造商的说明及其它有效标准和规定来安装设备。
- 使用设备时请勿超出指定的电、热和机械参数。
- 电子部件外壳的允许环境温度（取决于应用范围）与温度组别之间的关系如下表所示（表 1a FMP40、表 1b FMP45）。
- 在对齐（旋转）外壳后，重新拧紧固定螺丝（参见操作说明）。
- 电缆持续工作温度  $\geq T_a + 5\text{ K}$ 。
- 接线柜的盖罩或电子部件柜的盖罩：扭矩  $\geq 40\text{ Nm}$ 。
- 改动设备的电气和机械部件会降低防爆保护的类型，用户请勿擅自改动。
- 变送器的外壳装备有接地端子；在安装和使用的过程中，用户应确保该端子可靠接地。
- 在安装、使用和维护设备时，用户还必须遵守操作手册和下列标准中的规定：
  - GB50257-1996：“电气装置安装工程 爆炸和火灾危险环境电气装置施工及验收规范”。
  - GB3836.13-1997：“爆炸性气体环境用电气设备 第 13 部分：爆炸性气体环境用电气设备的检修”。
  - GB3836.15-2000：“爆炸性气体环境用电气设备 第 15 部分：危险场所电气安装（煤矿除外）”。
  - GB3836.16-2006：“爆炸性气体环境用电气设备 第 16 部分：电气装置的检查和维护（煤矿除外）”。

**可选件**

- 远程显示屏，例如 FHX40  
输入电源电路符合 [Ex ic IIC] (EN/IEC 60079-15)。遵守相关的安全指南。



F12, F23

- 设备的输入电源电路与地电势是绝缘的，它相对地电势至少有 500 V<sub>rms</sub> 绝缘强度。
- 在存在爆炸性气体的环境下，如果电路带电，切勿打开。  
当确定区域没有危险时，可打开电子部件柜。

T12 - OVP

- 设备的输入电源电路与地电势绝缘。对地绝缘强度限制为 600 V 电气放电装置。
- 在存在爆炸性气体的环境下，如果电路带电，切勿打开。  
当确定区域没有危险时，可打开电子部件柜。

T12

- 必须将电气仪器集成连接于本地等电势线上。输入电路与外壳进行电气连接。
- 接线柜：在存在爆炸性气体的环境下，如果电路带电，切勿打开。  
电子部件柜随时都可打开。

现场总线系统：PROFIBUS PA, FOUNDATION Fieldbus (基金会现场总线)

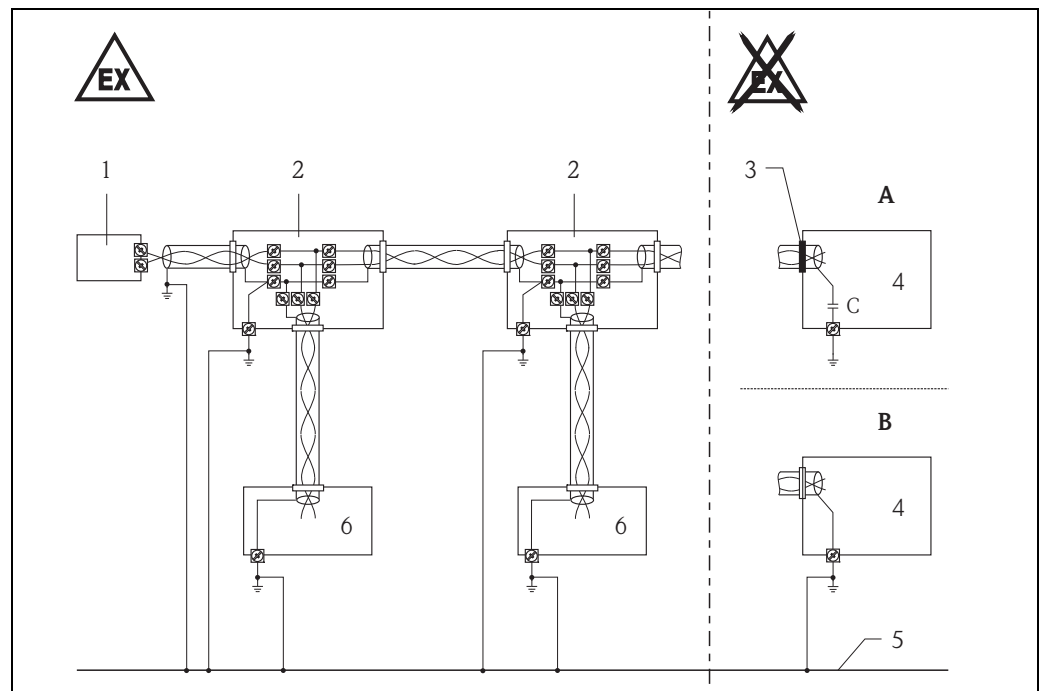


图 2

- A** 版本 1  
使用小型电容器 (例如 1 nF, 1500 V, 绝缘强度, 陶瓷)。  
连接到屏蔽的总电容不得超过 10 nF。
- B** 版本 2
- 1 端电阻
- 2 配电盘 / 接线盒
- 3 屏蔽层绝缘
- 4 电源单元 / 分段耦合器
- 5 电势平衡 (保持在高等级)
- 6 现场设备

## 温度表

遵循允许的探针温度范围！

\*1 = 功能型

受限于最大允许的探针温度

## FMP41C

## F12, T12 - OVP, T12

温度组别	最大允许输入温度 (过程连接)	电子部件外壳处的最大允许环境温度取决于输入温度		
		FMP41C	带有远程电子部件 / 隔离管	带有远程电子部件 / 隔离软管
T6	+ 85 °C + 70 °C	68 °C 70 °C	69 °C 70 °C	80 °C 80 °C
T5	+100 °C + 80 °C	76 °C 80 °C	79 °C 80 °C	80 °C 80 °C
T4	+135 °C + 80 °C	71 °C 80 °C	78 °C 80 °C	80 °C 80 °C
T3, T2, T1 (功能型) *1	+200 °C + 80 °C	61 °C 80 °C	75 °C 80 °C	80 °C 80 °C

## F23

温度组别	最大允许输入温度 (过程连接)	电子部件外壳处的最大允许环境温度取决于输入温度		
		FMP41C	带有远程电子部件 / 隔离管	带有远程电子部件 / 隔离软管
T6	+ 85 °C + 70 °C	67 °C 70 °C	69 °C 70 °C	80 °C 80 °C
T5	+100 °C + 80 °C	75 °C 80 °C	78 °C 80 °C	80 °C 80 °C
T4	+135 °C + 80 °C	66 °C 80 °C	77 °C 80 °C	80 °C 80 °C
T3, T2, T1 (功能型) *1	+200 °C + 80 °C	49 °C 80 °C	73 °C 80 °C	80 °C 80 °C

## 连接数据

电子插件	电源
4-20 mA HART	U = 30 V DC
PROFIBUS PA, FOUNDATION Fieldbus (基金会现场总线)	在相应标准中指定 (U = 32 V DC)



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