Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

Prosonic M
FMU40, FMU41, FMU42, FMU44
PROFIBUS PA, FOUNDATION Fieldbus

Ex ia IIC T1...T6 Ga/Gb
Ex ia IIC T1...T6 Gb
NEPSI GYJ12.1530X

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Endress+Hauser
People for Process Automation

Prosonic M
FMU40, FMU41, FMU42, FMU44

english

PROFIBUS PA, FOUNDATION Fieldbus

Associated Documentation

This document is an integral part of the following Operating Instructions:
PROFIBUS PA: BA00238F/00
FOUNDATION Fieldbus: BA00239F/00

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

Designation

Designation of explosion protection	**Ex ia IIC T1...T6 Ga/Gb** **Ex ia IIC T1...T6 Gb**

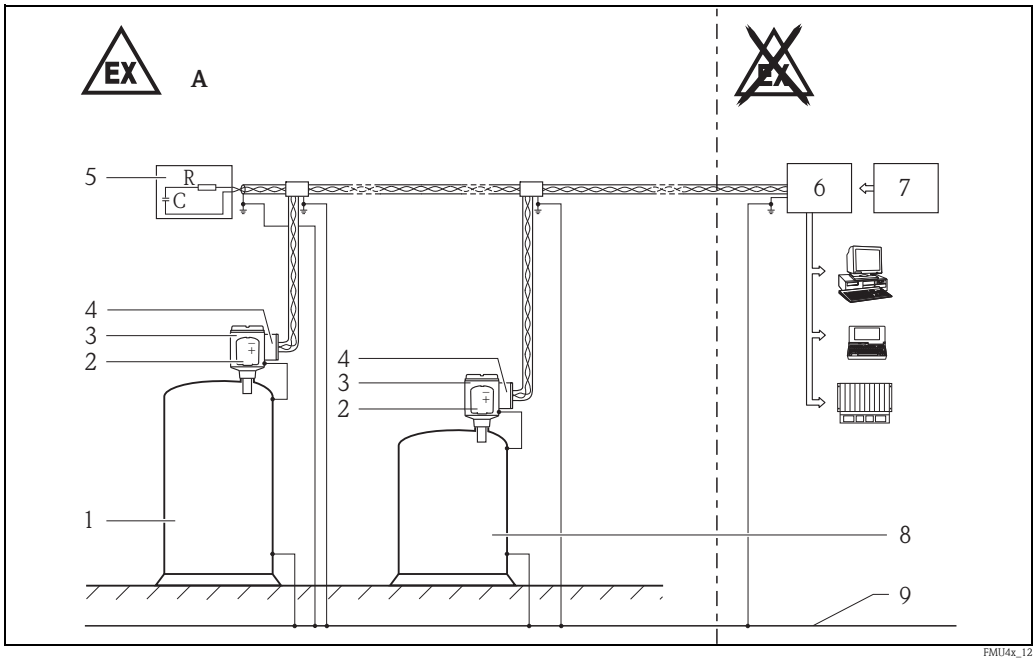
Applied standards

GB 3836.1-2010
GB 3836.4-2010
GB 3836.20-2010

Safety instructions: Special conditions

Permitted ambient temperature range at the electronics housing: –40 °C ≤ T_a ≤ +80 °C.
Observe the information in the temperature tables.

Safety instructions: Installation



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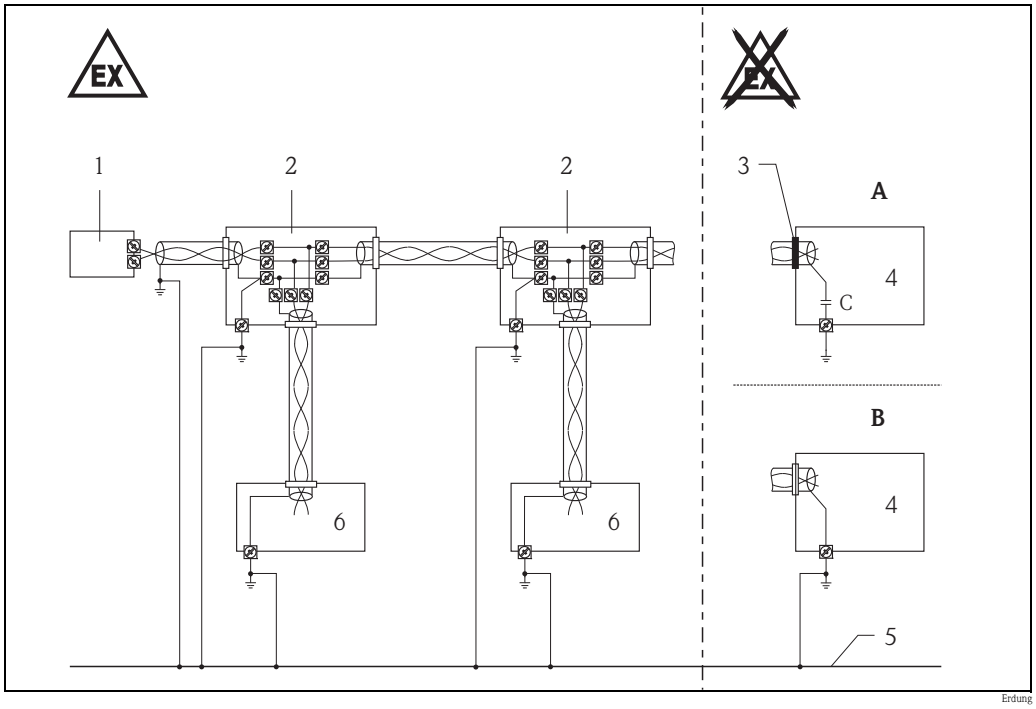
A *Zone 1*

1 *Tank, hazardous area Zone 0*
2 *Electronic insert*
3 *Housing, optionally with or without VU331 display and operating module:*
– T12-OVP, aluminium coated
4 *Terminal module with integrated overvoltage protection*
5 *Permitted terminating resistor Ex ia IIC*
6 *Certified associated apparatus (FISCO model)*
7 *Supply voltage*
8 *Tank, hazardous area Zone 1*
9 *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 and thermal parameters.
- The intrinsically safe input power circuit of the device is isolated from ground potential.
  The dielectric strength to earth is limited by 600 V electrode arresters.
- The relationship between the permitted ambient temperature for the electronics housing, dependent on the range of application and temperature classes is shown in the table (→ 🖹 6).
- Continuous duty temperature of the cable ≥ Ta +5 K.
- Avoid a build-up of electrostatic charge on the sensor surface. Do not make friction and clean with dry cloth.
- The user shall not change the configuration in order to ensure the explosion protection performance of the equipment. Any change may impair safety.
- 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)".
- For grounding the screen, → 2.



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*

Note

- The type of protection changes as follows when the devices are connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC or IIB: Ex ib IIC T6 or Ex ib IIB T6.
- The integrated overvoltage protector meets the requirements as per IEC/EN 60079-14, Section 12.3.
- For entity concept, the criteria for interconnection between the I/O circuits and the associated apparatus is as follows: $U_o \leq U_i$, $I_o \leq I_i$, $P_o \leq P_i$, $C_o \geq C_i + C_c$, $L_o \geq L_i + L_c$.
  Note: Cc and Lc represent the distributed capacitance and distributed inductance of cable.

Safety instructions: Zone 0

- Only operate devices in potentially explosive vapour/air mixtures under atmospheric conditions:
  –20 °C ≤ T ≤ +60 °C
  800 hPa ≤ p ≤ 1100 hPa
- If no potentially explosive mixtures are present, the transmitters may be operated under other atmospheric conditions in accordance with the manufacturer's specifications.
- Only install the devices in media for which the wetted materials have sufficient durability.
- Associated apparatus with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits are preferred.

Temperature tables

Process temperature
max. 80 °C

Temperature class	Ambient temperature
T6	–40 °C...+60 °C
T5	–40 °C...+75 °C
T4...T1	–40 °C...+80 °C

Connection data

Prosonic M with electronic insert PROFIBUS PA or FOUNDATION Fieldbus Ex ia IIC:
as per FISCO model or ENTITY concept (individual interconnection)

- Power supply and signal circuit in protection type: intrinsic safety Ex ia IIC or IIB

Maximum values			
U_i = 17.5 V I_i = 273 mA P_i = 1.2 W	or	U_i = 24 V I_i = 250 mA P_i = 1.2 W	L_i = 10 µH C_i = 5 nF Leak current ≤ 50 µA

Option

- Power supply and signal circuit in protection type: intrinsic safety Ex ia IIC or IIB.

Power supply		
U_o = 4.2 V I_o = 34 mA P_o = 36 mW	L_o = 5 mH C_o = 4 µF	effective inner inductance L_i = negligible effective inner capacitance C_i = negligible characteristic curve: linear

Prosonic M
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中文

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：
PROFIBUS PA：BA00238F/00
FOUNDATION Fieldbus (基金会现场总线)：BA00239F/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 ia IIC T1...T6 Ga/Gb** **Ex ia IIC T1...T6 Gb**

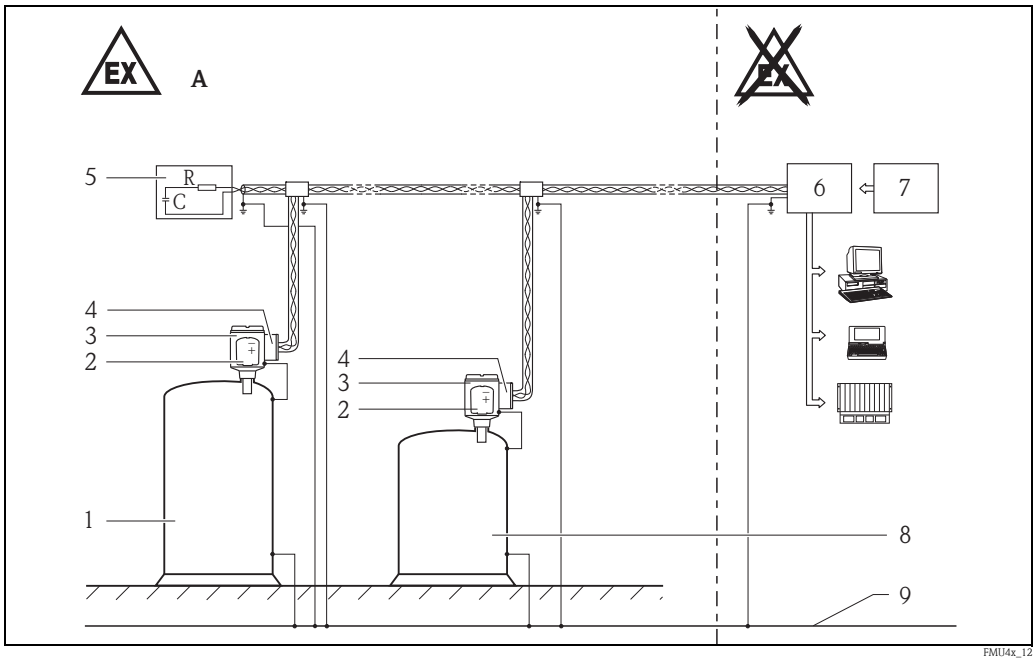
适用标准

GB 3836.1-2010
GB 3836.4-2010
GB 3836.20-2010

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 °C ≤ T_a ≤ +80 °C。
遵守温度表中的信息。

安全指南：
安装



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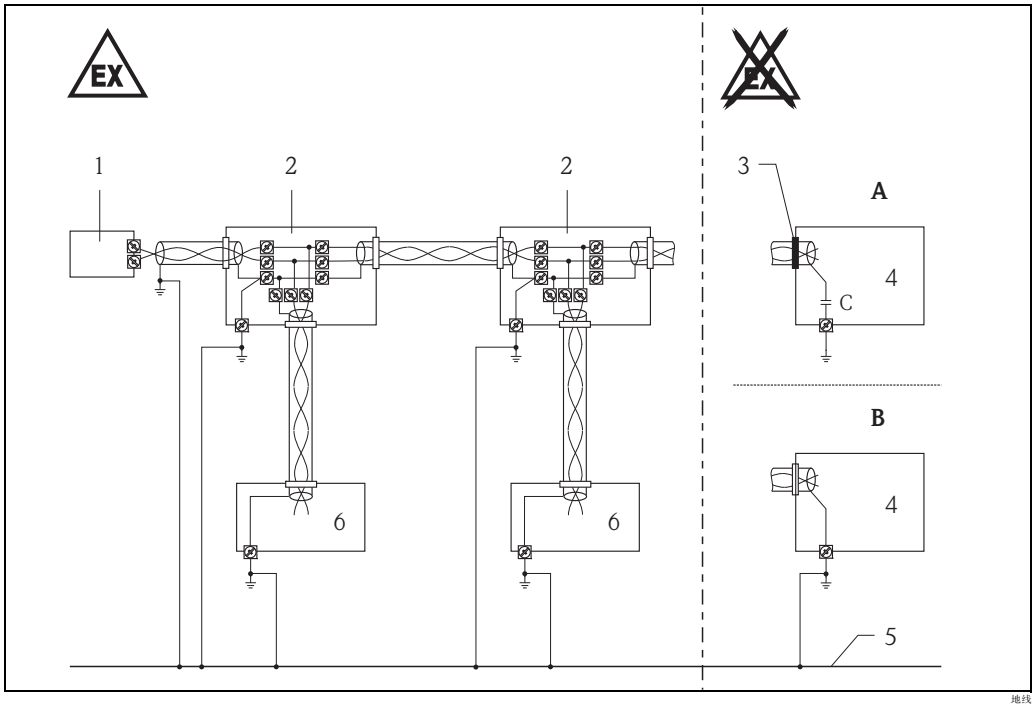
A *区域 1*

1 *液罐，危险区，区域 0*
2 *电子插件*
3 *外壳，可选带有或不带有 VU331 显示屏和操作模块：*
– T12-OVP，铝涂层
4 *带集成过电压保护装置的终端模块*
5 *允许的终端电阻 Ex ia IIC*
6 *经认证的关联设备 (FISCO 模型)*
7 *供电电压*
8 *液罐，危险区，区域 1*
9 *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、热参数。
- 设备的本质安全型输入电源电路与地电势在电气上隔离。
  对地绝缘强度限制为 600 V 电气放电装置。
- 电子部件外壳的允许环境温度取决于温度组别，与温度等级之间的关系如表中所示 (→ 10)。
- 电缆持续工作温度 ≥ Ta +5 K。
- 避免传感器表面上积累静电荷。不要用干布摩擦和清洁。
- 用户不得更改配置，以确保设备的防爆性能。任何更改都可能影响安全。
- 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：维修与检修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)”。
- 关于屏蔽接地，→ 2。



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 *终端电阻*
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*

注意

- 当设备连接到经认证的 IIC 和 IIB 设备组的 Ex ib 类本安型电路时，防护类型作如下改变：IIC 或 IIB 设备组的 Ex ib 类电路：Ex ib IIC T6 或 Ex ib IIB T6。
- 集成的过电压保护装置满足 IEC/EN 60079-14 第 12.3 节中规定的要求。
- 从实体概念的角度来讲， I/O 电路和关联设备之间进行互连的条件如下：
  $U_o \leq U_i$, $I_o \leq I_i$， $P_o \leq P_i$， $C_o \geq C_i + C_c$， $L_o \geq L_i + L_c$。
  注意：Cc 和 Lc 代表电缆的分布电容和分布电感。

安全指南：
区域 0

- 只有在下列大气条件下才能在有爆炸可能的蒸汽 / 空气混合物中操作设备：
  –20 °C ≤ T ≤ +60 °C
  800 hPa ≤ p ≤ 1100 hPa
- 如果不存在可能爆炸的混合物，则变送器可在符合制造商技术规范的其他大气条件下运行。
- 只有当介质的防潮材料具备足够的耐用性时，才可把设备安装于介质中。
- 在本安型和非本安型电路间最好采用电气隔离的关联设备。

温度表

过程温度
最高 80 °C

温度组别	环境温度
T6	–40 °C...+60 °C
T5	–40 °C...+75 °C
T4...T1	–40 °C...+80 °C

连接数据

带 PROFIBUS PA 或 FOUNDATION Fieldbus (基金会现场总线) 电子插件的 Prosonic M，Ex ia IIC：
按照 FISCO 模型或 ENTITY 概念 (单个互联)

- 电源和信号电路的防护类型：本安型 Ex ia IIC 或 IIB

最大值			
U_i = 17.5 V I_i = 273 mA P_i = 1.2 W	或	U_i = 24 V I_i = 250 mA P_i = 1.2 W	L_i = 10 µH C_i = 5 nF 泄漏电流 ≤ 50 µA

可选件

- 电源和信号电路的防护类型：本安型 Ex ia IIC 或 IIB。

电源		
U_o = 4.2 V I_o = 34 mA P_o = 36 mW	L_o = 5 mH C_o = 4 µF	有效的内部电容 L_i = 可忽略 有效的内部电容 C_i = 可忽略 特征曲线：线性

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