Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

Micropilot M FMR250

4-20 mA HART

DIP A20/21 T_A, T* IP65
DIP A21 T_A, T* IP65
DIP A20/22 T_A, T* IP65

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People for Process Automation

Micropilot M
FMR250

english

4-20 mA HART

Associated Documentation

This document is an integral part of the following Operating Instructions:
BA00284F/00

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 explosion protection	**DIP**	**A20/A21**	**T_A,**	**T***	**IP65**
	DIP	**A21**	**T_A,**	**T***	**IP65**
	DIP	**A20/A22**	**T_A,**	**T***	**IP65**

Applied standards

GB 12476.1-2000

Safety instructions: Special conditions

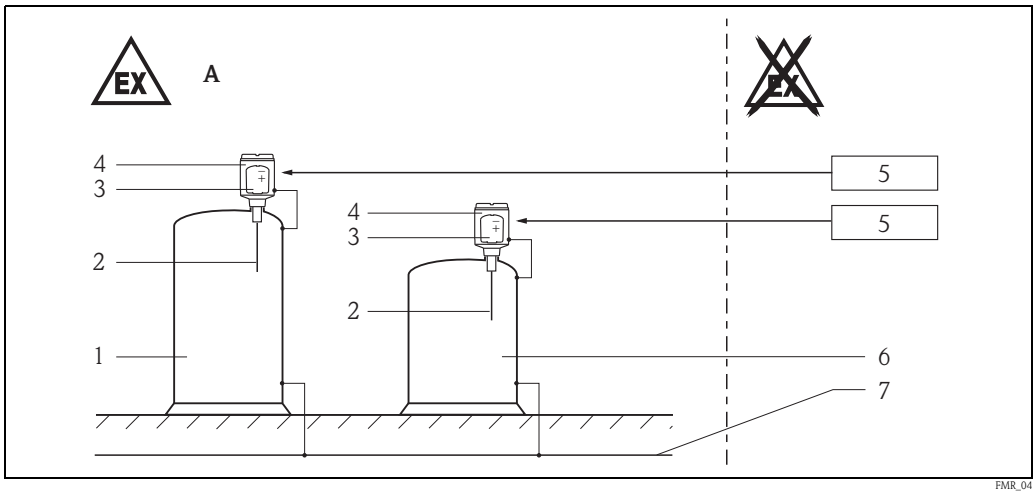
Permitted ambient temperature range at the electronics housing: –40 °C ≤ Ta ≤ +80 °C.
Observe the information in the temperature tables.

Safety instructions: Installation

Electronics compartment cover version:	
Zone 21	Only closed electronics compartment cover permitted
Zone 22	Electronics compartment cover with inspection glass permitted

Installation with standard supply

F12, F23

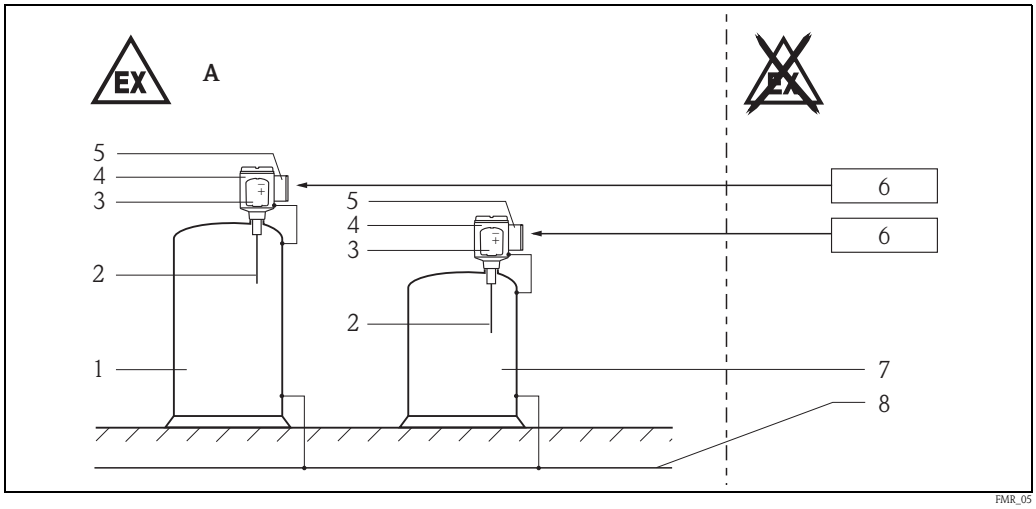


1

A *Zone 21, Zone 22*

1 *Tank, hazardous area Zone 20*
2 *Horn or parabolic antenna*
3 *Electronic insert*
4 *Housing:*
– *F12 (Aluminium)*
– *F23 (316L)*
5 *Uo = 36 V DC*
6 *Tank, hazardous area Zone 21*
7 *Local potential equalization*

T12-OVP

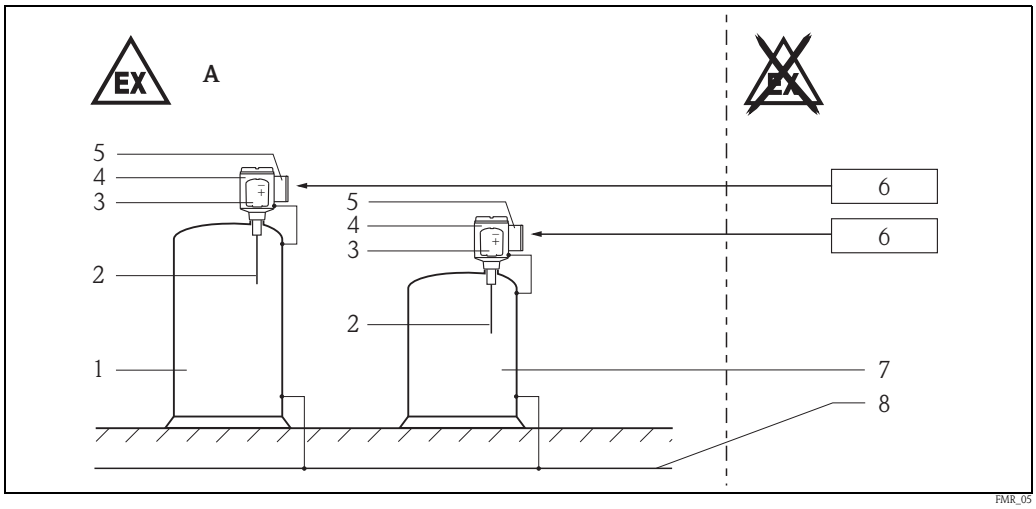


2

A *Zone 21, Zone 22*

1 *Tank, hazardous area Zone 20*
2 *Horn or parabolic antenna*
3 *Electronic insert;*
Electronics compartment
4 *Housing:*
– T12-OVP (Aluminium)
5 *Terminal module with integrated overvoltage protector*
6 *Uo = 36 V DC*
7 *Tank, hazardous area Zone 21*
8 *Local potential equalization*

T12



3

A *Zone 21, Zone 22*

1 *Tank, hazardous area Zone 20*
2 *Horn or parabolic antenna*
3 *Electronic insert;*
Electronics compartment Ex ia
4 *Housing:*
– T12 (Aluminium)
5 *Terminal module Ex-Limiter*
6 *Uo = 32 V DC*
7 *Tank, hazardous area Zone 21*
8 *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 (→ 🖹 7, "Temperature tables").
- After aligning (rotating) the housing, retighten the fixing screw (Allen screw on the threaded neck).
- Continuous duty temperature of the cable ≥ Ta +5 K.
- Only use suitable certified cable entries for the application.
- To maintain the ingress protection of the housing, install the housing cover and cable glands correctly. Close unused entry glands with approved sealing plugs.
- Do not open the connection compartments (T12, T12-OVP) or electronics compartments (F12, F23) under voltage.
- Cover of terminal compartment or cover of electronics compartment: Torque ≥ 40 Nm.
- Do not open the electrical connection of the power supply circuit under voltage in an explosive atmosphere.
- The external earth connection facility should be connected reliably.
- A suitable certified cable entry and blind plug shall be used and correctly installed. After mounting and connecting the sensor, check that a degree of protection of at least IP65 as per GB4208-2008 has been attained.
- Only operate devices in potentially explosive vapour/air mixtures under atmospheric conditions:
  –20 °C ≤ T ≤ +60 °C
  0.8 bar ≤ p ≤ 1.1 bar
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, according to EN 1127-1, the transmitters may be operated under other atmospheric conditions in accordance with the manufacturer's specifications.
- 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".
  – GB15577-2007: "Safety regulations for dust explosive prevention and protection".
  – GB12476.2-2006: "Electrical apparatus for use in the presence of combustible dust, Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation - Selection, installation and maintenance.

Air purge connection FMR250:
- In closed state the installation must have ingress protection ≥ IP67.
- Purging pressure > internal pressure of the vessel.
- In the not purging state a respective stop cock or valve must be closed. With open valve or stop cock and without purging fluid explosible atmospheres may be released or flames may enter from the outside.

F12, F23
- The input power circuit of the device is isolated from ground potential and has a dielectric strength of at least 500 Vrms with respect to it.
- Cover of electronics compartment may be opened for configuring the instrument if non-explosive atmosphere is present. If the cover of electronics compartment is opened make sure that no dust may deposit. After configuration close the housing by the cover, torque ≥ 40 Nm. Do not open the electronics compartments under voltage.

T12-OVP
- The input power circuit of the device is isolated from ground potential and has a dielectric strength of at least 290 Vrms with respect to it (600 V electrode arresters).
- Cover of electronics compartment may be opened for configuring the instrument if non-explosive atmosphere is present. If the cover of electronics compartment is opened make sure that no dust may deposit. After configuration close the housing by the cover, torque ≥ 40 Nm. Do not open the connection compartments under voltage.
- The integrated overvoltage protector meets the requirements as per IEC/EN 60079-14 Section 12.3.

T12
- The electrical apparatus must be integrated into the local potential equalization. The input circuit is galvanically connected to the housing.

Temperature tables

Electrical apparatus with standard supply

Note: Observe the permitted antenna temperature range.

Housing F12, T12-OVP	Antenna in	Electronics housing in	
	Zone 20	Ambient	Zone 21, Zone 22
Maximum permitted ambient temperature	–40 °C .....+200 °C	–40 °C...+80 °C	
Maximum surface temperature at 40 °C ambient temperature	+40 °C	+40 °C	+44 °C
Maximum surface temperature at 80 °C ambient temperature	+80 °C	+80 °C	+84 °C
Maximum surface temperature for antenna ambient temperatures > 80 °C and under simultaneous compliance of the ambient temperature at the electronics housing	.....+130 °C (identical to process temperature)	+75 °C	+84 °C
	.....+200 °C	+70 °C	+84 °C

Housing F23	Antenna in	Electronics housing in	
	Zone 20	Ambient	Zone 21, Zone 22
Maximum permitted ambient temperature	–40 °C .....+200 °C	–40 °C...+80 °C	
Maximum surface temperature at 40 °C ambient temperature	+40 °C	+40 °C	+50 °C
Maximum surface temperature at 80 °C ambient temperature	+80 °C	+80 °C	+90 °C
Maximum surface temperature for antenna ambient temperatures > 80 °C and under simultaneous compliance of the ambient temperature at the electronics housing	.....+130 °C (identical to process temperature)	+75 °C	+90 °C
	.....+200 °C	+65 °C	+90 °C

Housing T12	Antenna in	Electronics housing in	
	Zone 20	Ambient	Zone 21, Zone 22
Maximum permitted ambient temperature	–40 °C .....+200 °C	–40 °C...+80 °C	
Maximum surface temperature at 40 °C ambient temperature	+40 °C	+40 °C	+43 °C
Maximum surface temperature at 80 °C ambient temperature	+80 °C	+80 °C	+83 °C
Maximum surface temperature for antenna ambient temperatures > 80 °C and under simultaneous compliance of the ambient temperature at the electronics housing	.....+130 °C (identical to process temperature)	+70 °C	+83 °C
	.....+200 °C	+65 °C	+83 °C

Connection data

Power supply:		
F12, F23, T12-OVP	4-20 mA HART	U = 36 V Um = 36 V DC
	PROFIBUS PA, FOUNDATION Fieldbus	U = 32 V Um = 36 V DC
T12	4-20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	U = 32 V Um = 250 V AC

Micropilot M
FMR250

中文

4-20 mA HART

相关资料

本文档是下列操作手册的组成部分：
BA00284F/00

根据用户订购仪表的具体型号所提供的相应操作手册。

补充文档

防爆手册：
CP00021Z/11

名称

防爆标志和防护类型说明请查询防爆手册。

防爆代号

DIP	**A20/A21**	**T_A,**	**T* IP65**
DIP	**A21**	**T_A,**	**T* IP65**
DIP	**A20/A22**	**T_A,**	**T* IP65**

适用标准

GB 12476.1-2000

安全指南：特殊条件

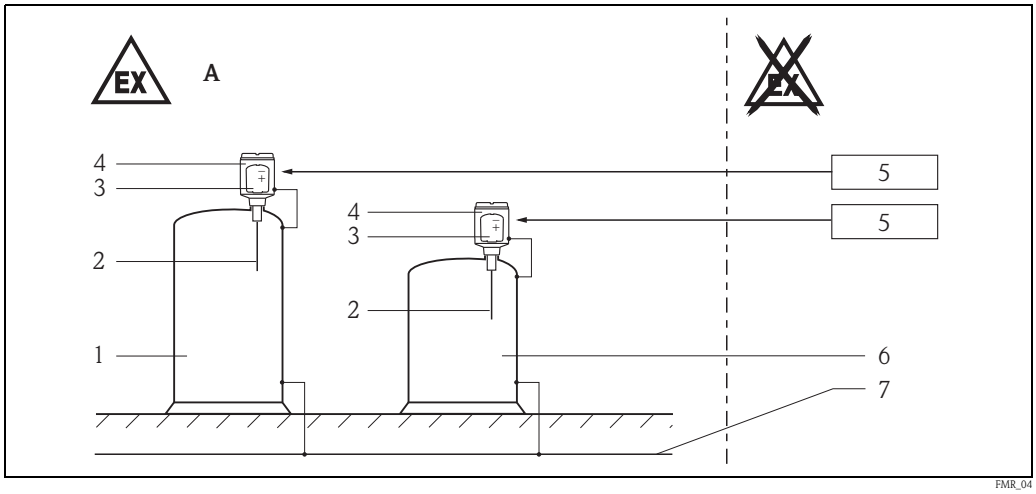
电子部件外壳处的允许环境温度范围：–40 °C ≤ Ta ≤ +80 °C。
遵守温度表中的信息。

安全指南：安装

电子部件柜盖类型：	
区域 **21**	仅允许使用闭合的电子部件柜盖
区域 **22**	允许使用带观察窗的电子部件柜盖

用标准电源进行安装

F12, F23

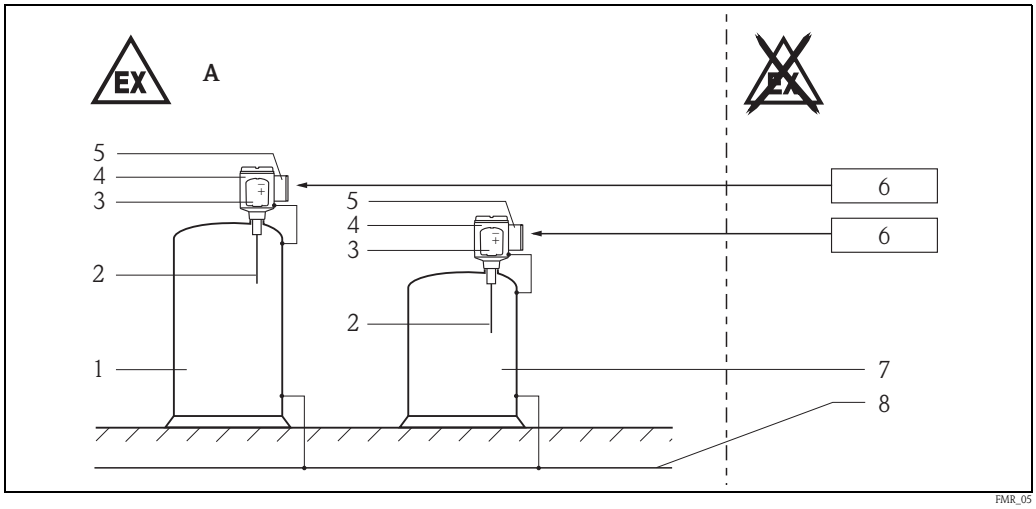


1

A *区域 21, 区域 22*

1 *液罐，危险区 20*
2 *喇叭形天线或抛物面天线*
3 *电子插件*
4 *外壳：*
– F12 (铝)
– F23 (316L)
5 *Uo = 36 V DC*
6 *液罐，危险区，区域 21*
7 *本地电势平衡*

T12-OVP

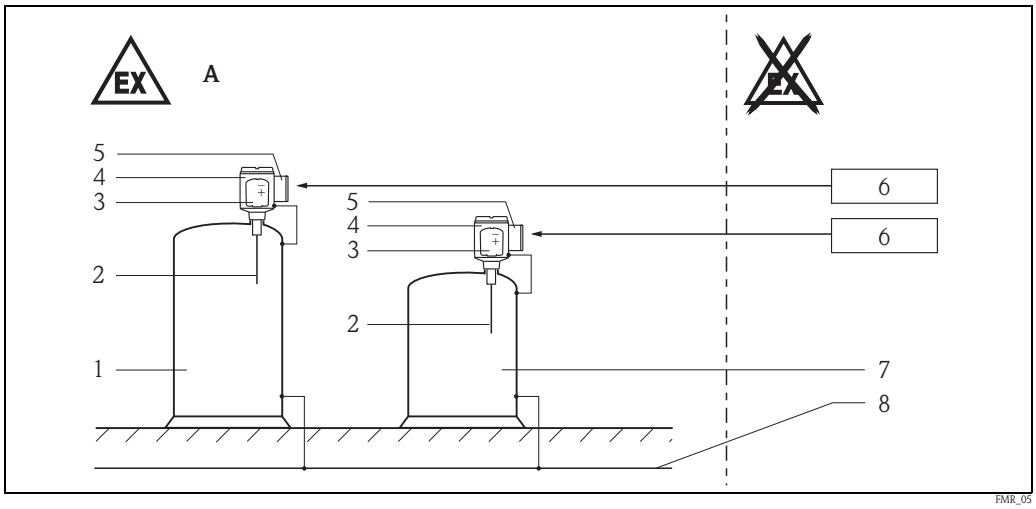


2

A *区域 21, 区域 22*

1 *液罐，危险区 20*
2 *喇叭形天线或抛物面天线*
3 *电子插件：*
电子接线柜
4 *外壳：*
– T12-OVP (铝)
5 *带集成过电压保护装置的终端模块*
6 *Uo = 36 V DC*
7 *液罐，危险区，区域 21*
8 *本地电势均衡*

T12



3

A *区域 21, 区域 22*

1 *液罐，危险区 20*
2 *喇叭形天线或抛物面天线*
3 *电子插件：*
电子接线柜 Ex ia
4 *外壳：*
– T12 (铝)
5 *接线端子块 Ex-Limiter*
6 *Uo = 32 V DC*
7 *液罐，危险区，区域 21*
8 *本地电势均衡*

- 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) 与温度等级之间的关系如表所示 (→ 13，“ 温度表 ”)。
- 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 ≥ Ta +5 K。
- 仅使用经认证适用于应用情况的电缆入口。
- 要维持外壳入口保护等级，请正确安装外壳封盖和电缆栓塞。
  使用通过防爆认证的密封塞堵塞未使用的电缆入口密封套。
- 在通电的情况下请勿打开接线柜 (T12、 T12-OVP) 或电子柜 (F12、 F23)。
- 接线柜的盖罩或电子部件柜的盖罩：扭矩 ≥ 40 Nm。
- 在爆炸性空气中请勿带电压打开电源电路的电气连接。
- 外部接地连接部件应可靠连接。
- 应该使用经认证的合适电缆入口和绝缘插头，并正确安装。
  在安装和连接传感器后，检查是否已达到国标 GB4208-2008 规定的 IP65 以上的防护等级。
- 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
  0.8 bar ≤ p ≤ 1.1 bar
- 如果不存在可能会爆炸的混合气体或者采取了额外的保护措施，根据 EN 1127-1 标准，变送器可以在符合制造商技术规范的其它大气条件下工作。
- 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 ”。
  – GB15577-2007：“ 粉尘防爆安全规程 ”。
  – GB12476.2-2006：“ 可燃性粉尘环境用电气设备，第 1 部分：用外壳和限制表面温度保护的电气设备 第 2 节：电气设备的选择、安装和维护 ”。

吹气清洗接口 FMR250：
- 在关闭状态下，安装必须具有 ≥ IP67 入口保护等级。
- 清洗压力 > 容器的内部压力。
- 在非清洗状态下，必须关闭各自的旋塞阀或阀门。
  在阀门或旋塞阀打开且没有清洗液时，可能会释放易爆炸的空气或者吸入外部的烟雾。

F12, F23
- 设备的输入电源电路与地电势绝缘，它相对地电势至少有 500 Vrms 绝缘强度。
- 如果周围不存在易爆炸的空气，可以打开电子部件的柜盖来配置仪器。如果电子部件柜盖打开，要确保没有积灰。
  在配置结束后，盖上柜盖，关闭外壳，所使用的扭矩为 ≥ 40 Nm。
  勿带电压开启电子室。

T12-OVP
- 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 290 Vrms 的绝缘强度 (600 V 放电管)。
- 如果周围不存在易爆炸的空气，可以打开电子部件的柜盖来配置仪器。如果电子部件柜盖打开，要确保没有积灰。
  在配置结束后，盖上柜盖，关闭外壳，所使用的扭矩为 ≥ 40 Nm。
  勿带电压开启接线室。
- 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。

T12
- 必须将电气装置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。

温度表

具有标准电源的电气设备

注意：遵循允许的天线温度范围。

外壳 F12, T12-OVP	天线位于	电子部件外壳位于	
	区域 **20**	环境	区域 **21,** 区域 **22**
最高允许环境温度	–40 °C .....+200 °C	–40 °C...+80 °C	
40 °C 环境温度时的最高表面温度	+40 °C	+40 °C	+44 °C
80 °C 环境温度时的最高表面温度	+80 °C	+80 °C	+84 °C
天线环境温度 > 80 °C 且符合电子部件外壳处的环境温度时的最高表面温度	.....+130 °C (同过程温度)	+75 °C	+84 °C
	.....+200 °C	+70 °C	+84 °C

外壳 F23	天线位于	电子部件外壳位于	
	区域 **20**	环境	区域 **21,** 区域 **22**
最高允许环境温度	–40 °C .....+200 °C	–40 °C...+80 °C	
40 °C 环境温度时的最高表面温度	+40 °C	+40 °C	+50 °C
80 °C 环境温度时的最高表面温度	+80 °C	+80 °C	+90 °C
天线环境温度 > 80 °C 且符合电子部件外壳处的环境温度时的最高表面温度	.....+130 °C (同过程温度)	+75 °C	+90 °C
	.....+200 °C	+65 °C	+90 °C

T12 外壳	天线位于	电子部件外壳位于	
	区域 **20**	环境	区域 **21,** 区域 **22**
最高允许环境温度	–40 °C .....+200 °C	–40 °C...+80 °C	
40 °C 环境温度时的最高表面温度	+40 °C	+40 °C	+43 °C
80 °C 环境温度时的最高表面温度	+80 °C	+80 °C	+83 °C
天线环境温度 > 80 °C 且符合电子部件外壳处的环境温度时的最高表面温度	.....+130 °C (同过程温度)	+70 °C	+83 °C
	.....+200 °C	+65 °C	+83 °C

连接数据

电源：		
F12, F23, T12-OVP	4-20 mA HART	U = 36 V Um = 36 V DC
	PROFIBUS PA， FOUNDATION Fieldbus (基金会现场总线)	U = 32 V Um = 36 V DC
T12	4-20 mA HART， PROFIBUS PA， FOUNDATION Fieldbus (基金会现场总线)	U = 32 V Um = 250 V AC

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