Safety Instructions
Liquiphant FailSafe
FTL80, FTL81, FTL85

Ex de IIC T6…T2 Ga/Gb

EN Document: XA00660F-A
Safety instructions for electrical apparatus for explosion-hazardous areas
→ 📄 3

ZH 文档资料代号：XA00660F-A
防爆危险区中使用的电气设备的安全指南
→ 📄 13

Endress+Hauser
People for Process Automation

Liquiphant FailSafe
FTL80, FTL81, FTL85

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Associated documentation

This document is an integral part of the following Operating Instructions:
BA01037F/00

The Operating Instructions pertaining to the device apply.

Supplementary documentation

Explosion-protection brochure:
CP00021Z/11

The Explosion-protection brochure is available:
- In the download area of the Endress+Hauser website: www.endress.com → Download → Advanced → Documentation Code: CP00021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

NEPSI Declaration of Conformity

Certificate number:
GYJ14.1057X

Affixing the certificate number certifies conformity with the standards under www.IECEx.com (depending on the device version).

- GB3836.1-2010
- GB3836.2-2010
- GB3836.3-2010
- GB3836.20-2010

Extended order code

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

Structure of the extended order code

FTL8x	-	*************	+	A*B*C*D*E*F*G*..
Device type		Basic specifications		Optional specifications

* = Placeholder
At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

- Basic specifications
  The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available.
  The selected option of a feature can consist of several positions.
- Optional specifications
  The optional specifications describe additional features for the device (optional features).
  The number of positions depends on the number of features available.
  The features have a 2-digit structure to aid identification (e.g. JA). The first digit (ID) stands for the feature group and consists of a number or a letter (e.g. J = test, certificate). The second digit constitutes the value that stands for the feature within the group (e.g. A = 3.1 material (wetted parts), inspection certificate).

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

Device type: FTL80, FTL81, FTL85

Basic specifications

Position		Selected option		Description
1, 2	Approval	FTL8x:	ND	Ex de IIC T6...T2 Ga/Gb
3	Electronics; Output	FTL8x:	S	FEL85; 2-wire, 4-20 mA
4	Display; Operating	FTL8x:	A	LED; switch
5	Housing	FTL8x:	E	T13 Alu, separate conn. compartment, IP66/68 NEMA Type 4X/6P Encl.
6	Electrical Connection	FTL8x:	B C D E	Thread M20 Thread G1/2 Thread NPT1/2 Thread NPT3/4
7	Application	FTL80:	A C D Y	Process max. 150 °C/302 °F, 64 bar/928 psi Process max. 230 °C/446 °F, 100 bar/1450 psi; incl. gas-tight feed through Process max. 280 °C/536 °F, 100 bar/1450 psi; incl. gas-tight feed through Process max. 300 °C/572 °F, 100 bar/1450 psi
		FTL81:	A B C D Y	Process max. 150 °C/302 °F, 64 bar/928 psi Process max. 150 °C/302 °F, 100 bar/1450 psi Process max. 230 °C/446 °F, 100 bar/1450 psi; incl. gas-tight feed through Process max. 280 °C/536 °F, 100 bar/1450 psi; incl. gas-tight feed through Process max. 300 °C/572 °F, 100 bar/1450 psi
		FTL85:	N P T	ECTFE, Process max. 120 °C/248 °F, 40 bar/580 psi PFA, Process max. 150 °C/302 °F, 40 bar/580 psi Enamel, Process max. 150 °C/302 °F, 25 bar/362 psi
9	Surface Refinement	FTL85:	N P Q R T	Coating ECTFE Coating PFA (Edlon) Coating PFA (RubyRed) Coating PFA (conductive) Coating Enamel

Optional specifications

ID		Selected option		Description
Mx	Sensor Design	FTL8x:	MP MR MS	Ambient temperature −50 °C/−58 °F Temperature separator Pressure tight feed through, incl. temperature separator
Nx	Accessory Mounted	FTL8x:	NE	Cover, housing T13 Alu, window

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
- 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 explosive gas atmospheres, Part 16: Inspection and maintenance of electrical installation (other than mines)".
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- 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 sensor and/or transmitter, depending on the range of application, and the temperature class (→ 🖹 9).
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

Safety instructions: Special conditions

Permitted ambient temperature range at the electronics housing: $-50\ °C \leq T_a \leq +70\ °C$.
Observe the information in the temperature tables.

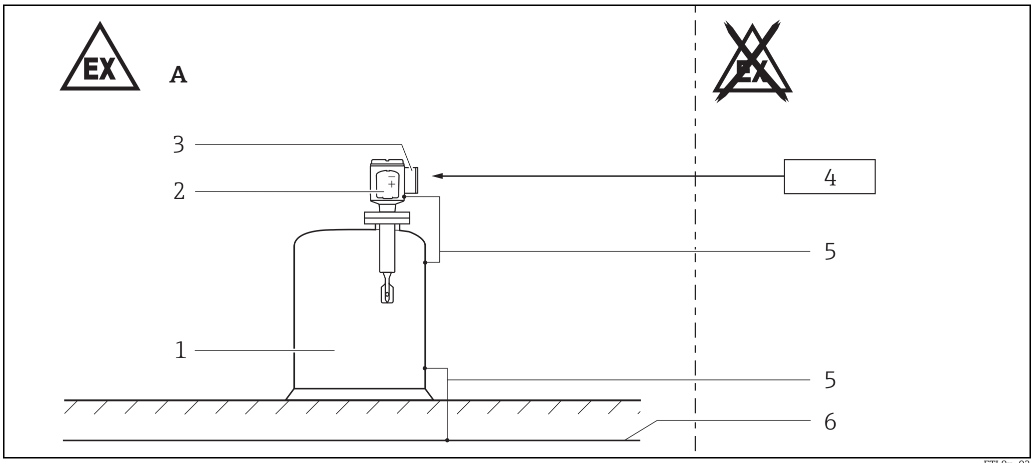
Device type FTL85, Basic specification, Position 9 (Surface Refinement) = N, P, Q
- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.

Gas group IIC
- If electrostatic charging of the probe can be avoided (e.g. through friction, cleaning, maintenance, strong medium flow), a probe coated with non-conductive material can be used.

Gas group IIB
- A probe coated with non-conductive material can be used.

- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- 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.

Safety instructions: Installation



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1

A Zone 1

1 Tank; Zone 0, Zone 1
2 Electronic insert, electronics compartment Ex d
3 Connection compartment Ex e
4 Power supply
5 Potential equalization line
6 Potential equalization

- Perform the following to achieve the degree of protection IP66/68:
  - Screw the cover tight.
  - Mount the cable entry correctly.
- Observe the maximum process conditions according to the manufacturer's Operating Instructions.
- At high medium temperatures, note flange pressure load capacity as a factor of temperature.
- When mounting the device:
  - Exclude any mechanical damage or friction during the application.
  - Pay particular attention to flow conditions and tank fittings.
- Support extension tube of the device if a dynamic load is expected.
- Connect the device:
  - Using suitable cable and wire entries of protection type “Increased safety (Ex e)”. Observe national regulations and standards.
  - Using piping systems of protection type “Increased safety (Ex e)”.
- When operating the transmitter housing at an ambient temperature under −20 °C, use appropriate cables and cable entries permitted for this application.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation.
- Continuous service temperature of the connecting cable: −40 to ≥ +85 °C; in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,min}$), ($T_{a,max}$ +20 K).
- In potentially explosive atmospheres:
  - Do not open the electrical connection of the power supply circuit when energized.
  - Do not open the connection compartment cover and the electronics compartment cover when energized.
- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing clamp on the cover.

Accessory high pressure sliding sleeve

- The high pressure sliding sleeve can be used for a continuous setting of the switch point and is suited for zone division if mounted properly (→ Operating Instructions).

Basic specification, Position 5 (Housing) = E

- Avoid sparks caused by impact and friction.

Potential equalization

- Integrate the device into the local potential equalization.

Electronics type	Cross section connecting wire	Tightening torque of terminal screw	Stripped insulation
FEL58	≤ 2.5 mm²	0.4 Nm	6 to 8 mm

Safety instructions: Ex d joints

If required or if in doubt: ask manufacturer for specifications.

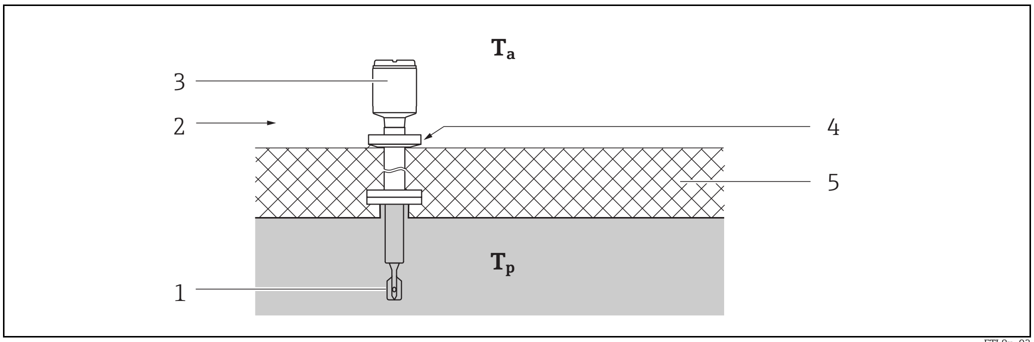
Safety instructions: Zone 0

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
  - Temperature: –20 to +60 °C
  - Pressure: 80 to 110 kPA (0.8 to 1.1 bar)
  - Air with normal oxygen content, usually 21 % (V/V)

  If no potentially explosive mixtures are present, or if additional protective measures have been taken, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.
- The sensor part of the device approved for Zone 0 does not cause any ignition hazards if it is operated under non-atmospheric pressures and temperatures.
- Only use the device in media to which the wetted materials have sufficient durability (e.g. process connection seal).

Explosion protection with heat insulation

Device type FTL80, FTL81, Basic specification, Position 7 (Application) = C, D, Y
- While observing the "temperature derating", the device is suitable for process temperatures up to 300 °C (→ 11).
- When operating, ensure that you rule out contact between hot component surfaces and potentially explosive atmospheres beyond the limits of the corresponding temperature class (→ 9). Suitable measures: e.g. thermal insulation at container and/or pipes.
- The temperature of 85 °C specified at the reference point may not be exceeded.
- To protect the electronics, observe the specified ambient temperature at the electronics housing.



2

T_a Ambient temperature
T_p Process temperature

1 Sensor
2 Temperature class, e.g. T6
3 Housing
4 Reference point: max. +85 °C
5 E.g. thermal insulation

Temperature tables

Ambient temperature electronics

When used outside Zone 0
−50…+70 °C

Process temperature sensor

When used in Zone 0
−20…+60 °C

Device type FTL80, FTL81, Basic specification, Position 7 (Application) = A, B, C, D, Y

When used outside Zone 0
−50…+150 °C (A, B)
−60…+230 °C (C)
−60…+280 °C (D)
−60…+300 °C (Y)

Device type FTL85, Basic specification, Position 7 (Application) = N, P, T

When used outside Zone 0
−50…+120 °C (N)
−50…+150 °C (P, T)

The dependency of the ambient and process temperatures upon the temperature class:

Device type FTL80, FTL81, Basic specification, Position 7 (Application) = A, B

Temperature class	Process temperature T_p (process): sensor	Ambient temperature T_a (ambient): electronics
T6	−50…+ 85 °C	−50…+70 °C
T5	−50…+100 °C	−50…+70 °C Additional temperature range for sensors with optional specifications *Mx* = MR, MS → 🗎 3
T4	−50…+135 °C	
T3	−50…+150 °C	

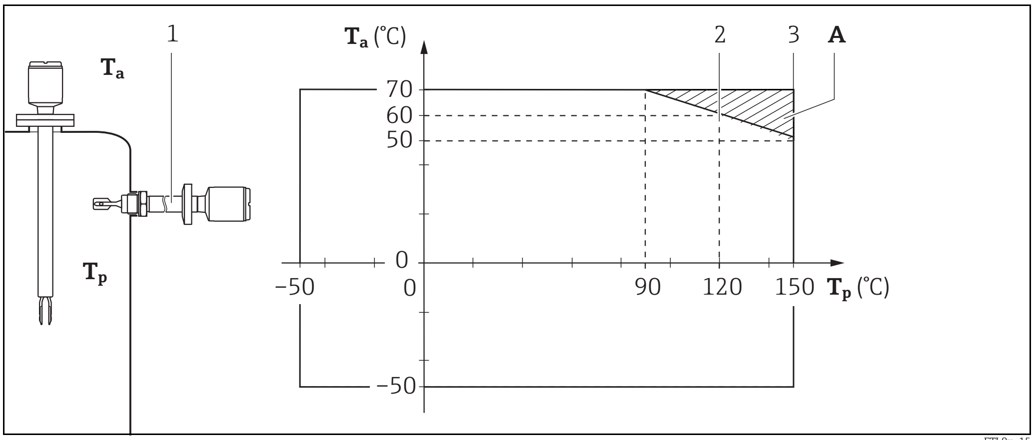
Device type FTL80, FTL81, Basic specification, Position 7 (Application) = C, D, Y

Temperature class	**Process temperature T_p (process): sensor**	**Ambient temperature T_a (ambient): electronics**
T6	−60…+ 85 °C	−50…+70 °C
T5	−60…+100 °C	−50…+70 °C For restrictions → 4
T4	−60…+135 °C	
T3	−60…+200 °C	
T2	−60…+230 °C (C) −60…+280 °C (D) −60…+300 °C (Y)	

Device type FTL85, Basic specification, Position 7 (Application) = N, P, T

Temperature class	**Process temperature T_p (process): sensor**	**Ambient temperature T_a (ambient): electronics**
T6	−50…+ 85 °C	−50…+70 °C
T5	−50…+100 °C	−50…+70 °C Additional temperature range for sensors with optional specifications *Mx* = MR, MS → 3
T4	−50…+120 °C (N)	
T4	−50…+135 °C (P, T)	
T3	−50…+150 °C (P, T)	

Device type FTL80, FTL81, Basic specification, Position 7 (Application) = A, B
Device type FTL85, Basic specification, Position 7 (Application) = N, P, T



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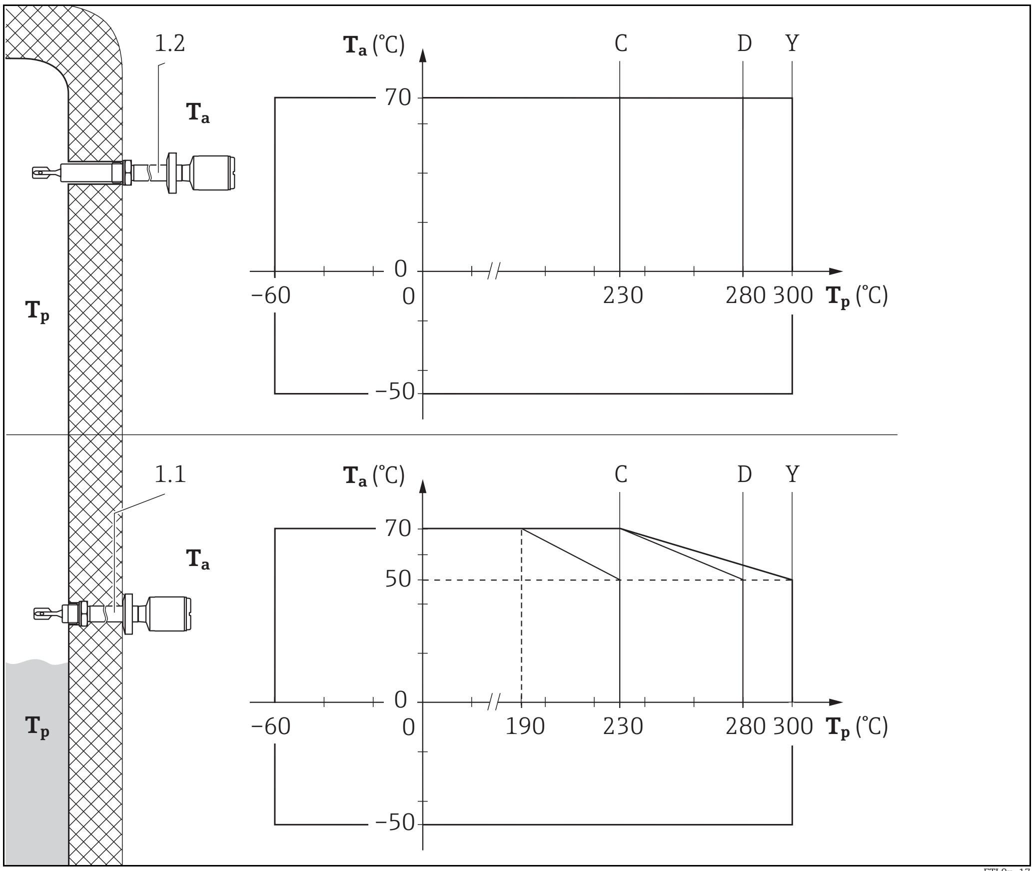
3

A Additional temperature range for sensors with optional specifications *Mx* = MR, MS

1 Temperature separator or pressure tight feed through
2 ECTFE
3 PFA, Enamel

Device type FTL80, FTL81, Basic specification, Position 7 (Application) = C, D, Y



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1 Temperature separator:
1.1 insulated
1.2 free-standing

Connection data

Basic specification, Position 1, 2 (Approval) = ND

Ex de

Note!
Only connect the device to terminals 1 and 2 or terminals 2 and 3, respectively.

Terminal 1 (–) MAX safety **Terminal 2 (+)** **Terminal 3 (–)** MIN safety
Power supply: U_e = 30 V DC U_m = 250 V AC I_{Nom} = 4...20 mA P_{max} ≤ 660 mW

Liquiphant FailSafe
FTL80、FTL81、FTL85

目录

相关文档资料

本文档是下列 《操作手册》的组成部分：
BA01037F

各种设备须参考各自的 《操作手册》。

补充文档资料

《防爆手册》：
CP00021Z

《防爆手册》的获取方式：
- 登陆 Endress+Hauser 网站的下载区：
  www.endress.com → 下载 → 高级搜索 → 文档资料代号：CP00021Z
- 设备的随箱 CD 光盘

制造商证书

NEPSI 一致性声明

证书号：
GYJ14.1057X

附带证书号的设备符合下列标准：

- GB3836.1-2010
- GB3836.2-2010
- GB3836.3-2010
- GB3836.20-2010

扩展订货号

铭牌上标识有扩展订货号，设备上的铭牌位置应清晰可见。
铭牌的详细信息请参考相关 《操作手册》。

扩展订货号的结构

```
    FTL8x      -  *************  +  A*B*C*D*E*F*G*..
----------------  ----------------------  ---------------------------
  设备型号            基本规格选项               可选规格选项
```

* = 占位符
在此位置处，选择的规格选项以数字或字母显示，以替代占位符。

- 基本规格选项
  基本规格选项包括设备必须具有的选项 (必选项)。位数取决于选项数量。
  选择的特定选项可能占多个位数。
- 可选规格选项
  可选规格选项描述了设备的其他特点 (可选项)。
  位数取决于可选选项数量。
  选项代号由两位字符组成，便于标识 (例如：JA)。第一位选项 (ID) 表示选项组，由数字或字母组成 (例如：J = 测试、证书)。第二位选项表示选项组中的特性。
  (例如：A = 3.1 材料 (接液部件)，检测证书)。

设备的详细信息请参考下列表格。表格中介绍了与爆炸危险区相关的每一位标准订货号和扩展订货号的选项 (ID)。

设备型号：FTL80、FTL81、FTL85

基本规格选项

订购选项		选型代号		说明
1、2	认证	FTL8x：	ND	Ex de IIC T6...T2 Ga/Gb
3	电子插件；输出	FTL8x：	S	FEL85 ；两线制， 4...20 mA
4	显示；操作	FTL8x：	A	LED 指示灯；开关
5	外壳	FTL8x：	E	T13 铝外壳， 独立接线腔， IP66/68 NEMA Type 4X/6P（外壳）
6	电气连接	FTL8x：	B C D E	M20 螺纹 G1/2 螺纹 NPT1/2 螺纹 NPT3/4 螺纹
7	应用	FTL80：	A C D Y	过程：max. 150 °C (302 °F)、64 bar (928 psi) 过程：max. 230 °C (446 °F)、100 bar (1450 psi) ； 带气密保护功能 过程：max. 280 °C (536 °F)、100 bar (1450 psi) ； 带气密保护功能 过程：max. 300 °C (572 °F)、100 bar (1450 psi)
		FTL81：	A B C D Y	过程：max. 150 °C (302 °F)、64 bar (928 psi) 过程：max. 150 °C (302 °F)、100 bar (1450 psi) 过程：max. 230 °C (446 °F)、100 bar (1450 psi) ； 带气密保护功能 过程：max. 280 °C (536 °F)、100 bar (1450 psi) ； 带气密保护功能 过程：max. 300 °C (572 °F)、100 bar (1450 psi)
		FTL85：	N P T	ECTFE， 过程：max. 120 °C (248 °F)、40 bar (580 psi) PFA， 过程：max. 150 °C (302 °F)、40 bar (580 psi) 瓷釉， 过程：max. 150 °C (302 °F)、25 bar (362 psi)
9	表面处理	FTL85：	N P Q R T	ECTFE 涂层 PFA 涂层 (Edlon) PFA 涂层（红宝石） PFA 涂层（导电性） 瓷釉涂层

可选规格选项

订购选项 (ID)		选型代号		说明
Mx	传感器设计	FTL8x：	MP MR MS	环境温度：−50 °C (−58 °F) 隔热管 气密保护功能， 带隔热管
Nx	安装附件	FTL8x：	NE	盖板， T13 铝外壳， 窗口

安全指南：概述

- 进行设备安装、电气连接、调试和维护的人员必须满足下列要求：
  - 具有承担任务和执行任务的适当资质
  - 经过防爆保护培训
  - 熟悉国家法规
- 安装、使用和维护设备时，用户必须遵守 《操作手册》和标准中列举的要求：
  - 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)”。
- 按照制造商说明和国家法规安装设备。
- 超出规定电气参数、热参数和机械参数时，禁止使用设备。
- 仅允许在接液部件材料具有足够耐腐蚀能力的介质中使用。
- 避免静电荷充电：
  - 塑料表面 (例如：外壳、传感器单元、特殊抛光、安装的附加板等)
  - 隔离电容器 (例如：隔离金属板)
- 传感器和 / 或变送器的允许环境温度 (取决于应用范围) 和温度等级之间的关系请参考温度表 (→ 🗎 19)。
- 改装设备可能会影响防爆保护，必须由 Endress+Hauser 授权的专业人员执行此类操作。

安全指南：特殊条件

电子腔外壳的允许环境温度：$-50\ ^\circ C \leq T_a \leq +70\ ^\circ C$。
注意温度表信息。

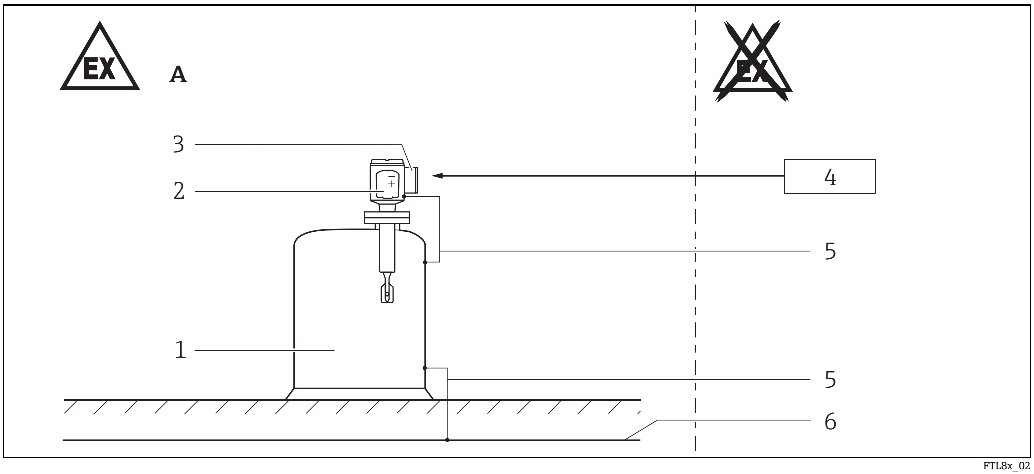
设备型号 FTL85，基本订购选项，选型代号 9 (表面处理) = N、P、Q
- 使用聚合材料或或带聚合物涂层的过程连接时，避免塑料表面的静电荷充电。

气体组 IIC
- 可以避免探头的静电荷充电时，可以使用带非导电涂层材料的探头
  (例如：摩擦、清洁、维护、强介质流)。

气体组 IIB
- 可以使用带非导电涂层材料的探头。

- 使用聚合材料或或带聚合物涂层的过程连接时，避免塑料表面的静电荷充电。
- 在对外壳或其他金属部分做额外或特殊处理时：
  - 注意静电荷充电和放电带来的危险。
  - 请勿使用干布擦拭表面。

安全指南：安装



1

A 1 区

1 罐体；0 区、1 区
2 Ex d 电子插件
3 Ex e 接线腔
4 电源
5 等电势连接线
6 等电势

- 执行下列操作，确保 IP66/68 防护等级：
  - 拧紧外壳盖。
  - 正确安装电缆入口。
- 注意制造商《操作手册》中的最高过程条件。
- 测量高温介质时，注意法兰的压力负载能力受温度的影响。
- 安装设备时：
  - 在应用过程中避免任何机械损坏或摩擦。
  - 注意流体条件和罐体装置。
- 可能出现动态负载时，支撑延伸管。
- 连接设备：
  - 使用合适的电缆和“增安 (Ex e)”防爆保护的电缆入口。
    遵守国家法规和标准。
  - 使用“增安 (Ex e)”防爆保护的管道系统。
- 在环境温度低于 −20 °C 的条件下操作变送器外壳时，使用可以在此类应用场合中使用的合适电缆和电缆入口。
- 使用满足防护等级要求的认证密封插头密封未使用的电缆入口。
  塑料运输密封堵头不满足此要求，在安装过程中必须更换。
- 连接电缆的持续工作温度：−40...+85 °C ；
  在符合工作温度范围的条件下，还应考虑过程条件的其他影响 ($T_{a,min}$)、($T_{a,max}$ +20 K)。
- 在潜在爆炸性大气环境中：
  - 带电时，请勿打开供电回路的电气连接。
  - 带电时，请勿打开接线腔盖和电子腔盖。
- 操作前：
  - 拧上外壳盖。
  - 拧紧外壳盖上的固定卡扣。

附件：高压滑动套管
- 高压滑动套管可用于连续设置开关点；正确安装时，可以在防爆区中使用 (→ 《操作手册)。

基本规格选项，选型代号 5 (外壳) = E
- 避免冲击和摩擦产生的火花。

电势平衡

- 将设备集成至本地等电势系统中。

电子插件类型	连接线芯横截面积	螺纹接线端子的紧固扭矩	绝缘层去皮长度
FEL58	≤ 2.5 mm^2	0.4 Nm	6...8 mm

安全指南：Ex d

如需要或如有疑问：具体规格参数请咨询制造商。

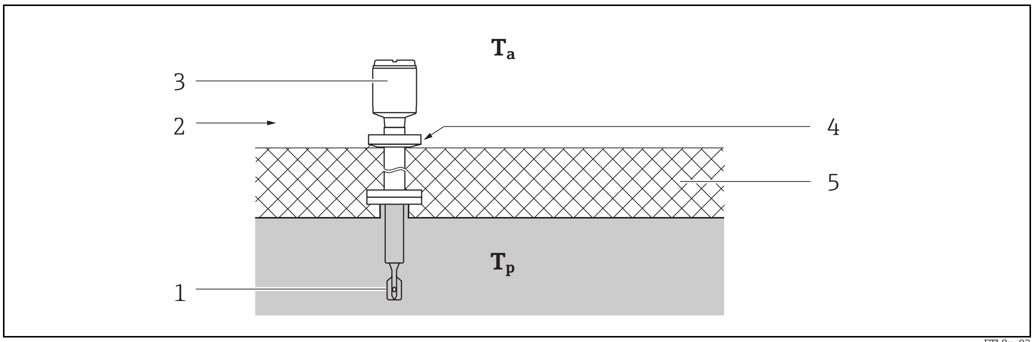
安全指南：0 区

- 蒸汽 / 空气混合物存在爆炸危险时，仅允许在大气环境下操作设备。
  - 温度：–20...+60 °C
  - 压力：80...110 kPA (0.8...1.1 bar)
  - 正常含氧量的空气，通常为 21 % (V/V)

  未出现潜在爆炸危险混合气体时，或已经采取其他防护措施时，可以根据制造商规范在非大气条件下操作设备。
- 在非大气压力和温度下使用时，通过 0 区认证的设备的传感器部分不会产生任何火花。
- 仅允许在接液部件材料具有足够耐腐蚀能力的介质中使用 (例如：过程连接密封圈)。

带隔热的防爆保护

设备型号 FTL80、FTL81，基本订购选项，选型代号 7 (应用) = C、D、Y
- 注意 “ 减温 ” 曲线，设备最高适用温度为 300 °C (→ 🗎 21)。
- 操作时，确保热部件表面不接触超出相应温度等级 (→ 🗎 19) 的潜在爆炸环境。
  合适的措施，例如：在容器和 / 或管道上安装保温层。
- 不得超出参考点的指定温度 85 °C。
- 为了保护电子插件，注意电子腔外壳的指定环境温度。



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T_a 环境温度
T_p 过程温度

1 传感器
2 温度等级，例如：T6
3 外壳
4 参考点：max. +85 °C
5 例如：保温层

温度表

电子插件的环境温度

在 0 区中使用
−50...+70 ℃

传感器的过程温度

在 0 区中使用
−20...+60 ℃

设备型号 FTL80、FTL81：基本规格选项，选型代号 7 (应用) = A、B、C、D、Y

在 0 区之外使用
−50...+150 ℃ (A、B)
−60...+230 ℃ (C)
−60...+280 ℃ (D)
−60...+300 ℃ (Y)

设备型号 FTL85：基本规格选项，选型代号 7 (应用) = N、P、T

在 0 区之外使用
−50...+120 ℃ (N)
−50...+150 ℃ (P、T)

环境温度和过程温度与温度等级之间的关系：

设备型号 FTL80、FTL81：基本规格选项，选型代号 7 (应用) = A、B

温度等级	过程温度 T_p (过程)：传感器	环境温度 T_a (环境)：电子插件
T6	−50...+ 85 ℃	−50...+70 ℃
T5	−50...+100 ℃	−50...+70 ℃ 带可选规格选项 Mx = MR、MS 的传感器的扩展温度范围 → 🗎 3
T4	−50...+135 ℃	
T3	−50...+150 ℃	

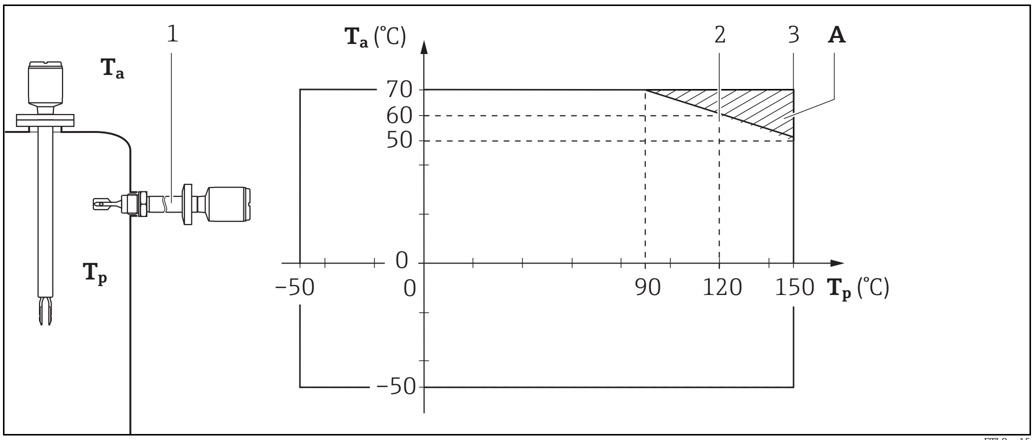
设备型号 FTL80、FTL81：基本规格选项，选型代号 7（应用）= C、D、Y

温度等级	过程温度 **T_p**（过程）：传感器	环境温度 **T_a**（环境）：电子插件
T6	−60...+ 85 °C	−50...+70 °C
T5	−60...+100 °C	−50...+70 °C 受限范围 → 4
T4	−60...+135 °C	
T3	−60...+200 °C	
T2	−60...+230 °C (C) −60...+280 °C (D) −60...+300 °C (Y)	

设备型号 FTL85，基本规格选项，选型代号 7（应用）= N、P、T

温度等级	过程温度 **T_p**（过程）：传感器	环境温度 **T_a**（环境）：电子插件
T6	−50...+ 85 °C	−50...+70 °C
T5	−50...+100 °C	−50...+70 °C 带可选规格选项 Mx = MR、MS 的传感器的扩展温度范围 → 3
T4	−50...+120 °C (N)	
T4	−50...+135 °C (P、T)	
T3	−50...+150 °C (P、T)	

设备型号 FTL80、FTL81：基本规格选项，选型代号 7（应用）= A、B
设备型号 FTL85：基本规格选项，选型代号 7（应用）= N、P、T



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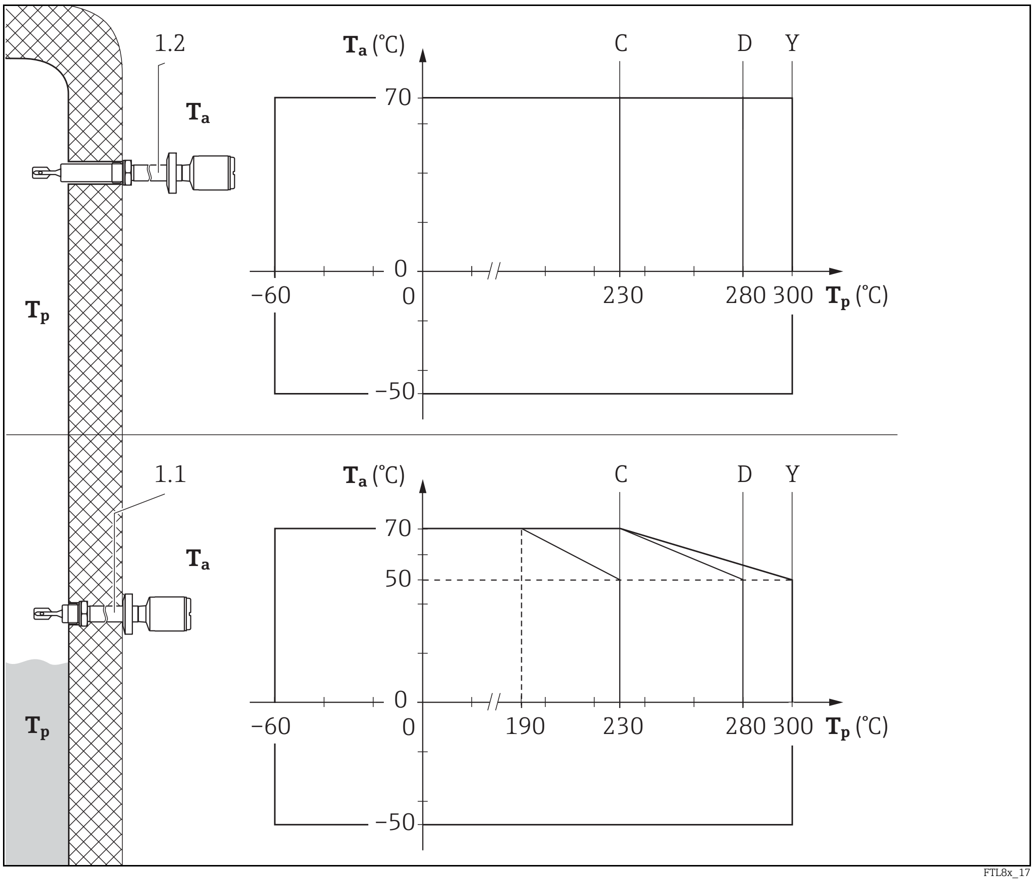
A 带可选规格选项 Mx = MR、MS 的传感器的扩展温度范围

1 隔热管或气密保护功能
2 ECTFE
3 PFA、瓷釉

设备型号 FTL80、FTL81：基本规格选项，选型代号 7 (应用) = C、D、Y



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1 隔热管：
1.1 绝缘
1.2 自由放置

连接参数

基本规格选项，订购选项 1、2 (认证) = ND

Ex de

注意！
仅将设备分别连接至接线端子 1 和 2，或接线端子 2 和 3。

接线端子 1 (–) 高限 **接线端子 2 (+)** **接线端子 3 (–) 低限**
电源： U_e = 30 V DC U_m = 250 V AC I_{Nom} = 4...20 mA P_{max} ≤ 660 mW

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