Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

Liquiphant M/S
FTL50(H), FTL51(H), FTL51C, FTL70, FTL71

NEPSI GYJ06464 (FTL50(H), FTL51(H)), Ex ia IIC T3...T6, NEPSI GYJ05557 (FTL51C), Ex ia IIC or Ex ia IIB T3...T6, NEPSI GYJ05558 (FTL70, FTL71), Ex ia IIC T2...T6

XC009F-D

en - Safety instructions for electrical apparatus for explosion-hazardous areas.

zh - 爆炸环境中电气仪表的安全指南。

XC009F-D/00/B2/12.09
71107464

Endress+Hauser
People for Process Automation

Liquiphant M/S
FTL50(H), FTL51(H), FTL51C, FTL70, FTL71

english

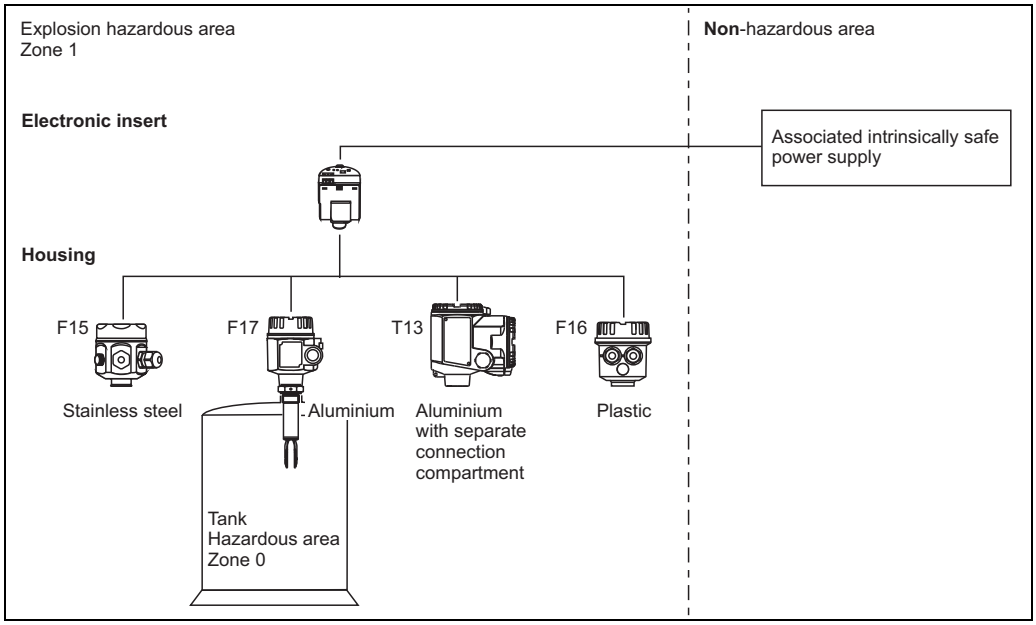
Associated Documentation

This document is an integral part of the following Operating Instructions:
KA143F/00, KA144F/00, KA163F/00, KA164F/00, KA162F/00, KA165F/00, KA172F/00, KA173F/00

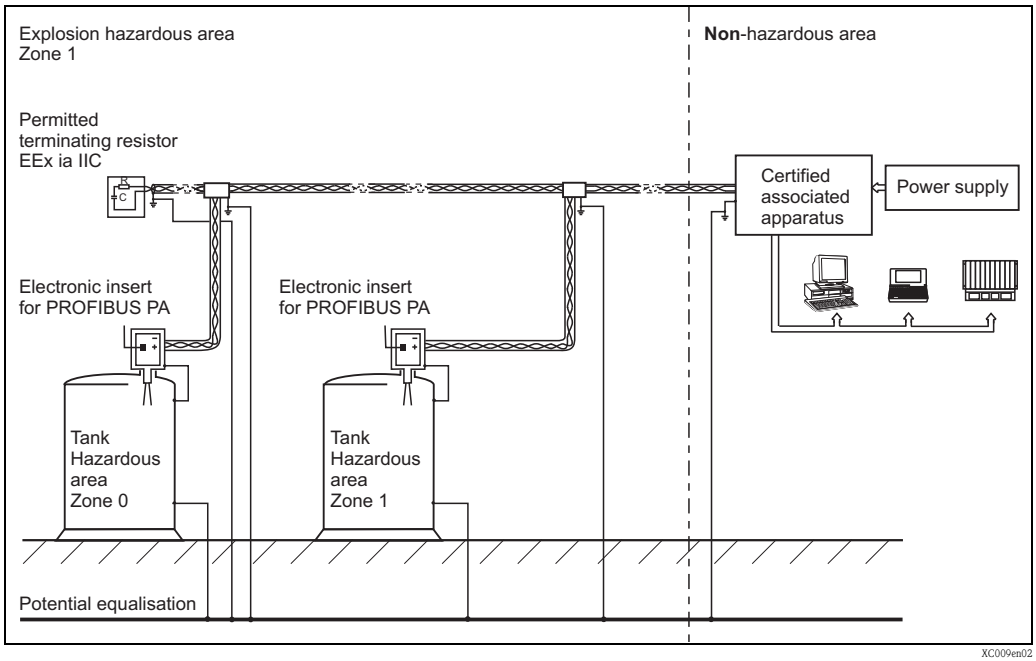
The Operating Instructions which are supplied and correspond to the device type apply.

Designation

Designation of explosion protection	FTL50/51(H), FTL51C	**Ex**	**ia**	**IIC**	**T3...T6**
		Ex	**ia**	**IIB**	**T3...T6**
	FTL70, FTL71	**Ex**	**ia**	**IIC**	**T2...T6**



Liquiphant M/S	Electronic insert	Ambient temperature electronics
FTL50(H), FTL51(H), FTL51C, FTL70, FTL71	FEL55/56/57/58	–50 °C ≤ Ta ≤ +70 °C
	FEL50D	–50 °C ≤ Ta ≤ +60 °C



Liquiphant M/S	Electronic insert	Ambient temperature electronics
FTL50(H), FTL51(H), FTL51C, FTL70, FTL71	FEL50A	–50 °C ≤ Ta ≤ +60 °C

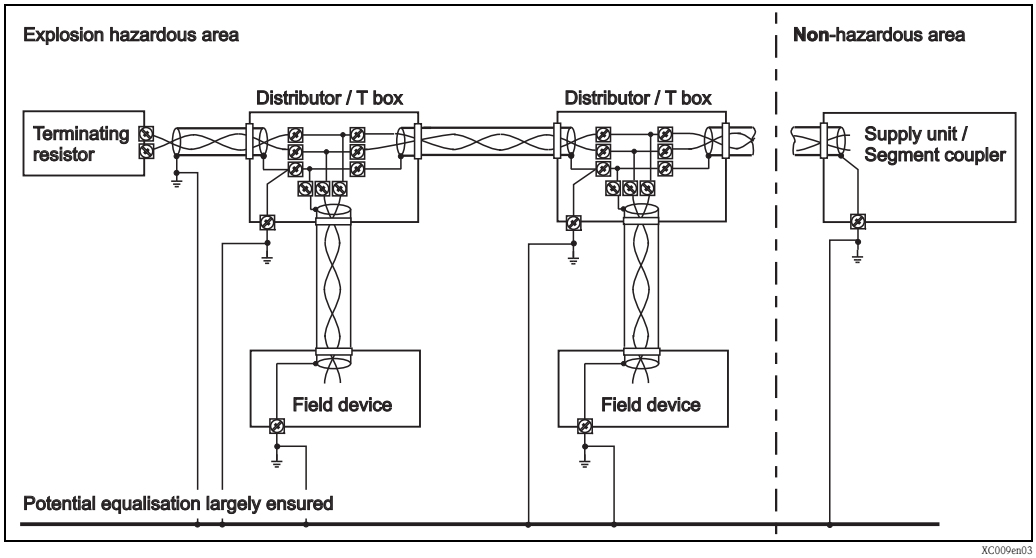
Electronic insert	Ui	Ii	Pi	Ci	Li
FEL55	36.0 V	100 mA	1.0 W	0.0 nF	0 µH
FEL56	16.0 V	52 mA	0.169 W	0.0 nF	0 µH
FEL57	16.7 V	150 mA	1.0 W	0.0 nF	0 µH
FEL58	16.0 V	52 mA	0.169 W	0.0 nF	0 µH
FEL50A (PROFIBUS PA)	17.5 V	500 mA	5.5 W	2.7 nF	10 µH
FEL50D (FML621)	27.6 V	93 mA	0.64 W	2.0 nF	0 µH

Zone	Type of protection	Type
Zone 0/1	Ex ia IIC T3...T6	FTL50(H), FTL51(H), FTL51C with coating of enamel or conductive PFA
Zone 0/1	Ex ia IIB T3...T6	FTL51C with coating of ECTFE or non-conductive PFA
Zone 0/1	Ex ia IIC T2...T6	FTL70, FTL71

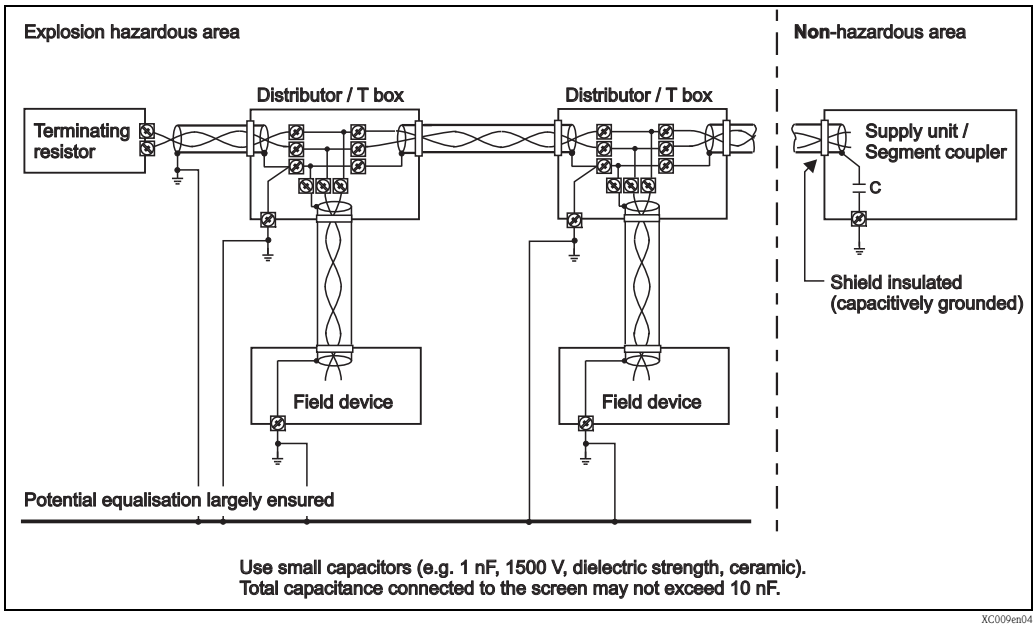
Safety instructions: Installation

- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and any other valid standards and regulations.
- Pay attention to 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.
- Connect the device using suitable cable and wire entries or using piping systems of protection type "Instrinsic safety (Ex i)".
- Connection of intrinsically safe PROFIBUS devices: 10 devices.
- To maintain the ingress protection IP66/67 of the housing, install the housing cover and cable glands correctly.
- Close unused entry glands with sealing plugs.
- Support extension tube of the device if a dynamic load is expected.
- The external earth connection facility should be connected reliably.
- The criteria for interconnection between the instrument and the associated apparatus is as below:
  $U_o \leq U_i$, $I_o \leq I_i$, $P_o \leq P_i$, $C_o \geq C_i+C_c$, $L_o \geq L_i+L_c$
  (Note: Cc and Lc stand for distributed capacitance and distributed inductance of cable.)
- Avoid a build-up of electrostatic charge on the F16 enclosure (polyester material). Do not make friction, clean with dry cloth or install it in the strong airflow.
- Forbid user to change the configuration to ensure the equipment’s explosion protection performance. Changes should be done only by experts from the manufacturer.
- 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)".
- Grounding the screen, see variant 2.
- Continuous duty temperature of the cable T_a +5 K.
- Avoid electrostatic charging of the plastic surfaces, for plastic process connections or plastic coatings.

Variant 1 (FEL50A)

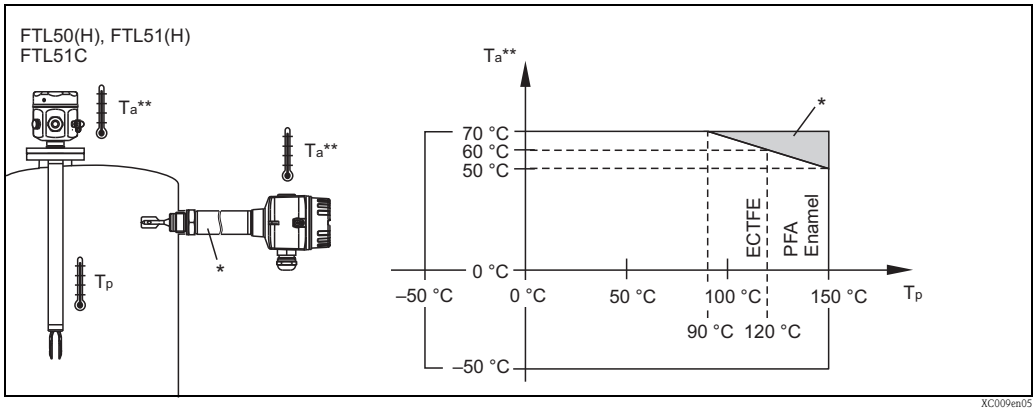


Variant 2 (FEL50A)

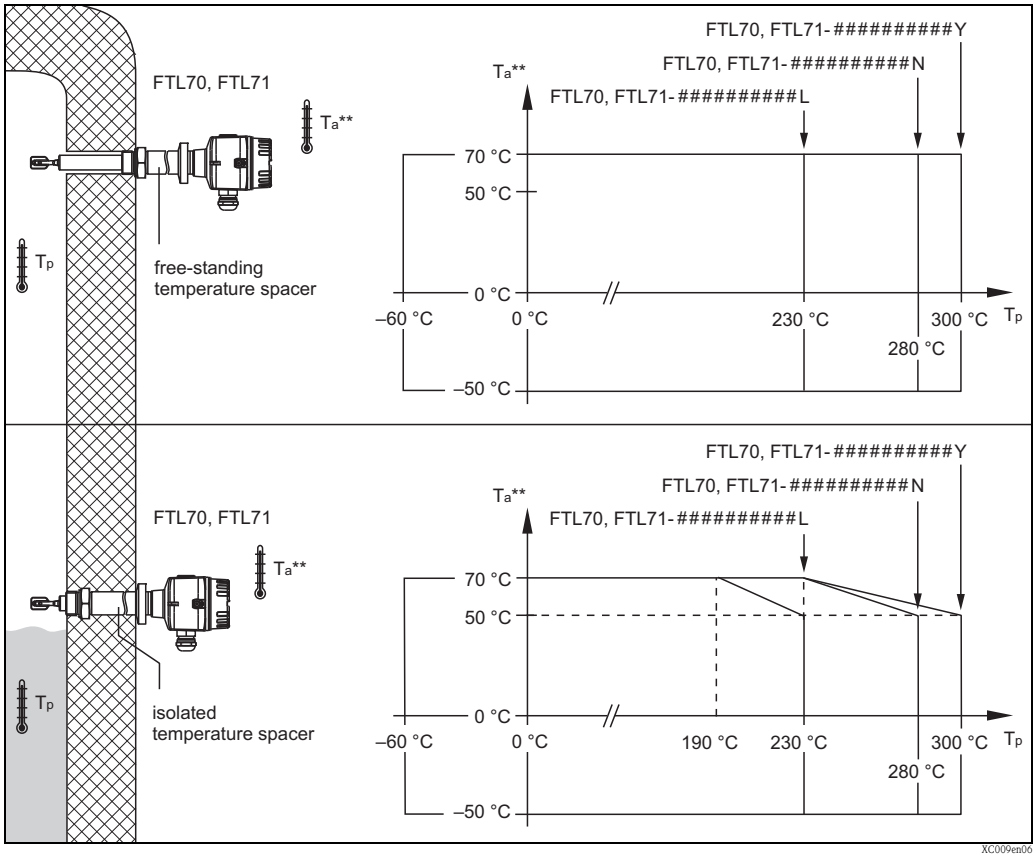


The dependency of the ambient and process temperatures upon the temperature class:

Type	**Temperature class**	**Process temperature Tp (process): sensor**	**Ambient temperature Ta (ambient): electronics**
FTL50(H), FTL51(H); FTL51C (ECTFE, PFA or enamel coating)	T6	–50 °C... +85 °C	–50 °C...+70 °C with FEL50A, FEL50D: –50 °C...+60 °C
FTL70, FTL71		–60 °C... +85 °C	
FTL50(H), FTL51(H); FTL51C (ECTFE, PFA or enamel coating)	T5	–50 °C...+100 °C	FTL50, FTL51, FTL51C: –50 °C...+70 °C with temperature spacer; without temperature spacer see temperature diagram below FTL70, FTL71: –50 °C...+70 °C
FTL70, FTL71		–60 °C...+100 °C	
FTL51C (ECTFE coating)	T4	–50 °C...+120 °C	
FTL50(H), FTL51(H); FTL51C (PFA or enamel coating)	T4	–50 °C...+135 °C	
FTL70, FTL71		–60 °C...+135 °C	
FTL50(H), FTL51(H); FTL51C (PFA or enamel coating)	T3	–50 °C...+150 °C	
FTL70, FTL71	T3	–60 °C...+200 °C	–50 °C...+70 °C For restrictions, see the temperature diagram on the next page
FTL70, FTL71- L	T2	–60 °C...+230 °C	
FTL70, FTL71- . . . . . N	T2	–60 °C...+280 °C	
FTL70, FTL71- . . . . . Y	T2	–60 °C...+300 °C	



** Additional temperature range for sensors with temperature spacer or pressure-tight bushing*
*** FEL50A, FEL50D: –50 °C ≤ Ta ≤ +60 °C (T6)*



*** FEL50A, FEL50D: –50 °C ≤ Ta ≤ +60 °C (T6)*

Safety instructions: Zone 0

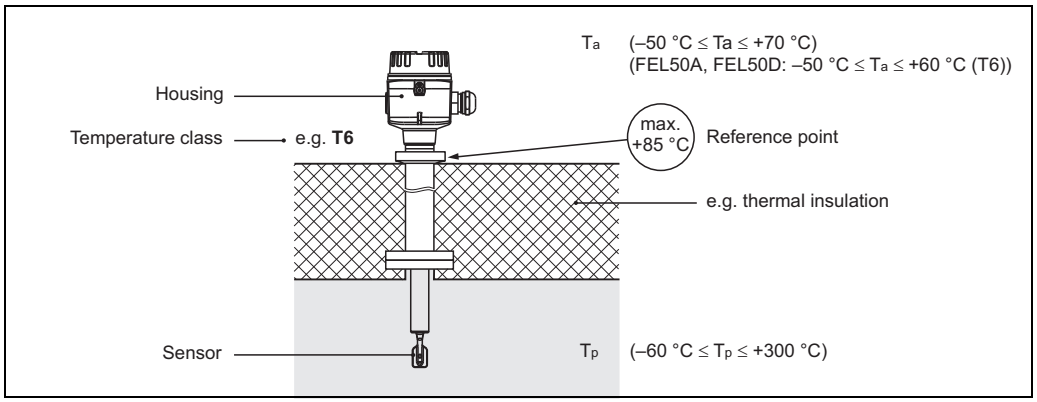
- The sensor part of the device approved for Zone 0 does not cause any ignition hazards if it is operated under non-atmospheric pressures and temperatures.
  Permissible process temperatures for operation in accordance with manufacturer's specifications: dependent on ambient temperature; see table and temperature graphics.
  Permissible pressures for operation in accordance with manufacturer's specifications: pe = –1 bar…+100 bar, dependent on process connection; see manufacturer's Operating Instructions.
- Only install the devices in media for which the wetted materials have sufficient durability (e.g. process connection seal).

Danger of electrostatic ignition

- Avoid electrostatic charging of the F16 plastic housing (among other things, friction, cleaning, maintenance etc.).

Explosion protection with heat insulation for Liquiphant S

- While observing the "temperature derating" described on page 8, Liquiphant S is suitable for process temperatures up to 300 °C.
- When operating, take suitable measures (e.g. thermal insulation at container and/or pipes) to ensure you rule out contact between hot component surfaces and potentially explosive atmospheres beyond the limits of the corresponding temperature class (see page 7).
- The temperature of 85 °C specified at the reference point may not be exceeded.
- The specified ambient temperature at the electronics housing must be observed to protect the electronics.



Liquiphant M/S
FTL50(H), FTL51(H), FTL51C, FTL70, FTL71

中文

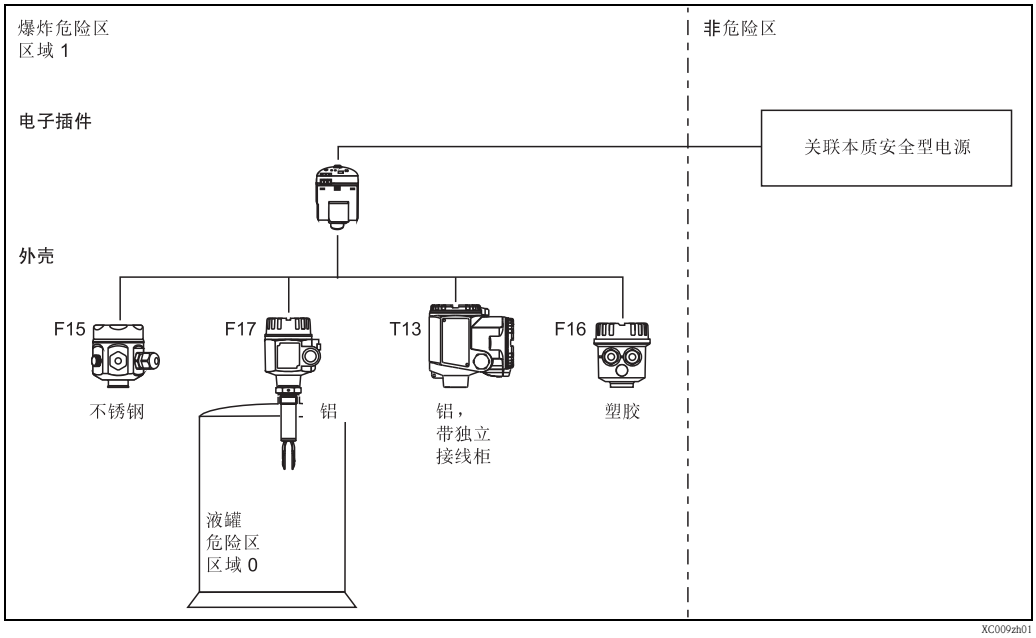
相关资料

本文档是下列操作手册的组成部分：
KA143F/00, KA144F/00, KA163F/00, KA164F/00, KA162F/00, KA165F/00, KA172F/00, KA173F/00

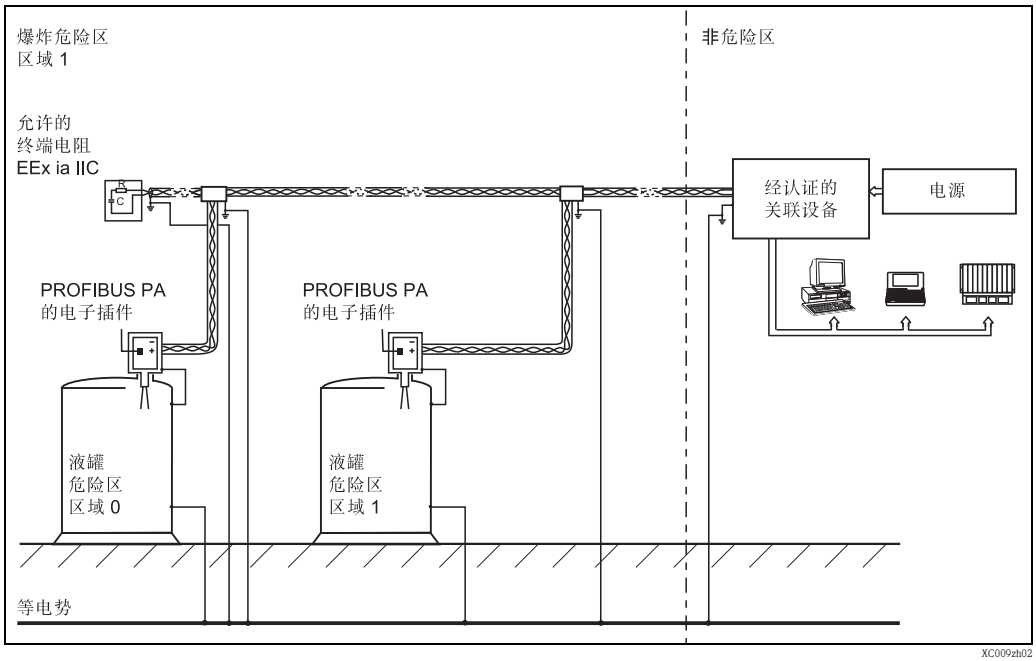
根据用户订购仪表的具体型号所提供的相应操作手册。

名称

防爆代号	FTL50/51(H), FTL51C	**Ex**	**ia**	**IIC**	**T3...T6**
		Ex	**ia**	**IIB**	**T3...T6**
	FTL70, FTL71	**Ex**	**ia**	**IIC**	**T2...T6**



Liquiphant M/S	电子插件	环境温度电子部件
FTL50(H), FTL51(H), FTL51C, FTL70, FTL71	FEL55/56/57/58	–50 °C ≤ Ta ≤ +70 °C
	FEL50D	–50 °C ≤ Ta ≤ +60 °C



Liquiphant M/S	电子插件	环境温度电子部件
FTL50(H), FTL51(H), FTL51C, FTL70, FTL71	FEL50A	–50 °C ≤ Ta ≤ +60 °C

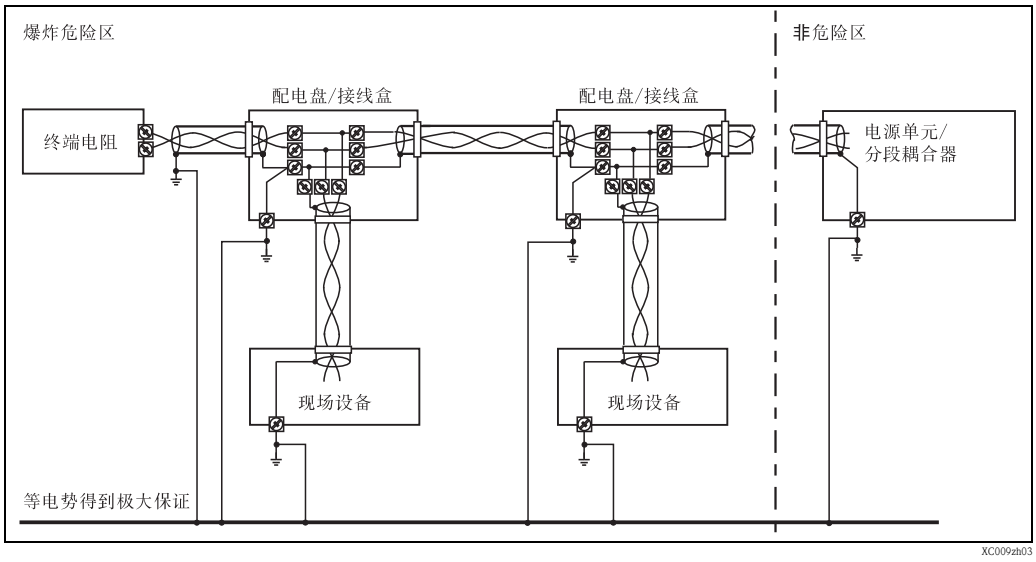
电子插件	Ui	Ii	Pi	Ci	Li
FEL55	36.0 V	100 mA	1.0 W	0.0 nF	0 µH
FEL56	16.0 V	52 mA	0.169 W	0.0 nF	0 µH
FEL57	16.7 V	150 mA	1.0 W	0.0 nF	0 µH
FEL58	16.0 V	52 mA	0.169 W	0.0 nF	0 µH
FEL50A (PROFIBUS PA)	17.5 V	500 mA	5.5 W	2.7 nF	10 µH
FEL50D (FML621)	27.6 V	93 mA	0.64 W	2.0 nF	0 µH

区域	防护类型	类型
区域 0/1	Ex ia IIC T3...T6	FTL50(H), FTL51(H)， 带有搪瓷或导电 PFA 涂层的 FTL51C
区域 0/1	Ex ia IIB T3...T6	带有 ECTFE 或非导电 PFA 涂层的 FTL51C
区域 0/1	Ex ia IIC T2...T6	FTL70, FTL71

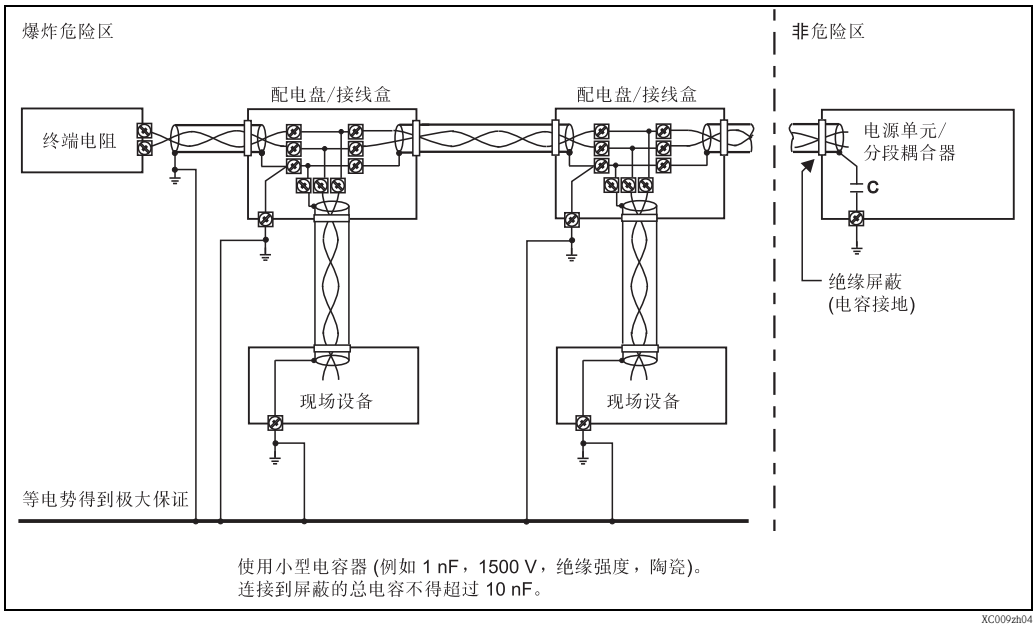
安全指南：
安装

- 遵守操作说明中的安装说明和安全指南。
- 按照制造商的说明及其它有效标准和规定来安装设备。
- 请遵照制造商操作说明注意极端运行条件。
- 在输入温度较高时：注意作为温度因数的凸缘压力负荷量。
- 使用合适的电缆和电线引入装置，或使用防护类型为“本质安全型 (Ex i)”的管路系统连接设备。
- 本质安全型 PROFIBUS 设备的连接：10 台设备。
- 要维持外壳入口防护等级 IP66/67，请正确安装外壳封盖和电缆栓塞。
- 用密封塞堵塞未使用的电缆入口。
- 如果有可能出现动态负载，则支持使用仪表延伸管。
- 外部接地连接部件应可靠连接。
- 仪器与关联设备之间的连接标准如下：
  $U_o \le U_i$， $I_o \le I_i$， $P_o \le P_i$， $C_o \ge C_i + C_c$， $L_o \ge L_i + L_c$
  (提示：Cc 和 Lc 代表电缆的分布电容和分布电感。)
- 避免 F16 外壳 (聚酯材料) 上积聚静电。请勿摩擦、用干布清洁或安装在强气流中。
- 为了保证设备的防爆性能，禁止用户改变配置。只能由制造商派来的专家进行更改。
- 在安装、使用和维护设备时，用户必须遵守操作说明和下列标准中的规定：
  – GB50257-1996：“电气设备安装工程 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)”。
- 接地屏蔽，参见变型 2。
- 电缆持续工作温度 T_a +5 K。
- 对于塑料工艺连接件或塑料涂层，应避免塑料表面产生静电荷。

变型 1 (FEL50A)

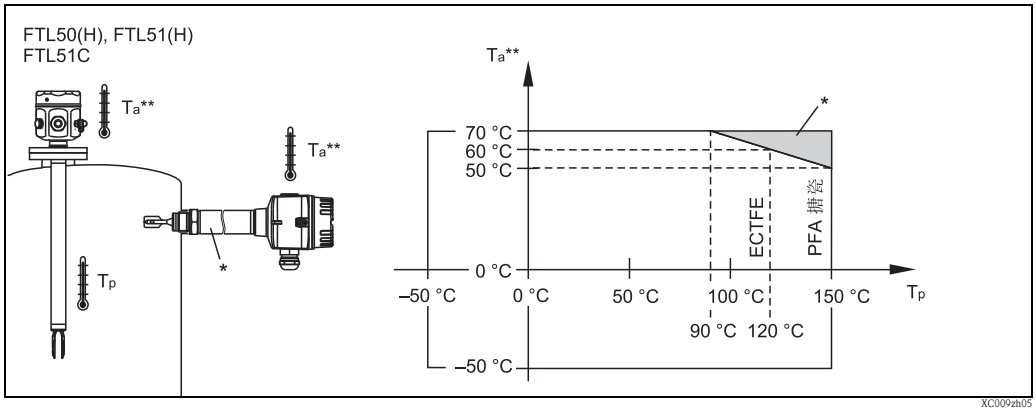


变型 2 (FEL50A)



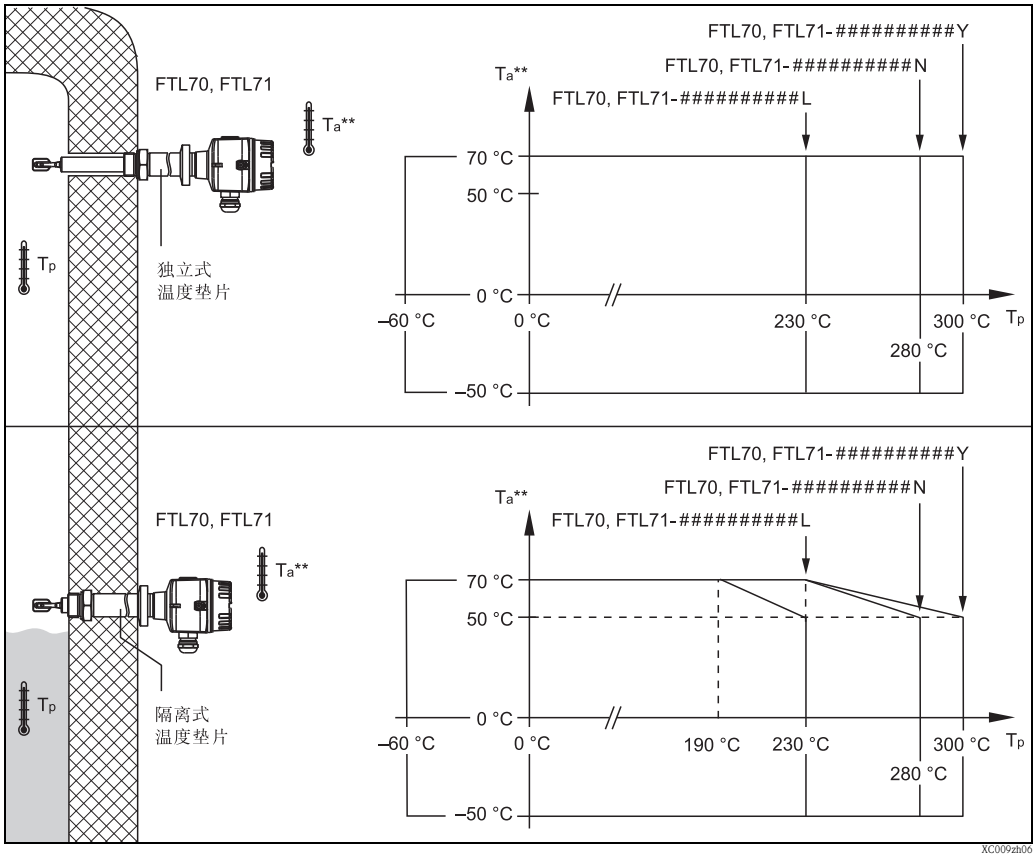
环境温度和过程温度与温度组别的关系：

类型	温度组别	过程温度 **Tp (过程) : 传感器**	环境温度 **Ta (环境) : 电子部件**
FTL50(H), FTL51(H) ； FTL51C (ECTFE、 PFA 或搪瓷涂层)	T6	–50 °C... +85 °C	–50 °C...+70 °C 对于 FEL50A, FEL50D： –50 °C...+60 °C
FTL70, FTL71		–60 °C... +85 °C	
FTL50(H), FTL51(H) ； FTL51C (ECTFE、 PFA 或搪瓷涂层)	T5	–50 °C...+100 °C	FTL50, FTL51, FTL51C： –50 °C...+70 °C 带温度垫片；
FTL70, FTL71		–60 °C...+100 °C	
FTL51C (ECTFE 涂层)	T4	–50 °C...+120 °C	不带温度垫片 参见下面的温度图表
FTL50(H), FTL51(H) ； FTL51C (PFA 或搪瓷涂层)	T4	–50 °C...+135 °C	
FTL70, FTL71		–60 °C...+135 °C	FTL70, FTL71： –50 °C...+70 °C
FTL50(H), FTL51(H) ； FTL51C (PFA 或搪瓷涂层)	T3	–50 °C...+150 °C	
FTL70, FTL71	T3	–60 °C...+200 °C	–50 °C...+70 °C
FTL70, FTL71- L	T2	–60 °C...+230 °C	限制条件 请参见下一页中的温度图表
FTL70, FTL71- . . . . . N	T2	–60 °C...+280 °C	
FTL70, FTL71- . . . . . Y	T2	–60 °C...+300 °C	



* *带温度垫片或耐压密封套管的传感器的附加温度范围*

** *FEL50A, FEL50D：–50 °C ≤ Ta ≤ +60 °C (T6)*



*** FEL50A, FEL50D：–50 °C ≤ Ta ≤ +60 °C (T6)*

安全指南：
区域 0

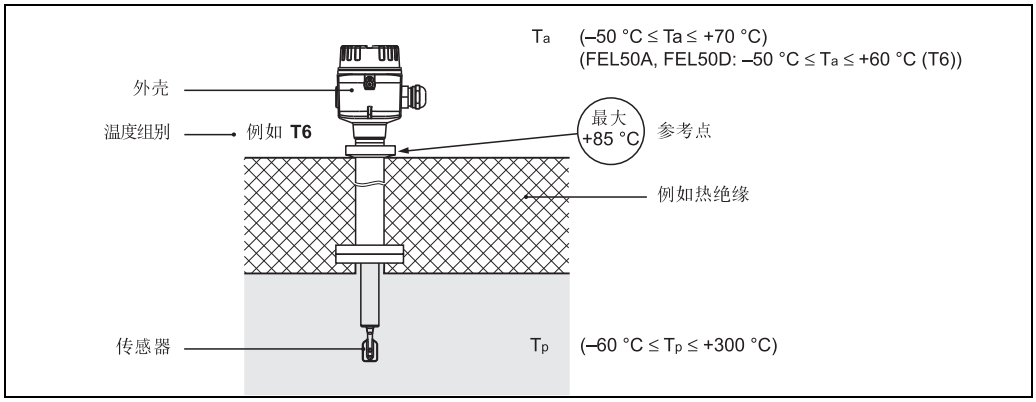
- 经认证可用于区域 0 的仪表传感器部分不会导致任何引燃危险 (当在非大气压力和温度下运行时)。
  符合制造商技术规范的运行过程温度：
  取决于环境温度；参见表格和温度图表。
  符合制造商技术规范的运行过程压力：
  pe = –1 bar...+100 bar，取决于工艺连接件；参见制造商操作说明。
- 当仪表的受潮部件对介质具有足够耐久性时，才可将仪表安装于介质中。
  (例如工艺连接密封件)。

有静电起火的危险

- 避免 F16 塑料外壳产生静电 (摩擦、清洁、维护等)。

Liquiphant S 的热绝缘防爆保护

- 在遵守第 16 页的 “温降”说明的同时， Liquiphant S 适用于最高达 300 °C 的过程温度。
- 使用时，请采取适当的措施 (如容器和 / 或管道采用热绝缘)，务必避免热组件表面与超出相应温度组别限制而有爆炸可能的空气发生接触 (参见第 15 页)。
- 参考点不得超过所规定的 85 °C 温度。
- 必须遵守电子部件外壳处的规定环境温度，以保护电子部件。



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