

# Safety Instructions

## **Liquiphant M**

### **FTL50(H), FTL51(H), FTL51C**

Ex db IIB T3 Ga/Gb

Ex db IIC T3 Ga/Gb





# Liquiphant M FTL50(H), FTL51(H), FTL51C

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**About this document**

This document has been translated into several languages. Legally determined is solely the English source text.

**Associated documentation**

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

- KA00143F/00, KA00163F/00 (FTL50, FTL51)
- KA00144F/00, KA00164F/00 (FTL50H, FTL51H)
- KA00162F/00, KA00165F/00 (FTL51C)

**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](http://www.endress.com) -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

**Manufacturer's certificates****Certificate of Conformity**

Certificate number:

DEK18.0005 (Ex db IIB T3 Ga/Gb)

DEK18.0006 (Ex db IIC T3 Ga/Gb)

Affixing the certificate number certifies conformity with the following standards (depending on the device version):

- JNIO SH-TR-46-1 : 2015
- JNIO SH-TR-46-2 : 2018
- IEC 60079-26 : 2014

**Manufacturer address**

Endress+Hauser SE+Co. KG  
Hauptstraße 1  
79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

**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

FTL5x(x)	–	*****	+	A*B*C*D*E*F*G*..
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

\* = 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.

## Extended order code: Liquiphant M



The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

### *Device type*

FTL50, FTL50H, FTL51, FTL51H, FTL51C

*Basic specifications*

Position 1 (Approval)		
Selected option		Description
FTL50(H) FTL51(H) FTL51C	W	JPN Ex db IIB T3 Ga/Gb

Position 5, 6 (Probe Length, Type)		
Selected option		Description
FTL50	Ax	Compact
FTL50H	Ax	Compact
	xC	Ra <1.5 µm
FTL51	BB, DB	..... mm/in; 316L
FTL51H	Bx, Dx	..... mm/in
	xC	Ra <1.5 µm
FTL51C	xL	PFA (Edlon)
	xM	PFA (RubyRed)
	xN	PFA (conductive)
	xS	Enamel

Position 7 (Electronics, Output)		
Selected option		Description
FTL50(H) FTL51(H)	2	FEL52; SIL 3-wire PNP 10-55 VDC
FTL51C	4	FEL54; SIL relay DPDT 19-253 VAC, 19-55 VDC

Position 8, 9 (Housing, Cable Entry)		
Selected option		Description
FTL50(H) FTL51(H)	x5	F13; Alu
FTL51C	Gx	M20 gland

*Optional specifications*

No options specific to hazardous locations are available.



The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

### Device type

FTL50, FTL50H, FTL51, FTL51H

### Basic specifications

Position 1 (Approval)		
Selected option		Description
FTL50(H)	7	JPN Ex db IIC T3 Ga/Gb
FTL51(H)		

Position 5, 6 (Probe Length, Type)		
Selected option		Description
FTL50	Ax	Compact
FTL50H	Ax	Compact
	xC	Ra <1.5 µm
FTL51	BB, CB, DB	..... mm/in; 316L
FTL51H	Bx, Cx, Dx	..... mm/in
	xC	Ra <1.5 µm

Position 7 (Electronics, Output)		
Selected option		Description
FTL50(H)	2	FEL52; SIL 3-wire PNP 10-55 VDC
FTL51(H)	4	FEL54; SIL relay DPDT 19-253 VAC, 19-55 VDC

Position 8, 9 (Housing, Cable Entry)		
Selected option		Description
FTL50(H)	x5	F13; Alu
FTL51(H)	Gx	M20 gland

### Optional specifications

No options specific to hazardous locations are available.

**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
- 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. enclosure, 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.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- Only open the device under the following condition: 17 minutes have elapsed since the power supply was switched off.

**Safety instructions:**  
**Special conditions**

Permitted ambient temperature range at the electronics enclosure:  
→  11, "Temperature tables".

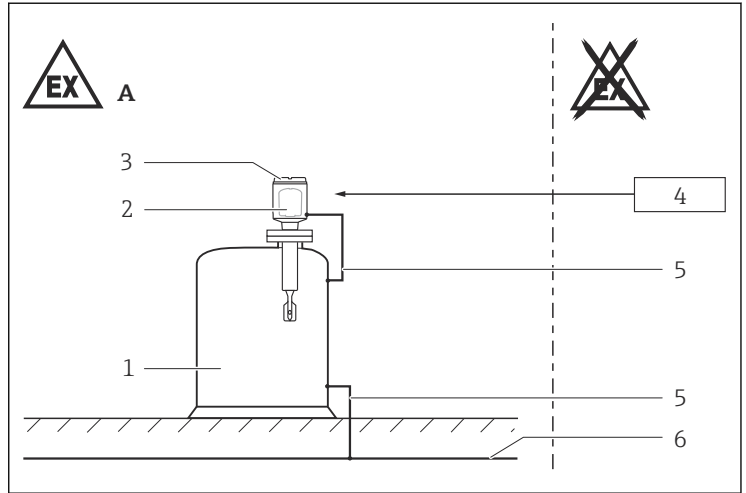
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
  - Observe the danger of electrostatic charging and discharge.
  - Do not install in the vicinity of processes ( $\leq 0.5$  m) generating strong electrostatic charges.

*Basic specification, Position 8, 9 = x5*

Avoid sparks caused by impact and friction.



## Safety instructions: Installation



### 1

- A Zone 1  
 1 Tank; Zone 0, Zone 1  
 2 Electronic insert  
 3 Enclosure  
 4 Supply unit  
 5 Potential equalization line  
 6 Local potential equalization

- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing clamp on the cover.
- In potentially explosive atmospheres:
  - Do not disconnect the electrical connection of the power supply circuit when energized.
  - Do not open the connection compartment cover and the electronics compartment cover when energized.
- 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.
- Install the device to 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.

- Only use certified cable entries suitable for the application. Observe national regulations and standards. Accordingly, the connection terminal does not include any ignition sources.
- 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.
- The built-in metallic sealing plug is examined and approved for explosion protection type Ex d with the device.
- When operating the transmitter enclosure at an ambient temperature under  $-20\text{ }^{\circ}\text{C}$ , use appropriate cables and cable entries permitted for this application.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.

### **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 separation if mounted properly (see Operating Instructions).

### **Potential equalization**

Integrate the device into the local potential equalization.

### **Safety instructions: Ex d joints**

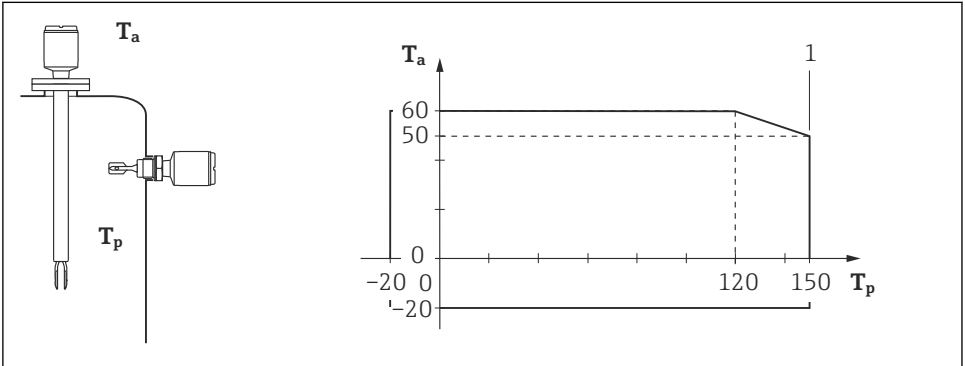
- If required or if in doubt: ask manufacturer for specifications.
- Flameproof joints are not intended to be repaired.

### **Safety instructions: Zone 0**

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
  - Temperature:  $-20$  to  $+60\text{ }^{\circ}\text{C}$
  - 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.
- Only use the device in media to which the wetted materials have sufficient durability (e.g. process connection seal).
- When using under non-atmospheric pressures and non-atmospheric temperatures: The sensor part of the device approved for Zone 0 does not cause any ignition hazards.

**Temperature tables**

Temperature class	Process temperature $T_p$ (process): sensor	Ambient temperature $T_a$ (ambient): electronics
T3	-20 to +150 °C	-20 to +60 °C



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$T_a$  Ambient temperature in °C

$T_p$  Process temperature in °C

1 PFA, Enamel, 316L

**Connection data**

Basic specification, Position 7	Power supply circuit	Output
2	$U = 10$ to $55 V_{DC}$ ; max. 0.83 W	PNP transistor; max. 350 mA
4	$U = 19$ to $253 V_{AC}$ , 50/60 Hz or $19$ to $55 V_{DC}$ ; max. 1.3 W	2 potential free change-over contacts; 6 A Ex d



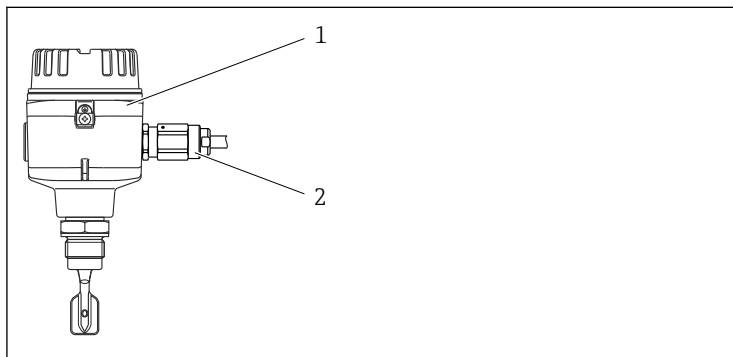
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## Attachment: Cable gland

- i** If the cable gland has to be replaced, use the following packing proof cable gland from the manufacturer Shimada Electric Co. Ltd.: EXTC-16MG (IECEX DEK 18.0029).

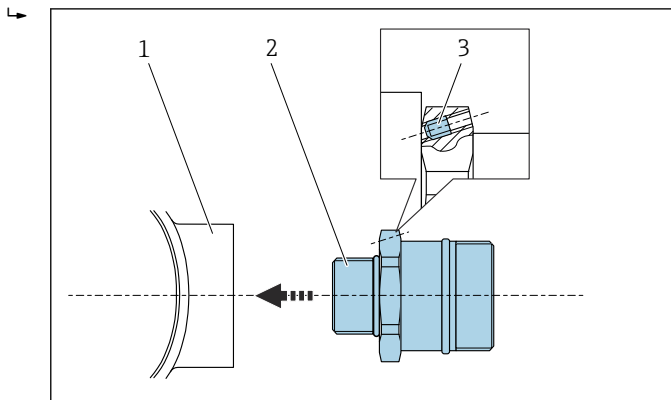


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- 1 *Liquiphant*
- 2 *Cable gland: EXTC-16MG*

### Mounting the cable gland

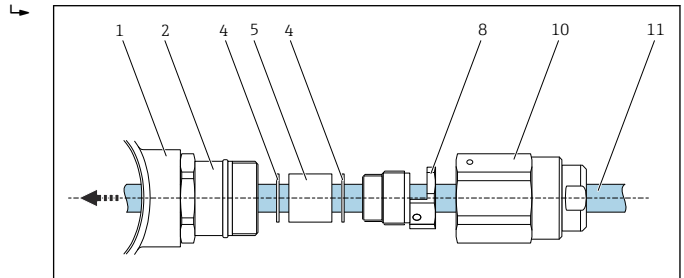
1. Tighten the cable gland (2) into thread hole of terminal box (1) using tightening tool with a torque of 4 Nm. Then tighten the lock screw (3) using a hexagon wrench (nominal 1.5).



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- 1 *Terminal box*
- 2 *Cable gland (M20x1.5)*
- 3 *Lock screw*

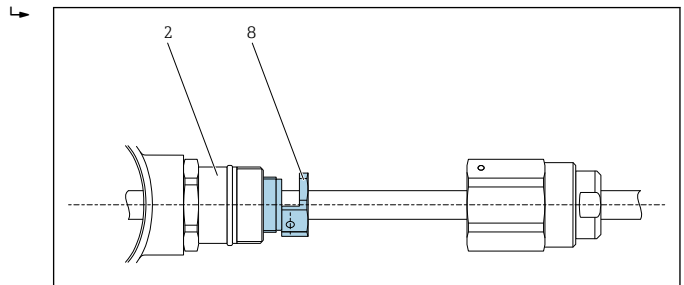
2. Pass the cable (11) through the individual parts.



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- 1 Terminal box
- 2 Cable gland
- 4 Washer
- 5 Sealing ring
- 8 Packing gland
- 10 Union nut/B. coupling
- 11 Cable

3. Screw the packing gland (8) into cable gland (2) using a wrench and tighten the sealing ring (5) with tightening torque 6 Nm.

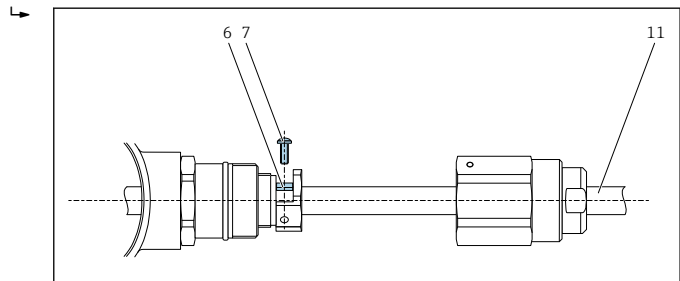


A0037075

- 2 Cable gland
- 8 Packing gland

Cable diameter (in mm)		Inner diameter of the sealing ring (in mm)	Inner diameter of the washer (in mm)
Minimum	Maximum		
ø 6	ø 8	ø 8	ø 10.5
ø 8	ø 10.0	ø 10.0	
ø 10.0	ø 12.0	ø 12.0	ø 13.0

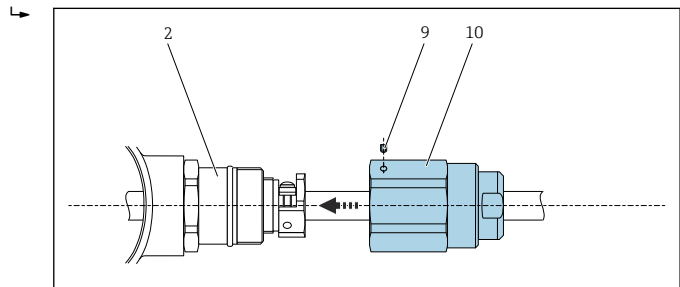
4. Secure the cable (11) firmly with clamp (6) and set screws (7). In this case the tightening torque is 1 Nm.



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- 6 Clamp  
7 Set screw  
11 Cable

5. Screw the union nut/B. coupling (10) onto cable gland (2) and tighten the lock screw (9) using a hexagon wrench (nominal 1.5).



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- 2 Cable gland  
9 Lock screw  
10 Union nut/B. coupling (G 1/2)











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