XA01768F-A/00/EN/01.18
71430316
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Safety Instructions
Soliphant M FTM50, FTM51

JPN: Ex d IIC T3 Ga/Gb
Ex tb IIIC T150°C Db
Ex d [ia Ga] IIC T4 Ga/Gb
Ex tb [ia] IIIC T135°C Db

Document: XA01768F-A
Safety instructions for electrical apparatus for explosion-hazardous areas → 3

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Attachment: Cable gland → 11

Endress+Hauser
People for Process Automation

Soliphant M FTM50, FTM51

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Associated documentation

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

- KA00229F/00
- TI00392F/00

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 -> Downloads -> Media Type: Documentation -> Documentation Type: Brochures and catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

Certificate of Conformity

Certificate number:
DEK18.0089X (FTM50)
DEK18.0090X (FTM51 with FEM51)
DEK18.0091X (FTM51 with FEM52)
DEK18.0092X (FTM51 with FEM54)

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

DEK18.0089X:
- JNIOSH-TR-46-1 : 2015
- JNIOSH-TR-46-2 : 2015
- JNIOSH-TR-46-9 : 2015
- IEC 60079-26 : 2006

DEK18.0090X, DEK18.0091X, DEK18.0092X:
- JNIOSH-TR-46-1 : 2015
- JNIOSH-TR-46-2 : 2015
- JNIOSH-TR-46-6 : 2015
- JNIOSH-TR-46-9 : 2015
- IEC 60079-26 : 2006

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

FTM5x	–	**********	+	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.

Extended order code: Soliphant 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

FTM50, FTM51

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
FTM50	S	JPN Ex d IIC T3 Ga/Gb JPN Ex tb IIIC T150°C Db
FTM51	S	JPN Ex d [ia Ga] IIC T4 Ga/Gb JPN Ex tb [ia] IIIC T135°C Db

Position 5 (Fork; Bulk Density)		
Selected option		**Description**
FTM50	A	155mm/6inch; min 10g/l standard fork
	K	100mm/4inch; min 50g/l short fork
FTM51	L	..... mm; min 10g/l standard fork
	M	..... mm; min 50g/l short fork

Position 6 (Electronics; Output)		
Selected option		**Description**
FTM50	1	FEM51; 2-wire 19-253VAC
	2	FEM52; 3-wire PNP 10-55VDC
	4	FEM54; relay DPDT, 19-253VAC/55VDC
	5	FEM55; 8/16mA, 11-36VDC
FTM51	1	FEM51; 2-wire 19-253VAC
	2	FEM52; 3-wire PNP 10-55VDC
	4	FEM54; relay DPDT, 19-253VAC/55VDC

Position 7 (Type of Probe)		
Selected option		**Description**
FTM50 FTM51	A	Compact

Position 8 (Housing)		
Selected option		**Description**
FTM50 FTM51	H	T13 Alu IP66/68 NEMA Type 4X Encl., separate conn. compartment

Position 9 (Cable Entry)		
Selected option		**Description**
FTM50 FTM51	2	Gland M20x1.5 (Ex d > thread M20)

Position 10 (Additional Option 1)		
Selected option		**Description**
FTM50 FTM51	A	Not selected

Position 11 (Additional Option 2)		
Selected option		**Description**
FTM50 FTM51	A	Not selected
	C	EN10204-3.1 material (wetted parts), inspection certificate

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

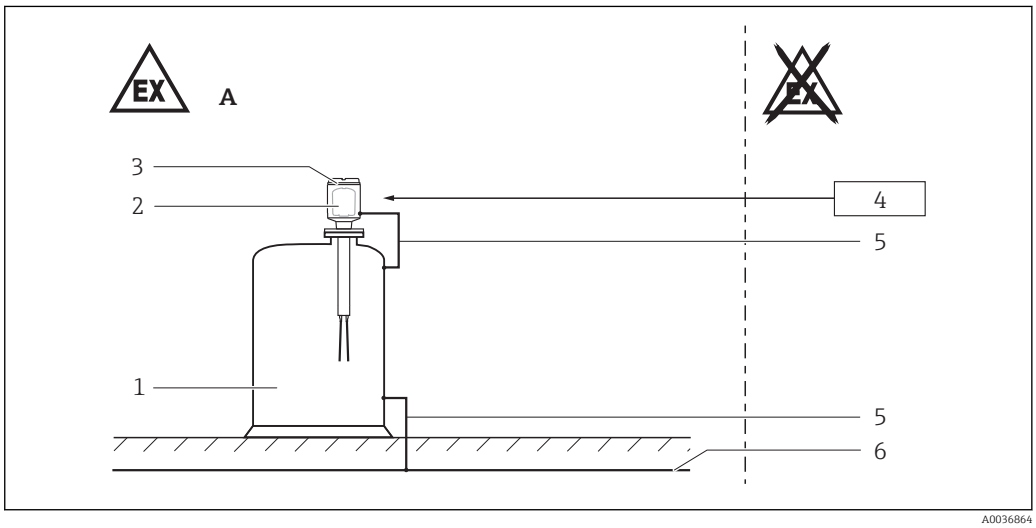
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations
- Install the device according 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. housing, sensor element, special varnishing, attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- 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.
- 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 housing:
→ 🖹 8, "Temperature tables".

- 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.
- Avoid sparks caused by impact and friction.

Safety instructions: Installation



1

A Zone 1, Zone 21
1 Tank; Zone 0, Zone 1, Zone 20, Zone 21
2 Housing
3 Electronic insert
4 Supply unit
5 Potential equalization
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 connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the housing.

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, Zone 1

- 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.
- 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.
- For operation in accordance with manufacturer's specifications:
  - Permissible medium temperatures: dependent on ambient temperature
  - Permissible pressures: −1 to +25 bar, dependent on process connection (see Operating Instructions).

Temperature tables

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

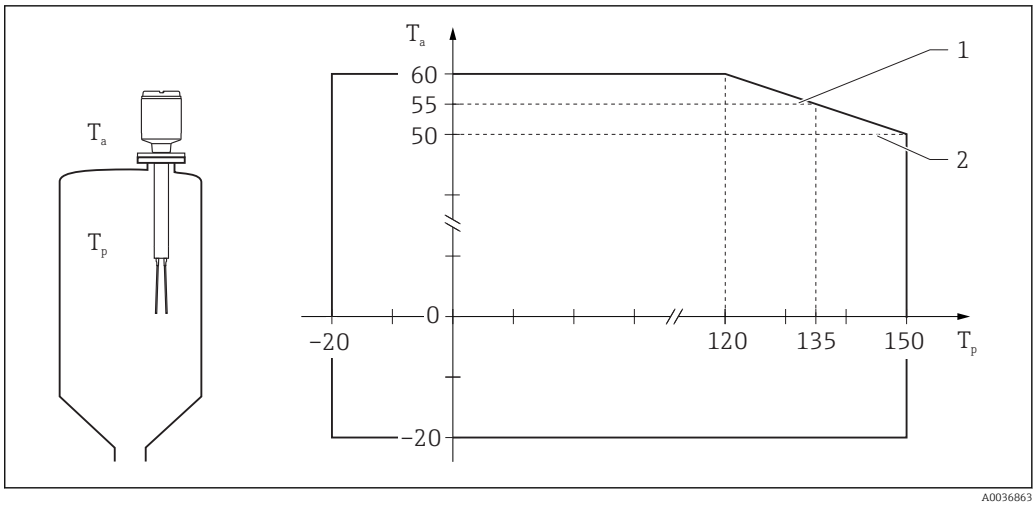
Temperature class	Process temperature T_p (process): sensor	Ambient temperature T_a (ambient): electronics
T4	−20 to +135 °C	see temperature graph
T3	−20 to +150 °C	

Device type FTM50

Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Ex d IIC T3 Ga/Gb Ex tb IIIC T150°C Db	$-20\ °C \leq T_a \leq +50\ °C$	$-20\ °C \leq T_p \leq +150\ °C$

Device type FTM51

Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Ex d [ia Ga] IIC T4 Ga/Gb Ex tb [ia] IIIC T135°C Db	$-20\ °C \leq T_a \leq +55\ °C$	$-20\ °C \leq T_p \leq +135\ °C$



2

T_a Ambient temperature in °C
T_p Process temperature in °C
1 FTM51
2 FTM50

Connection data

Position 6 (Electronics; Output)	**Power supply**	**Output**
1	U = 19 to 253 V_{AC}, 50/60 Hz; max. 1 W	max. 350 mA
2	U = 10 to 55 V_{DC}; max. 0.86 W	PNP transistor; max. 350 mA
4	U = 19 to 253 V_{AC}, 50/60 Hz, max. 1.5 W or 19 to 55 V_{DC}; max. 1.3 W	2 potential free change-over contacts; max. 4 A
5	U = 11 to 36 V_{DC}; max. 0.6 W	8 mA or 16 mA

Soliphant M FTM50, FTM51

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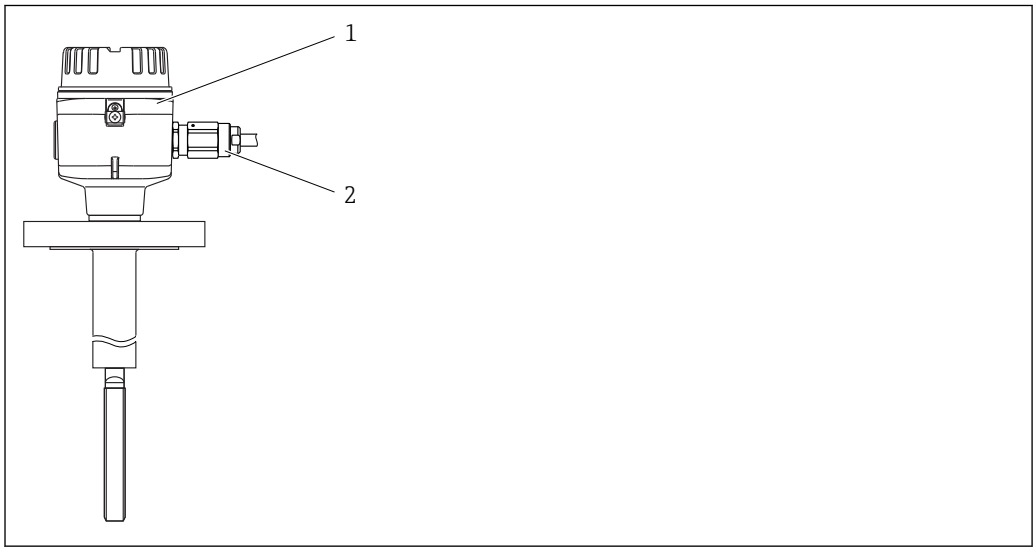
Attachment: Cable gland

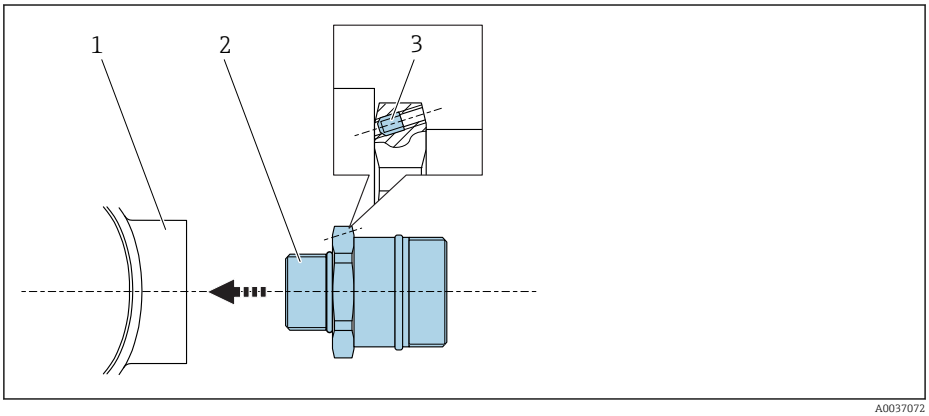
If the cable gland has to be replaced, use the following packing proof cable gland from the manufacturer Shimada Electric Co. Ltd.: EXTC-16MG (IECEx DEK 18.0029).



1 Soliphant
2 Cable gland: EXTC-16MG

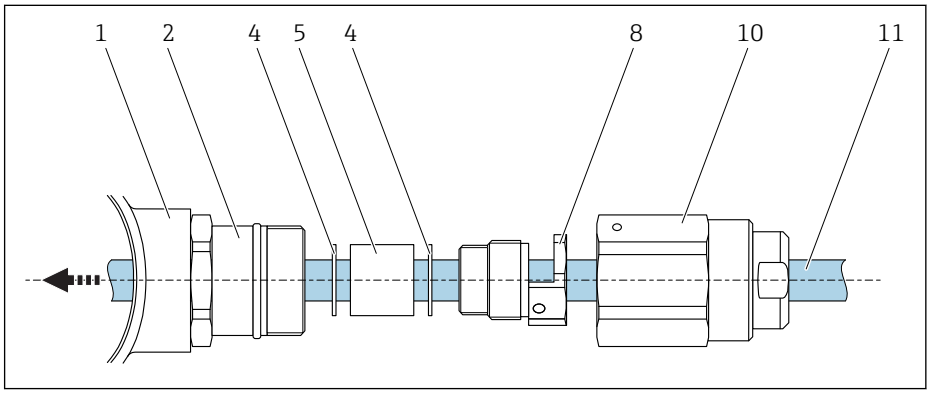
Mounting the cable gland

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).



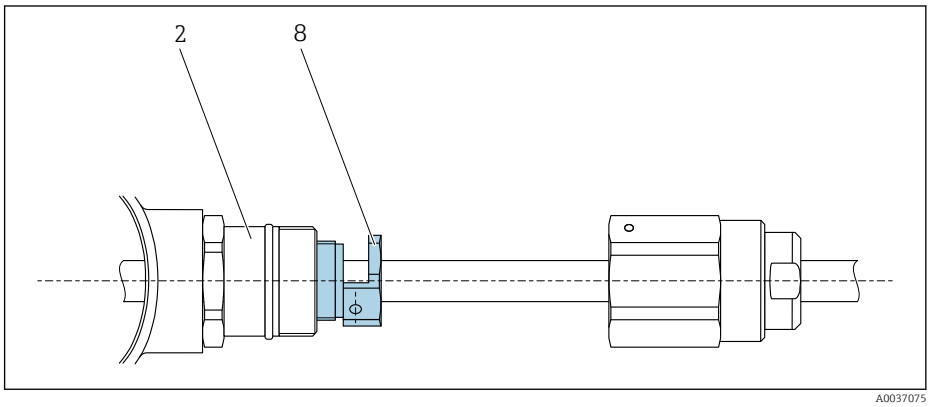
1 Terminal box
2 Cable gland (M20x1.5)
3 Lock screw

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



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

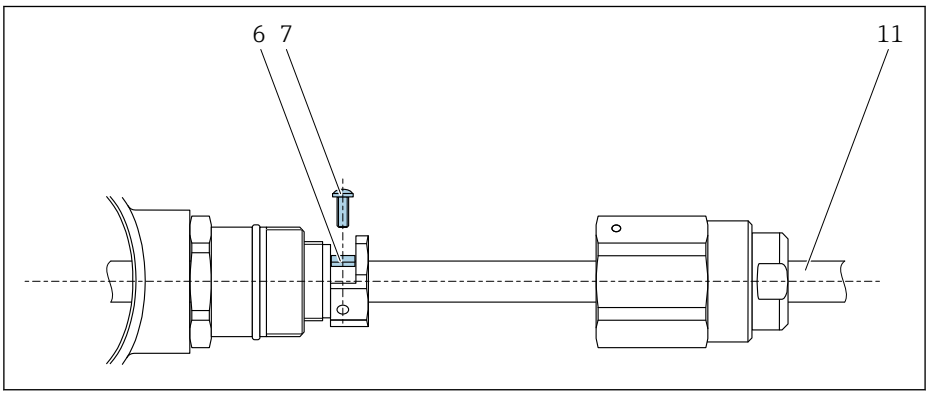
3. Screw the packing gland (8) into cable gland (2) using a wrench and tighten the sealing ring (5) with tightening torque 6 Nm.



2 Cable gland
8 Packing gland

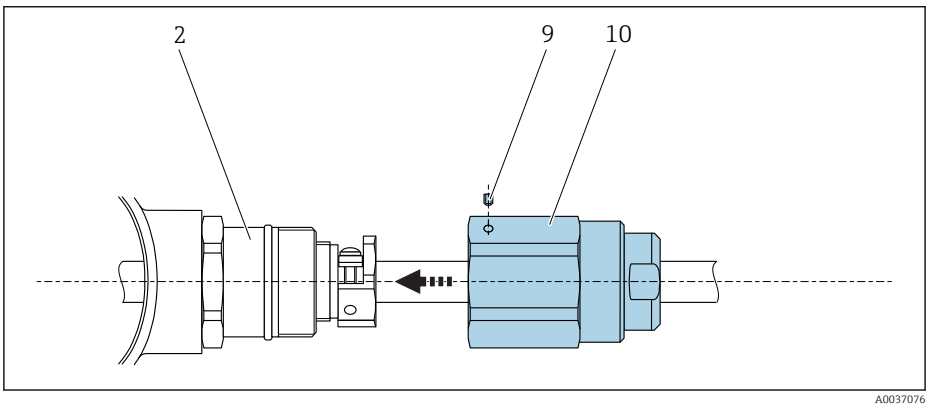
Cable diameter (in mm)		Inner diameter of the sealing ring (in mm)	Inner diameter of the washer (in mm)
Minimum	Maximum		
ø 6	ø 8	ø 8	ø 10.5
ø 8	ø 10.0	ø 10.0	
ø 10.0	ø 12.0	ø 12.0	ø 13.0

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



6 Clamp
7 Set screw

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).



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

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