XA00346F-E/00/EN/15.21
71546168
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Safety Instructions
Liquicap M
FMI51, FMI52, FTI51, FTI52

II 3 G Ex ec IIC T6 Gc
II 3 G Ex ec nC IIC T5 Gc
II 3 D Ex tc IIIC T100°C Dc

Endress+Hauser
People for Process Automation

Liquicap M FMI51, FMI52, FTI51, FTI52

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About this document

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

The document translated into EU languages is available:
- In the download area of the Endress+Hauser website: www.endress.com -> Downloads -> Manuals and Datasheets -> Type: Ex Safety Instruction (XA) -> Text Search: ...
- In the Device Viewer: www.endress.com -> Product tools -> Access device specific information -> Check device features

If not yet available, the document can be ordered.

Associated documentation

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

- BA00297F/00, BA00298F/00 (FMI51, FMI52)
- BA00299F/00 (FTI51, FTI52)

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 -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

EU Declaration of Conformity

Declaration Number:
EU_00957

The EU Declaration of Conformity is available:
In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Declaration -> Type: EU Declaration -> Product Code: ...

EU type-examination certificate

Certificate number:
EU 00957 X

List of applied standards: See EU Declaration of Conformity.

Manufacturer address

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

Address of the manufacturing plant: See nameplate.

Other standards

Among other things, the following standards shall be observed in their current version for proper installation:

- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

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

FMI5x, FTI5x	–	**********	+	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: Liquicap 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

FMI51, FMI52

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
FMI5x	M	ATEX II 3 G Ex ec IIC T6 Gc ATEX II 3 D Ex tc IIIC T 100 °C Dc

Position 2 (Inactive Length L3)		
Selected option		**Description**
FMI51	1	Not selected
	2, 5	..... mm/in, 316L
	3, 6	..... mm/in, fully insulated PTFE > 316L
FMI52	1	Not selected
	2, 5	..... mm/in, 316L
	3, 6	..... mm/in, fully insulated PFA > 316L

Position 3 (Active Probe length L1, Insulation)		
Selected option		**Description**
FMI51	A, B, C, D, H, K, M, N	..... mm/in, rod, 316L
	E, F, G, P, R, S	..... mm/in, rod, 316L + ground tube
FMI52	A, B, C, D	..... mm/in, 316

Position 7 (Electronics, Output)		
Selected option		**Description**
FMI5x	A	FEI50H; 4-20mA HART + display
	B	FEI50H; 4-20mA HART
	C	FEI57C; 2-wire PFM

Position 8 (Housing)		
Selected option		**Description**
FMI5x	1	F15 316L hygiene IP66/67 NEMA Type 4X
	3	F17 Alu IP66/67 NEMA Type 4X
	4	F13 Alu IP66 NEMA Type 4X + gas-tight probe seal
	5	T13 Alu IP66 NEMA Type 4X + gas-tight probe seal + separate conn. compartment
	6	F27 316L IP66/67 NEMA Type 6P + gas-tight probe seal

Position 9 (Cable Entry)		
Selected option		**Description**
FMI5x	A	Gland M20
	B	Thread G1/2
	C	Thread NPT1/2
	D	Thread NPT3/4
	E	Plug M12

Position 10 (Type of Probe)		
Selected option		**Description**
FMI5x	1	Compact
	2, 3, 4, 5	..... mm/in, L4 cable > separate enclosure

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

FTI51, FTI52

Basic specifications

Position 1 (Approval)		
Selected option		**Description**
FTI5x	M	ATEX II 3 G Ex ec IIC T6 Gc ATEX II 3 G Ex ec nC IIC T5 Gc ATEX II 3 D Ex tc IIIC T 100 °C Dc

Position 2 (Inactive Length L3)		
Selected option		**Description**
FTI51	A	Not selected
	B	Not selected + active build-up protection 125mm/5in, 316L
	C	Not selected + fully insulated, active build-up protection 125mm/5in, PFA > 316L
	1, 5	..... mm/in, 316L
	2, 6	..... mm/in, fully insulated PTFE > 316L
	3, 7	..... mm/in (≤ 500mm/20in), 316L + active build-up protection 125mm/5in, 316L
	4, 8	..... mm/in (> 500mm/20in), 316L + active build-up protection 125mm/5in, 316L

Position 2 (Inactive Length L3)		
Selected option		**Description**
FTI52	A	Not selected
	1, 5	..... mm/in, 316L
	3, 6	..... mm/in, fully insulated PFA > 316L

Position 3 (Active Probe length L1; Insulation)		
Selected option		**Description**
FTI51	A, B, C, D, H, K, M, N, T, 1	..... mm/in, rod, 316L
	E, F, G, P, R, S	..... mm/in, rod, 316L + ground tube
FTI52	A, B, C, D	..... mm/in, 316

Position 8 (Electronics, Output)		
Selected option		**Description**
FTI5x	1	FEI51; 2-wire 19-253 VAC
	2	FEI52; 3-wire PNP 10-55 VDC
	4	FEI54; relay DPDT, 19-253 VAC, 19-55 VDC
	5	FEI55; 8/16 mA, 11-35 VDC
	7	FEI57S; 2-wire PFM
	8	FEI58; NAMUR + test button (H-L signal)

Position 9 (Housing)		
Selected option		**Description**
FTI5x	1	F15 316L hygiene IP66/67 NEMA Type 4X
	3	F17 Alu IP66/67 NEMA Type 4X
	4	F13 Alu IP66 NEMA Type 4X + gas-tight probe seal
	5	T13 Alu IP66 NEMA Type 4X + gas-tight probe seal + separate conn. compartment
	6	F27 316L IP66/67 NEMA Type 6P + gas-tight probe seal

Position 10 (Cable Entry)		
Selected option		**Description**
FTI5x	A	Gland M20
	B	Thread G1/2
	C	Thread NPT1/2
	D	Thread NPT3/4
	E	Plug M12

Position 11 (Type of probe)		
Selected option		**Description**
FTI5x	1	Compact
	2, 3, 4, 5	..... mm/in, L4 cable > separate enclosure

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

- The device is intended to be used in explosive atmospheres as defined in the scope of EN IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- 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.

Safety instructions: Special conditions

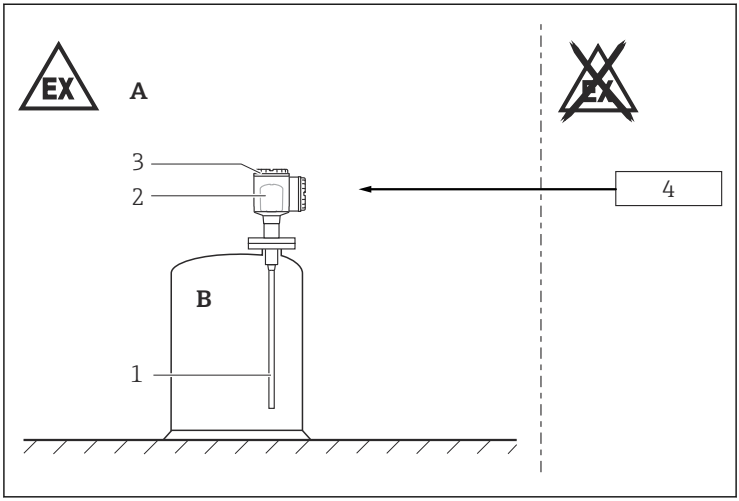
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
  - Observe the danger of electrostatic charging and discharge.
  - Do not install in the vicinity of processes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

Basic specification, Position 3 = E, F, G, P, R, S
Probes can be used in gases of Group IIC, IIB and IIA.

Basic specification, Position 3 = A, B, C, D, H, K, M, N, T, 1
Probes can be used in gases of Group IIC and IIB if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow). These probes are marked by the warning sign "Avoid Electrostatic Charge".

Device type FTI5x, Basic specification, Position 8 = 1, 4
- In a condensing atmosphere: The device must not be serviced or installed.
- The device must be externally protected against transient overvoltage up to 140 % of the maximum voltage.

Safety instructions: Installation



1

A Zone 2, Zone 22
B Zone 2, Zone 22
1 Rope or rod probes
2 Electronic insert
3 Enclosure
4 Associated power supply

- Mechanically fix probes which are more than 3 m (e.g. using guy ropes).
- Do not open in a potentially explosive dust atmosphere.
- To maintain the ingress protection of the enclosure:
  - Screw the cover tight.
  - Mount the cable entry correctly.
- Cable glands with ATEX-Ex e approval and metallic glands: Only use with an ingress protection of at least IP65. Lay connecting cable and secure.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.

Basic specification, Position 8 (FMI5x), 9 (FTI5x) = 1
- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing clamp on the cover.
- Tightening torque of the securing screw: max. 1 Nm.

Basic specification, Position 8 (FMI5x), 9 (FTI5x) = 3, 4, 5
Tighten the cover with torque 12 Nm.

Potential equalization

Integrate the device into the local potential equalization.

Temperature tables

Application in gas

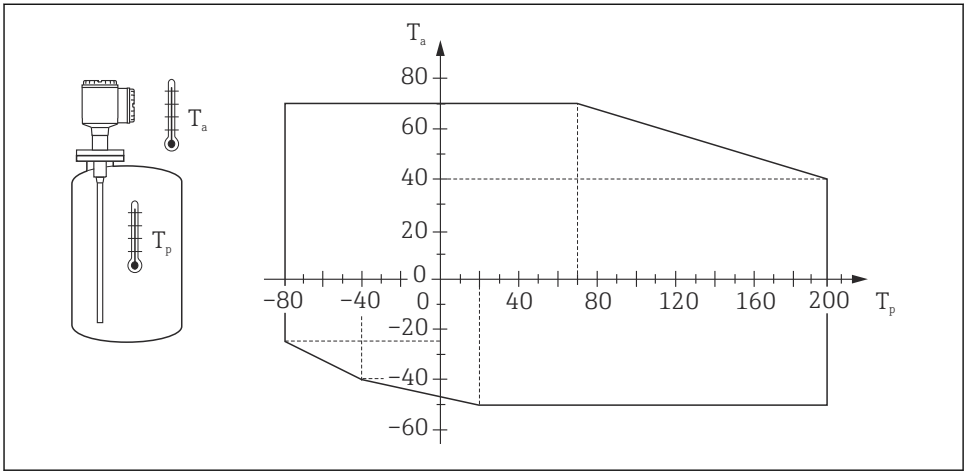
II 3 G Ex ec IIC T6 Gc

Basic specification, Position 7 (FMI5x), Position 8 (FTI5x)	**Temperature class**	**Ambient temperature T_a (ambient): electronics**	**Process temperature T_p (process)**
A, B, C, 1, 2	T6	−50 °C ≤ T_a ≤ +60 °C	→ 2, 14, → 3, 15
	T3...T5	−50 °C ≤ T_a ≤ +70 °C	
5, 7, 8	T6	−50 °C ≤ T_a ≤ +55 °C	→ 2, 14, → 3, 15
	T3...T5	−50 °C ≤ T_a ≤ +70 °C	

II 3 G Ex ec nC IIC T5 Gc

Basic specification, Position 8 (FTI5x)	**Temperature class**	**Ambient temperature T_a (ambient): electronics**	**Process temperature T_p (process)**
4	T5	−50 °C ≤ T_a ≤ +50 °C	→ 2, 14, → 3, 15
	T3...T4	−50 °C ≤ T_a ≤ +70 °C	

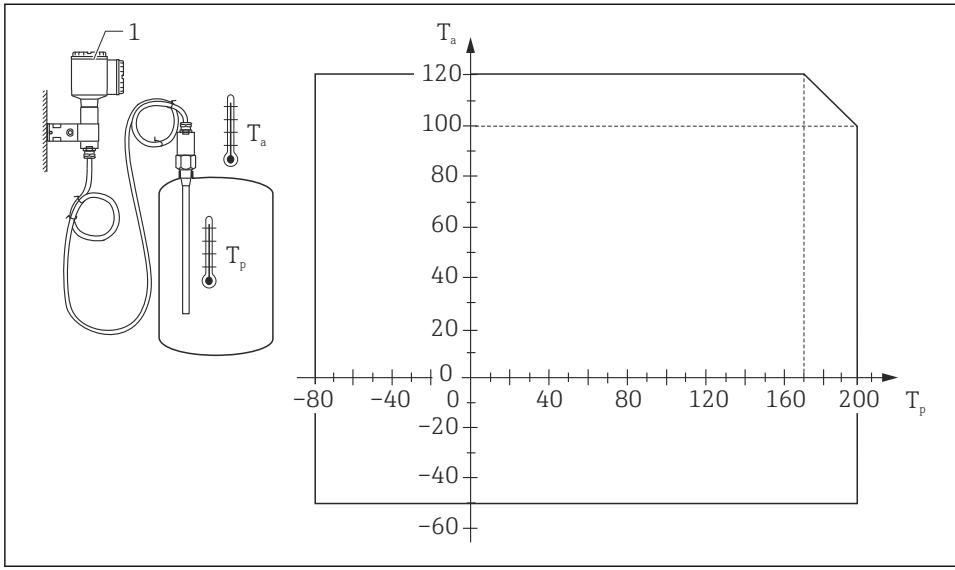
Basic specification, Position 10 (FMI5x), 11 (FTI5x) = 1



2

T_a *Ambient temperature in °C*
T_p *Process temperature in °C*

Basic specification, Position 10 (FMI5x), 11 (FTI5x) = 2, 3, 4, 5



3

T_a Ambient temperature in °C
T_p Process temperature in °C
1 Temperature at the separate enclosure ≤ 70 °C

Application in dust

II 3 D Ex tc IIIC T 100 °C Dc

Basic specification, Position 7 (FMI5x), Position 8 (FTI5x)	**Ambient temperature T_a (ambient): electronics**	**Max. surface temperature ($T_{a,max}$)**	**Protection type of enclosure**
all	−50 °C ≤ T_a ≤ +60 °C	+100 °C	IP65

Connection data

Application in dust:
Connetion to non-intrinsically safe circuits.

Basic specification, Position 7 (FMI5x), Position 8 (FTI5x)	**Power supply**	**Output**
A, B	12 to 35 V_{DC}	4 to 20 mA
C	≤ 19.2 V_{DC}	PFM
1	19 to 253 V_{AC}	-
2	10 to 55 V_{DC}	PNP transistor, max. 350 mA
4	19 to 253 V_{AC}	253 V_{AC} / 6 A [1)] 1500 VA / cos φ = 1 750 VA / cos φ > 0.7
	19 to 55 V_{DC}	30 V_{DC} / 6 A [1)] 125 V_{DC} / 0.2 A
5	11 to 35 V_{DC}	8 mA / 16 mA
7	9 to 12.5 V_{DC}	PFM
8	4 to 12.5 V_{DC}	NAMUR

1) Basic specification, Position 8 (FMI5x), 9 (FTI5x) = 5: 4 A

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