

Safety Instructions

Liquicap M

FMI51, FMI52, FTI51, FTI52

NEPSI: Ex nA IIC T3...T6 Gc
Ex nA nC IIC T3...T5 Gc



Document: XA00430F-D

Safety instructions for electrical apparatus for explosion-hazardous areas → 3

Liquicap M FMI51, FMI52, FTI51, FTI52

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Associated documentation	<p>This document is an integral part of the following Operating Instructions:</p> <ul style="list-style-type: none"> ■ BA00297F/00, BA00298F/00 (FMI51, FMI52) ■ BA00299F/00 (FTI51, FTI52) 										
Supplementary documentation	<p>Explosion-protection brochure: CP00021Z/11</p> <p>The Explosion-protection brochure is available:</p> <ul style="list-style-type: none"> ■ 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	<p>NEPSI Declaration of Conformity</p> <p>Certificate number: GYJ17.1294X</p> <p>Affixing the certificate number certifies conformity with the following standards (depending on the device version):</p> <ul style="list-style-type: none"> ■ GB3836.1-2010 ■ GB3836.8-2014 										
Manufacturer address	<p>Endress+Hauser GmbH+Co. KG Hauptstraße 1 79689 Maulburg, Germany Address of the manufacturing plant: See nameplate.</p>										
Extended order code	<p>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.</p> <p>Structure of the extended order code</p> <table border="0" style="width: 100%; text-align: center;"> <tr> <td style="width: 30%;">FMI5x, FTI5x</td> <td style="width: 10%;">–</td> <td style="width: 30%;">*****</td> <td style="width: 10%;">+</td> <td style="width: 20%;">A*B*C*D*E*F*G*..</td> </tr> <tr> <td><i>(Device type)</i></td> <td></td> <td><i>(Basic specifications)</i></td> <td></td> <td><i>(Optional specifications)</i></td> </tr> </table> <p>* = Placeholder At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.</p> <p><i>Basic specifications</i></p> <p>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.</p> <p><i>Optional specifications</i></p> <p>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).</p>	FMI5x, FTI5x	–	*****	+	A*B*C*D*E*F*G*..	<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>
FMI5x, FTI5x	–	*****	+	A*B*C*D*E*F*G*..							
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>							

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	4	NEPSI Ex nA IIC T3...T6 Gc

Position 2 (Inactive Length L3)		
Gewählte Option		Beschreibung
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 8 (Electronics; Output)		
Selected option		Description
FMI5x	A	FEI50H; 4-20mA HART + display
	B	FEI50H; 4-20mA HART
	C	FEI57C; 2-wire PFM

Position 9 (Housing)		
Selected option		Description
FMI5x	1	F15 316L hygiene IP66/67 NEMA4X
	3	F17 Alu IP66/67 NEMA4X
	4	F13 Alu IP66 NEMA4X + gas-tight probe seal
	5	T13 Alu IP66 NEMA4X + gas-tight probe seal + separate conn. compartment
	6	F27 316L IP66/67 NEMA6P + gas-tight probe seal

Position 10 (Cable Entry)		
Selected option		Description
FMI5x	A	Gland M20 (Ex d > thread M20)
	B	Thread G1/2
	C	Thread NPT1/2
	D	Thread NPT3/4
	E	Plug M12

Position 11 (Type of Probe)		
Selected option		Description
FMI5x	1	Compact
	2, 3, 4, 5	..... mm/in, L4 cable > separate housing

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	4	NEPSI Ex nA nC IIC T3...T5 Gc

Position 2 (Inactive Length L3)		
Gewählte Option		Beschreibung
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
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 NEMA4X
	3	F17 Alu IP66/67 NEMA4X
	4	F13 Alu IP66 NEMA4X + gas-tight probe seal
	5	T13 Alu IP66 NEMA4X + gas-tight probe seal + separate conn. compartment
	6	F27 316L IP66/67 NEMA6P + gas-tight probe seal

Position 10 (Cable Entry)		
Selected option		Description
FTI5x	A	Gland M20 (Ex d > thread 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 housing

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
- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
 - GB50257-2014: "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
 - GB3836.13-2013: "Explosive atmospheres, Part 13: Equipment repair, overhaul and reclamation".
 - 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.
- 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

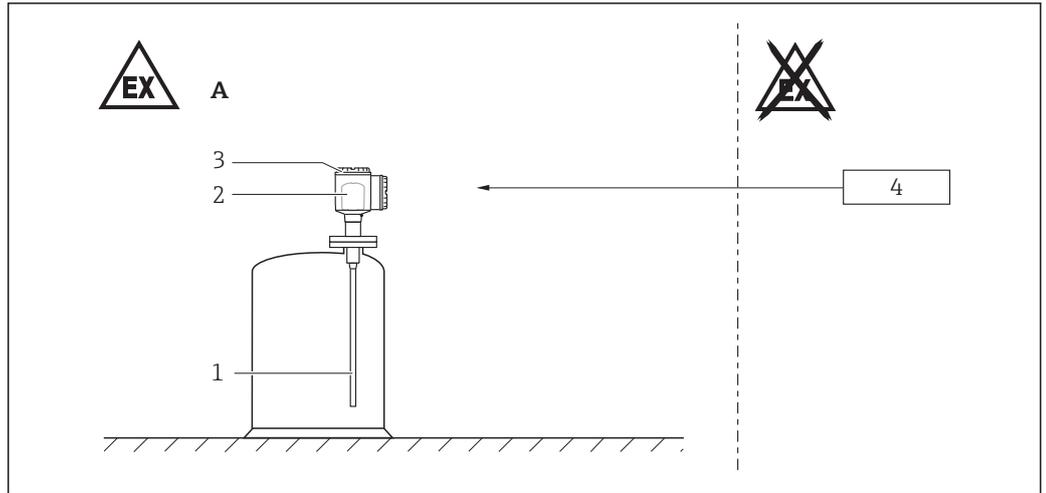
In the event of additional or alternative special varnishing on the housing or other metal parts:

- Observe the danger of electrostatic charging and discharge.
- Do not rub surfaces with a dry cloth.

Basic specification, Position 3 (Active Probe length L1; Insulation) = E, F, G, P, R, S
Probes can be used in gases of Group IIC, IIB and IIA.

Basic specification, Position 3 (Active Probe length L1; Insulation) = 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".

**Safety instructions:
Installation**



- 1 Probe
- A Zone 2
- 1 Rope or rod probes
- 2 Electronic insert
- 3 Housing
- 4 Associated power supply

- Mechanically fix probes which are more than 3 m (e.g. using guy ropes).
- To maintain the ingress protection of the housing:
 - Screw the cover tight.
 - Mount the cable entry correctly.

Potential equalization

Integrate the device into the local potential equalization.

Temperature tables

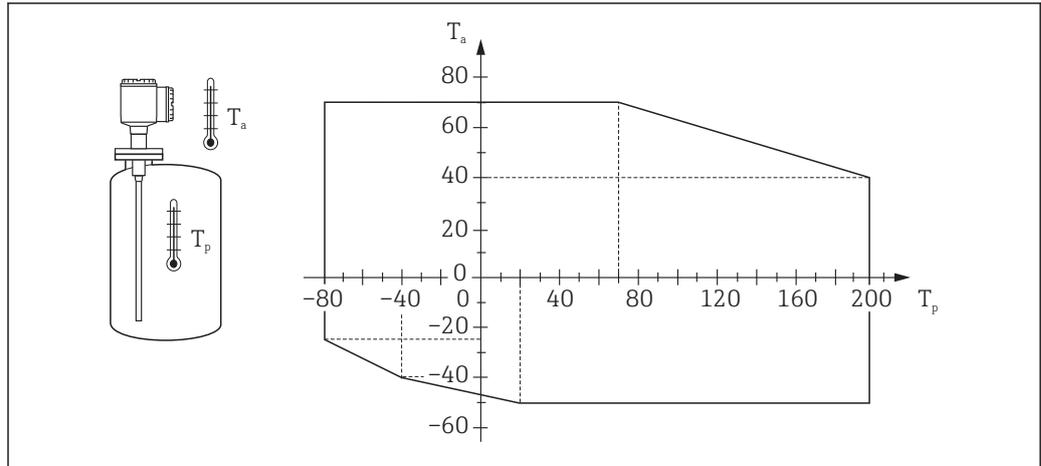
II 3 G Ex nA IIC T6 Gc

Basic specification, Position 8 (Electronics; Output)	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, ☑ 10, → ☑ 3, ☑ 10
	T3...T5	-50 °C ≤ T _a ≤ +70 °C	
5, 7, 8	T6	-50 °C ≤ T _a ≤ +55 °C	→ ☑ 2, ☑ 10, → ☑ 3, ☑ 10
	T3...T5	-50 °C ≤ T _a ≤ +70 °C	

II 3 G Ex nA nC IIC T5 Gc

Basic specification, Position 8 (Electronics; Output)	Temperature class	Ambient temperature T _a (ambient): electronics	Process temperature T _p (process)
4	T5	-50 °C ≤ T _a ≤ +50 °C	→ ☑ 2, ☑ 10, → ☑ 3, ☑ 10
	T3...T4	-50 °C ≤ T _a ≤ +70 °C	

Basic specification, Position 11 (Type of Probe) = 1

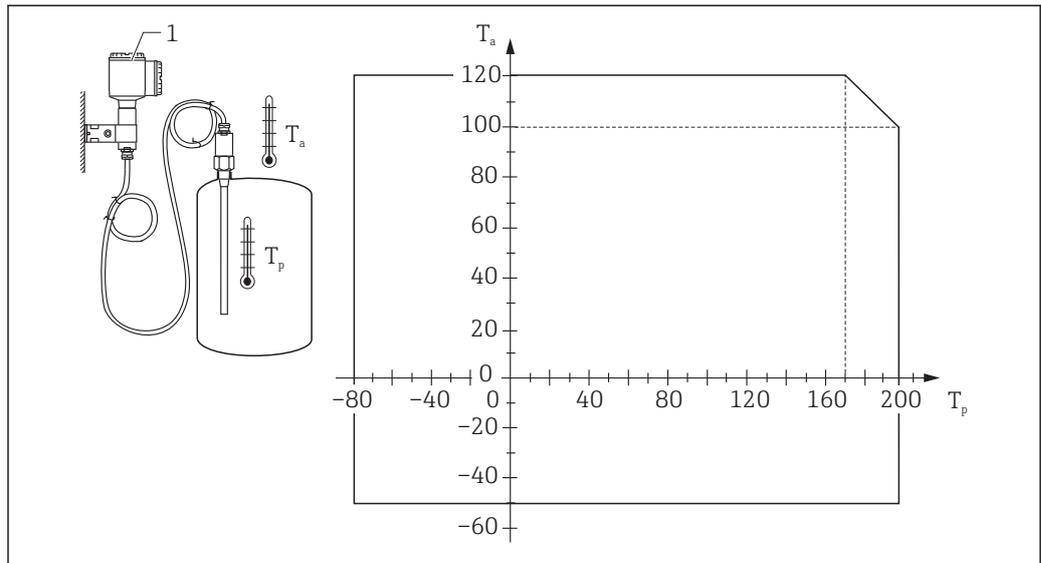


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2

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

Basic specification, Position 11 (Type of Probe) = 2, 3, 4, 5



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3

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

Connection data

<i>Basic specification, Position 8 (Electronics; Output)</i>	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 9 (Housing) = 5: 4 A



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