

# Safety Instructions

## Solicap M FTI55, FTI56

EAC: Ex ia III C T\* Da  
Ex ia III C T\* Da/Db  
Ex ia III C T\* Da/Dc  
Ex ia/tb III C T\* Da/Db  
Ex ia/tc III C T\* Da/Dc



Document: XA01653F-A  
Safety instructions for electrical apparatus for explosion-hazardous areas → 3

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# Solicap M FTI55, FTI56

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<b>Associated documentation</b>	This document is an integral part of the following Operating Instructions: BA00300F/00										
<b>Supplementary documentation</b>	Explosion-protection brochure: CP00021Z/11 The Explosion-protection brochure is available: <ul style="list-style-type: none"> <li>■ In the download area of the Endress+Hauser website: <a href="http://www.endress.com">www.endress.com</a> -&gt; Downloads -&gt; Media Type: Documentation -&gt; Documentation Type: Brochures and catalogs -&gt; Text Search: CP00021Z</li> <li>■ On the CD for devices with CD-based documentation</li> </ul>										
<b>Manufacturer's certificates</b>	<b>Certificate of Conformity TP TC 012/2011</b>  Inspection authority: LLC NANIO CCVE (ООО «НАНИО ЦСВЭ»)  Certificate number: TC RU C-DE.AA87.B.00705  Affixing the certificate number certifies conformity with the following standards (depending on the device version): <ul style="list-style-type: none"> <li>■ GOST R IEC 60079-31-2010</li> <li>■ GOST 31610.0-2014 (IEC 60079-0:2011)</li> <li>■ GOST 31610.11-2014 (IEC 60079-11:2011)</li> </ul>										
<b>Manufacturer address</b>	Endress+Hauser GmbH+Co. KG Hauptstraße 1 79689 Maulburg, Germany Address of the manufacturing plant: See nameplate.										
<b>Extended order code</b>	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.  <b>Structure of the extended order code</b>  <table border="0" style="margin-left: 40px;"> <tr> <td style="text-align: center;">FTI5x</td> <td style="text-align: center;">–</td> <td style="text-align: center;">*****</td> <td style="text-align: center;">+</td> <td style="text-align: center;">A*B*C*D*E*F*G*..</td> </tr> <tr> <td style="text-align: center;"><i>(Device type)</i></td> <td></td> <td style="text-align: center;"><i>(Basic specifications)</i></td> <td></td> <td style="text-align: center;"><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> <i>Basic specifications</i> 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.  <i>Optional specifications</i> 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).	FTI5x	–	*****	+	A*B*C*D*E*F*G*..	<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>
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: Solicap 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

FTI55

#### Basic specifications

Position 1 (Approval)		
Selected option		Description
FTI55	V	EAC Ex ia/tc IIIC T* Da/Dc
	W	EAC Ex ia/tb IIIC T* Da/Db
	X	EAC Ex ia IIIC T* Da

Position 2 (Inactive Length L3)		
Selected option		Description
FTI55	A	Not selected
	B	Not selected + active build-up protection 125mm/5inch, 316L
	1, 5	..... mm/in, 316L

Position 3 (Active Probe Length L1)		
Selected option		Description
FTI55	A, B, H, K, E, P	..... mm/in, steel
	C, D, M, N	..... mm/in, 316L

Position 4 (Insulation Rod)		
Selected option		Description
FTI55	1	Fully insulated, PE, max. 80°C/175°F
	2, 3	75mm/3in L2, partial insulated PPS, max. 180°C/350°F (Ex max. 150°C/300°F)

Position 8 (Electronics; Output)		
Selected option		Description
FTI55	Y	Special version: FEI50H
	1 <sup>1)</sup>	FEI51; 2-wire 19-253VAC
	2 <sup>1)</sup>	FEI52; 3-wire PNP 10-55VDC
	4 <sup>1)</sup>	FEI54; relay DPDT, 19-253VAC, 19-55VDC
	5	FEI55; 8/16mA, 11-35VDC
	7 <sup>2)</sup>	FEI57S; 2-wire PFM
	8 <sup>2)</sup>	FEI58; NAMUR+test button (H-L signal)

1) Only in connection with supply circuit "Non-intrinsically safe"

2) Only in connection with supply circuit "Intrinsically safe Ex ia"

Position 9 (Housing)		
Selected option		Description
FTI55	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 11 (Type of probe)		
Selected option		Description
FTI55	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

FTI56

#### Basic specifications

Position 1 (Approval)		
Selected option		Description
FTI56	V	EAC Ex ia/tc IIIC T* Da/Dc
	W	EAC Ex ia/tb IIIC T* Da/Db
	X	EAC Ex ia IIIC T* Da

Position 2 (Inactive Length L3)		
Selected option		Description
FTI56	A	Not selected
	1, 5	..... mm/in, 316L

Position 3 (Active Probe Length L1; Tension Weight)		
Selected option		Description
FTI56	A, B, H, K	..... mm/in, ..... mm/" rope 316; 316L
	C, D, M, N	..... mm/in, ..... mm/" rope steel zinc coated; steel

Position 4 (Insulation Rope)		
Selected option		Description
FTI56	1	Fully insulated, PA, max. 120°C/250°F
	2	500mm L2, partial insulated, PTFE, max. 180°C/350°F (Ex max. 150°C/300°F)

Position 8 (Electronics; Output)		
Selected option		Description
FTI56	Y	Special version: FEI50H
	1 <sup>1)</sup>	FEI51; 2-wire 19-253VAC
	2 <sup>1)</sup>	FEI52; 3-wire PNP 10-55VDC
	4 <sup>1)</sup>	FEI54; relay DPDT, 19-253VAC, 19-55VDC
	5	FEI55; 8/16mA, 11-35VDC
	7 <sup>2)</sup>	FEI57S; 2-wire PFM
	8 <sup>2)</sup>	FEI58; NAMUR+test button (H-L signal)

- 1) Only in connection with supply circuit "Non-intrinsically safe"
- 2) Only in connection with supply circuit "Intrinsically safe Ex ia"

Position 9 (Housing)		
Selected option		Description
FTI56	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 11 (Type of probe)		
Selected option		Description
FTI56	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
- 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.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)

#### Safety instructions: Special conditions

Permitted ambient temperature range at the electronics housing, permitted process temperature:  
 $-50\text{ °C} \leq T_a \leq +70\text{ °C}$

- Observe the information in the 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.

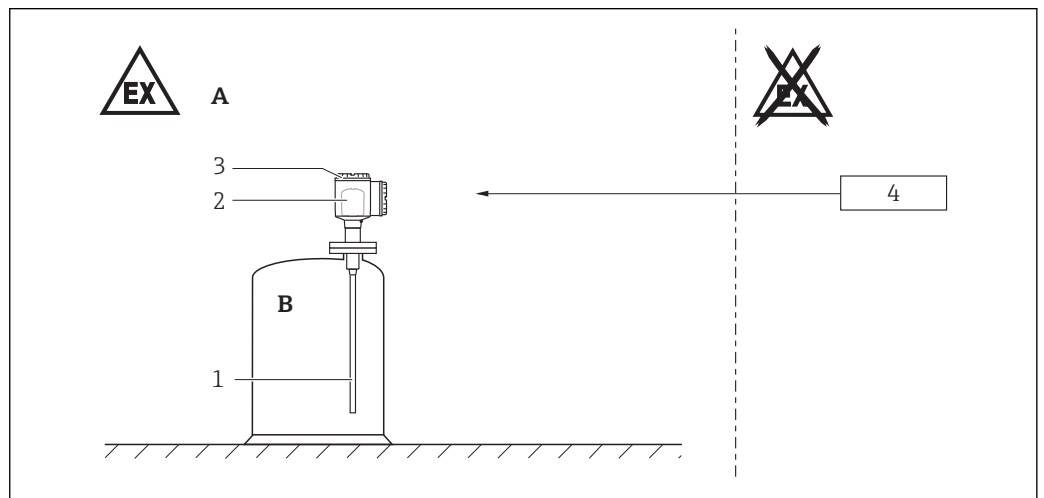
*Basic specification, Position 9 (Housing) = 4, 5 and covers with glass window*

Restriction to  $-40\text{ °C} \leq T_a \leq +70\text{ °C}$ .



**Safety instructions:**  
**Installation**

Supply circuit "Intrinsically safe Ex ia"

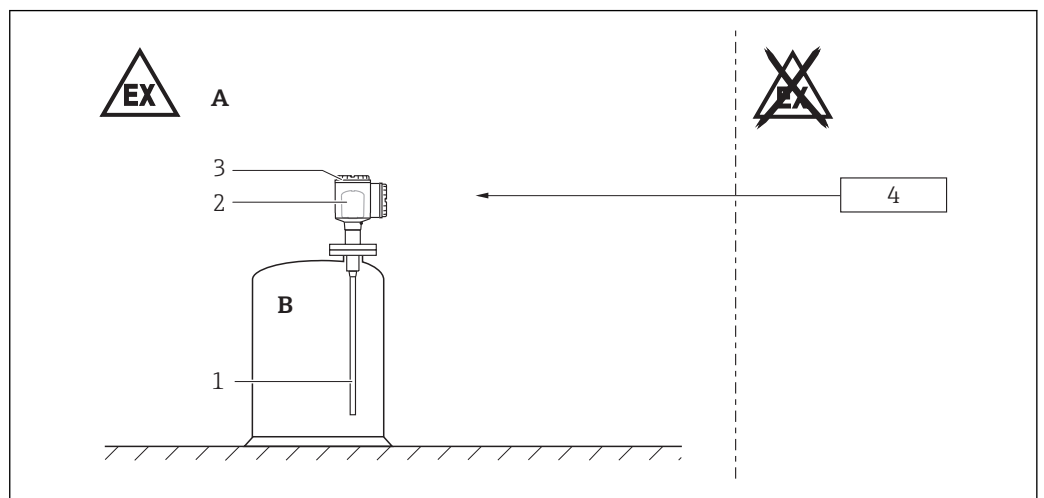


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- A Zone 20, Zone 21, Zone 22  
 B Zone 20  
 1 Rope or rod probes  
 2 Electronic insert  
 3 Housing  
 4 Certified associated apparatus

Supply circuit "Non-intrinsically safe"



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2

- A Zone 21, Zone 22  
 B Zone 20  
 1 Rope or rod probes  
 2 Electronic insert  
 3 Housing  
 4 Power supply

- Do not open in a potentially explosive dust atmosphere.
- 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.
- To maintain the ingress protection of the housing:
  - Screw the cover tight.
  - Mount the cable entry correctly.
- After aligning (rotating) the housing, retighten the fixing screw (see Operating Instructions).

- Connect the device using suitable cable and wire entries of protection type "Equipment dust ignition protection by enclosure (Ex t)" or "Increased safety (Ex e)" (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.
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Mechanically fix probes which are more than 3 m (e.g. using guy ropes).

Basic specification, Position 9 (Housing) = 1

Before operation:

- Screw in the cover all the way.
- Tighten the securing clamp on the cover.



Basic specification, Position 9 (Housing) = 3, 4, 5, 6

Tighten the cover with torque 12 Nm.

**Intrinsic safety**

Observe the pertinent guidelines when interconnecting intrinsically safe circuits.

**Potential equalization**

Install potential equalization between the certified associated apparatus (non-hazardous area, ) and the device (explosion-hazardous area, )

**Safety instructions: Zone 20**

- In the event of potentially explosive dust/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.

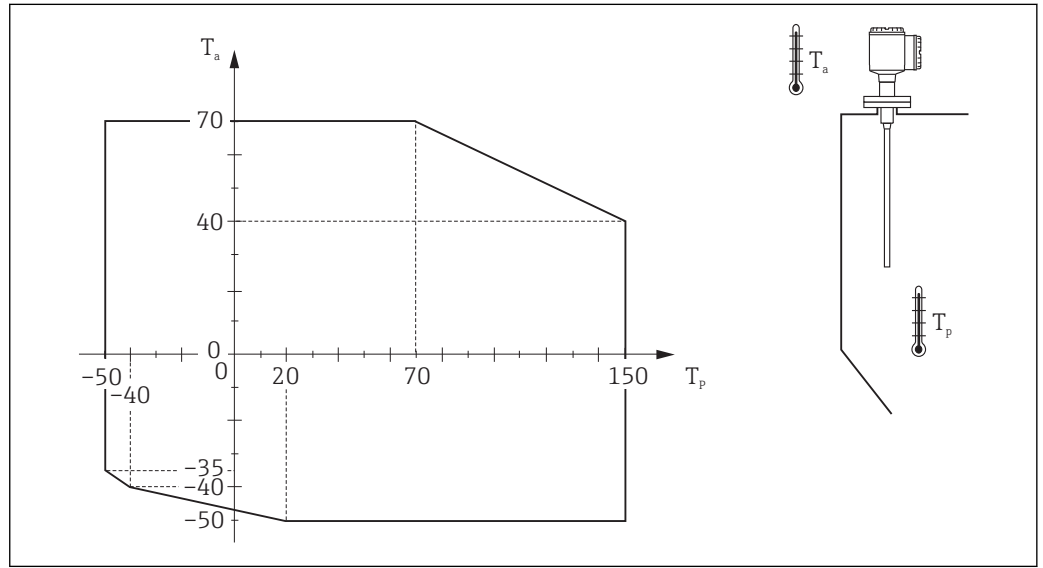
**Temperature tables**

	Probe and electronics housing in Zone 20	
	Connection to certified intrinsically safe power circuits	
Maximum surface temperature at 70 °C ambient temperature	80 °C	Deposited material with a layer of 500 mm T <sub>500</sub> 130 °C

	Probe in Zone 20	Electronics housing in Zone 21, Zone 22	
		Connection to certified intrinsically safe power circuits	Connection to non-intrinsically safe power circuits
Maximum surface temperature at 70 °C ambient temperature	70 °C	80 °C	90 °C
The compact version can also be used for process temperatures between +70 to +150 °C if it can also be ensured that the ambient temperature at the electronics housing does not exceed the values as indicated in the temperature graphic.	150 °C	40 °C	40 °C

**Compact version**

Rod and rope version, partially insulated

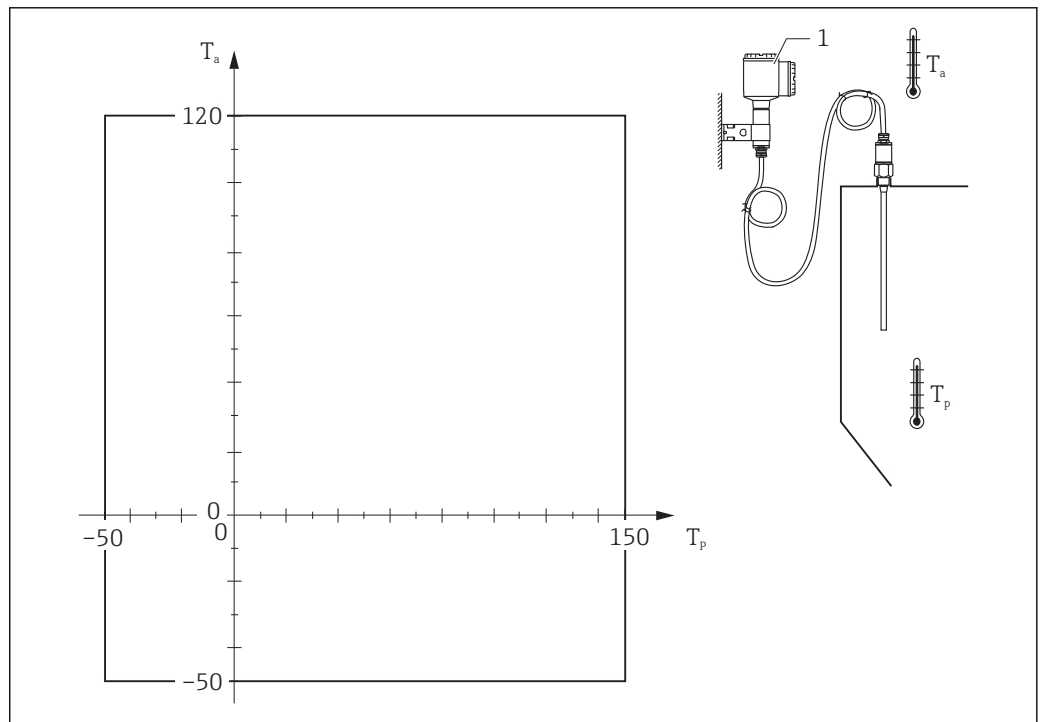


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$T_a$  Ambient temperature in °C  
 $T_p$  Process temperature in °C

**Version with separate housing**



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4

$T_a$  Ambient temperature in °C  
 $T_p$  Process temperature in °C  
 1 Temperature at the separate housing:  $-40\text{ °C} \leq T_a \leq +70\text{ °C}$

## Connection data

## Connection to certified intrinsically safe circuits Ex ia (Zone 20)

Basic specification, Position 8 (Electronics; Output)	Electrical data
Y	$U_i \leq 30 \text{ V}$ $I_i \leq 120 \text{ mA}$ $P_i \leq 1 \text{ W}$ $C_i \leq 2.4 \text{ nF}$ $L_i \leq 0$
5	$U_i \leq 36 \text{ V}$ $I_i \leq 100 \text{ mA}$ $P_i \leq 1 \text{ W}$ $C_i \leq 2.4 \text{ nF}$ $L_i \leq 0$
7	$U_i \leq 16.1 \text{ V}$ $I_i \leq 100 \text{ mA}$ $P_i \leq 1 \text{ W}$ $C_i \leq 2.4 \text{ nF}$ $L_i \leq 0$
8	$U_i \leq 18 \text{ V}$ $I_i \leq 52 \text{ mA}$ $P_i \leq 170 \text{ mW}$ $C_i/L_i \leq 0$

## Connection to non-intrinsically safe circuits (Zone 20/21 or Zone 20/22)

Basic specification, Position 8 (Electronics; Output)	Electrical data
Y <sup>1)</sup>	$U \leq 35 \text{ V}_{\text{DC}}$
5 <sup>1)</sup>	$U \leq 35 \text{ V}_{\text{DC}}$

1) With Basic specification, Position 9 (Housing) = 5 only with limiting module

Basic specification, Position 8 (Electronics; Output)	Power supply	Relay circuit
1	19 to 253 V <sub>AC</sub>	–
2	10 to 55 V <sub>DC</sub>	–
4	19 to 253 V <sub>AC</sub>	253 V <sub>AC</sub> / 6 A 1 500 VA / cos φ = 1 750 VA / cos φ > 0.7
	19 to 55 V <sub>DC</sub>	30 V <sub>DC</sub> / 4 A 125 V <sub>DC</sub> / 0.2 A

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