

Safety Instructions

Soliphant M

FTM50, FTM51, FTM52

Ga/Gb Ex d IIC T6...T2 X, Ga/Gb Ex d e IIC T6...T2 X

Ga/Gb Ex d [ia Ga] IIC T6...T2 X

Ga/Gb Ex d e [ia Ga] IIC T6...T2 X

Ex ta IIIC T80 °C T₅₀₀ 130 °C Da X

Ex ta IIIC T90 °C Da X and Ex tb IIIC T90 °C Db X

Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X



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

Soliphant M FTM50, FTM51, FTM52

Table of contents

Associated documentation	4
Supplementary documentation	4
Manufacturer's certificates	4
Manufacturer address	4
Extended order code	4
Safety instructions: General	6
Safety instructions: Special conditions	6
Safety instructions: Installation	7
Safety instructions: Zone 0	8
Temperature tables	8
Connection data	13

Associated documentation	<p>This document is an integral part of the following Operating Instructions:</p> <ul style="list-style-type: none"> ■ KA00229F/00 (FTM50, FTM51) ■ KA00230F/00 (FTM52) ■ TI00392F/00 (FTM50, FTM51, FTM52) 										
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 -> Brochures and Catalogs -> Text Search: CP00021Z ■ On the CD for devices with CD-based documentation 										
Manufacturer's certificates	<p>Certificate of Conformity TP TC 012/2011</p> <p>Inspection authority: LLC NANIO CCVE (ООО «НАНИО ЦСВЭ»)</p> <p>Certificate number: EAЭC RU C-DE.AA87.B.00381/20</p> <p>Affixing the certificate number certifies conformity with the following standards (depending on the device version):</p> <ul style="list-style-type: none"> ■ GOST 31610.0-2014 (IEC 60079-0:2011) ■ GOST IEC 60079-1-2011 ■ GOST R IEC 60079-7-2012 ■ GOST 31610.26-2012/IEC 60079-26:2006 ■ GOST R IEC 60079-31-2010 										
Manufacturer address	<p>Endress+Hauser SE+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="margin-left: 40px;"> <tr> <td style="text-align: center;">FTM5x</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> <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</p>	FTM5x	-	*****	+	A*B*C*D*E*F*G*..	<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>
FTM5x	-	*****	+	A*B*C*D*E*F*G*..							
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>							

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, FTM52

Basic specifications

Position 1 (Approval)		
Selected option		Description
FTM50	R	EAC Ga/Gb Ex d e IIC T6...T2 X EAC Ex ta IIIC T80 °C T ₅₀₀ 130 °C Da X EAC Ex ta IIIC T90 °C Da X and Ex tb IIIC T90 °C Db X
	V	EAC Ga/Gb Ex d IIC T6...T2 X EAC Ex ta IIIC T80 °C T ₅₀₀ 130 °C Da X EAC Ex ta IIIC T90 °C Da X and Ex tb IIIC T90 °C Db X
FTM51	R	EAC Ga/Gb Ex d e [ia Ga] IIC T6...T2 X EAC Ex ta [ia Da] IIIC T80 °C T ₅₀₀ 130 °C Da X EAC Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X
	V	EAC Ga/Gb Ex d [ia Ga] IIC T6...T2 X EAC Ex ta [ia Da] IIIC T80 °C T ₅₀₀ 130 °C Da X EAC Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X
FTM52	R	EAC Ga/Gb Ex d e [ia Ga] IIC T6 X EAC Ex ta [ia Da] IIIC T80 °C T ₅₀₀ 130 °C Da X EAC Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X
	V	EAC Ga/Gb Ex d [ia Ga] IIC T6 X EAC Ex ta [ia Da] IIIC T80 °C T ₅₀₀ 130 °C Da X EAC Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X

Position 6 (Electronics; Output)		
Selected option		Description
FTM5x	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

Position 7 (Type of Probe)		
Selected option		Description
FTM5x	A	Compact
	D, E	Cable > separate housing
	G, H	Cable, armoured > separate housing

Position 8 (Housing)		
Selected option		Description
FTM5x	H	T13 Alu IP66/68 NEMA Type 4X Encl., separate conn. compartment
	5 ¹⁾	F13 Alu IP66/68 NEMA Type 4X Encl.
	6 ¹⁾	F27 316L IP67/68 NEMA Type 4X/6P Encl.

1) Only in connection with Position 1 (Approval) = V

Position 11 (Additional Option 2)		
Selected option		Description
FTM5x	A	Not selected
FTM50 FTM51	C	EN10204-3.1 material (wetted parts), inspection certificate
	D, E	Temp. separator ≤150°C
	F, H	High temperature ≤280°C
	J, K	High temperature ≤230°C
	Y	Special version: High temperature ≤300°C

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

- Comply with the installation and safety instructions in the Operating Instructions.
- 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.
- In potentially explosive atmospheres: Do not open the connection compartment cover and the electronics compartment cover when energized.
- Waiting time before opening the electronics compartment after switching off the power supply: 17 minutes.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ...)
 - Of isolated capacities (e.g. isolated metallic plates)

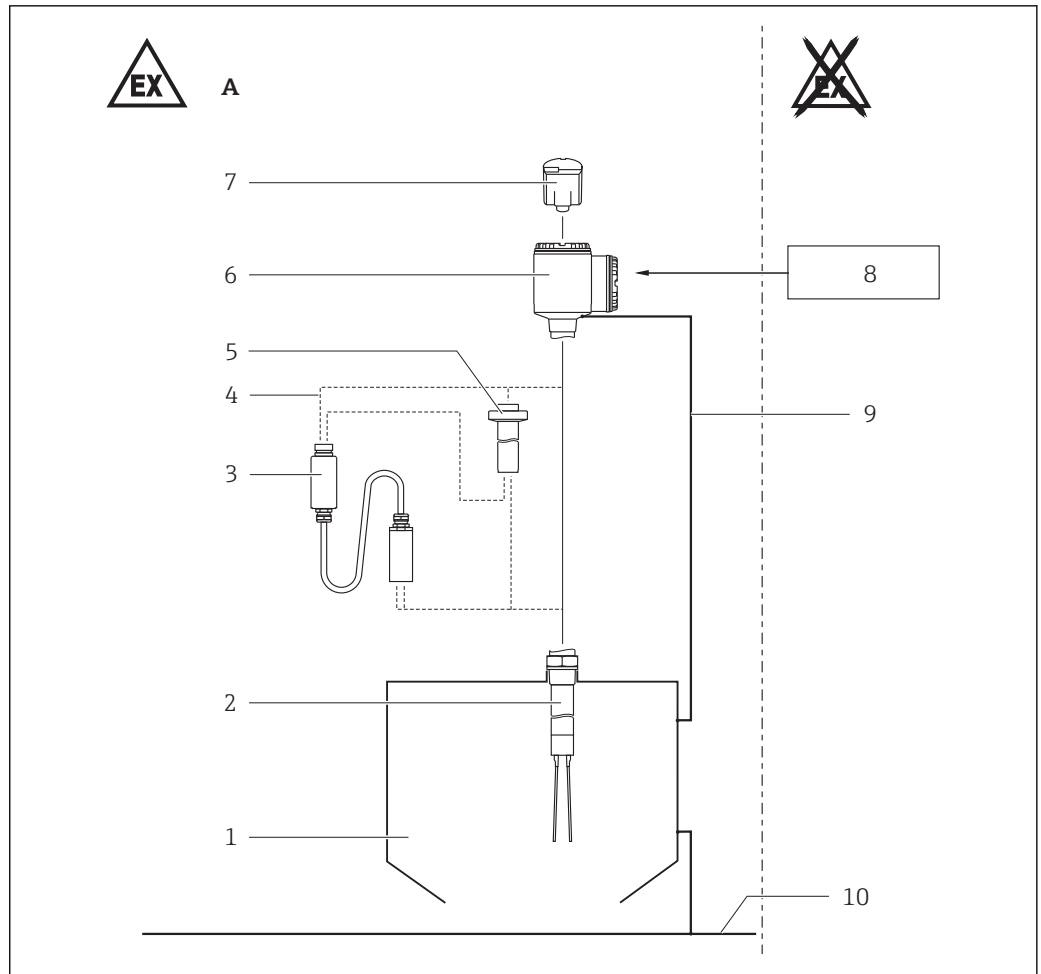
Safety instructions: Special conditions

- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the housing 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 8 (Housing) = H, 5

Avoid sparks caused by impact and friction.

Safety instructions:
Installation



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- A Zone 1, Zone 20, Zone 21
 1 Tank; Hazardous area Zone 0, Zone 1, Zone 20, Zone 21
 2 Version
 3 Separate installation (optional)
 4 [Ex ia] circuit
 5 Temperature spacer (optional at 150 °C)
 6 Housing
 7 Electronic insert
 8 Supply unit
 9 Potential equalization
 10 Local potential equalization

- 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.
- Connect the device:
 - Using suitable cable and wire entries of protection type "Flameproof Enclosure (Ex d)".
 - Using piping systems of protection type "Flameproof Enclosure (Ex d)".
- To maintain the ingress protection of the housing IP66/67: Install the housing cover, cable glands and blind plugs correctly.
- Seal unused entry glands with approved Ex d sealing plugs.
- 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 the device in media to which the wetted materials have sufficient durability (e.g. process connection seal).

- Use a process connection seal that meets the materials compatibility and temperature requirements.
- When connecting the cables, ensure there is adequate strain relief at place of installation.
- Protect the connecting cable between the separate housing and the level sensor from tension and friction (e.g. due to electrostatic charge from medium flow).

Safety instructions: Zone 0

- 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:

Device type FTM50, FTM51

Version	Temperature class	Process temperature T_p (process): sensor	Ambient temperature T_a (ambient): electronics
150 °C, 230 °C, 280 °C	T6	-50 to +85 °C	-50 to +70 °C
150 °C, 230 °C, 280 °C	T5	-50 to +100 °C	see temperature graph
150 °C, 230 °C, 280 °C	T4	-50 to +135 °C	
150 °C	T3	-50 to +150 °C	
230 °C, 280 °C	T3	-50 to +200 °C	
230 °C, 280 °C	T2	-50 to +230 °C/+280 °C	

Device type FTM52

Version	Temperature class	Process temperature T_p (process): sensor	Ambient temperature T_a (ambient): electronics
80 °C	T6	-40 to +80 °C	-50 to +70 °C

Compact version

Device type FTM50

Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Ga/Gb Ex d IIC T6...T2 X Ga/Gb Ex d e IIC T6...T2 X	Position 6 (Electronics; Output) = 1, 2, 5 -50 °C ≤ T_a ≤ +70 °C Position 6 (Electronics; Output) = 4 -50 °C ≤ T_a ≤ +60 °C	-50 °C ≤ T_p ≤ +230 °C -50 °C ≤ T_p ≤ +280 °C
Ga/Gb Ex d IIC T6...T3 X Ga/Gb Ex d e IIC T6...T3 X		-50 °C ≤ T_p ≤ +150 °C
Ex ta IIIC T80 °C T ₅₀₀ 130 °C Da X ¹⁾ Ex ta IIIC T90 °C Da X and Ex tb IIIC T90 °C Db X ²⁾		

1) FEM55

2) FEM51/52/54/55

Device type FTM51

Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Ga/Gb Ex d [ia Ga] IIC T6...T2 X Ga/Gb Ex d e [ia Ga] IIC T6...T2 X	Position 6 (Electronics; Output) = 1, 2, 5 $-50\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$	$-50\text{ }^\circ\text{C} \leq T_p \leq +230\text{ }^\circ\text{C}$ $-50\text{ }^\circ\text{C} \leq T_p \leq +280\text{ }^\circ\text{C}$
Ga/Gb Ex d [ia Ga] IIC T6...T3 X Ga/Gb Ex d e [ia Ga] IIC T6...T3 X		Position 6 (Electronics; Output) = 4 $-50\text{ }^\circ\text{C} \leq T_a \leq +60\text{ }^\circ\text{C}$
Ex ta [ia Da] IIIC T80 °C T_{500} 130 °C Da X ¹⁾ Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X ²⁾		

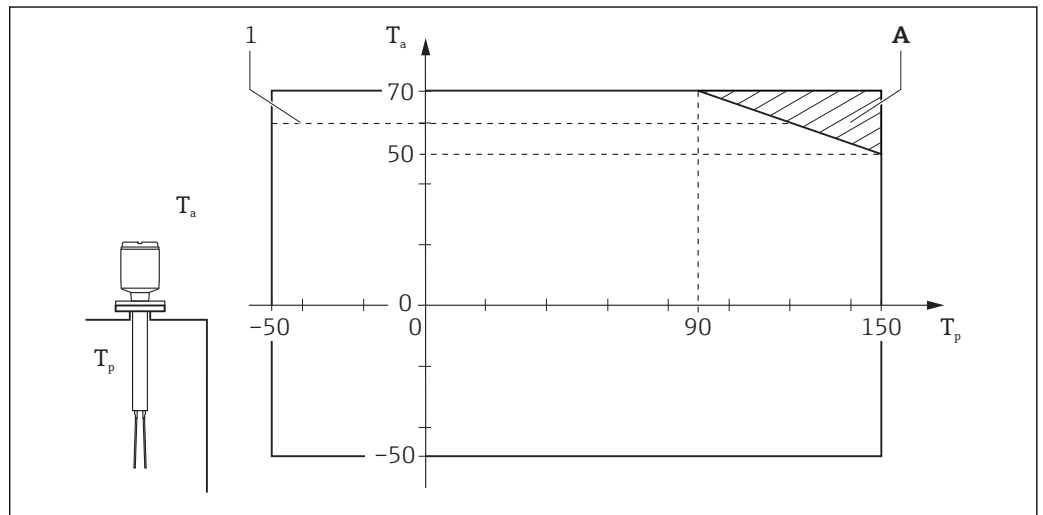
- 1) FEM55
- 2) FEM51/52/54/55

Device type FTM52

Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Ga/Gb Ex d [ia Ga] IIC T6 X Ga/Gb Ex d e [ia Ga] IIC T6 X	Position 6 (Electronics; Output) = 1, 2, 5 $-50\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$	$-50\text{ }^\circ\text{C} \leq T_p \leq +80\text{ }^\circ\text{C}$
Ex ta [ia Da] IIIC T80 °C T_{500} 130 °C Da X ¹⁾ Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X ²⁾		Position 6 (Electronics; Output) = 4 $-50\text{ }^\circ\text{C} \leq T_a \leq +60\text{ }^\circ\text{C}$

- 1) FEM55
- 2) FEM51/52/54/55

Device type FTM50, FTM51

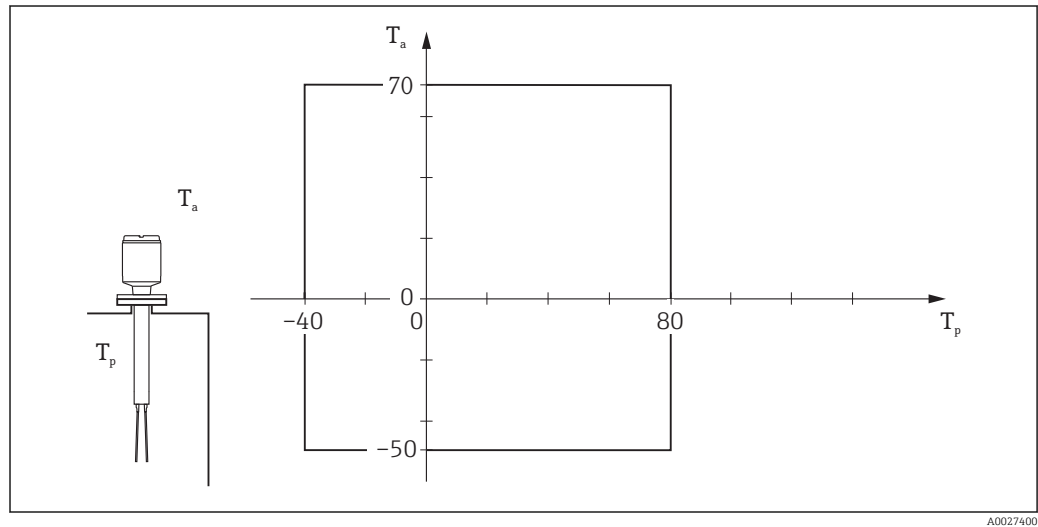


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- T_a Ambient temperature in °C
- T_p Process temperature in °C
- A Additional temperature range for sensors with temperature spacer
- 1 T_a for FEM54: -50 to $+60\text{ }^\circ\text{C}$

Device type FTM52



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

Version with separate housing

Device type FTM50, FTM51

	Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Housing	Ga/Gb Ex d [ia Ga] IIC T6...T2 X Ga/Gb Ex d e [ia Ga] IIC T6...T2 X Ga/Gb Ex d [ia Ga] IIC T6...T3 X Ga/Gb Ex d e [ia Ga] IIC T6...T3 X	Position 6 (Electronics; Output) = 1, 2, 5 $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ Position 6 (Electronics; Output) = 4 $-50\text{ °C} \leq T_a \leq +60\text{ °C}$	$-50\text{ °C} \leq T_p \leq +150\text{ °C}$
Sensor	Ga/Gb Ex ia IIC T6...T2 X	$-50\text{ °C} \leq T_a \leq +120\text{ °C}$	$-50\text{ °C} \leq T_p \leq +230\text{ °C}$ $-50\text{ °C} \leq T_p \leq +280\text{ °C}$
Housing	Ex ta [ia Da] IIIC T80 °C T ₅₀₀ 130 °C Da X ¹⁾ Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X ¹⁾	$-50\text{ °C} \leq T_a \leq +70\text{ °C}$	$-50\text{ °C} \leq T_p \leq +150\text{ °C}$
Sensor	Ex ia IIIC Txx °C +10K Da X ²⁾ Ex ia IIIC Txx °C +10K Da X and Ex ia IIIC Txx °C +10K Db X ²⁾	$-50\text{ °C} \leq T_a \leq +120\text{ °C}$	

1) FEM55

2) depending on process temperature

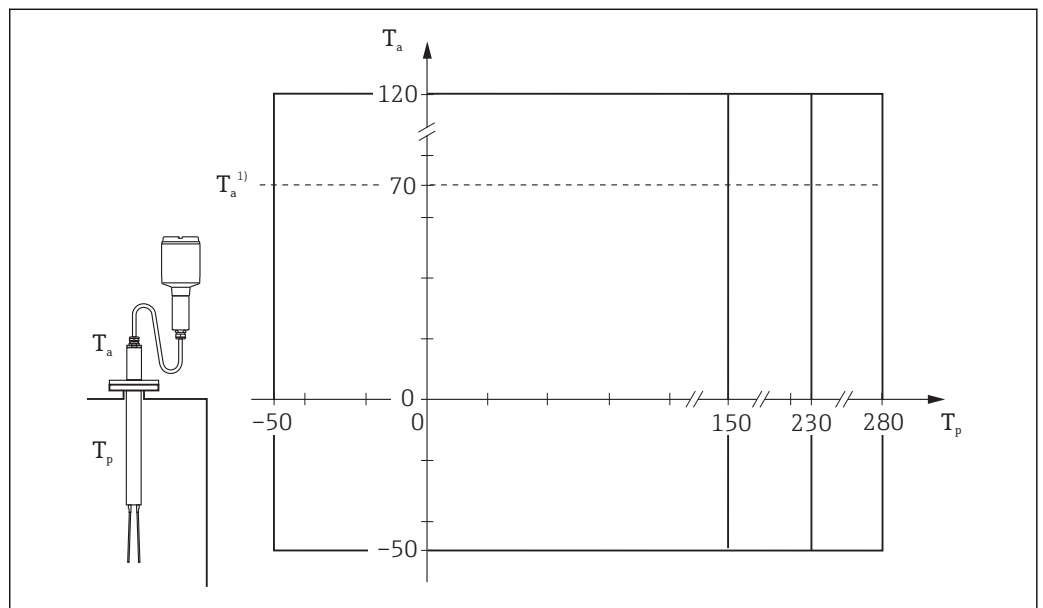
Device type FTM52

	Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Housing	Ga/Gb Ex d [ia Ga] IIC T6 X Ga/Gb Ex d e [ia Ga] IIC T6 X Ga/Gb Ex d [ia Ga] IIC T6 X Ga/Gb Ex d e [ia Ga] IIC T6 X	Position 6 (Electronics; Output) = 1, 2, 5 $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ Position 6 (Electronics; Output) = 4 $-50\text{ °C} \leq T_a \leq +60\text{ °C}$	$-50\text{ °C} \leq T_p \leq +80\text{ °C}$
Sensor	Ga/Gb Ex ia IIC T6 X	$-50\text{ °C} \leq T_a \leq +80\text{ °C}$	

	Type of protection	Ambient temperature T_a (ambient): housing	Process temperature T_p (process)
Housing	Ex ta [ia Da] IIIC T80 °C T ₅₀₀ 130 °C Da X ¹⁾ Ex ta [ia Da] IIIC T90 °C Da X and Ex tb [ia Da] IIIC T90 °C Db X	$-50\text{ °C} \leq T_a \leq +70\text{ °C}$	$-50\text{ °C} \leq T_p \leq +80\text{ °C}$
Sensor	Ex ia IIIC Txx °C +10K Da X ²⁾ Ex ia IIIC Txx °C +10K Da X and Ex ia IIIC Txx °C +10K Db X ²⁾	$-50\text{ °C} \leq T_a \leq +80\text{ °C}$	

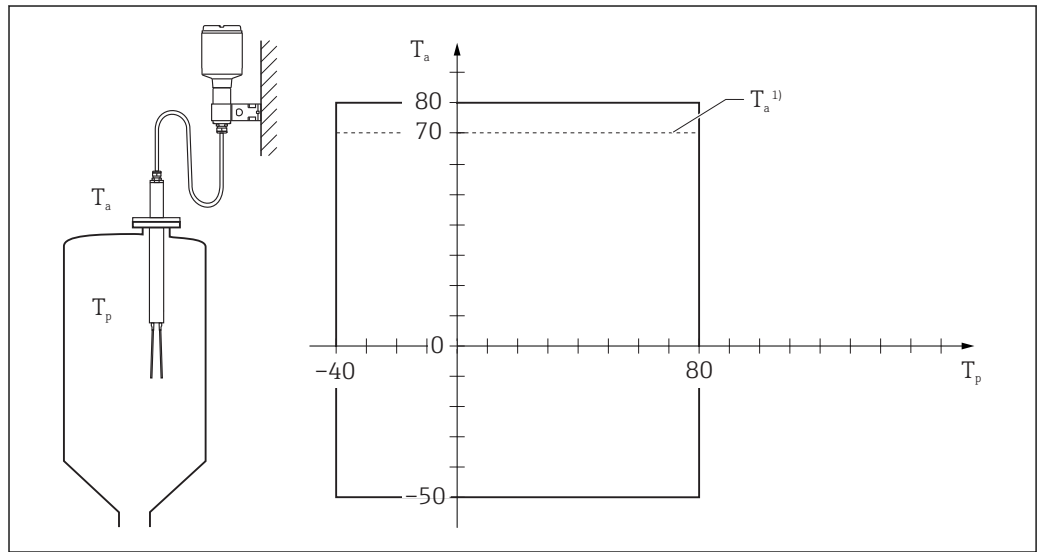
- 1) FEM55
- 2) depending on process temperature

Device type FTM50, FTM51



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- T_a Ambient temperature in °C
- T_p Process temperature in °C
- 1 T_a at housing: Restriction to 70 °C

Device type FTM52



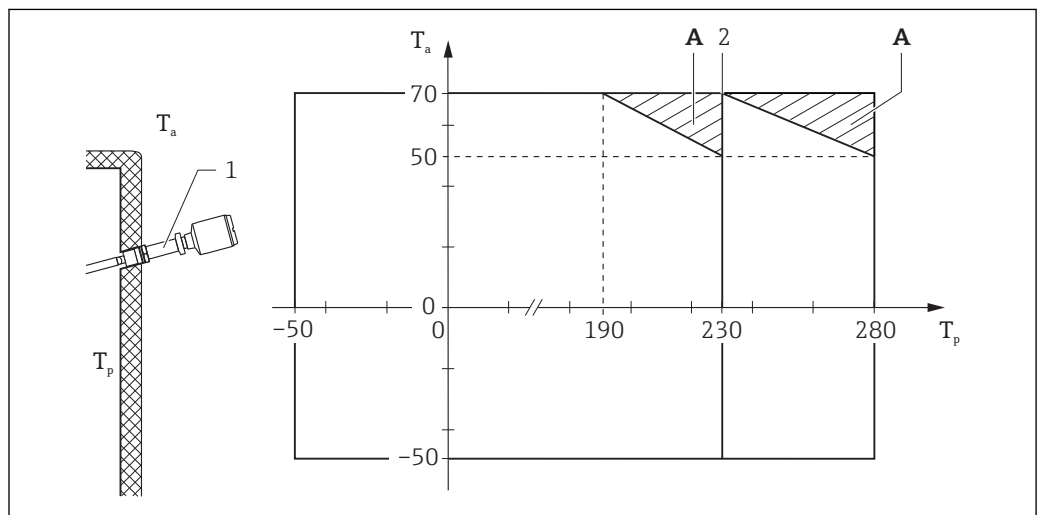
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- T_a Ambient temperature in °C
- T_p Process temperature in °C
- 1 T_a at housing: Restriction to 70 °C

High-temperature version

Device type FTM50, FTM51



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- T_a Ambient temperature in °C
- T_p Process temperature in °C
- A Additionally utilizable temperature range when using the temperature spacer outside the insulation
- 1 Temperature spacer outside the insulation
- 2 Antistick coating possible up to max. 230 °C

Connection data

<i>Position 6 (Electronics; Output)</i>	Power supply	Output
1	19 to 253 V _{AC}	-
2	10 to 55 V _{DC}	-
4	19 to 253 V _{AC}	253 V _{AC} / 6 A (Ex de version: 4 A) 1 500 VA / cos φ = 1 750 VA cos φ > 0.7
	19 to 55 V _{DC}	30 V _{DC} / 4 A 125 V _{DC} / 0.2 A
5	11 to 36 V _{DC}	-



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