

Safety Instructions

Soliphant M

FTM50, FTM51, FTM52

EAC: Ga/Gb Ex ia IIC T2...T6 X
Ex ia IIIC T** °C Da/Db X



Document: XA01590F-B

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

Soliphant M FTM50, FTM51, FTM52

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Associated documentation	This document is an integral part of the following Operating Instructions: ■ KA00229F/00 (FTM50, FTM51) ■ KA00230F/00 (FTM52)										
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 TP TC 012/2011 Inspection authority: LLC NANIO CCVE (ООО «НАНИО ЦСВЭ») Certificate number: TC RU C-DE.AA87.B.00924 Affixing the certificate number certifies conformity with the following standards (depending on the device version): ■ GOST 31610.0-2014 (IEC 60079-0:2011) ■ GOST 31610.11-2014 (IEC 60079-11:2011) ■ GOST 31610.26-2012 (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 <table><tr><td>FTM5x</td><td>–</td><td>*****</td><td>+</td><td>A*B*C*D*E*F*G*..</td></tr><tr><td>(Device type)</td><td></td><td>(Basic specifications)</td><td></td><td>(Optional specifications)</td></tr></table> * = Placeholder At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders. <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	FTM5x	–	*****	+	A*B*C*D*E*F*G*..	(Device type)		(Basic specifications)		(Optional specifications)
FTM5x	–	*****	+	A*B*C*D*E*F*G*..							
(Device type)		(Basic specifications)		(Optional specifications)							

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
FTM5x	W	EAC Ex ia IIC T** °C Da/Db X ¹⁾ EAC Ga/Gb Ex ia IIC T2...T6 X ¹⁾

1) For detailed information see "Safety instructions: Installation" chapter

Position 6 (Electronics; Output)		
Selected option		Description
FTM5x	5	FEM55; 8/16 mA, 11-36 VDC
	7	FEM57; 2-wire PFM
	8	FEM58; NAMUR + test button (H-L signal)

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
	1	F16 Polyester IP66/67 NEMA Type 4X Encl. + transparent cover
	3	F17 Alu IP66/67 NEMA Type 4X Encl.
	5	F13 Alu IP66/68 NEMA Type 4X Encl.
	6	F27 316L IP67/68 NEMA Type 4X/6P Encl.
	7	F15 316L hygiene IP66/67 NEMA Type 4X/6P Encl.

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

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)
- 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

Permitted ambient temperature range at the electronics housing:
 $-50^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$

- Observe the information in the temperature tables.
- 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 ($\leq 0.5\text{ m}$) generating strong electrostatic charges.

Basic specification, Position 7 (Type of Probe) = D, E, G, H

The probe version with separate housing is only suited for fixed installation.

Basic specification, Position 7 (Type of Probe) = D, E

Avoid electrostatic charging of the connecting cable between the separate housing and the sensor.

Basic specification, Position 7 (Type of Probe) = D, E

and Basic specification, Position 8 (Housing) = H, 1, 3, 5

In Zone 0 not permitted.

Basic specification, Position 8 (Housing) = H, 1, 3, 5

Avoid sparks caused by impact and friction.

Basic specification, Position 8 (Housing) = 1

Avoid electrostatic charging of the housing (e.g. friction, cleaning, maintenance, strong medium flow).

**Safety instructions:
Installation**

Position 1 (Approval) = W in connection with Position 7 (Type of Probe) = A	
FTM50 FTM51	Ex ia IIIC T90 °C Da/Db X Ga/Gb Ex ia IIC T2...T6 X ¹⁾ Ga/Gb Ex ia IIC T3...T6 X ²⁾
FTM52	Ex ia IIIC T90 °C Da/Db X Ga/Gb Ex ia IIC T2...T6 X

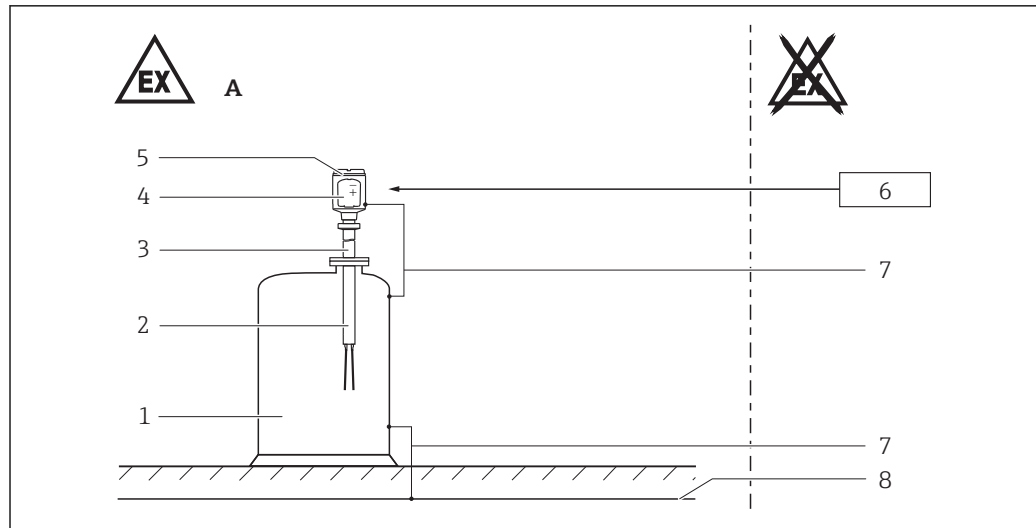
- 1) Only in connection with Position 11 (Additional Option 2) = F, H, J, K, Y
 2) Only in connection with Position 11 (Additional Option 2) = A, C

Position 1 (Approval) = W in connection with Position 7 (Type of Probe) = D, E	
Electronics housing FTM5x	Ex ia IIIC T90 °C Da/Db X Ga/Gb Ex ia IIC T2...T6 X Ga/Gb Ex ia IIC T3...T6 X
Sensor housing FTM5x	Ex ia IIIC T90 °C Da/Db X ¹⁾
Sensor housing FTM50 FTM51	Ga/Gb Ex ia IIC T2...T6 X Ga/Gb Ex ia IIC T3...T6 X
Sensor housing FTM52	Ga/Gb Ex ia IIC T2...T6 X

- 1) Designation due to limited space only in this XA; not on the nameplate

Position 1 (Approval) = W in connection with Position 7 (Type of Probe) = G, H	
Electronics housing FTM5x	Ex ia IIIC T90 °C Da/Db X Ga/Gb Ex ia IIC T2...T6 X Ga/Gb Ex ia IIC T3...T6 X
Sensor housing FTM5x	Ex ia IIIC T90 °C Da/Db X ¹⁾
Sensor housing FTM50 FTM51	Ga/Gb Ex ia IIC T2...T6 X ^{1), 2)} Ga/Gb Ex ia IIC T3...T6 X ^{1), 3)}
Sensor housing FTM52	Ga/Gb Ex ia IIC T2...T6 X ¹⁾

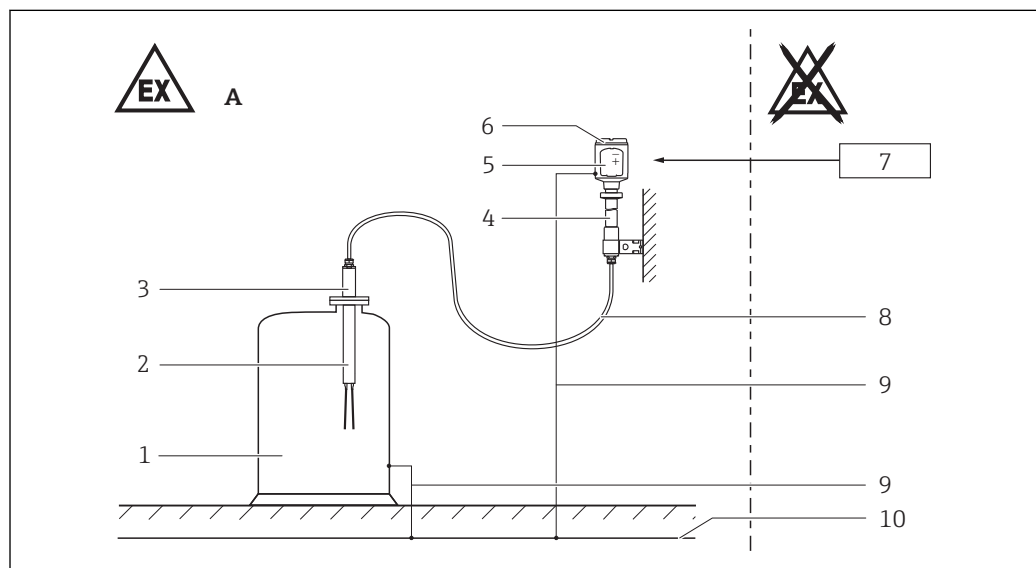
- 1) Designation due to limited space only in this XA; not on the nameplate
 2) Only in connection with Position 11 (Additional Option 2) = F, H, J, K, Y
 3) Only in connection with Position 11 (Additional Option 2) = A, C



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- A Basic specification, Position 8 (Housing) = 6, 7 and Position 7 (Type of Probe) = A: Zone 1, Zone 21
 Basic specification, Position 8 (Housing) = H, 1, 3, 5 and Position 7 (Type of Probe) = A: Zone 1, Zone 21
- 1 Tank, Hazardous area Zone 0, Zone 1, Zone 20, Zone 21
- 2 Version
- 3 Temperature separator (optional at 150 °C)
- 4 Electronic insert; Electronic compartment Ex ia
- 5 Housing
- 6 Power supply
- 7 Potential equalization line
- 8 Potential equalization



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- A Basic specification, Position 8 (Housing) = 6, 7 and Position 7 (Type of Probe) = G, H: Zone 1, Zone 21
 Basic specification, Position 8 (Housing) = H, 1, 3, 5 and Position 7 (Type of Probe) = D, E, G, H: Zone 1, Zone 21
- 1 Tank, Hazardous area Zone 0, Zone 1, Zone 20, Zone 21
- 2 Version
- 3 Sensor housing
- 4 Temperature separator (optional at 150 °C)
- 5 Electronic insert; Electronic compartment Ex ia
- 6 Electronics housing
- 7 Power supply
- 8 Connecting cable
- 9 Potential equalization line
- 10 Potential equalization

- Connect the device using suitable cable and wire entries of protection type "Intrinsic safety (Ex i)".
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.
- 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.
- 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).
- Use a process connection seal that meets the materials compatibility and temperature requirements.
- Support extension tube of the device if a dynamic load is expected.
- Continuous service temperature of the connecting cable: -40 °C to $\geq +85\text{ °C}$; in accordance with the range of service temperature taking into account additional influences of the process conditions.
For Zone 20 applications with complete immersion $T_{a,max} +35\text{ K}$.

Basic specification, Position 8 (Housing) = 1, 3, 6, 7

Perform the following to achieve the degree of protection IP66/67:

- Screw the cover tight.
- Mount the cable entry correctly.

Basic specification, Position 8 (Housing) = H, 5

Perform the following to achieve the degree of protection IP66/68:

- Screw the cover tight.
- Mount the cable entry correctly.

Accessory high pressure sliding sleeve

The high pressure sliding sleeve can be used for a continuous setting of the switch point and is suited for zone division if mounted properly (see Operating Instructions).

Application in gas

- 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 $+25\text{ bar}$ (FTM50/51), -1 to $+2\text{ bar}$ (FTM52), dependent on process connection (see Operating Instructions).

Intrinsic safety

- The device is only suitable for connection to certified, intrinsically safe equipment with explosion protection Ex ia.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{rms} .
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.

Potential equalization

Integrate the device into the local potential equalization.

Safety instructions: Zone 0

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
 - Temperature: -20 to $+60\text{ °C}$
 - 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.
- Associated devices with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits are preferred.
- Only use the device in media to which the silicone rubber potting compound of the electronic insert and the housing made of 316L have sufficient durability.
- Only use the device in media to which the wetted materials have sufficient durability (e.g. process connection seal).
- If used under non-atmospheric conditions and if the manufacturer's specifications are observed: The sensor approved for the pressure vessel (Zone 0) does not cause any ignition hazards.

**Safety instructions:
Zone 0, Zone 20**

The device is designed for operation in Zone 0 or Zone 20. In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

Temperature tables

Application in gas:

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

Type Version	Temperature class	Process temperature T_p (process): sensor	Ambient temperature T_a (ambient): electronics
FTM50, FTM51 150 °C, 230 °C, 280 °C	T6	-50 to +85 °C	-50 to +55 °C <i>Basic specification, Position 8 (Housing) = 1: -40 to +55 °C</i>
FTM52 80 °C	T6	-40 to +80 °C	
FTM50, FTM51 150 °C, 230 °C, 280 °C	T5	-50 to +100 °C	→  3,  11 →  4,  12 →  5,  13
FTM50, FTM51 150 °C, 230 °C, 280 °C	T4	-50 to +135 °C	
FTM50, FTM51 150 °C 230 °C, 280 °C	T3	-50 to +150 °C	
	T3	-50 to +200 °C	
FTM50, FTM51 230 °C, 280 °C	T2	-50 to +230 °C/+280 °C	

Application in dust:

Deposited material with a layer up to 5 mm

Type	Surface temperature T	Process temperature T_p (process): sensor	Ambient temperature: probe with Basic specification, Position 7 (Type of Probe) = D, E, G, H	Ambient temperature T_a (ambient): electronics
FTM50, FTM51	Sensor: $T_{p,max} +5$ K	-50 to +150 °C -50 to +300 °C	max. 120 °C	-50 to +60 °C <i>Basic specification, Position 8 (Housing) = 1: -40 to +60 °C</i>
FTM52	Housing: $T_{a,max} +5$ K	-40 to +80 °C	max. 80 °C	

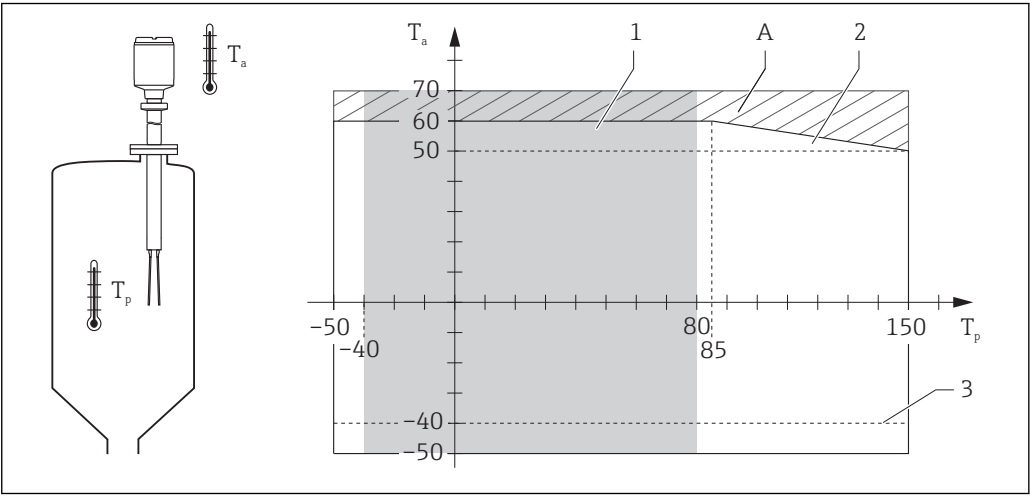
Deposited material with a layer of 500 mm

Type	Surface temperature T_{500}	Process temperature T_p (process): sensor	Ambient temperature: probe with Basic specification, Position 7 (Type of Probe) = D, E, G, H	Ambient temperature T_a (ambient): electronics
FTM50, FTM51	Sensor: $T_{p,max} +24$ K	-50 to +150 °C -50 to +300 °C	max. 120 °C	-50 to +60 °C <i>Basic specification, Position 8 (Housing) = 1: -40 to +60 °C</i>
FTM52	Housing: $T_{a,max} +31$ K	-40 to +80 °C	max. 80 °C	

Compact version

Basic specification, Position 7 (Type of Probe) = A

Device type FTM50, FTM51, FTM52



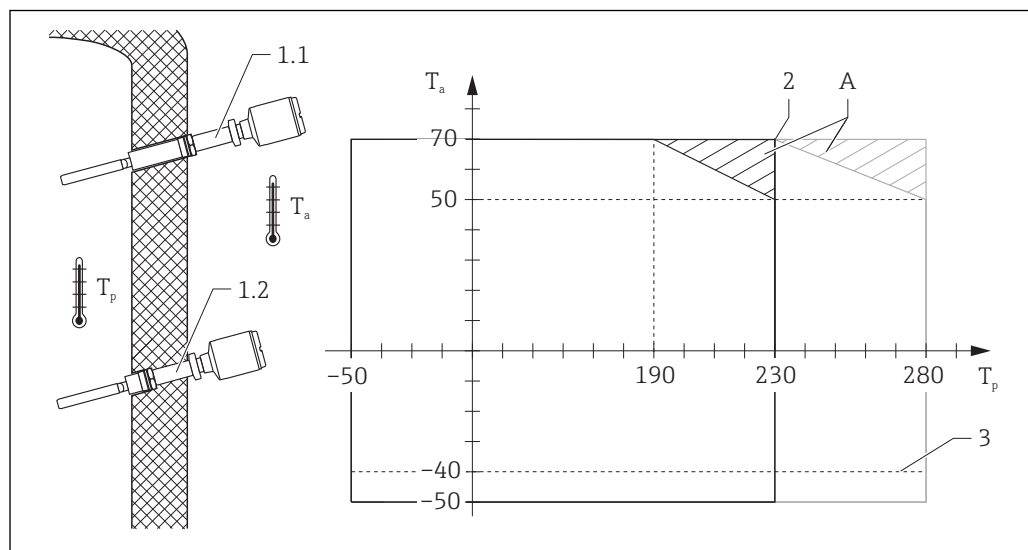
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- T_a Ambient temperature in °C
- T_p Process temperature in °C
- A Additional temperature range for sensors with temperature separator (Basic specification, Position 11 (Additional Option 2) = D, E)
- 1 Device type FTM52
- 2 Device type FTM50, FTM51
- 3 T_a Basic specification, Position 8 (Housing) = 1: Restriction to -40 °C

High temperature version

Basic specification, Position 11 (Additional Option 2) = F, H, J, K, Y

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 separator outside the insulation

1 Temperature separator:

1.1 insulated

1.2 free-standing

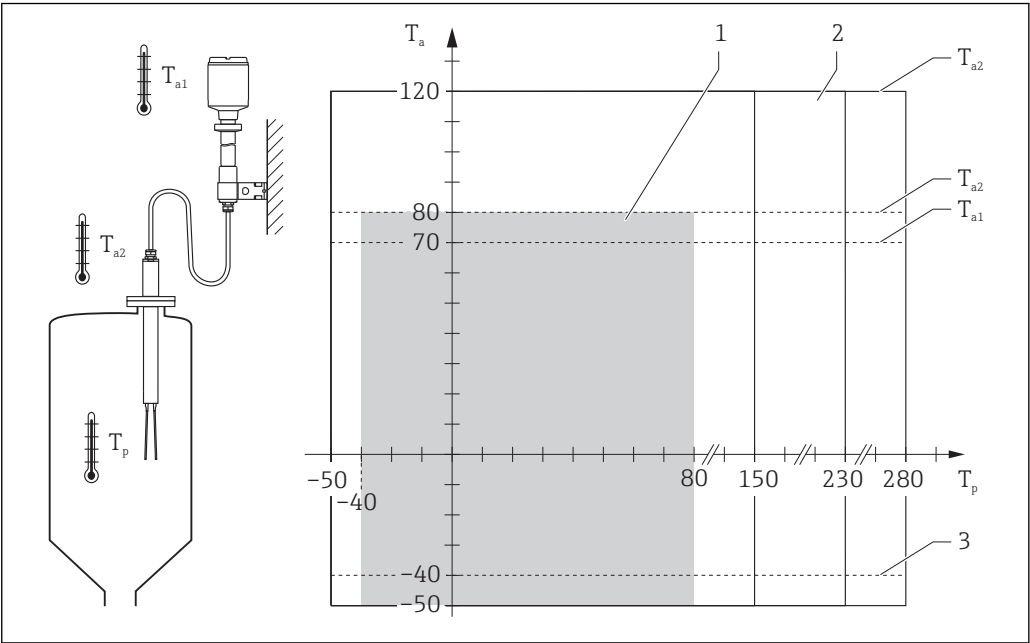
2 Antistick coating: Possible up to max. 230 °C

3 T_a Basic specification, Position 8 (Housing) = 1: Restriction to -40 °C

Version with separate housing

Basic specification, Position 7 (Type of Probe) = D, E, G, H

Device type FTM50, FTM51, FTM52



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- T_a Ambient temperature in °C
- T_p Process temperature in °C
- 1 Device type FTM52
- 2 Device type FTM50, FTM51
- 3 T_a Basic specification, Position 8 (Housing) = 1: Restriction to -40 °C

Connection data

Basic specification, Position 6 (Electronics; Output)	Power supply
5	U _i = 36 V I _i = 100 mA P _i = 1 W L _i = 0 C _i = 0
7	U _i = 16.7 V I _i = 150 mA P _i = 1 W L _i = 0 C _i = 0
8	U _i = 18 V I _i = 52 mA P _i = 170 mW L _i = 0 C _i = 30 nF



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