



Level



Pressure



Flow



Temperature

Liquid
Analysis

Registration

Systems
Components

Services



Solutions

Technical Information

Soliphant M FTM50, FTM51, FTM52

Level limit switch

Universal vibration limit switch for fine-grained bulk solids,
also for explosion-hazardous areas



Application

Soliphant M is a robust level limit switch for use in silos containing fine-grained or powdery solids even with a low bulk density.

The various designs mean the device has a wide range of applications. Many certificates are available for use in dust or gas incensive hazard areas.

FTM50 compact design for installation in any direction. A wide range of applications thanks to various variations e.g.

- polished short fork with stainless steel housing (F15) and Tri-Clamp
- coated standard fork with aluminium housing (F17) and flange
- standard fork with 280 °C (540 °F) rating and aluminium housing (F13)

FTM51 with extension pipe up to 4 m (13.1 ft) for installation in any direction

FTM52 with rope up to 20 m (65.6 ft) for installation from above

Typical applications: cereals, flour, cocoa, sugar, animal feed, detergents, dye powder, chalk, gypsum, cement, sand, plastic granules, fly ash

Your benefits

- Market leader in the area of level detection of bulk solids with practical experience since 1967
- SIL2 in accordance with IEC 61508
- No mechanically moving parts: no wear, long operating life
- Insensitive to external vibrations and build-up: maintenance-free operation, independent of bulk solids
- Various electronic inserts: e.g. NAMUR, relay, thyristor and PFM-signal outputs for optimum alignment with the plant control system
- Density setting and switching delay selectable
- Process temperature up to 280 °C (540 °F)
- Choice of coated or polished sensor
- Diagnostic function: warning in the event of impending device failure due to buildup or abrasion.

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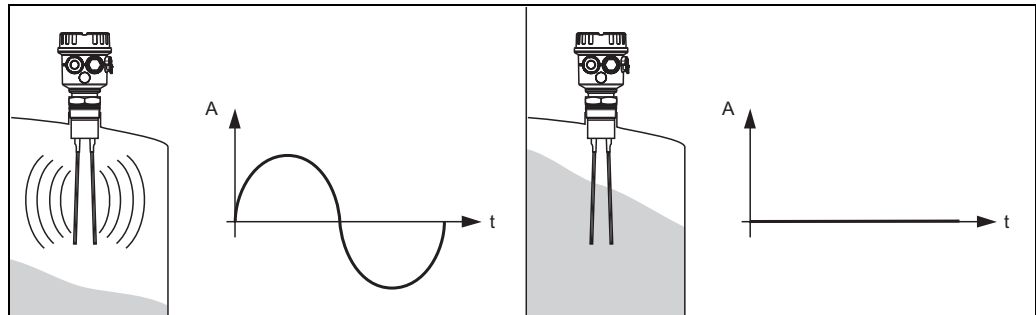
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Function and system design

Measuring principle

A piezoelectric drive excites the tuning fork of Soliphant M FTM50, FTM51 and FTM52 to its resonance frequency. If medium covers the tuning fork, the fork's vibrating amplitude changes (the vibration is damped). Soliphant M's electronics compare the actual amplitude with a target value and indicates whether the tuning fork is vibrating freely or whether it is covered by medium.



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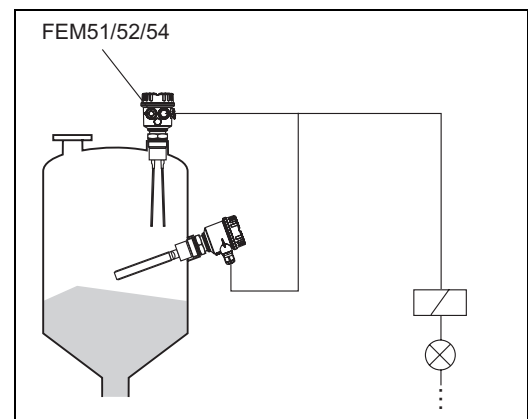
A = amplitude

Measuring system

The components of the measuring system depend on the electronic insert selected.

Level limit switch

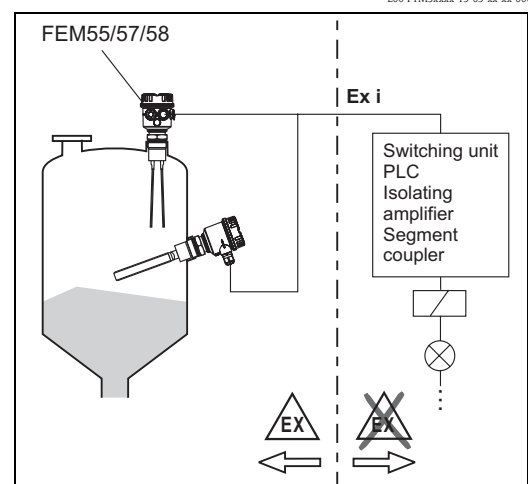
Soliphant M FTM with electronic versions
FEM51, FEM52, FEM54



L00-FTM5xxxx-15-05-xx-xx-000

Level sensor

Soliphant M FTM with electronic versions
FEM55, FEM57, FEM58
for connecting to a separate switching unit
or an isolating amplifier
e.g. Nivotester FTL325N, FTL375N (NAMUR)
or FTL325P, FTL375P (PFM)



L00-FTM5xxxx-15-05-xx-xx-en-000

Electronic versions for level limit switch

FEM51:
Two-wire AC version;
Switch the load directly into the power supply circuit via the thyristor.

FEM52:
Three-wire DC version;
Switch the load via the transistor (PNP) and separate connection.

FEM54:
Universal current version with relay output;
Switch the loads via 2 floating change-over contacts (DPDT).

Electronic versions for level sensor

FEM55:
For separate switching unit; signal transmission 8/16 mA along two-wire cabling.

FEM57:
For separate switching unit; PFM signal transmission;
Current pulses superposed on the power supply along the two-wire cabling.
Self test from the switching unit without changing levels.

FEM58:
For separate switching unit; signal transmission H-L edge 2.2...4.0 / 0.4...1.0 mA to EN 50227 (NAMUR) along two-wire cabling.
Checking of connecting cabling and other devices by pressing a button on the electronic insert.

Cable specifications

Within the indicated standards and guidelines to interference immunity (see also page 15 "Electromagnetic compatibility") normal instrument cable is sufficient. If higher interference levels are present, screened cable must be used.

Immunity to temperature change of connecting cable

The connecting cables must withstand the ambient temperature +5 K.

Connecting cables

- Electronic inserts: cross-section max. 2.5 mm² (AWG 14); strand in ferrule to DIN 46228
- Protective earth in housing: cross-section max. 2.5 mm² (AWG 14)
- Equipotential bonding connection on housing: cross-section max. 4 mm² (AWG 12)

Cable entry

Housing-specific; Phoenix screw terminal on electronic insert

Input

Measured variable

Level (according to the mounting location and the overall length)

Measuring range (detection range)

- FTM50: overall length see Page 20
- FTM51: overall length 300... 4000 mm (12...155 in)
- FTM52: overall length 750...20000 mm (30...800 in)

The measuring range of Soliphant M depends on the medium, mounting location and fork length.
The detection range is located within the length of the fork.

One can distinguish between

- standard fork with a length of 155 mm (6 in) (Bulk density of the medium ≥ 10 g/l (0.7 lbs)) and
- short fork with a length of 100 mm (4 in) (Bulk density of the medium ≥ 50 g/l (3 lbs))

Input signal

Probes covered => little to no vibrating amplitude
Probes not covered => large vibrating amplitude

Selectable frequency monitoring (diagnosis) for detection of abrasion and build-up

Measuring frequency	<ul style="list-style-type: none"> ■ standard fork: approx. 140 Hz ■ short fork: approx. 350 Hz
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Output

Galvanic isolation	<p>FEM51, FEM52, FEM55: Between sensor and power supply</p> <p>FEM54: Between sensor, power supply and load</p> <p>FEM57, FEM58: See switching unit connected</p>
Switch behaviour	Binary
Power-on behaviour	<p>When switching on the power supply the output is set to "signal on alarm".</p> <p>After a maximum of 3 s it switches to the correct output signal.</p>
Fail-safe mode	<p>Minimum/maximum residual current safety selectable on electronic insert. (with FEM57 only at Nivotester)</p> <p>MAX = maximum safety: The output switches safety-oriented when the fork is covered (signal on alarm) For use with overfill protection for example</p> <p>MIN = minimum safety: The output switches safety-oriented when the fork is uncovered (signal on alarm) For use with running empty protection for example</p>
Switching delay	<p>0.5 s when the sensor is covered</p> <p>150 °C (300 °F): 1.5 s when the sensor is uncovered (1.0 s for short fork)</p> <p>230/280 °C (450/540 °F): 2.0 s when the sensor is uncovered (1.0 s for short fork)</p> <p>Can be changed to 5 s for covering and uncovering.</p>
Ex specifications	<p>FEM51, FEM52, FEM54, FEM55:</p> <ul style="list-style-type: none"> – Explosion protection for explosive gas-air mixtures: Ex d, Ex de, XP, intrinsically safe sensor circuit Ex ia, IS – Explosion protection for explosive dust-air mixtures: Dust-Ex to EN 50281-1-1, DIP to EN 61241-0 <p>FEM57, FEM58:</p> <ul style="list-style-type: none"> – Explosion protection for explosive gas-air mixtures: Ex ia, IS (Intrinsically safe power supply + intrinsically safe sensor circuit) – Explosion protection for explosive dust-air mixtures: Ex iaD, IS (Intrinsically safe power supply + intrinsically safe sensor circuit)

FEM51 electronic insert (AC 2-wire)

Power supply	<p>Supply voltage: 19...253 V AC</p> <p>Power consumption: < 1.0 W</p> <p>Residual current consumption (I_R): < 4 mA; 5.5 mA for short fork (in switch-off moment < 1 mA for 100 ms)</p> <p>Short-circuit protection</p> <p>Separation voltage: 3.6 kV</p> <p>FEM51 overvoltage protection: overvoltage category II</p>
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Electrical connection

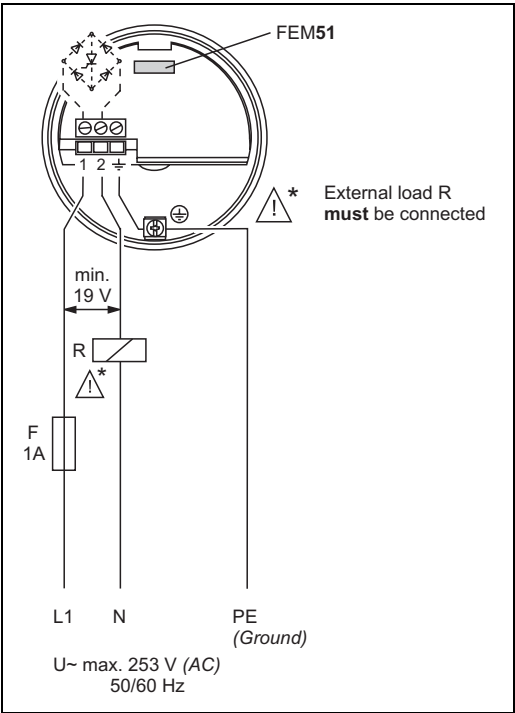
Two-wire AC connection

Always connect in series with a load!

Check the following:

- the residual current consumption in blocked state
- that for low voltage
 - the voltage drop across the load is such that the minimum terminal voltage at the electronic insert (19 V) when blocked is not undershot.
 - the voltage drop across the electronics when switched through is observed (up to 12 V)
- that a relay cannot de-energise with holding power below 1 mA.
If this is the case, a resistor should be connected parallel to the relay (RC module available on request).

When selecting the relay, pay attention to the holding power / rated power
(See below "Connectable load")




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Output signal

I_L = load current (switched through)

I_R = residual current (blocked)

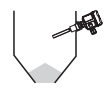



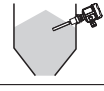



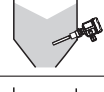



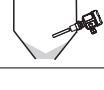











 = lit

 = flashes

 = unlit

L00-FTL5xxxx-07-05-xx-xx-000

* See also "Operating elements" on Page 25.

Safety mode	Level	Output signal	LEDs green yellow red
MAX		1 $\xrightarrow{I_L}$ 2	  
		1 $\xrightarrow{I_R}$ 2	  
MIN		1 $\xrightarrow{I_L}$ 2	  
		1 $\xrightarrow{I_R}$ 2	  
Maintenance required *		1 $\xrightarrow{I_L / I_R}$ 2	  
Instrument failure		1 $\xrightarrow{I_R}$ 2	  

L00-FTM5xxxx-04-05-xx-en-001

Signal on alarm

Output signal on power failure or in the event of device failure: I_R

Connectable load

- For relays with a minimum holding power/rated power > 2.5 VA at 253 V (10 mA) or > 0.5 VA at 24 V (20 mA)
- Relays with a lower holding power/rated power can be operated by means of an RC module connected in parallel
- For relays with a maximum holding power/rated power < 89 VA at 253 V or 8.4 VA at 24 V
- Voltage drop across FEM51 max. 12 V
- Residual current with blocked thyristor max. 4 mA (5.5 mA for short fork)
- Load current max. 350 mA (short-circuit proof)

FEM52 electronic insert (DC PNP)

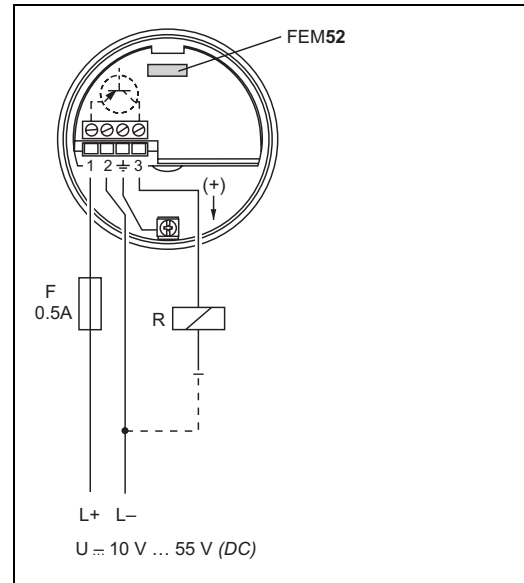
Power supply

DC voltage: 10...55 V
 Ripple: max. 1.7 V, 0...400 Hz
 Current consumption: max. 16 mA
 Power consumption: max. 0.86 W
 Reverse polarity protection
 Separation voltage: 3.6 kV
 FEM52 overvoltage protection: overvoltage category III

Electrical connection

Three-wire DC connection

Preferably used with programmable logic controllers (PLC), DI module as per EN 61131-2.
 Positive signal at switching output of the electronics (PNP).



100-FTM5xxxx-04-05-xx-xx-007

Output signal

I_L = load current
(switched through)

I_R = residual current
(blocked)

= lit
 = flashes

= unlit
 100-FTL5xxxx-07-05-xx-xx-000

* See also "Operating elements" on Page 25.

Safety mode	Level	Output signal	LEDs green yellow red
MAX		$L+ \xrightarrow{I_L} 1 \rightarrow 3$	
		$1 \xrightarrow{I_R} 3$	
MIN		$L+ \xrightarrow{I_L} 1 \rightarrow 3$	
		$1 \xrightarrow{I_R} 3$	
Maintenance required *		$1 \xrightarrow{I_L / I_R} 3$	
Instrument failure		$1 \xrightarrow{I_R} 3$	

100-FTM5xxxx-04-05-xx-xx-007

Signal on alarm

Output signal on power failure or in the event of device failure: < 100 μ A

Connectable load

- Load switched via transistor and separate PNP connection, max. 55 V
- Load current max. 350 mA (cyclical overload and short-circuit protection)
- Residual current < 100 μ A (with transistor blocked)
- Capacitive load max. 0.5 μ F at 55 V, max. 1.0 μ F at 24 V
- Residual voltage < 3 V (for transistor switched through)

FEM54 electronic insert (AC/DC with relay output)

Power supply

Alternating voltage 19...253 V, 50/60 Hz or DC voltage: 19...55 V
 Power consumption: max. 1.5 W
 Reverse polarity protection
 Separation voltage: 3.6 kV
 FEM54 overvoltage protection: overvoltage category II

Electrical connection

Universal current connection with relay output (DPDT)

Power supply:
 Please note the different voltage ranges
 for AC and DC.

Output:
 When connecting an instrument with
 high inductance, provide a spark arrester
 to protect the relay contact.
 A fine-wire fuse (depending on the
 load connected) protects the relay
 contact on short-circuiting.
 Both relay contacts switch simultaneously.

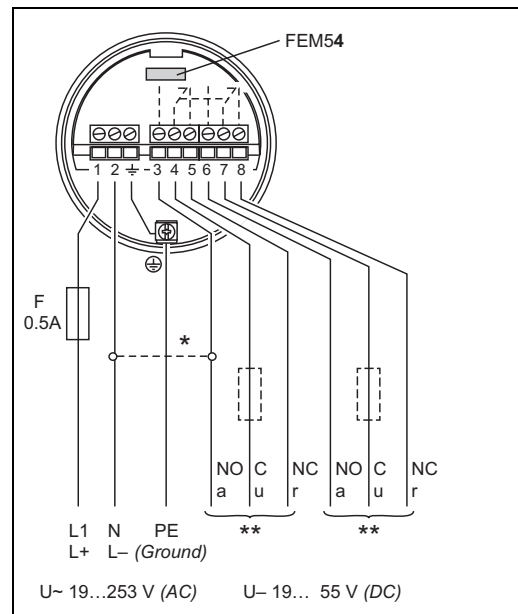
* When jumpered, the relay
 output works with NPN logic.

** See below "Connectable load"



Note!

Please note the different voltage ranges
 for AC and DC.



L00-FTM5xxxx-04-05-xx-xx-004

Output signal



= relay energised



= relay de-energised



= lit



= flashes



= unlit

L00-FTL5xxxx-07-05-
xx-xx-001

* See also "Operating elements"
 on Page 25.

Safety mode	Level	Output signal	LEDs green yellow red
MAX		3 4 5 6 7 8	
		3 4 5 6 7 8	
MIN		3 4 5 6 7 8	
		3 4 5 6 7 8	
Maintenance required *			
Instrument failure		3 4 5 6 7 8	

L00-FTM5xxxx-04-05-xx-xx-008

Signal on alarm

Output signal on power failure or in the event of device failure: relay de-energised

Connectable load

- Loads switched via 2 floating change-over contacts (DPDT)
- I~ max. 6 A (Ex de 4 A), U~ max. 253 V; P~ max. 1500 VA, cos φ = 1, P~ max. 750 VA, cos φ > 0.7
- I- max. 6 A (Ex de 4 A) to 30 V, I- max. 0.2 A to 125 V
- The following applies when connecting a functional low-voltage circuit with double isolation as per IEC 1010: Sum of voltages of relay output and power supply max. 300 V

FEM55 electronic insert (8/16 mA)

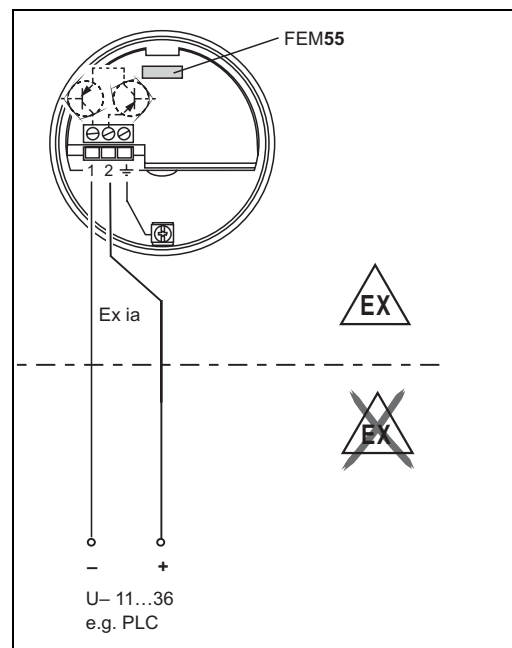
Power supply

Supply voltage: 11...36 V DC
 Power consumption: < 600 mW
 Reverse polarity protection
 Separation voltage: 3.6 kV
 FEM55 overvoltage protection: overvoltage category III

Electrical connection

Two-wire connection for separate switching unit

For connecting to programmable logic controllers (PLC) for example, AI module 4-20 mA to EN 61131-2.
 Output signal jump from high to low current on limit.



L00-FTM5xxxx-04-05-xx-en-000

Output signal

$$\sim 16 \text{ mA} = 16 \text{ mA} \pm 5 \%$$

$$\sim 8 \text{ mA} = 8 \text{ mA} \pm 6 \%$$



= lit



= flashes



= unlit

L00-FTL5xxxx-07-05-xx-xx-000

* See also "Operating elements" on Page 25.

Safety mode	Level	Output signal	LEDs green yellow red
MAX		+ 2 $\xrightarrow{\sim 16 \text{ mA}}$ 1	
		+ 2 $\xrightarrow{\sim 8 \text{ mA}}$ 1	
MIN		+ 2 $\xrightarrow{\sim 16 \text{ mA}}$ 1	
		+ 2 $\xrightarrow{\sim 8 \text{ mA}}$ 1	
Maintenance required *		+ 2 $\xrightarrow{8/16 \text{ mA}}$ 1	
		3.6 mA	
Instrument failure		+ 2 $\xrightarrow{3.6 \text{ mA}}$ 1	

L00-FTM5xxxx-04-05-xx-en-000

Signal on alarm

Output signal on power failure or in the event of device failure: < 3.6 mA

Connectable load

- $R = (U - 11 \text{ V}) / 16.8 \text{ mA}$
- $U = \text{connection DC voltage } 11 \text{ V} \dots 36 \text{ V}$

FEM58 electronic insert (NAMUR H-L edge)



Note!
Only in combination with standard fork (fork length 155 mm (6.1 in)).

Power supply	Supply voltage: 8.2 V DC $\pm 20\%$
	Power consumption: $< 8\text{ mW}$ at $I < 1\text{ mA}$; $< 36\text{ mW}$ at $I = 2.2\text{...}4.8\text{ mA}$
	Separation voltage: 1.9 kV
	Connection data interface: IEC 60947-5-6

Electrical connection

Two-wire connection for separate switching unit

For connecting to isolating amplifiers acc. to NAMUR (IEC 60947-5-6), e.g. FTL325N, FTL375N from Endress+Hauser.

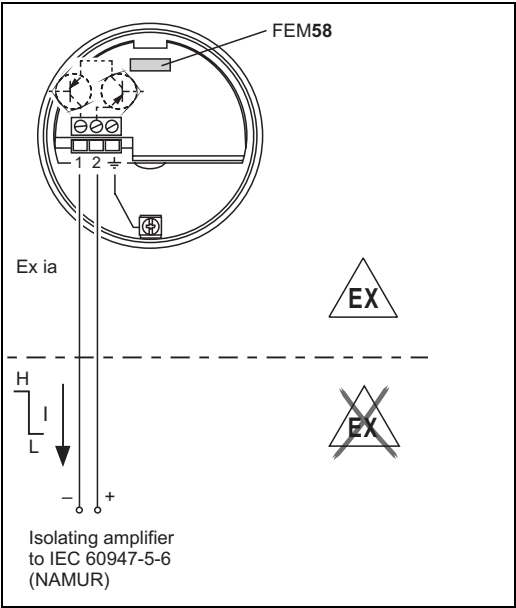
Output signal jump from high to low current on limit.

(H-L edge)

Additional function:
Test button on the electronic insert.
Pressing the button breaks the connection to the isolating amplifier.

Note!
For Ex-d applications, the additional function can only be used if the housing is not exposed to an explosive atmosphere.

Note!
Connecting to multiplexer:
Set clock time to min. 5 s.



L00-FTM5xxxx-04-05-xx-en-005

Output signal

Safety mode	Level	Output signal	LEDs green yellow red
MAX		$\begin{matrix} + \\ 2 \end{matrix} \xrightarrow{2.2 \dots 4.8\text{ mA}} 1$	
		$\begin{matrix} + \\ 2 \end{matrix} \xrightarrow{0.4 \dots 1.0\text{ mA}} 1$	
MIN		$\begin{matrix} + \\ 2 \end{matrix} \xrightarrow{2.2 \dots 4.8\text{ mA}} 1$	
		$\begin{matrix} + \\ 2 \end{matrix} \xrightarrow{0.4 \dots 1.0\text{ mA}} 1$	
Maintenance required *		$\begin{matrix} + \\ 2 \end{matrix} \xrightarrow{0.4 \dots 4.8\text{ mA}} 1$	
Instrument failure		$\begin{matrix} + \\ 2 \end{matrix} \xrightarrow{0.4 \dots 1.0\text{ mA}} 1$	

= lit
 = flashes
 = unlit

L00-FTL5xxxx-07-05-xx-xx-000

* See also "Operating elements" on Page 25.

L00-FTM5xxxx-04-05-xx-en-012

Signal on alarm	Output signal in event of device failure: $< 1.0\text{ mA}$
-----------------	---

Connectable load	■ See Technical Data of isolating amplifier connected according to IEC 60947-5-6 (NAMUR)
	■ Connection also to isolating amplifier with safety engineering ($I = 3\text{...}4.8\text{ mA}$)

FEM57 electronic insert (PFM)

Power supply

Supply voltage: 9.5...12.5 V DC
 Power consumption: < 150 mW
 Reverse polarity protection
 Current consumption: 10...13 mA
 Separation voltage: 2.6 kV

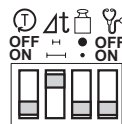
Electrical connection

Two-wire connection for separate switching unit

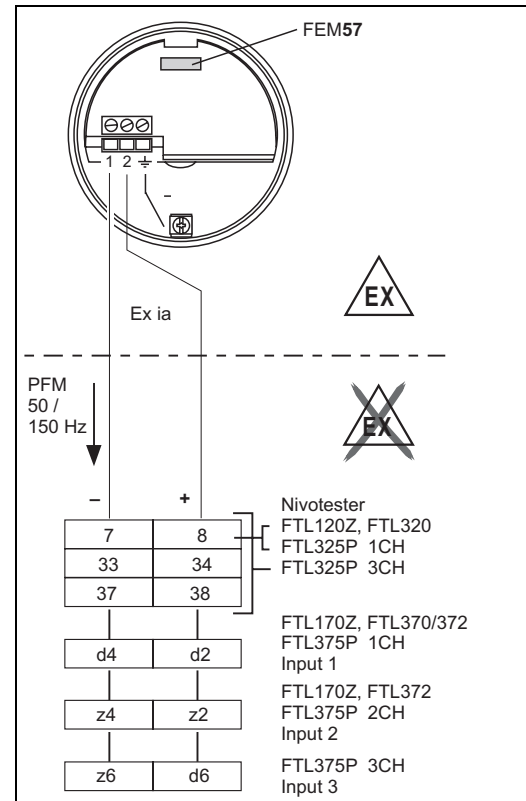
For connecting to switching units
 Nivotester FTL120Z, FTL170Z, FTL320,
 FTL325P, FTL370, FTL372, FTL375P
 from Endress+Hauser.

Output signal jump of PFM signal from high to
 low frequency when sensor is covered.
 Switching between minimum/maximum
 safety in the Nivotester.

Additional function "self test":
 After interruption of the power supply,
 a test cycle is activated which checks the sensor
 and electronics without any change in level.
 For this purpose, the operating elements must be
 configured as follows.



The test is activated and monitored at the
 switching unit.



L00-FTM5xxxx-04-05-xx-en-009

Output signal

☀ = lit
 ⚡ = flashes
 ● = unlit

L00-FTL5xxxx-07-05-
 xx-xx-000

* See also "Operating elements"
 on Page 25

Safety mode	Level	Output signal (PFM)	LEDs green yellow red
		150 Hz 	☀ ☀ ●
		50 Hz 	☀ ● ●
Maintenance required *		150 Hz 	☀ ☀ ☀
		0 Hz 	☀ ● ☀
Instrument failure		0 Hz 	☀ ● ☀

L00-FTM5xxxx-04-05-xx-en-009

Signal on alarm

Output signal on power failure or in the event of device failure: 0 Hz

Connectable load

- Floating relay contacts in connected switching unit Nivotester FTL120Z, FTL170Z, FTL320, FTL325P, FTL370, FTL372 or FTL375P.
- For contact load see the Technical Data of the switching unit.

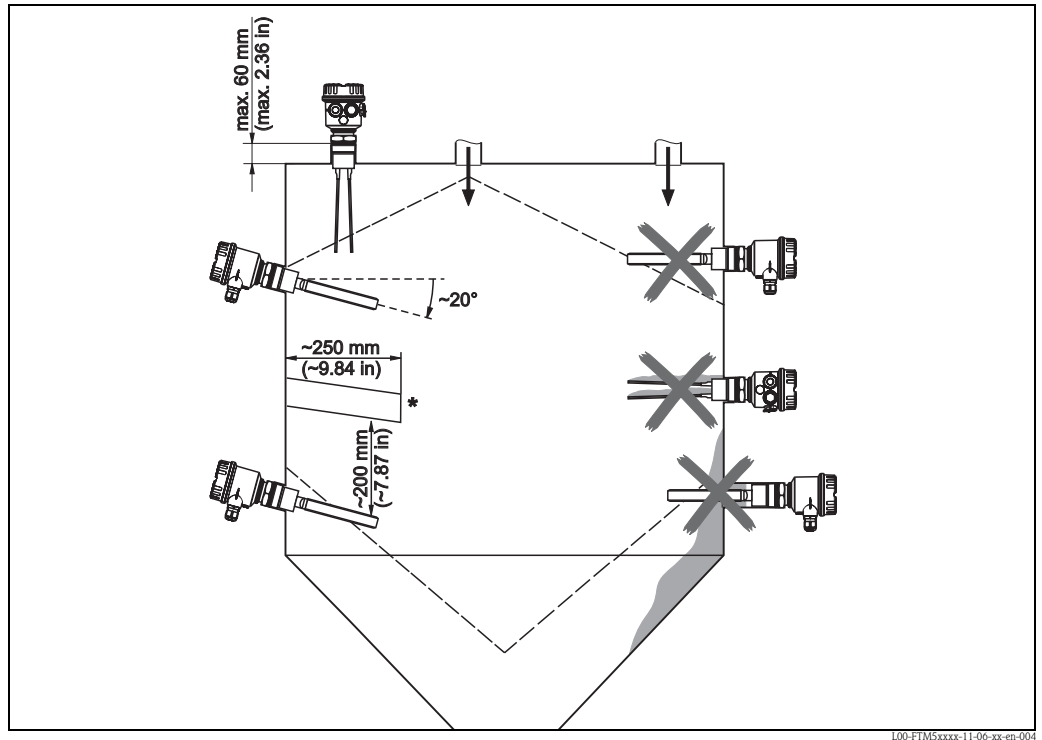
Operating conditions

Installation instructions

Mounting location

e.g. storage or buffer container

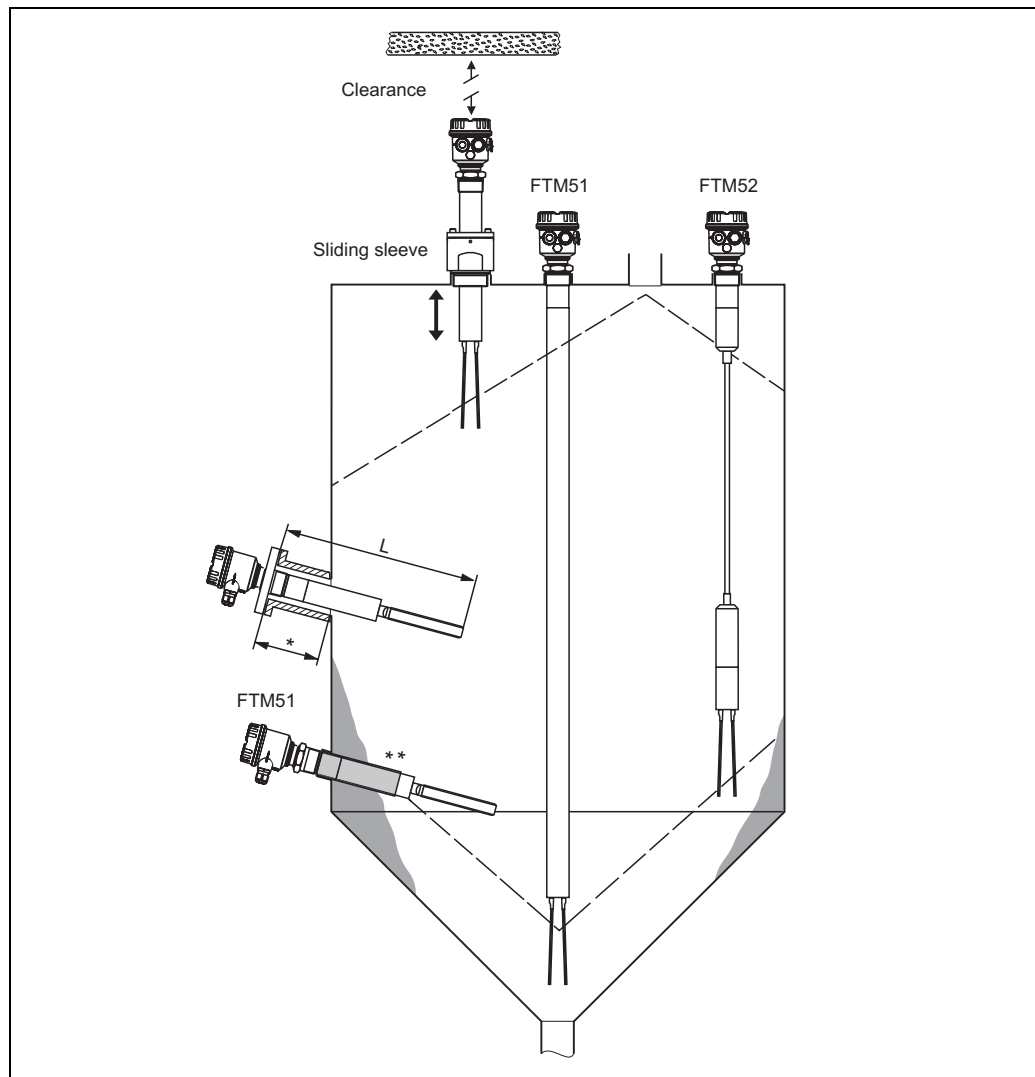
Orientation FTM50



Horizontal installation / Vertical installation

** Protective cover (to be provided by customer)*

Orientation FTM51, FTM52



Horizontal installation / Vertical installation

* Nozzle length; maximum: L - 145 mm (5.71 in) for short fork or L - 200 mm (7.87 in) for standard fork

** Supporting tube (to be provided by customer)

L00-FTM5xxxx-11-06-xx-en-001

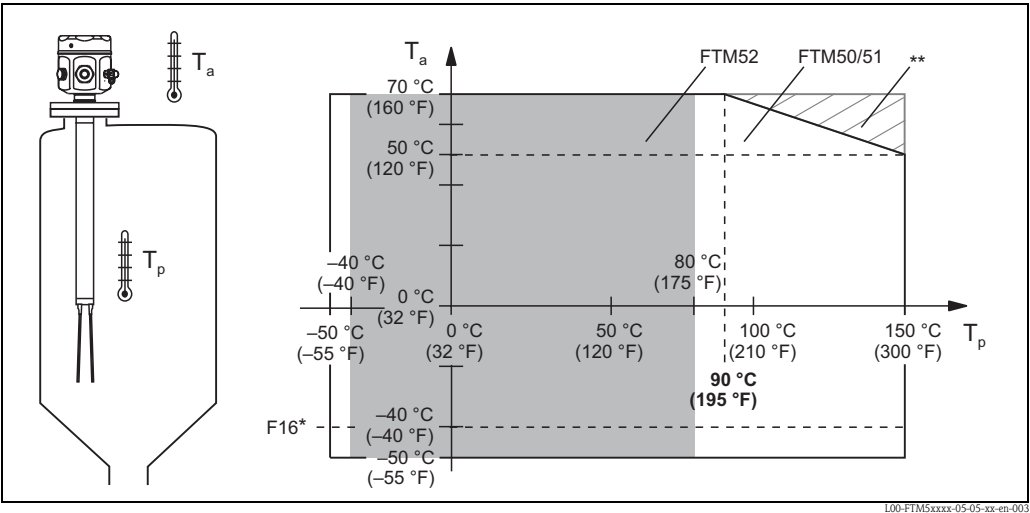
Ambient conditions

Ambient temperature range	-50...+70 °C (-55...+160 °F) (-40...+70 °C with F16 housing (-40...+160 °F with F16 housing))
Storage temperature	-50...+85 °C (-55...180 °F)
Climate class	Climatic protection as per DIN IEC 68 Part 2-38, Fig. 2a
Degree of protection	IP66/IP67, NEMA4X: housing F15, F16, F17, separate housing IP66/IP68, NEMA4X/6P: housing F13, T13
Vibration resistance	to EN 60068-2-64: 0.01 g ² /Hz
Shock resistance	to EN 60068-2-27: 30 g (1.0581 oz)
Electrical safety	IEC 61010, CAN/CSA-C22.2 No. 61010-1-04 US standard UL 61010-1, 2 nd Edition

Electromagnetic compatibility	Interference emission to EN 61326, Electrical equipment Class B, Interference immunity to EN 61326, Annex A (Industrial) and NAMUR Recommendation NE 21 (EMC)
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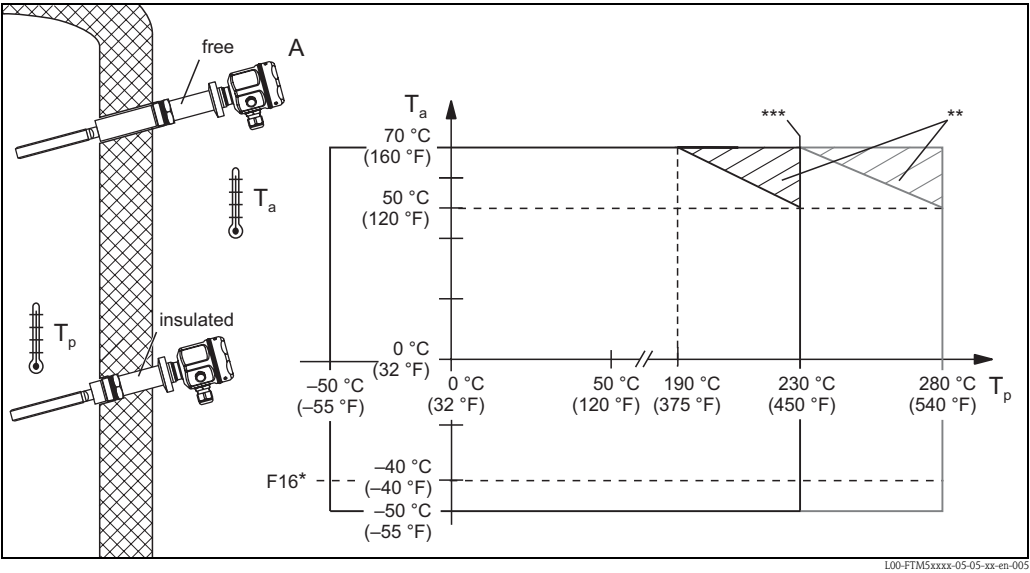
Process conditions

Medium temperature limits	Permitted ambient temperature T_a at housing depending on the process temperature T_p in the container.
Non-hazardous area and Ex d + DIP certificates (Ex ia certificates see Page 36, "Certificates")	



- * Restriction to -40 °C (-40 °F) with F16 housing
- ** Additional temperature range for sensors (FTM50, FTM51) with temperature spacer

High temperature (only FTM50, FTM51)



- * Restriction to -40 °C (-40 °F) with F16 housing
- ** Additionally utilizable temperature range when using the temperature spacer outside the insulation (A)
- *** Antistick coating possible up to max. 230 °C (450 °F)

Thermal shock resistance	■ Maximum 120 K ■ At high temperature 260 K
---------------------------------	--

Limiting medium pressure range

-1...25 bar (-14.5...360 psi)

Maximum Working Pressure (MWP)

FTM50/51: 25 bar (360 psi)

FTM52: 2 bar (30 psi) (6 bar (90 psi) for Ex d, Ex de and FM/CSA XP)

The specified range may be reduced by the selected process connection.

The pressure rating (PN) specified on the flanges refers to a reference temperature of 20 °C (68 °F), for ASME flanges to 100 °F. Observe pressure-temperature dependency.

The pressure values permitted at higher temperatures can be found in the following standards:

■ pR EN 1092-1: 2005 Table, Appendix G2

With regard to its stability property, the material 1.4435 is identical to 1.4404 which is grouped under 13E0 in EN 1092-1 Tab. 18. The chemical composition of the two materials can be identical.

■ ASME B 16.5a - 1998 Tab. 2-2.2 F316

■ ASME B 16.5a - 1998 Tab. 2.3.8 N10276

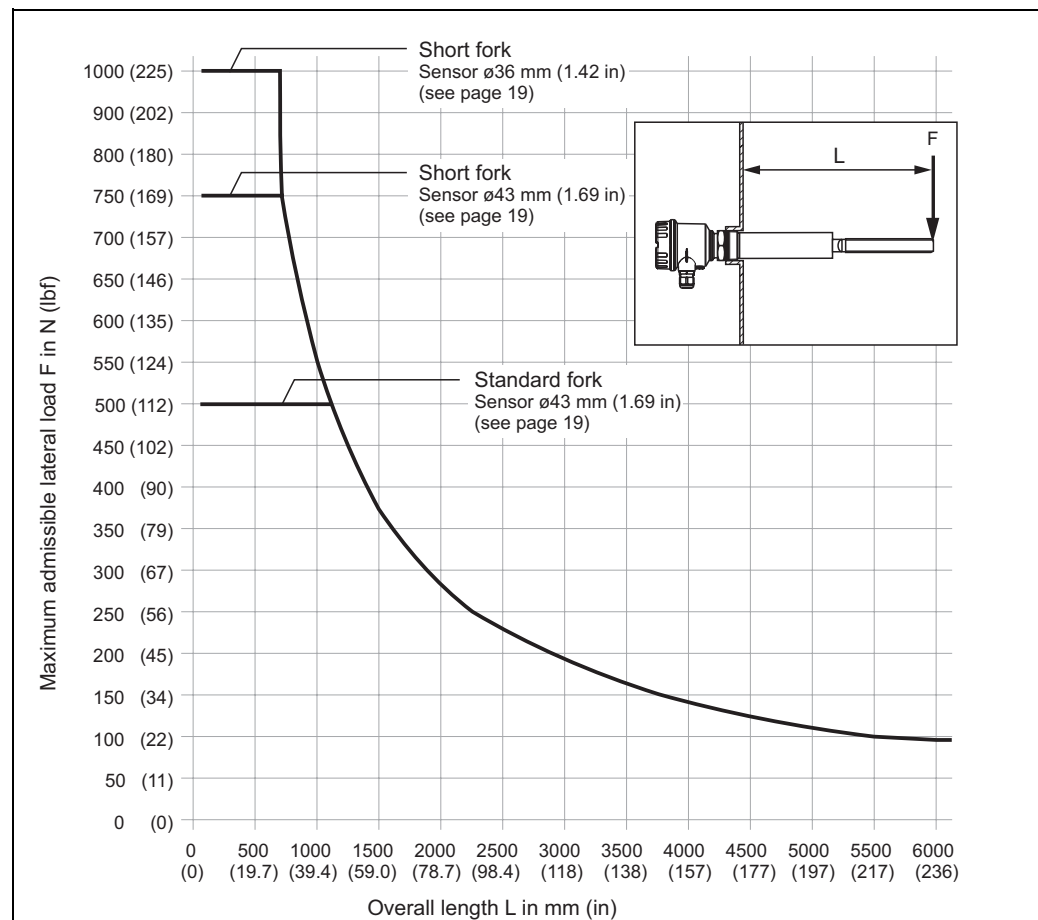
■ JIS B 2220

Burst pressure

FTM50/51: 100 bar (1450 psi)

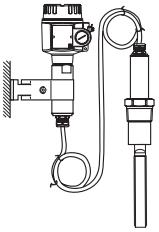
State of aggregation

Solids

Grain size $\leq 10 \text{ mm}$ ($\leq 0.39 \text{ in}$)**Bulk density** $\geq 10 \text{ g/l}$ ($\geq 0.7 \text{ lbs}$) (standard fork) $\geq 50 \text{ g/l}$ ($\geq 3 \text{ lbs}$) (short fork)**Lateral load (static)****Tensile strength rope FTM52**

3000 N (674.4 lbf)

Mechanical construction

	Polyester housing F16	Stainless steel housing F15	Aluminium housing F17	Aluminium housing F13	Aluminium housing T13 with separate connection comp.	Separate housing 
Dust-Ex	X (not for II 1/2 D)	X	X	X	X	X
Ex ia	X	X	X	X	X	X
EEx nA/nL/nC	X	X	X	X	X	X
Ex d	—	—	—	X	X	X
Ex de	—	—	—	—	X	X
IP66/67	X	X	X	—	—	X
IP66/68	—	—	—	X	X	—
Recommended in the event of severe external vibrations	—	—	—	X	X	X
Goretex filter	X	X	X	—	—	—

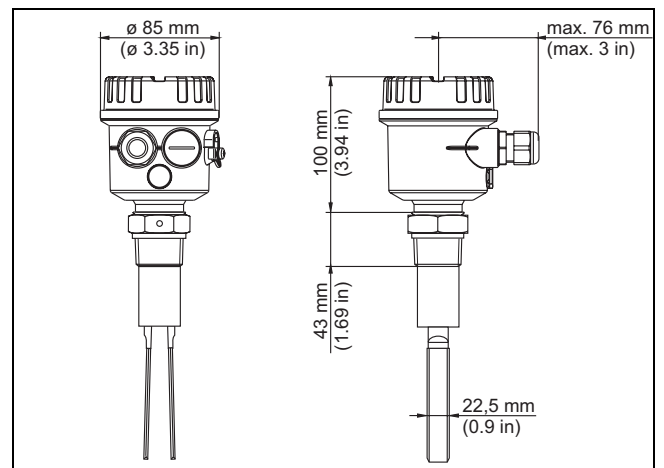
Design, dimensions

Housing and process connection

Polyester housing (F16)

Process connection:

R 1½
1½ NPT
1¼ NPT



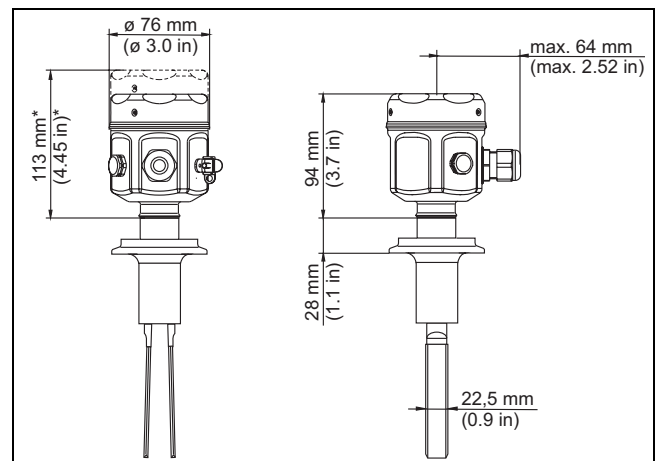
L00-FTM5xxxx-06-05-xx-en-008

Stainless steel housing (F15)

Process connection:

Tri-Clamp

* Stainless steel cover with glass insert

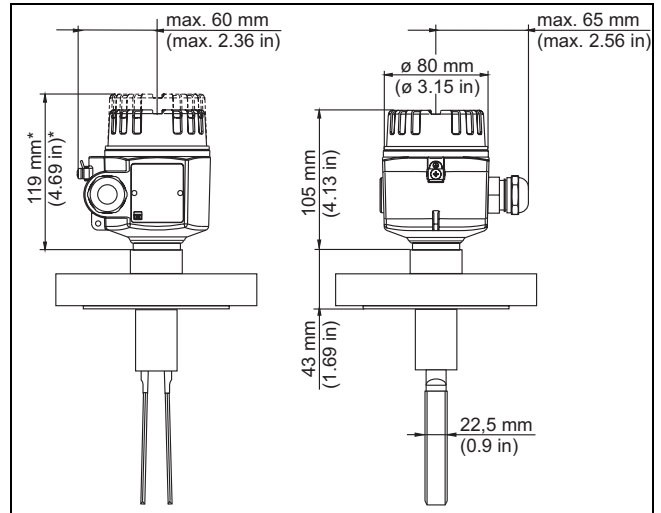


L00-FTM5xxxx-06-05-xx-en-009

Aluminium housing (F17)

Process connection:
Flange

* Aluminium cover with glass insert



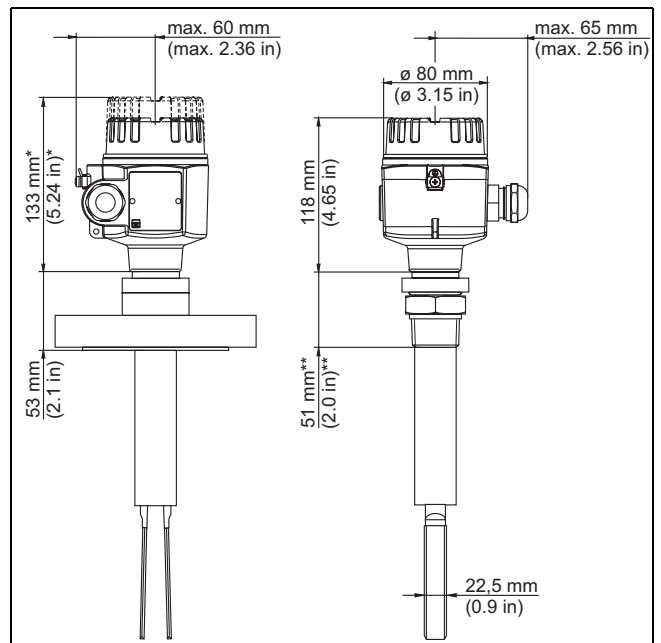
100-FTM5xxxx-06-05-xx-en-010

Aluminium housing (F13)

Process connection:
For Ex d for FTM51 and FTM52

* Aluminium cover with glass insert

** For Tri-Clamp 36 mm (1.42 in)



100-FTM5xxxx-06-05-xx-en-011

Aluminium housing (T13)

with separate connection compartment

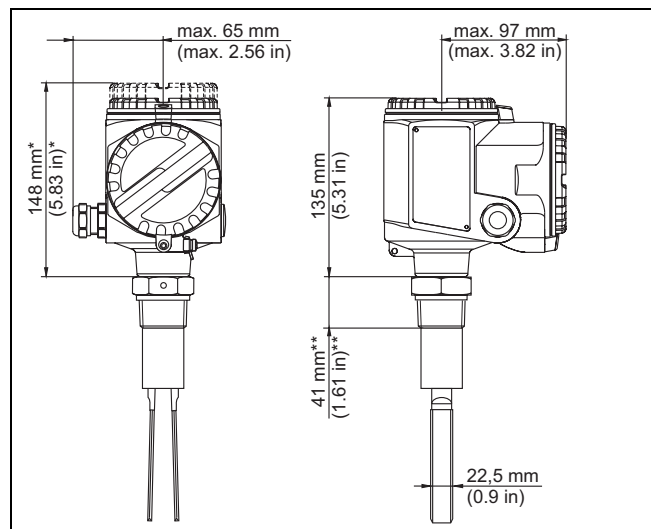
Process connection:
For Ex d(e) for FTM50

For Ex d(e) for FTM51 and FTM52:
Dimensions of flange and thread
see previous diagram

R 1½
1½ NPT
1¼ NPT

* Aluminium cover with glass insert

** For Tri-Clamp 16 mm (0.63 in)



100-FTM5xxxx-06-05-xx-en-012

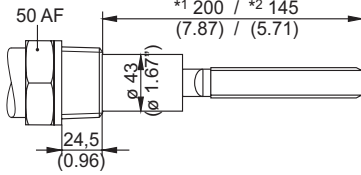
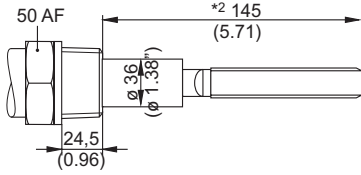
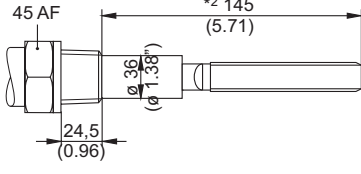
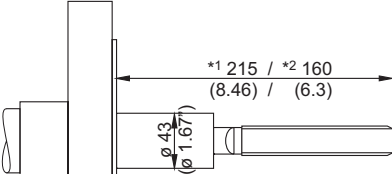
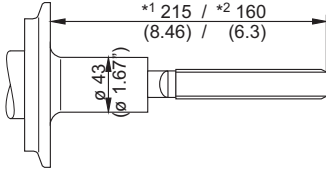
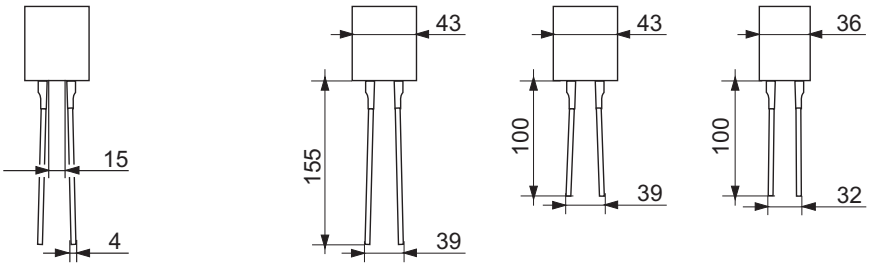
Weight	Depends on type
Material	<p>Housing:</p> <p>316L (1.4404, 1.4435), PBT, aluminium coated</p> <p>Process connections:</p> <ul style="list-style-type: none">■ 316L (1.4404, 1.4435)■ PTFE coating: prevents build-up■ ETFE coating: prevents corrosion <p>Sensor:</p> <ul style="list-style-type: none">■ 316L (1.4404, 1.4435), FTM52: PUR/silicone rope insulation, PBT■ PTFE coating: prevents build-up■ ETFE coating: prevents corrosion

Temperature spacer	Length and version depend on temperature and certificate:		
	150 °C (300 °F)	230 °C (450 °F)	280 °C (540 °F)

L00-FTM5xxxx-06-05-xx-xx-019

	150 °C (300 °F)		230 °C (450 °F)	280 °C (540 °F)
Certificate	A, 1, 2, 3, 4, 7, 8, C, D, F, X	5, 6, H, Z	not applicable	not applicable
L for housing F15, F16, F17	145 mm (5.71 in)	—	175 mm (6.89 in)	215 mm (8.46 in)
L for housing F13, T13	145 mm (5.71 in)	165 mm (6.5 in)	165 mm (6.5 in)	205 mm (8.07 in)

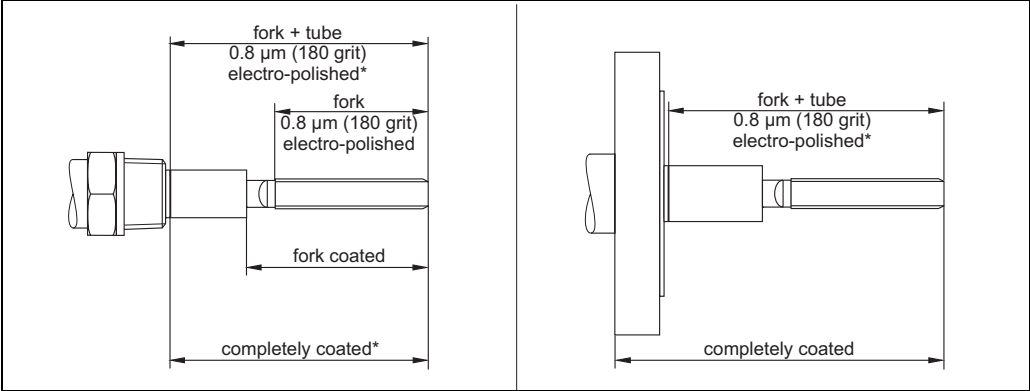
Process connections

Process connection	Code	Dimensions (FTM50) mm (in)	Accessories	Pressure Temperature (for FTM50/51)
1½ NPT ANSI B 1.20.1 Sensor ø 43 mm ø 1.67" R 1½ EN 10226	GJ GG			max. 25 bar (max. 360 psi) max. 280 °C (max. 540 °F)
1½ NPT ANSI B 1.20.1 Sensor ø 36 mm ø 1.38"	GX			max. 25 bar (max. 360 psi) max. 150 °C (max. 300 °F)
1¼ NPT ANSI B 1.20.1 Sensor ø 36 mm ø 1.38"	GK			max. 25 bar (max. 360 psi) max. 150 °C (max. 300 °F)
Flange ANSI B 16.5 EN 1092-1 (DIN 2527 B) JIS B2220	A# B# K#		Seal according to design Installed on site In conformity with FDA*	See nominal pressure of flange, however max. 25 bar (max. 360 psi) max. 280 °C (max. 540 °F)
Tri-Clamp 2" ISO 2852 Sensor ø 43 mm ø 1.67"	TD		Clamping ring and front seal Installed on site In conformity with FDA*	max. 16 bar (max. 230 psi) max. 120 °C (max. 250 °F) max. 2 bar (max. 30 psi) max. 150 °C (max. 300 °F)
 <p>Fork dimensions: standard fork and short fork</p> <p>* Material in conformity with FDA as per 21 CFR Part 177.1550/2600 *¹ overall length standard fork *² overall length short fork</p> <p style="text-align: right;">L00-FTM5xxxx-06-05-xx-xx-030</p>				

Coated or polished

Process connection: Thread

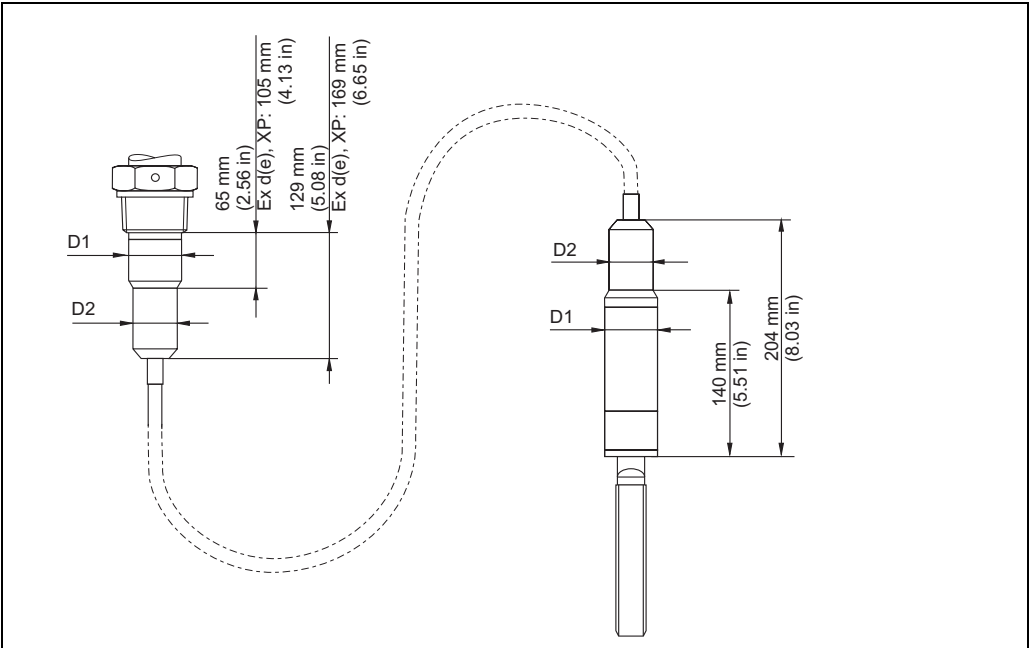
Process connection: Flange



L00-FTM5xxxx-06-05-xx-en-007

* Polished or coated only up to the welding seam

FTM52 rope version

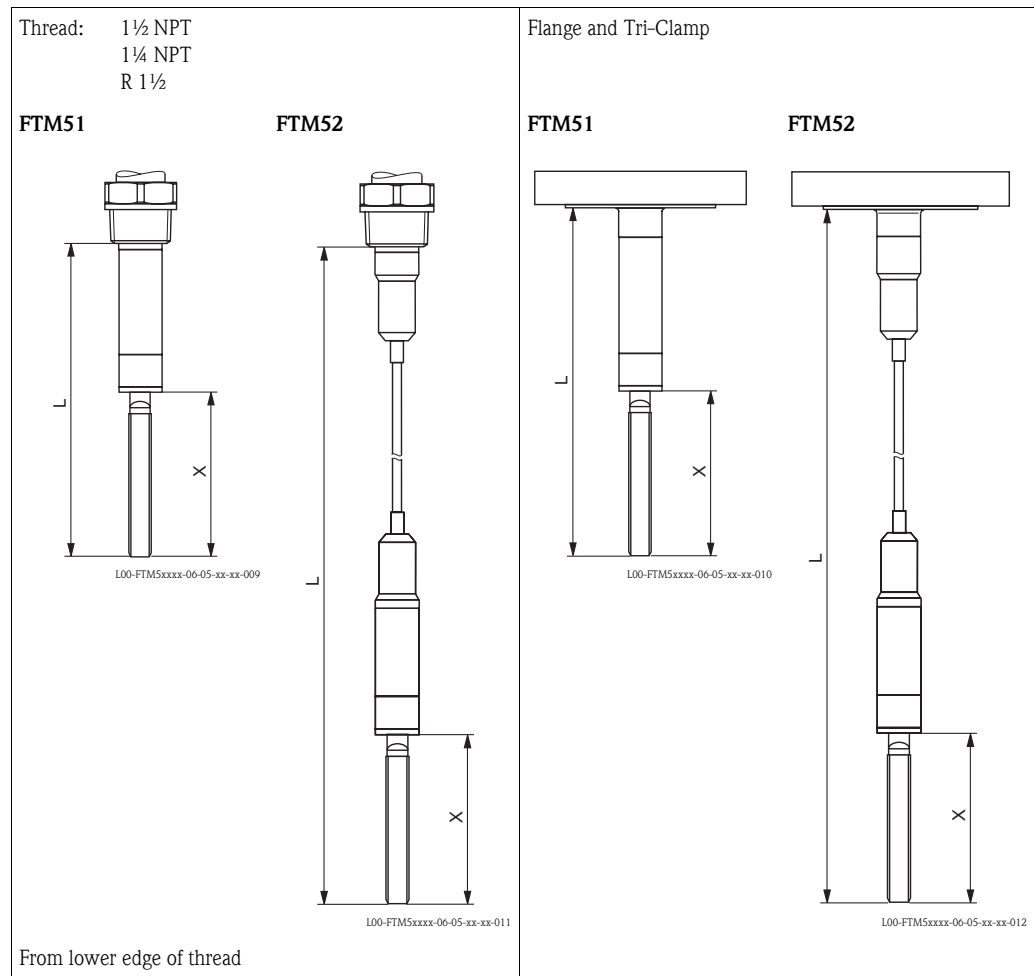


L00-FTM5xxxx-06-05-xx-en-015

	Process connection: GJ, GG, A#, B#, K#, TD	Process connection: GK, GX
ø D1	43 mm (1.67 in)	36 mm (1.42 in)
ø D2	37 mm (1.46 in)	37 mm (1.46 in)

Overall length

For FTM51, depends on process connection and selected pipe extension,
for FTM52, depends on process connection and selected rope length



L = overall length, X = fork length

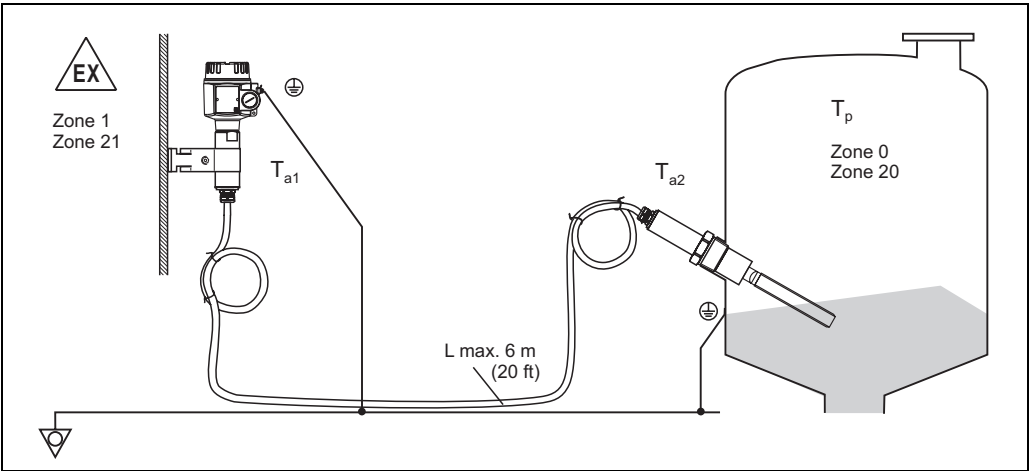
Further informations to overall length/fork length see "Measuring range" on Page 5.

The diameter of the FTM51 pipe extension is identical to that of FTM50
(see also "Process connections"/"Dimensions", Page 20 ff.)

Separate housing

Application: for extended ambient temperature and applications with confined installation location (e.g. filling nozzle applications).

The cable between the separate housing and sensor can be shortened at the customer's.



L00-FTM5xxxx-15-06-xx-en-002

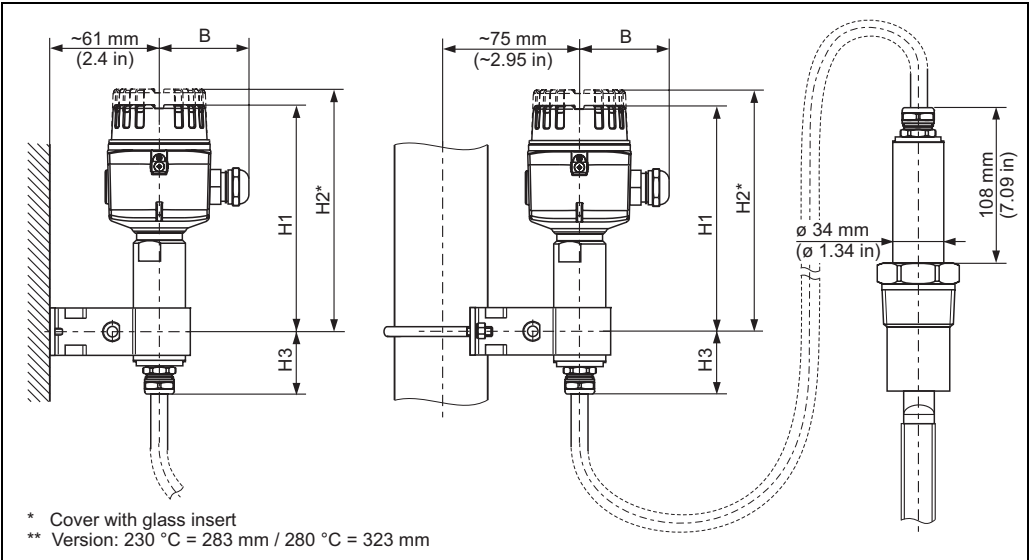
	T _{a1}	T _{a2}	T _p
FTM50, FTM51	70 °C (160 °F)	120 °C (250 °F)	Depending on version: 150 °C, 230 °C, 280 °C (300 °F, 450 °F, 540 °F)
FTM52	70 °C (160 °F)	80 °C (175 °F)	80 °C (175 °F)

Housing extension heights

Housing: Wall mounting

Housing: Tube mounting

Sensor



L00-FTM5xxxx-06-05-xx-en-016

	Polyester housing (F16)	Stainless steel housing (F15)	Aluminium housing (F17)	Aluminium housing (F13)	Aluminium housing (T13) with separate connection compartment
B	76 mm (3 in)	64 mm (2.52 in)	65 mm (2.56 in)	65 mm (2.56 in)	97 mm (3.82 in)
H1	155 mm (6.1 in)	166 mm (6.54 in)	160 mm (6.3 in)	243 mm (9.57 in)	260 mm (10.2 in)
H2	—	185 mm (7.28 in)	174 mm (6.85 in)	258 mm (10.2 in)	273 mm (10.7 in)

	Separate housing	Separate housing and armoured tube
H3	41 mm (1.61 in)	62 mm (2.44 in)

Human interface

Display elements



Note!

The switch settings in the following graphics are in the as-delivered state.

FEM51

A green LED lit:

Indicates operational status

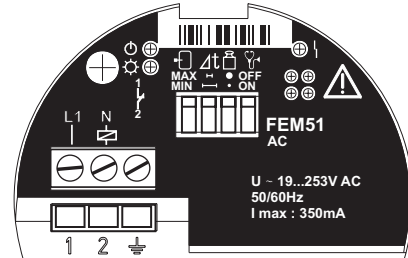
A yellow LED lit:

Indicates switching status

A red LED:

flashing – indicates maintenance is required

lit – indicates device failure



L00-FTM5xxxx-03-05-xx-xx-001

FEM52

A green LED lit:

Indicates operational status

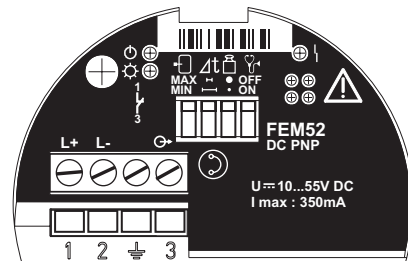
A yellow LED lit:

Indicates switching status

A red LED:

flashing – indicates maintenance is required

lit – indicates device failure



L00-FTM5xxxx-03-05-xx-xx-002

FEM54

A green LED lit:

Indicates operational status

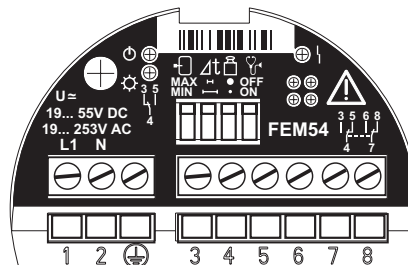
A yellow LED lit:

Indicates switching status

A red LED:

flashing – indicates maintenance is required

lit – indicates device failure



L00-FTM5xxxx-03-05-xx-xx-004

FEM55

A green LED lit:

Indicates operational status

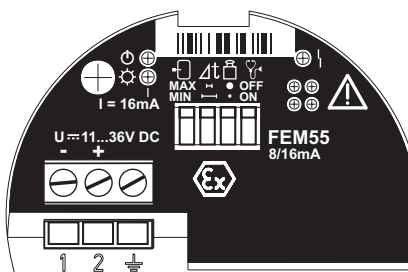
A yellow LED lit:

Indicates switching status

A red LED:

flashing – indicates maintenance is required

lit – indicates device failure



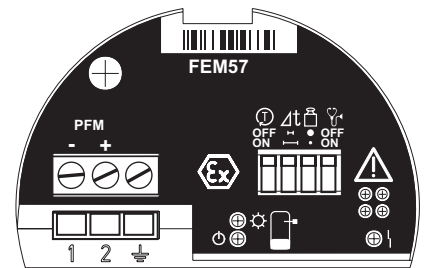
L00-FTM5xxxx-03-05-xx-xx-005

FEM57

A green LED lit:
Indicates operational status

A yellow LED lit :
Indicates covered status

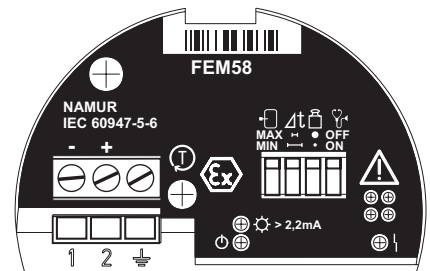
A red LED:
flashing - indicates maintenance is required
lit - indicates device failure

**FEM58**

A green LED:
flashing - indicates operational status

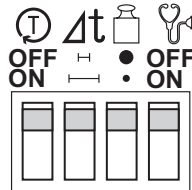
A yellow LED lit:
Indicates switching status

A red LED:
flashing - alternately with green LED
if maintenance is required
flashing - indicates device failure



Note!
Test button - breaks the cable connection

**Operating elements of
electronic inserts
FEM51, FEM52, FEM54,
FEM55, FEM58**



(factory setting)



One switch for safety mode

MAX Overfill protection
MIN Dry running protection



One switch for switching delay

⇌ 0.5 s when covered, 1.5 s when uncovered (short fork 1 s)

⇌ 5 s when covered, 5 s when uncovered



One switch for bulk density/density setting

- 50 g/l (3 lbs) standard fork, 200 g/l (12 lbs) short fork (high bulk density)
- 10 g/l (0.7 lbs) standard fork, 50 g/l (3 lbs) short fork (low bulk density)



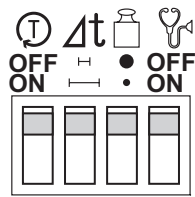
One switch for diagnosis

OFF Diagnosis of abrasion and build-up switched OFF.

ON Diagnosis of abrasion and build-up switched ON.

- For additional density setting to high bulk density:
abrasion and build-up are indicated per LED at the electronic insert only
- For additional density setting to low bulk density:
output of "signal on alarm" for abrasion and build-up

Operating elements for FEM57 electronic insert



(factory setting)

L00-FTM5xxxx-19-05-xx-xx-002



One switch for recurrent testing

- OFF Recurrent testing switched OFF
 ON At the same time, switching delay 0.5 s when covered, density setting low bulk density and diagnosis ON (see also Page 12):
 Perform recurrent proof test when voltage returns.



One switch for switching delay

- ⇐ 0.5 s when covered
 150 °C (300 °F): 1.5 s when uncovered (short fork 1 s)
 230/280 °C (450/540 °F): 2 s when uncovered (short fork 1 s)
 ⇐ 5 s when covered, 5 s when uncovered



One switch for bulk density/density setting

- 50 g/l (3 lbs) standard fork, 200 g/l (12 lbs) short fork (high bulk density)
- 10 g/l (0.7 lbs) standard fork, 50 g/l (3 lbs) short fork (low bulk density)

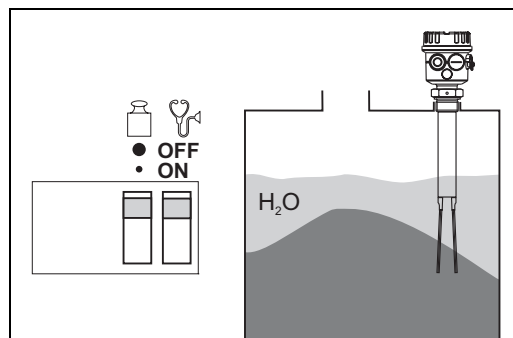


One switch for diagnosis

- OFF Diagnosis of abrasion and build-up switched OFF
 ON Diagnosis of abrasion and build-up switched ON
- For additional density setting to high bulk density:
 abrasion and build-up are indicated per LED at the electronic insert only
 - For additional density setting to low bulk density:
 output of "signal on alarm" for abrasion and build-up

Sediment detection FTM50, FTM51

Detection of solids under water



L00-FTM5xxxx-19-05-xx-xx-014

Only sediment is detected.

Water-like liquids or entrained substances are not detected.

The standard version of FTM52 is not suitable for immersion due to the IP67 rope seal!
 Version with IP68 available on request.

Certificates and approvals

CE mark, declaration of conformity	<p>The instrument is designed to meet state-of-the-art safety requirements, has been tested and left the factory in a condition in which it is safe to operate.</p> <p>The instrument complies with the applicable standards and regulations as listed in the EC declaration of conformity and thus complies with the statutory requirements of the EG directives.</p> <p>Endress+Hauser confirms the successful testing of the instrument by affixing to it the CE mark.</p>
Ex approval	<p>Your Endress+Hauser sales centre can provide you with information on the Ex versions which can currently be delivered.</p> <p>All explosion protection data are given in a separate documentation (see "Supplementary documentation") which is available upon request.</p> <p>Copies of certificates available upon request.</p>
Type of protection	See "Ordering information" as of Page 28 and "Supplementary documentation" on Page 36.
Other standards and guidelines	<p>Other standards and guidelines that were taken into consideration in designing and developing Soliphant M FTM50, FTM51, FTM52:</p> <ul style="list-style-type: none">■ Low Voltage Directive (73/23/EEC)■ DIN EN 61010 Part 1, 2001 Protection Measures for Electrical Equipment for Measurement, Control, Regulation and Laboratory Procedures Part 1: General requirements■ EN 61326 Electrical Equipment for Measurement, Control and Laboratory Use EMC requirements
Functional safety (SIL validation)	<p>Use in safety systems requiring functional safety to SIL2 in accordance with IEC 61508.</p> <p>See "Supplementary documentation" on Page 36.</p>

Ordering information



Note!

This overview does not mark options which are mutually exclusive.

Soliphant M FTM50

Basic weight (F16 housing, thread R 1½, fork 100 mm (4 in), 50 g/l (3 lbs)): 1,1 kg (2.4 lbs)

10	Approval:		
	A	Non-hazardous area	
	C	CSA General Purpose, CSA C US	
	D	FM DIP-AIS Cl. II, III, Div. 1, Gr. E-G + CSA DIP Cl. II, III, Div. 1+2, Gr. E-G	
	E	IEC Ex iaD A20	
	F	FM IS Cl. I, II, III, Div. 1, Gr. A-G + NI + CSA IS Cl. I, II, III, Div. 1+2, Gr. A-G	
	G	IEC Ex tD [iaD] A21	
	H	FM XP-AIS Cl. I, Div. 1, Gr. A-D + CSA XP Cl. I, Div. 1+2, Gr. A-D	
	S	TIIS Ex d IIC T3	
	T	TIIS Ex ia IIC T3	
	X	NEPSI Ex ia IIC T6	
	Z	NEPSI Ex d [ia] IIC T6	
	8	NEPSI DIP	
	Y	Special version	
	1	ATEX II 1 D, II 1/2 GD, II 1/3 GD	Ex ia IIC T6
	2	ATEX II 1/2 D	Ex tD
	3	ATEX II 3 D, ATEX II 3 G	EEx nA/nL/nC
	4	ATEX II 1/3 D	Ex tD
	5	ATEX II 1 D, ATEX II 1/2 G	Ex de [ia] IIC T6
	6	ATEX II 1 D, ATEX II 1/2 G	Ex d [ia] IIC T6
	7	ATEX II 1 D, II 1 G	Ex ia T6, XA -> Note safety instructions!

20		Process Connection:	Additional weight
	AF	2", 150 lbs, RF, flange ANSI B16.5	2,5 kg (5.5 lbs)
	AG	3", 150 lbs, RF, flange ANSI B16.5	5,0 kg (11.0 lbs)
	AH	4", 150 lbs, RF, flange ANSI B16.5	7,1 kg (15.6 lbs)
	B3	DN50, PN25/40 A, flange EN1092-1 (DIN2527 B)	3,3 kg (7.3 lbs)
	BS	DN80, PN10/16 A, flange EN1092-1 (DIN2527 B)	4,9 kg (10.8 lbs)
	BT	DN100, PN10/16 A, flange EN1092-1 (DIN2527 B)	5,7 kg (12.6 lbs)
	GG	Thread EN10226 R 1½	–
	GJ	Thread ANSI NPT 1½, d = 1.67" sensor	–
	GK	Thread ANSI NPT 1¼, d = 1.38" sensor	–
	GX	Thread ANSI NPT 1½, d = 1.38" sensor suitable for ISA nozzle	–
	KF	10K 50, RF, flange JIS B2220	1,8 kg (4.0 lbs)
	KG	10K 80, RF, flange JIS B2220	3,3 kg (7.3 lbs)
	KH	10K 100, RF, flange JIS B2220	4,4 kg (9.7 lbs)
	TD	Tri-Clamp ISO2852, DN40-51 (2")	–
	YY	Special version	–

30		Material; Surface Refinement:	
	A	PTFE>316L; fork coated, reduces build-up , no corrosion safety	
	B	PTFE>316L; completely coated, reduces build-up , no corrosion safety	
	C	ETFE>316L; completely coated	
	2	316L; Ra ≤ 3,2 µm/80 grit, without	
	5	316L; Ra ≤ 0,8 µm/180 grit, fork electro-polished,	
	7	316L; Ra ≤ 0,8 µm/180 grit, fork + tube electro-polished	
	9	Special version	

40		Fork; Bulk Density:	Additional weight
	A	155 mm/6 in; min. 10 g/l (0.7 lbs)	0,1 kg (0.2 lbs)
	K	100 mm/4 in; min. 50 g/l (3 lbs)	–
	Y	Special version	

50		Electronics; Output:	
	1	FEM51: 2-wire 19...253 V AC,	Probe circuit, intrinsically safe
	2	FEM52: 3-wire PNP 10... 55 V DC,	Probe circuit, intrinsically safe

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Soliphant M FTM51

Basic weight (F16 housing, thread R 1½, overall length 300 mm (11.8 in), 50 g/l (3 lbs)): 1,4 kg (3.1 lbs)

10	Approval:		
	A	Non-hazardous area	
	C	CSA General Purpose, CSA C US	
	D	FM DIP-AIS Cl. II, III, Div. 1, Gr. E-G + CSA DIP Cl. II, III, Div. 1+2, Gr. E-G	
	E	IEC Ex iaD A20	
	F	FM IS Cl. I, II, III, Div. 1, Gr. A-G + NI + CSA IS Cl. I, II, III, Div. 1+2, Gr. A-G	
	G	IEC Ex tD [iaD] A21	
	H	FM XP-AIS Cl. I, Div. 1, Gr. A-D + CSA XP Cl. I, Div. 1+2, Gr. A-D	
	S	TIIIS Ex d [ia] IIC T4	
	T	TIIIS Ex ia IIC T3	
	X	NEPSI Ex ia IIC T6	
	Z	NEPSI Ex d [ia] IIC T6	
	8	NEPSI DIP A20 Ta, T4	
	Y	Special version	
	1	ATEX II 1 D, II 1/2 GD, II 1/3 GD	Ex ia IIC T6
	2	ATEX II 1/2 D	Ex tD
	3	ATEX II 3 D, ATEX II 3 G	EEx nA/nL/nC
	4	ATEX II 1/3 D	Ex tD
	5	ATEX II 1 D, ATEX II 1/2 G	Ex de [ia] IIC T6
	6	ATEX II 1 D, ATEX II 1/2 G	Ex d [ia] IIC T6
	7	ATEX II 1 D, II 1 G	Ex ia T6, XA -> Note safety instructions!

20	Process Connection:		Additional weight
	AF	2", 150 lbs, RF, flange ANSI B16.5	2,5 kg (5.5 lbs)
	AG	3", 150 lbs, RF, flange ANSI B16.5	5,0 kg (11.0 lbs)
	AH	4", 150 lbs, RF, flange ANSI B16.5	7,1 kg (15.6 lbs)
	B3	DN50, PN25/40 A, flange EN1092-1 (DIN2527 B)	3,3 kg (7.3 lbs)
	BS	DN80, PN10/16 A, flange EN1092-1 (DIN2527 B)	4,9 kg (10.8 lbs)
	BT	DN100, PN10/16 A, flange EN1092-1 (DIN2527 B)	5,7 kg (12.6 lbs)
	GG	Thread EN10226 R 1½	—
	GJ	Thread ANSI NPT 1½, d = 1.67" sensor	—
	GK	Thread ANSI NPT 1¼, d = 1.38" sensor	—
	GX	Thread ANSI NPT 1½, d = 1.38" sensor suitable for ISA nozzle	—
	KF	10K 50, RF, flange JIS B2220	1,8 kg (4.0 lbs)
	KG	10K 80, RF, flange JIS B2220	3,3 kg (7.3 lbs)
	KH	10K 100, RF, flange JIS B2220	4,4 kg (9.7 lbs)
	TD	Tri-Clamp ISO2852, DN40-51 (2")	—
	YY	Special version	—

30	Material; Surface Refinement:		
	A	PTFE>316L; fork coated , reduces build-up , no corrosion safety	
	B	PTFE>316L; completely coated, reduces build-up , no corrosion safety	
	C	ETFE>316L; completely coated	
	2	316L; Ra ≤ 3,2 µm/80 grit, without	
	5	316L; Ra ≤ 0,8 µm/180 grit, fork electro-polished	
	7	316L; Ra ≤ 0,8 µm/180 grit, fork + tube electro-polished	
	9	Special version	

40	Overall Length; Bulk Density:			Additional weight
	L	... mm;	min. 10 g/l (0.7 lbs)	2,0 kg (4.4 lbs)/m*
	M	... mm;	min. 50 g/l (3 lbs)	2,0 kg (4.4 lbs)/m*
	P	... in;	min. 10 g/l (0.7 lbs)	5,1 kg (11.2 lbs)/100 in*
	Q	... in;	min. 50 g/l (3 lbs)	5,1 kg (11.2 lbs)/100 in*
	S	... mm;	min. 10 g/l (0.7 lbs), surface refinement	2,0 kg (4.4 lbs)/m*
	T	... mm;	min. 50 g/l (3 lbs), surface refinement	2,0 kg (4.4 lbs)/m*
	U	... in;	min. 10 g/l (0.7 lbs), surface refinement	5,1 kg (11.2 lbs)/100 in*
	V	... in;	min. 50 g/l (3 lbs), surface refinement	5,1 kg (11.2 lbs)/100 in*
	Y	Special version		
		* With process connection GK and GX: 2,8 kg (6.2 lbs)/m or 7,1 kg (15.7 lbs)/100 in		

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Soliphant M FTM52

Basic weight (F16 housing, thread R 1½, overall length 1000 mm (39 in), 50 g/l (3 lbs)): 2,2 kg (4.9 lbs)

10	Approval:		
	A	Non-hazardous area	
	C	CSA General Purpose, CSA C US	
	D	FM DIP-AIS Cl. II, III, Div. 1, Gr. E-G + CSA DIP Cl. II, III, Div. 1+2, Gr. E-G	
	E	IEC Ex iaD A20	
	F	FM IS Cl. I, II, III, Div. 1, Gr. A-G + NI + CSA IS Cl. I, II, III, Div. 1+2, Gr. A-G	
	G	IEC Ex tD [iaD] A21	
	H	FM XP-AIS Cl. I, Div. 1, Gr. A-D + CSA XP Cl. I, Div. 1+2, Gr. A-D	
	S	TIIIS Ex d [ia] T4	
	T	TIIIS Ex ia IIC T3	
	X	NEPSI Ex ia IIC T6	
	Z	NEPSI Ex d [ia] IIC T6	
	8	NEPSI DIP A20 Ta, T4	
	Y	Special version	
	1	ATEX II 1 D, II 1/2 GD, II 1/3 GD	Ex ia IIC T6
	2	ATEX II 1/2 D	Ex tD [iaD]
	3	ATEX II 3 D, ATEX II 3 G	EEx nA/nL/nC
	4	ATEX II 1/3 D	Ex tD [iaD]
	5	ATEX II 1 D, ATEX II 1/2 G	Ex de [ia] IIC T6
	6	ATEX II 1 D, ATEX II 1/2 G	Ex d [ia] IIC T6
	7	ATEX II 1 D, II 1 G	Ex ia T6, XA -> Note safety instructions!

20	Process Connection:		Additional weight
	AF	2", 150 lbs, RF, flange ANSI B16.5	2,5 kg (5.5 lbs)
	AG	3", 150 lbs, RF, flange ANSI B16.5	5,0 kg (11.0 lbs)
	AH	4", 150 lbs, RF, flange ANSI B16.5	7,1 kg (15.6 lbs)
	B3	DN50, PN25/40 A, flange EN1092-1 (DIN2527 B)	3,3 kg (7.3 lbs)
	BS	DN80, PN10/16 A, flange EN1092-1 (DIN2527 B)	4,9 kg (10.8 lbs)
	BT	DN100, PN10/16 A, flange EN1092-1 (DIN2527 B)	5,7 kg (12.6 lbs)
	GG	Thread EN10226 R 1½	—
	GJ	Thread ANSI NPT 1½, d = 1.67" sensor	—
	GK	Thread ANSI NPT 1¼, d = 1.38" sensor	—
	GX	Thread ANSI NPT 1½, d = 1.38" sensor suitable for ISA nozzle	—
	KF	10K 50, RF, flange JIS B2220	1,8 kg (4.0 lbs)
	KG	10K 80, RF, flange JIS B2220	3,3 kg (7.3 lbs)
	KH	10K 100, RF, flange JIS B2220	4,4 kg (9.7 lbs)
	TD	Tri-Clamp ISO2852, DN40-51 (2")	—
	YY	Special version	—

30	Material; Surface Refinement:		
	A	PTFE>316L; fork coated, reduces build-up , no corrosion safety	
	2	316L; Ra ≤ 3,2 µm/80 grit, without	
	5	316L; Ra ≤ 0,8 µm/180 grit, fork electro-polished	
	9	Special version	

40	Overall Length; Bulk Density:			Additional weight
	B	... mm;	min. 10 g/l (0.7 lbs)	1,3 kg (2.9 lbs)/10 m
	C	... mm;	min. 50 g/l (3 lbs)	1,3 kg (2.9 lbs)/10 m
	F	... in;	min. 10 g/l (0.7 lbs)	1,7 kg (3.7 lbs)/500 in
	G	... in;	min. 50 g/l (3 lbs)	1,7 kg (3.7 lbs)/500 in
	Y	Special version		

50	Electronics; Output:		
	1	FEM51: 2-wire 19...253 V AC,	Probe circuit, intrinsically safe
	2	FEM52: 3-wire PNP 10... 55 V DC,	Probe circuit, intrinsically safe
	4	FEM54: relay DPDT 19...253 V AC/55 V DC,	Probe circuit, intrinsically safe
	5	FEM55: 8/16 mA 11... 36 V DC	Probe circuit, intrinsically safe
	7	FEM57: 2-wire PFM	
	8	FEM58: NAMUR + test button (H-L signal)	
	9	Special version	

[illegible]

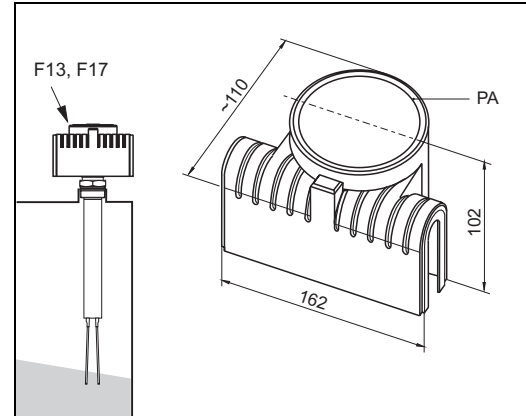
Accessories

Removing tool

for Soliphant M FTM50, FTM51, FTM52
71026213

Protection cover

for Soliphant M FTM50, FTM51, FTM52
with F13 and F17 housing
71040497



L00-FTM5xxxx-03-05-xx-xx-009

Sliding sleeve

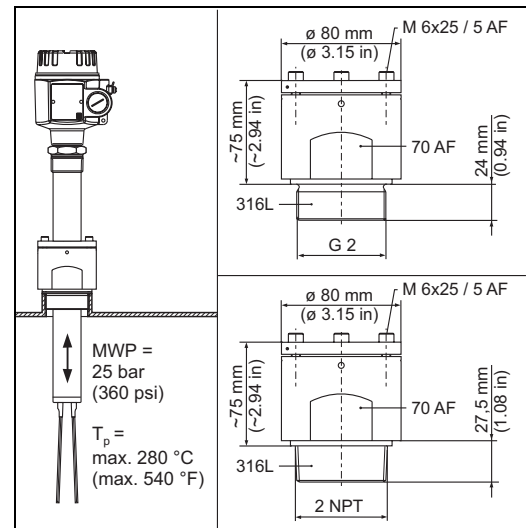
for Soliphant M FTM51
with material version A, 2, 5 (see Page 30).

For pressurised container.

- G 2
DIN ISO 228/1
52024631
- 2 NPT
ANSI B 1.20.1
52024630



Note!
Suitable for multiple switch-point
configurations!



L00-FTM5xxxx-03-05-xx-xx-002

Rope shortening set

for Soliphant M FTM52
52024632

Spare parts

Sensor	The FTM5xX replacement sensors can be ordered through Endress+Hauser Service!
Electronic insert	<ul style="list-style-type: none"> ■ FEM51 electronic insert 52026497 ■ FEM52 electronic insert 52026498 ■ FEM54 electronic insert 52026499 ■ FEM55 electronic insert 52026500 ■ FEM57 electronic insert 52026501 ■ FEM58 electronic insert 52026502
Cover	<ul style="list-style-type: none"> ■ Cover for polyester housing (F16), transparent plastic with seal 52025790 ■ Cover for aluminium housing (F13, F17), aluminium with glass insert and seal (not for Ex d/XP) 52027693 ■ Cover for aluminium housing (F13, F17), aluminium with seal (not for Ex d/XP) 52002699 ■ Cover for aluminium housing (F13), aluminium with seal (for Ex d/XP) 520002698 ■ Cover for stainless steel housing (F15), stainless steel with seal 52027000 ■ Cover for stainless steel housing (F15), stainless steel with seal (for certificates D, 2, 3, 4) 52027708 ■ Cover for stainless steel housing (F15), stainless steel with glass insert and seal 52027002 ■ Cover for stainless steel housing (F15), stainless steel with glass insert and seal (for certificates D, 2, 3, 4) 52027709 ■ Cover for aluminium housing (T13) electronics compartment, aluminium with seal 52006903 ■ Cover for aluminium housing (T13) electronics compartment, aluminium, glass insert and seal (for Ex d/Ex de/XP) 52028271 ■ Cover for aluminium housing (T13) terminal compartment, aluminium with seal 52007103
Cable (for separate housing)	<ul style="list-style-type: none"> ■ Cable, separate housing F15, F16, F17 71035208 ■ Cable armoured, separate housing F15, F16, F17 71035209 ■ Cable, separate housing F13, T13 71035210 ■ Cable armoured, separate housing F13, T13 71035211 ■ Cable Ex d/Ex de/XP, separate housing F13, T13 71035212 ■ Cable armoured Ex d/Ex de/XP, separate housing F13, T13 71035213

Supplementary documentation



Note!

This supplementary documentation can be found on our product pages on www.endress.com

Operating Instructions

- Soliphant M FTM50, FTM51
KA229F/00/a6
- Soliphant M FTM52
KA230F/00/a6
- Soliphant M FTM51, sliding sleeve, pressurised
KA239F/00/a6
- Soliphant M FTM52, rope shortening
KA231F/00/a6
- Soliphant M FTM50, FTM51, FTM52, separate housing
Instructions for mounting and shortening (on the housing side)
KA264F/00/a6
- Soliphant M FTM50, FTM51, FTM52, separate housing and armored tube
Instructions for mounting and shortening (on the housing side)
KA265F/00/a6
- Soliphant M FTM50, FTM51, FTM52, separate housing
Demounting and mounting of the sensor
KA273F/00/a6

Certificates

ATEX

- ATEX II 1 D, II 1/2 GD, II 1/3 GD Ex ia IIC T6
XA305F/00/a3
- ATEX II 1 D, II 1 G Ex ia IIC T6 (X)
XA319F/00/a3
- ATEX II 1 D, II 1/2 G Ex d/de [ia] IIC T6
XA306F/00/a3
- ATEX II 1/2 D, II 1/3 D Ex tD
XA307F/00/a3
- ATEX II 3 D, II 3 G EEx nA/nL/nC
XA331F/00/a3
- NEPSI DIP
XA393F/00/b2
- NEPSI Ex ia
XA394F/00/b2
- NEPSI Ex d [ia]
XA395F/00/b2
- IEC Ex, Ex ia (in preparation)
XA391F/00/en
- IEC Ex, Ex tD (in preparation)
XA392F/00/en

FM

- FM
ZD218F/00/en

CSA

- CSA
ZD219F/00/en

Functional Safety

- Soliphant M + electronic insert FEM51
SD203F/00/en
- Soliphant M + electronic insert FEM52
SD204F/00/en
- Soliphant M + electronic insert FEM54
SD205F/00/en
- Soliphant M + electronic insert FEM55
SD208F/00/en
- Soliphant M + electronic insert FEM57 + Nivotester FTL325P
SD207F/00/en
- Soliphant M + electronic insert FEM58
SD206F/00/en

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