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Technical Information
Liquiphant FTL33 IO- Link

Vibronic

Point level switch for liquids in the food industry

Application

The Liquiphant FTL33 is a point level switch for universal use in all liquids. It is used preferably in storage tanks, mixing vessels and pipes, where the internal and external hygiene requirements are particularly stringent.

Ideal for applications in which float switches or conductive, capacitance and optical sensors have been used up to now. The Liquiphant FTL33 also works in areas where these measuring principles are not suitable due to conductivity, buildup, turbulence, flow conditions or air bubbles.

The Liquiphant FTL33 can be used for process temperatures up to:
- 100 °C (212 °F), suitable for CIP
- 150 °C (302 °F), suitable for CIP and SIP

Your benefits

- 3-A and EHEDG certificates
- CIP and SIP cleanability guaranteed up to 150 °C (302 °F) continuous temperature
- All-metal separation, no plastics in the process
- Robust stainless steel housing, optionally available with M12x1 plug with IP69 degree of protection
- External function test with test magnet
- Onsite function check possible thanks to LED indication
- Compact design for easy installation even in confined conditions or hard-to-access areas

Endress+Hauser
People for Process Automation

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Important document information

Symbols used

Symbols for certain types of information and graphics

Permitted
Procedures, processes or actions that are permitted

Forbidden
Procedures, processes or actions that are forbidden

Tip
Indicates additional information

Reference to documentation

Reference to graphic

Notice or individual step to be observed

1., 2., 3.
Series of steps

Result of a step

1, 2, 3, ...
Item numbers

A, B, C, ...
Views

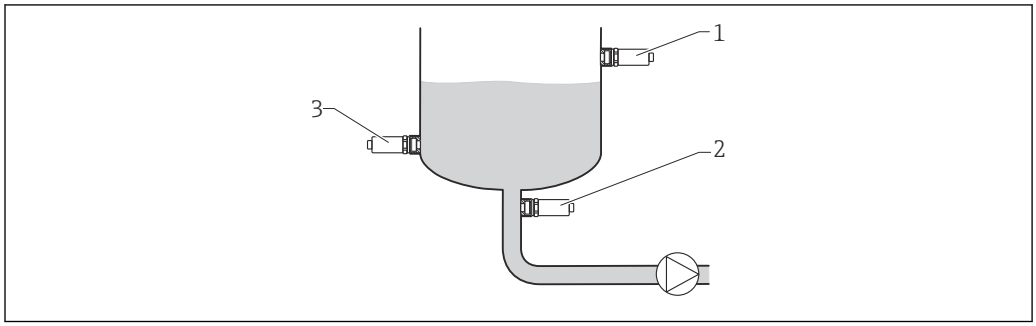
Function and system design

Measuring principle

A piezoelectric drive causes the tuning fork of the device to vibrate at its resonance frequency. When the tuning fork is immersed in a liquid, its intrinsic frequency changes due to the change in density of the surrounding medium. The electronics system in the point level switch monitors the resonance frequency and indicates whether the tuning fork is vibrating in air or is covered by liquid.

Measuring system

The measuring system consists of a point level switch, e.g. for connection to programmable logic controllers (PLC).



1 Installation examples

1 Overfill protection or upper level detection (maximum safety)
2 Dry running protection for pump (minimum safety)
3 Lower level detection (minimum safety)

Input

Measured variable

Density

Measuring range

- > 0.7 g/cm³ (optionally available: > 0.5 g/cm³)
- Can be configured by the customer onsite via IO-Link

Output

Switch output

Switching behavior: On/Off

Function

- 3-wire DC-PNP:
  Positive voltage signal at the switch output of the electronics (PNP)
  Switching capacity: 200 mA
- IO-Link (4-wire):
  Switching capacity:
  - 105 mA (for mode with 2x load)
  - 200 mA (for mode with 1x IO-Link and 1x load)

Operating modes

The device has two operating modes: maximum safety (MAX) and minimum safety (MIN).

By choosing the corresponding operating mode, the user ensures that the device also switches in a safety-oriented manner even in an alarm condition, e.g. if the power supply line is disconnected.

- **Maximum safety (MAX)**
  The device keeps the electronic switch closed as long as the liquid level is below the fork. Sample application: overfill protection
- **Minimum safety (MIN)**
  The device keeps the electronic switch closed as long as the fork is immersed in liquid. Sample application: Dry running protection for pumps

The electronic switch opens if the limit is reached, if a fault occurs or the power fails (quiescent current principle).

Window functions

Power supply

Supply voltage

SIO mode
10 to 30 VDC

IO-Link mode
18 to 30 VDC

IO-Link communication is guaranteed only if the supply voltage is at least 18 V.

Power consumption

< 1 W (at max. load: 200 mA)

Current consumption

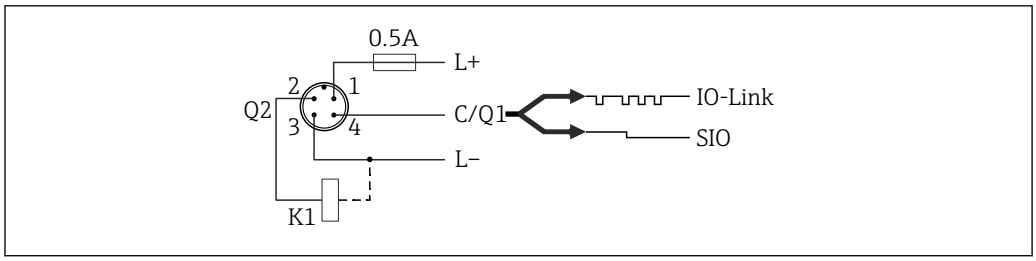
< 15 mA

Electrical connection

Connecting the device

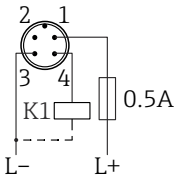
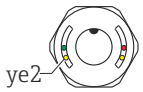
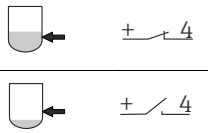
The following electronic version and connection are available for the device:
- Electronic version 4-wire DC-PNP, IO-Link with connection via M12 plug

A fine-wire fuse is necessary for operation: 500 mA slow-blow.

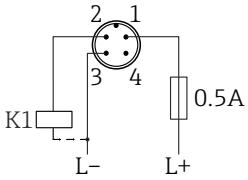


Pin 1 Supply voltage +
Pin 2 1st switch output
Pin 3 Supply voltage -
Pin 4 IO-Link communication or 2nd switch output (SIO mode)

SIO mode (without IO-Link communication)

Minimum safety		
Terminal assignment	**MIN output**	**LED yellow (ye) 1**
	 A0037918  	

Symbols	**Description**
☼	Yellow LED (ye) lit
●	Yellow LED (ye) not lit
K1	External load

Maximum safety		
Terminal assignment	**MAX output**	**LED yellow (ye) 2**
	 A0037919 	

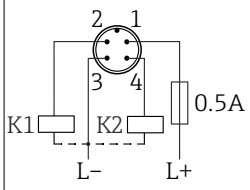
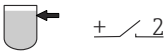
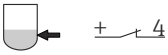
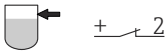
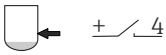
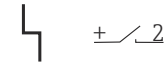
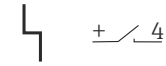
Symbols	**Description**
☼	Yellow LED (ye) lit
●	Yellow LED (ye) not lit
K1	External load

Function monitoring with M12 plug

When both outputs are connected, the MIN and MAX outputs assume opposite states (XOR) when the device is operating fault-free. In the event of an alarm condition or a cable break, both outputs

are de-energized. This means that function monitoring is possible in addition to level monitoring. The behavior of the switch outputs can be configured via IO-Link.

Connection for function monitoring using XOR operation

Terminal assignment	MAX output	LED yellow (ye) 2	MIN output	LED yellow (ye) 1	LED red (rd)
					
					
					
					

Symbols	Description
	LED lit
	LED not lit
	Fault or warning
K1/K2	External load

Post-connection check

❑Are the device and cable undamaged (visual inspection)?

❑Does the supply voltage match the specifications on the nameplate?

❑If supply voltage is present, is the green LED lit?

❑With IO-Link communication: is the green LED flashing?

Device plugs

M12 plug: IEC 60947-5-2

Length of connecting cable

- Max. 25 Ω/wire, total capacitance < 100 nF
- IO-Link communication: < 10 nF

Overvoltage protection

Overvoltage category II

Reverse polarity protection

Integrated; no damage in the event of reverse polarity or short-circuit.

Short-circuit protection

Overload protection/short-circuit protection at I > 200 mA; the sensor is not destroyed.

If both switch outputs are active: 105 mA per switch output.

Intelligent monitoring:

Testing for overload at intervals of approx. 1.5 s; normal operation resumes once the overload/short-circuit has been rectified

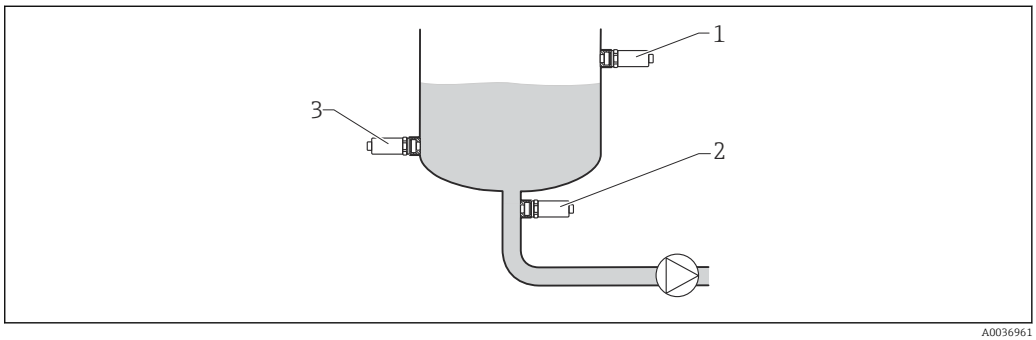
Performance characteristics

Reference operating conditions	Ambient temperature:	+25 °C (+77 °F)
	Process pressure:	1 bar (14.5 psi)
	Fluid:	Water (density: approx. 1 g/cm³, viscosity 1 mm²/s)
	Medium temperature:	25 °C (77 °F)
	Density setting:	> 0.7 g/cm³
	Switching time delay:	Standard (0.5 s, 1 s)
Switch point	13 mm (0.51 in)±1 mm	
Hysteresis	max. 3 mm (0.12 in)	
Non-repeatability	±1 mm (0.04 in) in accordance with DIN 61298-2	
Influence of ambient temperature	Negligible	
Influence of medium temperature	−25 µm (984 µin)/°C	
Influence of medium pressure	−20 µm (787 µin)/bar	
Switching delay	▪ 0.5 s when tuning fork is covered ▪ 1.0 s when tuning fork is uncovered ▪ Optionally available: 0.2 s; 1.5 s or 5 s (when the tuning fork is covered and uncovered) ▪ Can be configured via IO-Link from 0.3 to 60 s	
Switch-on delay	max. 3 s	
Measuring frequency	Approx. 1 100 Hz in air	
Measured error	In event of device change: ±2 mm (0.08 in) as per DIN 61298-2	

Installation

Orientation

The point level switch can be installed in any position in a vessel, pipe or tank. Foam formation does not affect the function.



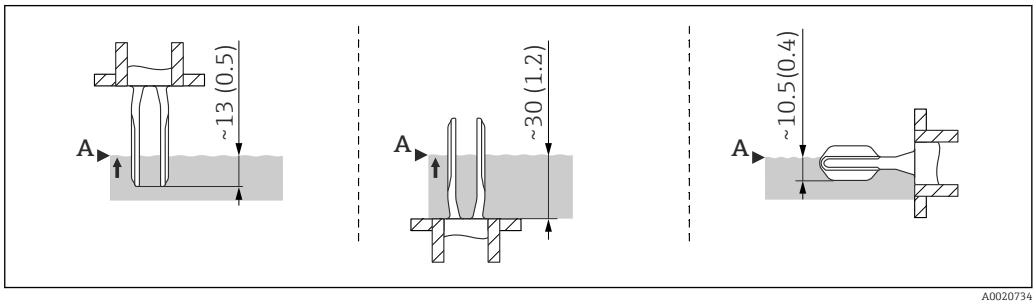
2 *Installation examples*

1 Overfill protection or upper level detection (maximum safety)
2 Dry running protection for pump (minimum safety)
3 Lower level detection (minimum safety)

Installation instructions

Switch point

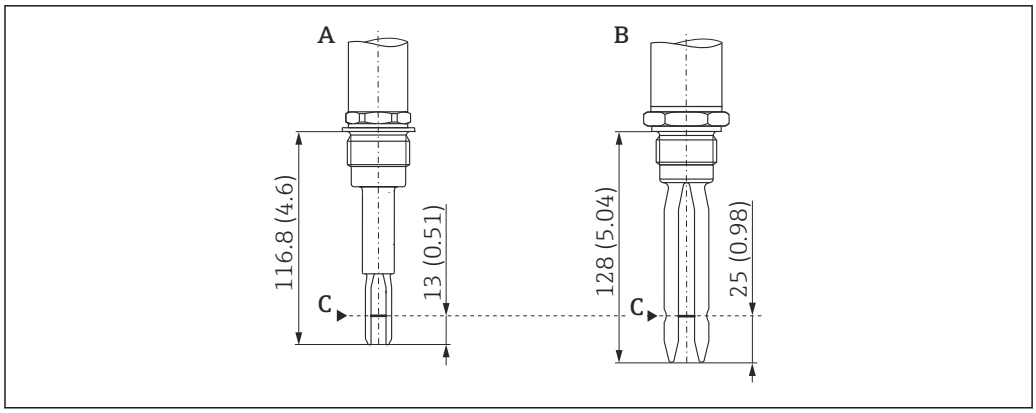
The switch point (A) on the sensor depends on the orientation of the point level switch (water +25 °C (+77 °F), 1 bar (14.5 psi).



3 *Orientation: vertical from above, vertical from below, horizontal; dimensions in mm (in)*

Short tube version

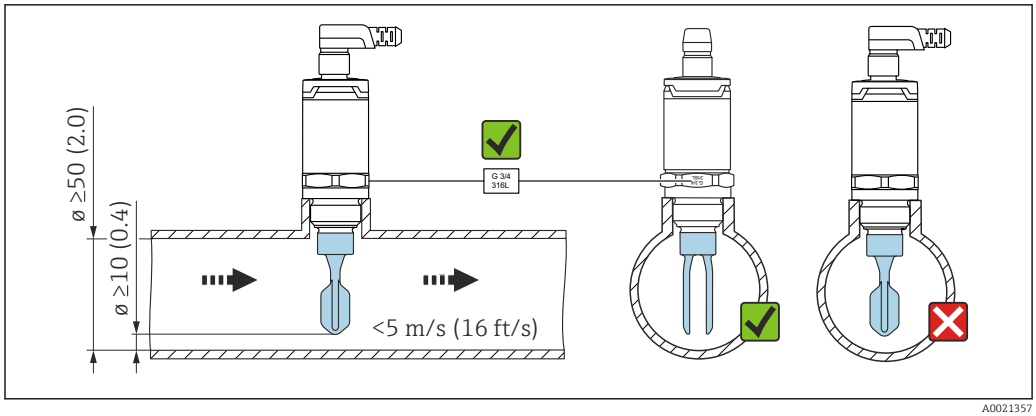
The use of the short tube ensures that the switch point is at the same level as in the previous Liquiphant FTL260 and FTL330 models when an identical thread is selected. In this way, the device can be replaced quickly and easily. (Applies for process connections G 1" weld-in adapter for flush mount installation and MNPT 1")



Dimensions mm (in)
A Liquiphant FTL33 with short tube
B Liquiphant FTL260 or FTL330
C Switch point

Installation in pipes

During installation, pay attention to the position of the fork in order to minimize turbulence in the pipe.

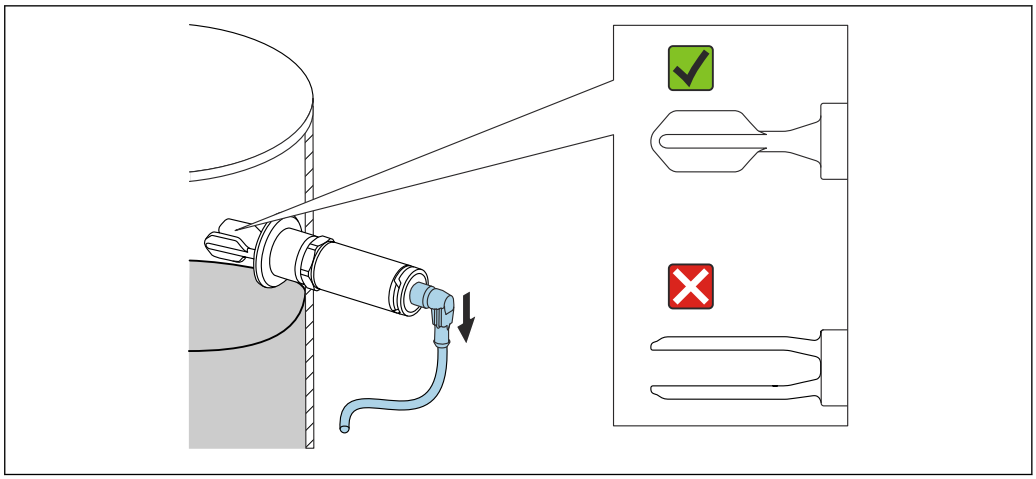


Dimensions mm (in)

Installation in vessels

If installed horizontally, pay attention to the position of the tuning fork to ensure that the liquid can drip off.

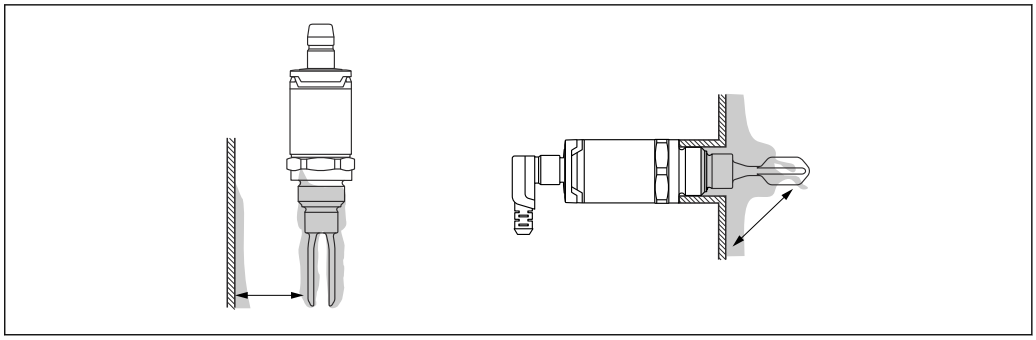
The electrical connection, e.g. M12 plug, should be pointing down with the cable. This can prevent moisture from penetrating.



4 *Position of the fork in the case of horizontal installation in a vessel*

Distance from wall

Ensure that there is sufficient distance between the expected buildup on the tank wall and the fork.
Recommended distance from wall ≥10 mm (0.39 in).

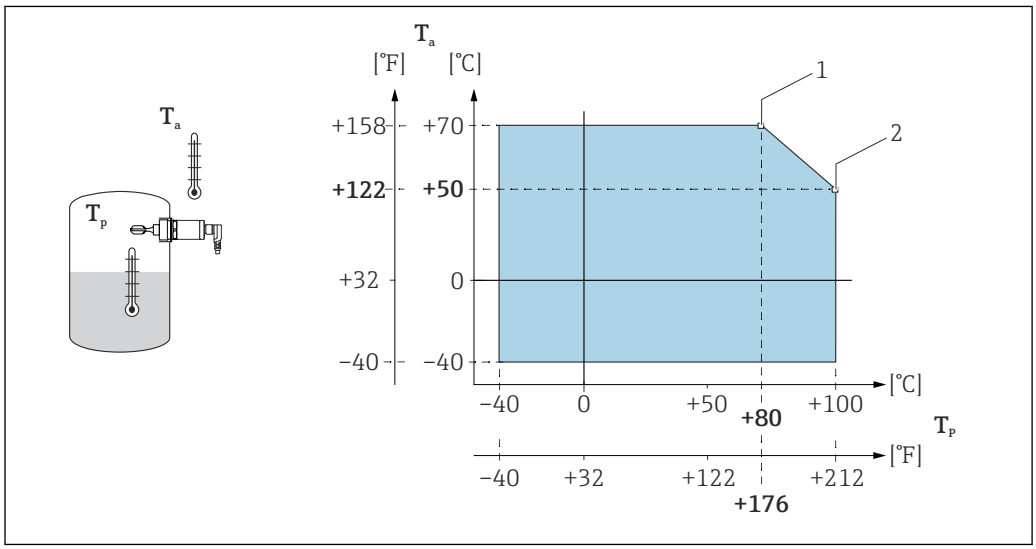


Length of connecting cable

- For IO-Link up to 20 m (65.6 ft)
- Max. 25 Ω/wire, total capacitance < 100 nF

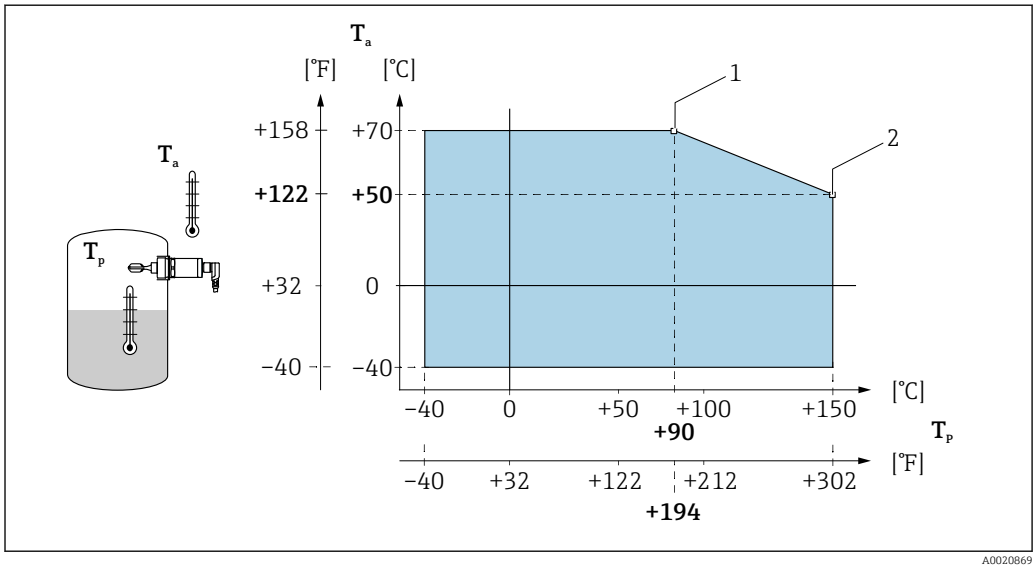
Environment

Ambient temperature range −40 to +70 °C (−40 to +158 °F)



5 Derating curve: 100 °C (212 °F)

1 I_{max}: 200 mA (DC-PNP)
2 I_{max}: 150 mA (DC-PNP)
Ta Ambient temperature range
Tp Process temperature



6 Derating curve: 150 °C (302 °F)

1 I_{max}: 200 mA (DC-PNP)
2 I_{max}: 150 mA (DC-PNP)
Ta Ambient temperature range
Tp Process temperature

Storage temperature −40 to +85 °C (−40 to +185 °F)

Climate class DIN EN 60068-2-38/IEC 68-2-38: Test Z/AD

Altitude Up to 2 000 m (6 600 ft) above sea level

Degree of protection	▪ IP65/67 NEMA Type 4X Enclosure (M12 plug) ▪ IP66/68/69 NEMA Type 4X/6P Enclosure (M12 plug for metal housing cover)
Shock resistance	a = 300 m/s^2 = 30 g, 3 axes x 2 directions x 3 shocks x 18 ms, as per test Ea, prEN 60068-2-27:2007
Vibration resistance	a(RMS) = 50 m/s^2, ASD = 1.25 (m/s^2)^2/Hz, f = 5 to 2 000 Hz, t = 3 x 2 h, as per test Fh, EN 60068-2-64:2008
Cleaning	Resistant to typical cleaning agents from the outside. Passed Ecolab test.
Electromagnetic compatibility	Electromagnetic compatibility in accordance with all relevant requirements of the EN 61326 series and NAMUR recommendation EMC (NE21). For details, refer to the EC Declaration of Conformity. The EC Declaration of Conformity is available in the Download Area of the Endress+Hauser website: www.endress.com → Downloads.
Reverse polarity protection	**3-wire DC-PNP and IO-Link** Integrated. In the event of reverse polarity, the device is deactivated automatically.
Short-circuit protection	**3-wire DC-PNP and IO-Link** Overload protection/short-circuit protection at I > 200 mA; the sensor is not destroyed. For IO-Link communication: 105 mA per output if both switch outputs are active. Intelligent monitoring: Testing for overload at intervals of approx. 1.5 s; normal operation resumes once the overload/short-circuit has been rectified.

Process

Note the pressure and temperature derating depending on the selected process connection.

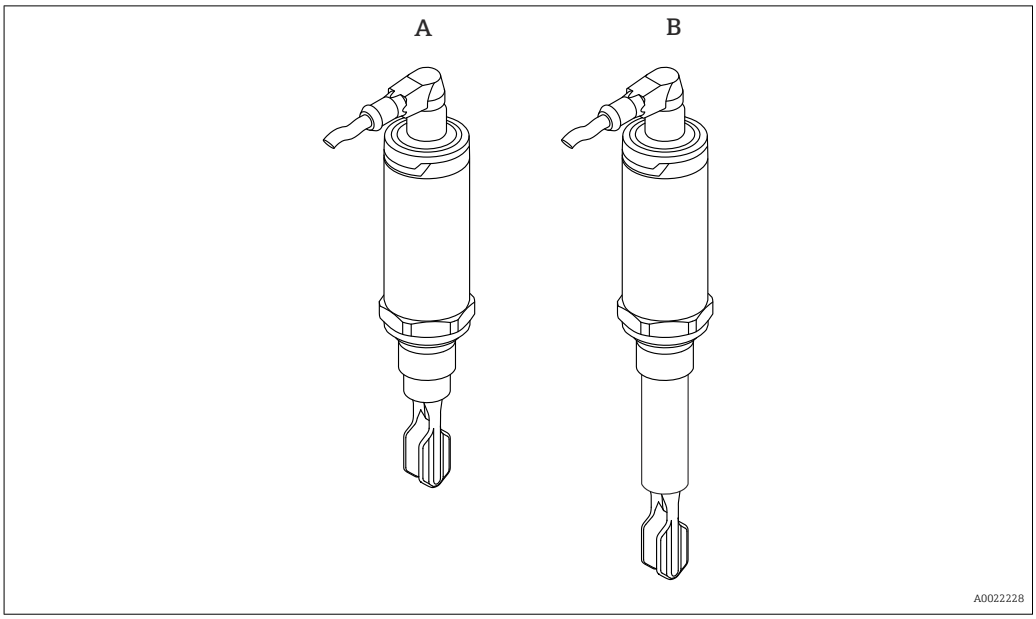
Process temperature range	−40 to +100 °C (−40 to +212 °F) −40 to +150 °C (−40 to +302 °F)
Process pressure range	Max. −1 to +40 bar (−14.5 to +580 psi)
Density	>0.7 g/cm³ (optionally available: >0.5 g/cm³), can be configured via IO-Link
State of aggregation	Liquid
Viscosity	1 to 10 000 mPa·s, dynamic viscosity
Solids contents	ø < 5 mm (0.2 in)
Lateral loading capacity	Lateral loading capacity of the tuning fork: maximum 200 N

Mechanical construction

Design

The point level switch is available in different versions and can be assembled in accordance with user specifications.

The versions can be selected via the product structure in the Product Configurator, see the "Ordering information" section. For examples, see below:



Versions	Examples	
	A	B
Electrical connection	M12 plug	M12 plug
Housing (sensor design) for process temperatures up to:	150 °C (302 °F)	150 °C (302 °F)
Sensor type	Compact version	Short tube version

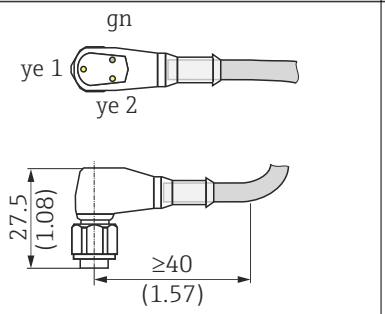
For detailed information on the process connections, see the "Sensor type" section.

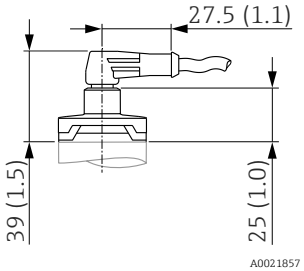
For information on the short tube version, see the "Installation instructions" section.

Plug

Dimensions

Dimensions mm (in)

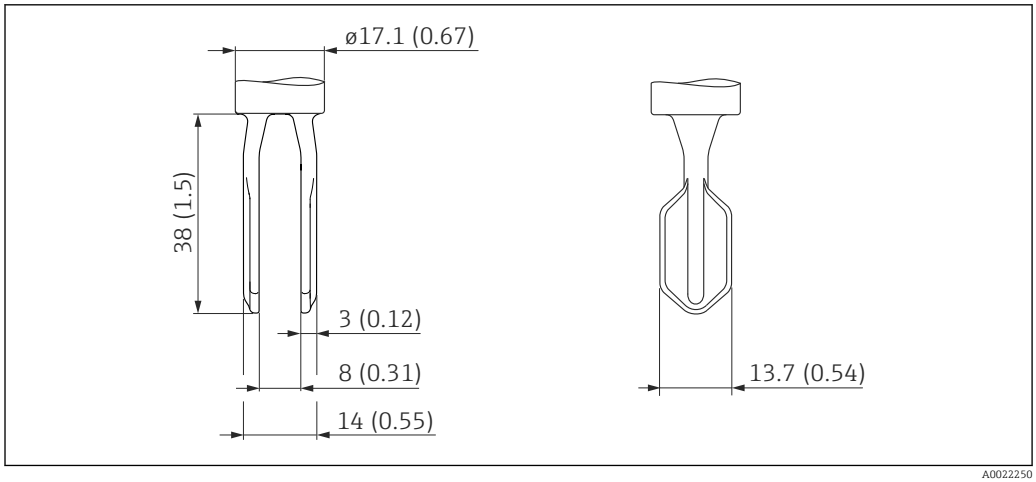
Electrical connection with housing cover	Designation
	**M12 plug IP69 with LED** ▪ **Material of housing cover, metal:** 316L (1.4404/1.4435) ▪ **Degree of protection:** IP66/68/69 NEMA Type 4X/6P Enclosure

Electrical connection with housing cover	Designation
	**M12 plug** ▪ **Material of housing cover, plastic:** PPSU ▪ **Degree of protection:** IP65/67 NEMA Type 4X Enclosure

Tuning fork

Dimensions

Dimensions mm (in)



Sensor type

Dimensions

Dimensions mm (in)

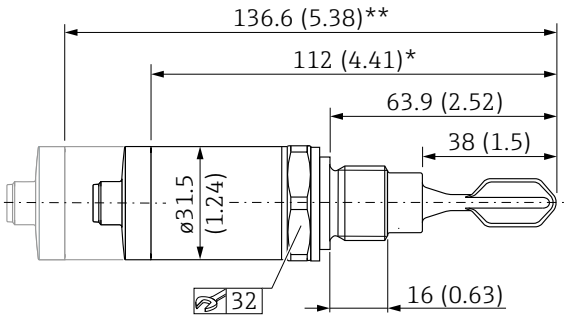
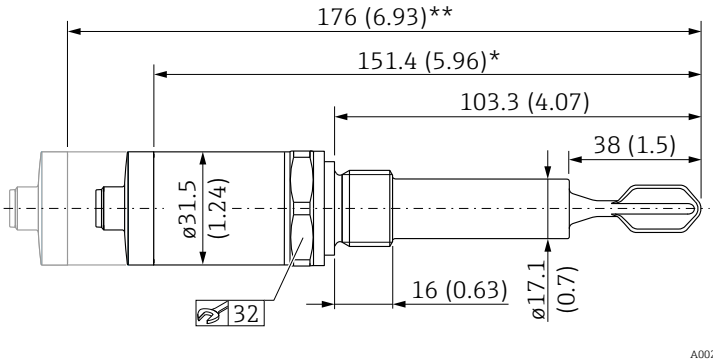
The total dimensions of the device can vary depending on the plug selected.

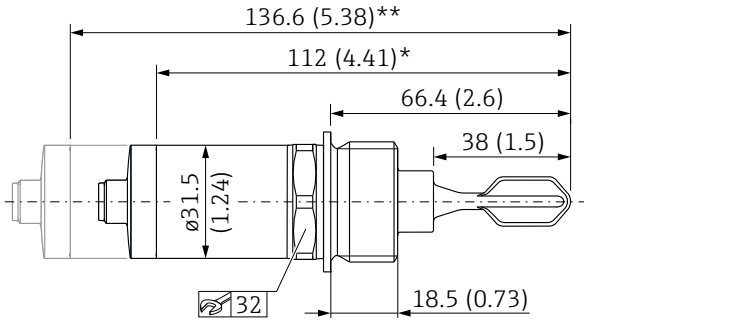
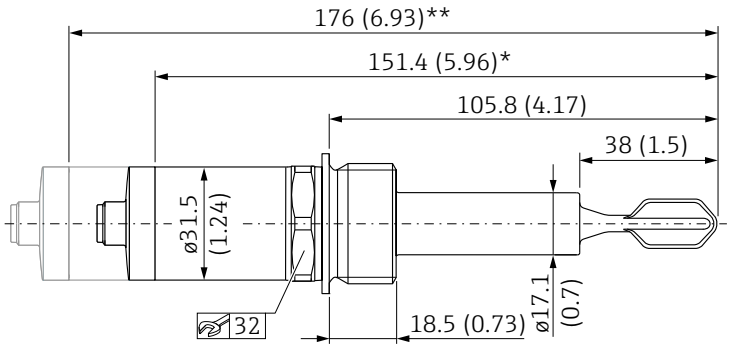
Information on the following tables

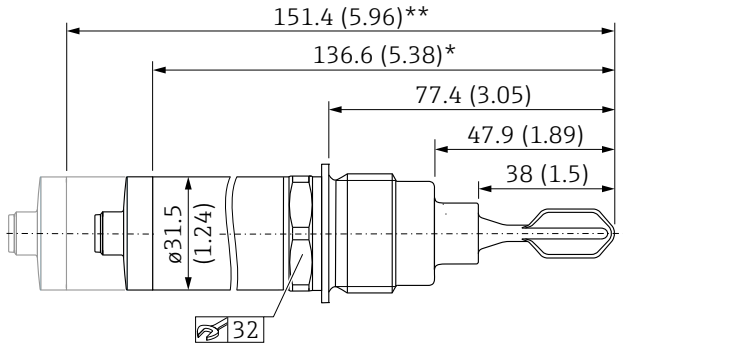
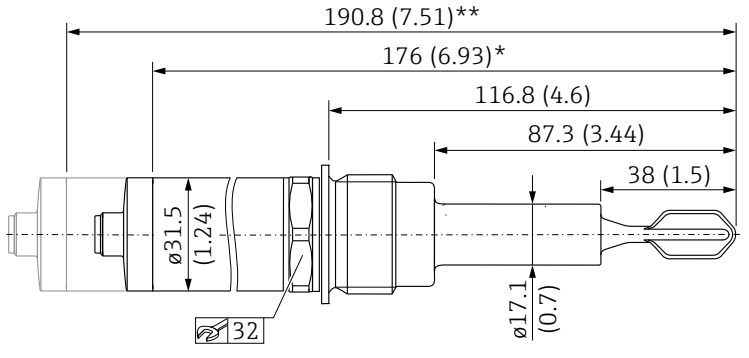
- Meaning of symbols:
  * Dimension for process temperature max. 100 °C (212 °F)
  ** Dimension for process temperature max. 150 °C (302 °F)
- If several versions have the same dimensions, one example of the compact version and one example of the short tube version is given.
- The versions in the second column refer to the process connections in the product structure.

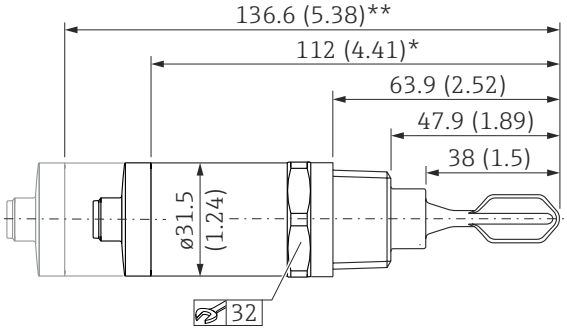
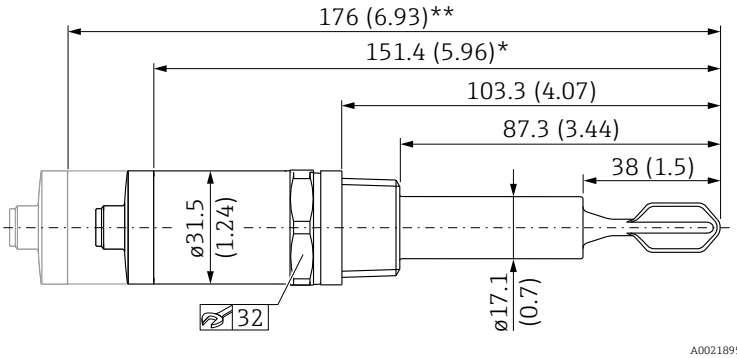
For detailed information, see "Technical Information" TI00426F (Weld-in adapters, process adapters and flanges)

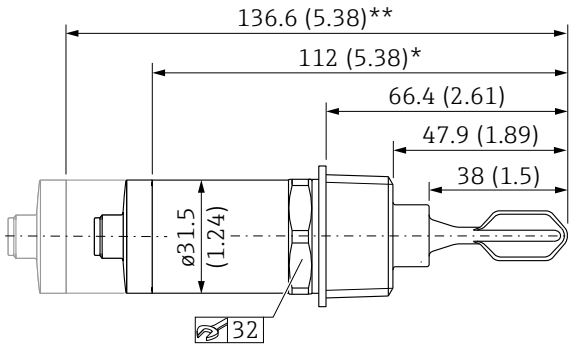
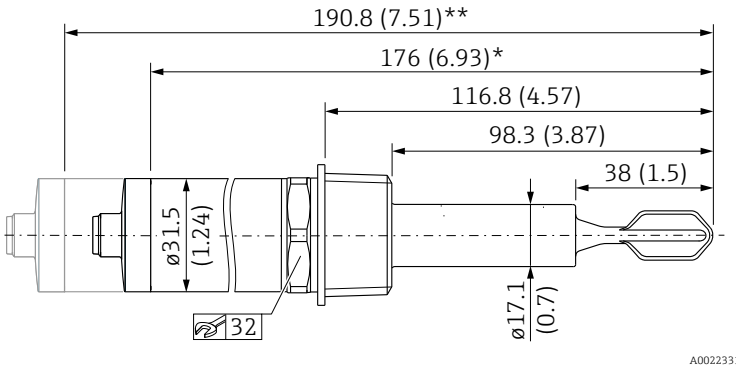
Available in the Download Area of the Endress+Hauser website (www.endress.com/downloads).

Dimensions	Version	Description
 *7 Compact version, example G ½"*	WBJ WCJ	**Thread ISO 228 G ½"** **Thread ISO 228 G ¾"** ▪ Material: 316L ▪ Scope of delivery: flat seal (FA) ▪ Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F)
 *8 Short tube version, example G ½"*	W5J	**Thread ISO 228 G ¾" for flush mount installation in weld-in adapter** ▪ Material: 316L ▪ Scope of delivery: flat seal (FA) Accessory: weld-in adapter ▪ Scope of delivery: seal (VMQ) ▪ Pressure and temperature (maximum): +25 bar (+352 psi) at +150 °C (+302 °F) +40 bar (+580 psi) at +100 °C (+212 °F) The dimensions apply for G ½"; G ¾" and G ¾" for flush mount installation.

Dimensions	Version	Description
 *9 Compact version*  *10 Short tube version*	WDJ	**Thread ISO 228 G 1"** ▪ Material: 316L ▪ Scope of delivery: flat seal (FA) ▪ Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F)

Dimensions	Version	Description
 *11 Compact version*  *12 Short tube version*	WSJ	**Thread ISO 228 G 1"** **for flush mount installation in weld-in adapter** ▪ Material: 316L ▪ Scope of delivery: flat seal (FA) Accessory: weld-in adapter ▪ Scope of delivery: seal (VMQ) ▪ Pressure and temperature (maximum): +25 bar (+362 psi) at +150 °C (+302 °F) +40 bar (+580 psi) at +100 °C (+212 °F)

Dimensions	Version	Description
 *13 Compact version, example MNPT ¾"*	VAJ	**Thread ASME MNPT ½"**
	VBJ	**Thread ASME MNPT ¾"**
	XBJ	**Thread EN10226 R ½"**
	XCJ	**Thread EN10226 R ¾"**
		Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F)
		The dimensions apply for MNPT ½", MNPT ¾"; R ½" and R ¾".
 *14 Short tube version, example MNPT ¾"*		

Dimensions	Version	Description
 *15 Compact version, example MNPT 1"*	VCJ	**Thread ASME MNPT 1"**
	XDJ	**Thread EN10226 R 1"** Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F) The dimensions apply for MNPT 1" and R 1".
 *16 Short tube version, example MNPT 1"*		

Pay attention to the temperature and pressure specifications for seals used at the customer site.

Endress+Hauser supplies DIN/EN process connections with threaded connection in stainless steel in accordance with AISI 316L (DIN/EN material number 1.4404 or 1.4435). In terms of their stability-temperature property, the materials 1.4404 and 1.4435 are grouped in EN 1092-1 table 18 under 13E0. The chemical composition of the two materials can be identical.

Weight

Sensor type	Weight
Compact version with process adapter G ½" and valve plug for process temperature up to 100 °C (212 °F)	Approx. 140 g (4.938 oz)
Short tube version with process adapter G ½" and valve plug for process temperature up to 150 °C (302 °F)	Approx. 169 g (5.961 oz)

Materials

Material specifications in accordance with AISI and DIN EN.

Materials in contact with process

Component part	Material
Tuning fork	316L
Process adapter	316L (1.4404/1.4435)
Short tube	316L (1.4404/1.4435)
Seal for weld-in adapter with G ¾", G 1"	VMQ
Flat seal	FA (composite material based on aramid fibers combined with NBR)

Materials not in contact with process

Component part	Material
Housing cover with M12 plug (IP65/67)	PPSU
Housing cover with M12 plug (IP66/68/69)	316L (1.4404/1.4435)
Design ring	PBT/PC
Housing	316L (1.4404/1.4435)

Surface roughness

Metallic surface in contact with process:

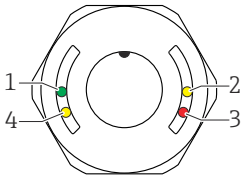
Ra ≤1.5 µm (59 µin), EHEDG

Ra ≤0.76 µm (30 µin), EHEDG, 3-A

The surface is not defined in the area of the welding seam.

Operability

LED indicator



A0036944

Position	LED color	Description of function
1	green (gn)	Status/communication ▪ Lit: SIO mode ▪ Flashing: active communication, flash frequency ▪ Flashing with increased luminosity: device search (device identification), flash frequency
2	yellow (ye) 1	Switch status/switch output 1 With IO-Link communication in accordance with customer calibration: sensor is covered by medium.
3	red (rd)	Warning/Maintenance required Flashing: error remediable, e.g. invalid calibration Fault/device failure Lit: see Diagnostics and troubleshooting
4	yellow (ye) 2	Switch status/switch output 2 [1] With IO-Link communication in accordance with customer calibration: sensor is covered by medium.

1) Activated only if both switch outputs are active.

On the metal housing cover (IP69), there is no external signaling via LEDs. A connecting cable with an M12 plug and LED display can be optionally ordered as an accessory. See the "Accessories" section

Function test with test magnet

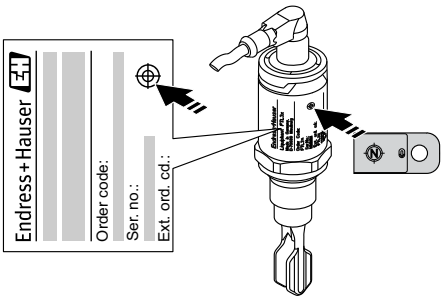
Carry out a function test while the device is in operation.

▶ Hold the test magnet for at least 2 s against the marking on the housing.

↳ This inverts the current switch status, and the yellow LED changes state. When the magnet is removed, the switching status valid at that time is adopted.

If the test magnet is held against the marking for longer than 30 s, the red LED will flash: The device returns automatically to the current switch status.

The test magnet is not included in the scope of delivery. It can optionally be ordered as an accessory. See the "Accessories" -> "Additional accessories" section



A0020960

17 *Position for test magnet on housing*

Certificates and approvals

The following documents are also available in the Download Area of the Endress+Hauser website:www.endress.com → Downloads.

CE mark

The measuring system is in conformity with the statutory requirements of the applicable EC Directives. These are listed in the corresponding EC Declaration of Conformity along with the standards applied. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.

EAC conformity

The measuring system meets the legal requirements of the applicable EAC guidelines. These are listed in the corresponding EAC Declaration of Conformity together with the standards applied.

Endress+Hauser confirms successful testing of the device by affixing to it the EAC mark.

RCM-Tick marking

The supplied product or measuring system meets the ACMA (Australian Communications and Media Authority) requirements for network integrity, interoperability, performance characteristics as well as health and safety regulations. Here, especially the regulatory arrangements for electromagnetic compatibility are met. The products are labelled with the RCM- Tick marking on the name plate.

A0029561

Approval

CSA C/US General Purpose

Sanitary compatibility

The Liquiphant FTL33 has been developed for use in hygienic processes. The materials in contact with the process meet FDA requirements as well as the 3-A Sanitary Standard No. 74-06. Endress +Hauser confirms this by affixing the 3-A sign to the device.

The following certificate copies can be ordered with the device (optional):

3-A

74-xx

A0019569

EHEDG

TYPE EL - CLASS I

A0022286

- If cleaning in place (CIP) is required, weld-in adapters that comply with 3-A requirements are offered. If installed horizontally, ensure that the leakage hole is pointing down. This allows leaks to be detected as quickly as possible.
- To avoid the risk of contamination, install the device according to the EHEDG design principles. Document 37 "Hygienic design and application of sensors" and Document 16 "Hygienic pipe couplings".
- Suitable connections and seals must be used in order to guarantee a hygienic design in accordance with the specifications of 3-A and EHEDG.
- For information on 3-A and EHEDG approved seals, weld-in adapters and process adapters, see the "Weld-in adapters, process adapters and flanges" documentation, TI00426F.
- The gap-free connections can be cleaned of all residue using sterilization in place (SIP) and cleaning in place (CIP), which are typical cleaning methods within the industry. Attention must be paid to the pressure and temperature specifications of the sensor and process connections for CIP and SIP processes.

Hygiene approval

For information on 3-A and EHEDG approved seals, weld-in adapters and process adapters, see the "Weld-in adapters, process adapters and flanges" documentation, TI00426F.

The versions can be selected via the product structure in the Product Configurator, see .

Process connections		Approvals	
	Version	EHEDG	3-A
Thread ISO 228 G ½", 316L	WBJ	-	-
Thread ISO 228 G 1, 316L, weld-in adapter installation accessory Thread ISO 228 G ¾, 316L, weld-in adapter installation accessory	WSJ W5J	✔	✔
Thread M24, 316L, installation, adapter accessory	X2J	✔	✔
Thread ASME MNPT ½", 316L Thread ASME MNPT ¾", 316L Thread ASME MNPT 1", 316L	VAJ VBJ VCJ	-	-
DIN 11851 DN25 PN40 without slotted nut, 316L DIN 11851 DN32 PN40 without slotted nut, 316L DIN 11851 DN40 PN40 without slotted nut, 316L	1GJ 1HJ 1JJ	✔	✔
Tri-Clamp ISO 2852 DN25-38 (1 to 1-½"), 316L, DIN 32676 DN25-40 Tri-Clamp ISO 2852 DN40-51 (2"), 316L, DIN 32676 DN50	3CJ 3EJ	✔	✔
Flush mount, 316L, without slotted nut, weld-in adapter installation accessory	5ZJ	✔	✔

CRN approval

Versions with a CRN approval (Canadian Registration Number) are listed in the corresponding registration documents. CRN-approved devices are labeled with registration number 0F16950.5C on the nameplate. For further details on the maximum pressure values, see the Download Area of the Endress+Hauser website.

Inspection certificates

The following documents can be ordered with the device (optional):

- Acceptance test certificate as per EN 10204-3.1 (only for versions with ≤ RA 0.76 µm (30 µin))
- Test report of surface roughness as per ISO 4287/Ra (only for versions with ≤ RA 0.76 µm (30 µin))
- Final inspection report

Manufacturer declarations

The following manufacturer declarations can be ordered (optional):

- FDA conformity
- TSE-free, materials free from animal origin
- ROHS-compliant in accordance with Endress+Hauser regulation
- Regulation EC 2023/ 2006 (GMP)
- Regulation (EC) No. 1935/2004 on materials and articles intended to come into contact with food

Pressure Equipment Directive

The device does not fall within the scope of Pressure Equipment Directive 97/23/EC as it does not have a pressurized housing as defined in Article 1, Section 2.1.4 of the directive.

Other standards and guidelines

The applicable European guidelines and standards can be found in the relevant EU Declarations of Conformity.

Regulation (EU) No. 10/2011: The device does not fall within the scope of the regulation on plastic materials and articles intended to come into contact with food as the wetted materials are made of stainless steel only. The silicone seals supplied comply with BfR Recommendation XV (commodities based on silicones) and the EPDM seals supplied comply with BfR Recommendation XXI (commodities based on natural and synthetic rubber) of the German Federal Institute for Risk Assessment (BfR).

Ordering information

Ordering information

Detailed ordering information is available from your nearest sales organization www.addresses.endress.com or in the Product Configurator under www.endress.com .

Product Configurator - the tool for individual product configuration
- Up-to-the-minute configuration data
- Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
- Ability to order directly in the Endress+Hauser Online Shop

Services (optional)

In addition, the following services can be selected via the product structure in the Product Configurator:

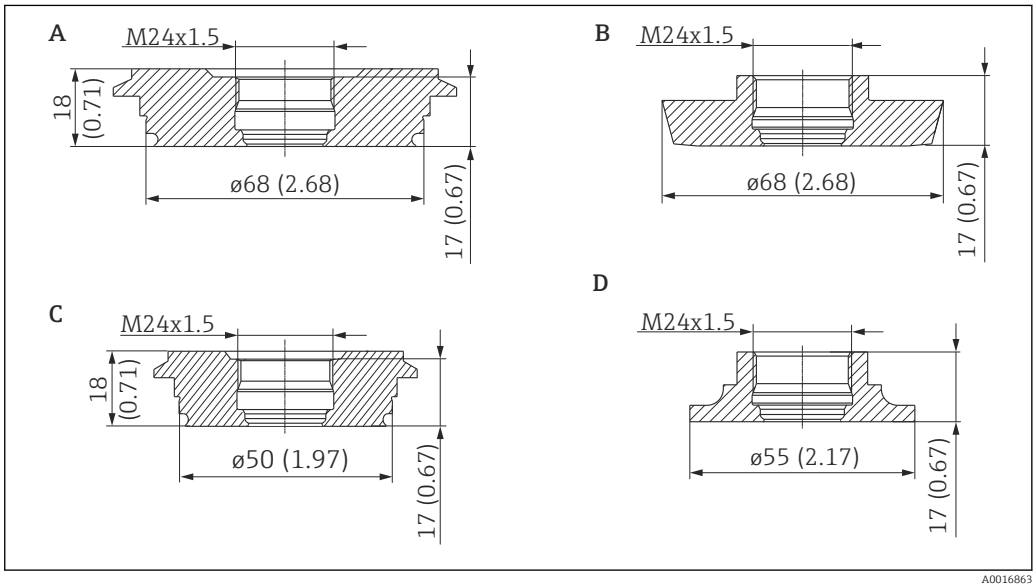
- Cleaned of oil+grease
- Density setting > 0.5 g/cm³
- Switching delay setting

Accessories

The adapters are optionally available with inspection certificate 3.1 EN10204.

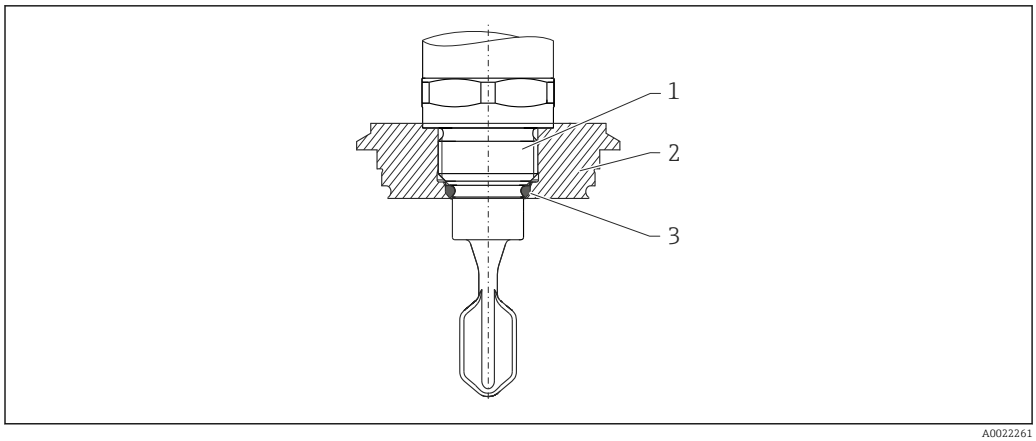
Process adapter M24

The following process adapters are available for process connection M24. Pay attention to material specifications.



A0016863

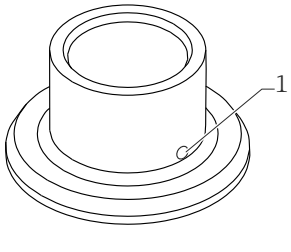
View	Process adapter M24 for:	Pressure rating PN	Order number	Order number with 3.1 inspection certificate
A	Varivent N	40	52023997	52024004
B	DIN11851 DN50 with slotted nut	25	52023998	52024005
C	Varivent F	40	52023996	52024003
D	SMS 1½"	25	52026997	52026999



1 *Device with process adapter M24*
2 *Hygienic connection (Varivent example)*
3 *O-ring*

Weld-in adapter

Various weld-in adapters are available for installation in vessels or pipes.

View (example)	Description
 1 *Leakage hole*	**G ¾"** ø29 pipe installation ø50 vessel installation FDA-listed materials as per 21 CFR Part 175-178
	G 1" ø53 pipe installation ø60 vessel installation
	M24 ø65 vessel installation
	Rd52 Vessel installation

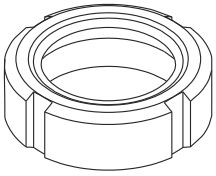
If installed horizontally and weld-in adapters with a leakage hole are used, ensure that the leakage hole is pointing down. This allows leaks to be detected as quickly as possible.

For detailed information, see "Technical Information" TI00426F (Weld-in adapters, process adapters and flanges)

Available in the Download Area of the Endress+Hauser website (www.endress.com/downloads).

Slotted nut

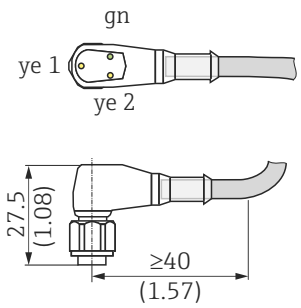
The slotted nuts can be ordered optionally as an accessory.

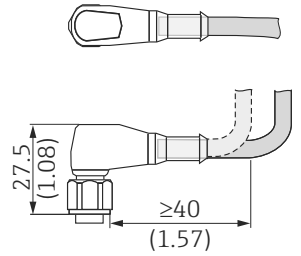
View (example)	Process adapter DIN11851 (milk pipe)	PN	Order number
	DIN11851 F25 (also for process adapter, flush mount)	40	52021715
	DIN11851 F32	40	71258359
	DIN11851 F40	40	71258361
	Material: 304 (1.4307)		

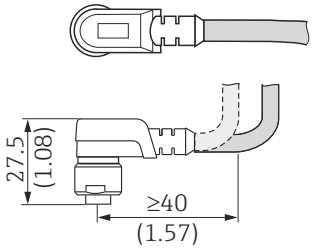
Plug-in jack, cable

The plug-in jacks listed are suitable for use in the temperature range –25 to +70 °C (–13 to +158 °F).

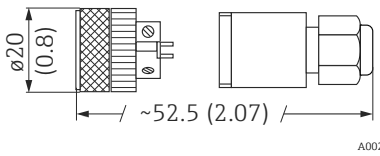
Engineering unit mm (in)

Plug-in jack M12 IP69 with LED	Description	Order number
	▪ Elbowed 90° ▪ Terminated at one end ▪ 5 m (16 ft) PVC cable (orange) ▪ Slotted nut 316L ▪ Body: PVC (transparent)	52018763

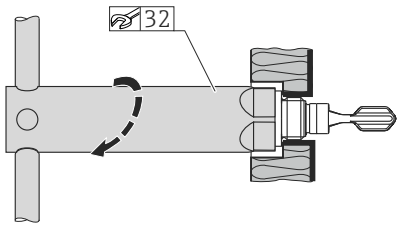
Plug-in jack M12 IP69	Description	Order number
	▪ Terminated at one end ▪ Elbowed 90° ▪ 5 m (16 ft)PVC cable (orange) ▪ Slotted nut 316L (1.4435) ▪ Body: PVC (orange)	52024216

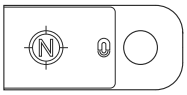
Plug-in jack M12 IP67	Description	Order number
	▪ Elbowed 90° ▪ 5 m (16 ft) PVC cable (gray) ▪ Slotted nut Cu Sn/Ni ▪ Body: PUR (black)	52010285

Wire colors for M12 plug: 1 = BN (brown), 2 = WT (white), 3 = BU (blue), 4 = BK (black)

Plug-in jack M12 IP67	Description	Order number
	▪ Self-terminated connection to M12 plug ▪ Slotted nut Cu Sn/Ni ▪ Body: PBT	52006263

Additional accessories

Socket wrench for mounting	Description	Order number
 A0022273	▪ Hexagonal ▪ Size across flats AF32	52010156

Test magnet	Description	Order number
 A0021732	Information in "Operation" section	71267011

Supplementary documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *W@M Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from nameplate
- *Endress+Hauser Operations App*: Enter the serial number from the nameplate or scan the 2D matrix code (QR code) on the nameplate

Operating Instructions Liquiphant FTL33

BA01286F

Operating Instructions Liquiphant FTL33 IO-Link

BA01934F

Additional documentation

Weld-in adapter, process adapter and flanges (overview)

TI00426F

Weld-in adapter (installation instructions)

SD01622Z

Valve plug (installation instructions)

SD00356F

Hygiene approvals

SD02503F

Certificates

Overfill protection

ZE01010F

Leak

ZE01011F

www.addresses.endress.com

For more Endress+Hauser product please visit: www.ainstru.com
Mail: Sales@ainstru.com

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