

# Technical Information

## Liquiphant FTL33 IO- Link

Vibronic



### Point level switch for liquids in the food sector

#### 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), CIP-capable
- 150 °C (302 °F), CIP- and SIP-capable

#### 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 connector with Degree of protection IP69
- 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

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## Important document information

### Symbols for certain types of information

Symbol	Meaning
	<b>Permitted</b> Procedures, processes or actions that are permitted.
	<b>Preferred</b> Procedures, processes or actions that are preferred.
	<b>Forbidden</b> Procedures, processes or actions that are forbidden.
	<b>Tip</b> Indicates additional information.
	Reference to documentation.
	Reference to page.
	Reference to graphic.
	Visual inspection.

### Symbols in graphics

Symbol	Meaning
1, 2, 3 ...	Item numbers
1. 2. 3...	Series of steps
A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections
	<b>Hazardous area</b> Indicates the hazardous area.
	<b>Safe area (non-hazardous area)</b> Indicates the non-hazardous area.

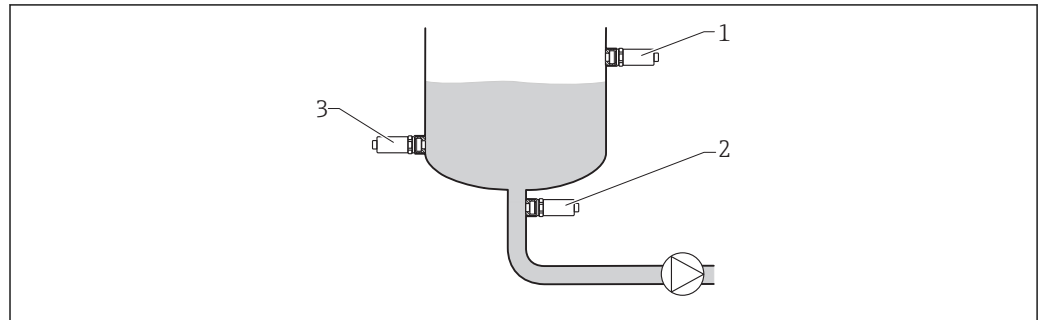
## Function and system design

### 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 prevention or upper level detection (maximum safety)
- 2 Dry running protection for pump (minimum safety)
- 3 Lower level detection (minimum safety)

## Input

<b>Measured variable</b>	Density
<b>Measuring range</b>	customer-specific

## Output

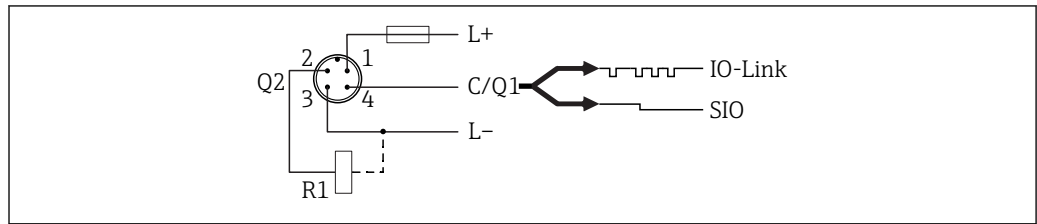
<b>Switch output</b>	<p>Switching behavior: On/Off</p> <ul style="list-style-type: none"> <li>▪ <b>Function</b> 3-wire DC-PNP: Positive voltage signal at the switch output of the electronics (PNP), switching capacity 200 mA</li> <li>▪ <b>IO-Link (4-wire):</b> Switching capacity:105 mA/200 mA</li> </ul>
<b>Operating modes</b>	<p>The device has two operating modes: maximum safety (MAX) and minimum safety (MIN).</p> <p>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.</p> <ul style="list-style-type: none"> <li>▪ <b>Maximum safety (MAX)</b> The device keeps the electronic switch closed as long as the liquid level is below the fork. Sample application: overflow prevention</li> <li>▪ <b>Minimum safety (MIN)</b> The device keeps the electronic switch closed as long as the fork is immersed in liquid. Sample application: Dry running protection for pumps</li> </ul> <p>The electronic switch opens if the limit is reached, if a fault occurs or the power fails (quiescent current principle).</p> <p><b>Window functions</b></p>

## Power supply

<b>Supply voltage</b>	<p><b>SIO mode</b> 10 to 30 VDC</p> <p><b>IO-Link mode</b> 18 to 30 VDC</p> <p>IO-Link communication is guaranteed only if the supply voltage is at least 18 V.</p>
<b>Power consumption</b>	< 1 W (at max. load: 200 mA)
<b>Current consumption</b>	< 15 mA

Electrical connection

Connecting the device



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- 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)

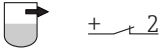

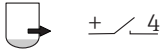


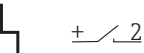

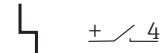


Minimum safety		
Terminal assignment	MIN output	LED yellow (ye) 1
	+  4	
	+  4	

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

Function monitoring

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	Red LED (rd)
	+  2		+  4		
	+  2		+  4		

Connection for function monitoring using XOR operation					
Terminal assignment	MAX output	LED yellow (ye) 2	MIN output	LED yellow (ye) 1	Red LED (rd)
	 + 2		 + 4		
	 + 2		 + 4		

**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/core, total capacity < 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  $I > 250$  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

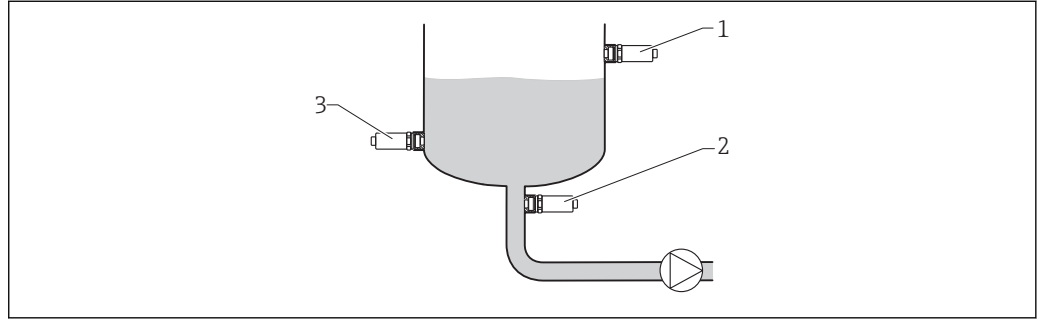
<b>Reference operating conditions</b>	Ambient temperature:	+25 °C (+77 °F)
	Process pressure:	1 bar (14.5 psi)
	Fluid:	Water (density: approx. 1 g/cm <sup>3</sup> , viscosity 1 mm <sup>2</sup> /s)
	Medium temperature:	25 °C (77 °F)
	Density setting:	> 0.7 g/cm <sup>3</sup>
	Switching time delay:	Standard (0.5 s, 1 s)
<b>Switch point</b>	13 mm (0.51 in)±1 mm	
<b>Hysteresis</b>	max. 3 mm (0.12 in)	
<b>Non-repeatability</b>	±1 mm (0.04 in) in accordance with DIN 61298-2	
<b>Influence of ambient temperature</b>	Negligible	
<b>Influence of medium temperature</b>	-25 µm (984 µin)/°C	
<b>Influence of medium pressure</b>	-20 µm (787 µin)/bar	
<b>Switching delay</b>	<ul style="list-style-type: none"> <li>■ 0.5 s when tuning fork is covered</li> <li>■ 1.0 s when tuning fork is uncovered</li> <li>■ Optionally available: 0.2 s; 1.5 s or 5 s (when the tuning fork is covered and uncovered)</li> <li>■ Can be configured via IO-Link from 0.3 to 60 s</li> </ul>	
<b>Switch-on delay</b>	max. 3 s	
<b>Measuring frequency</b>	Approx. 1 100 Hz in air	
<b>Measured error</b>	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.



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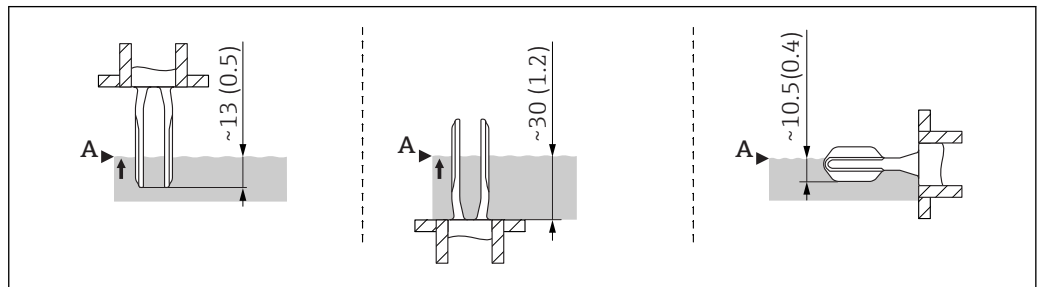
#### 2 Installation examples

- 1 Overfill prevention 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)).

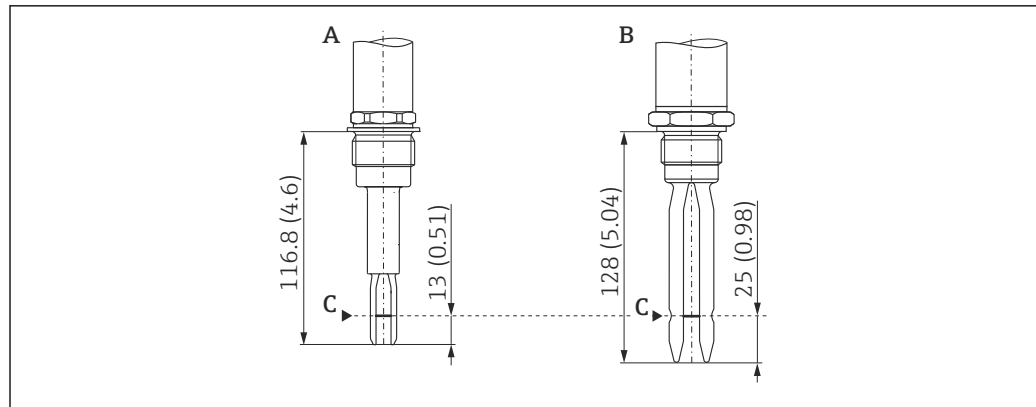


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#### 3 Vertical and horizontal orientation, dimensions in mm (in)

#### 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-mounted installation and MNPT 1")



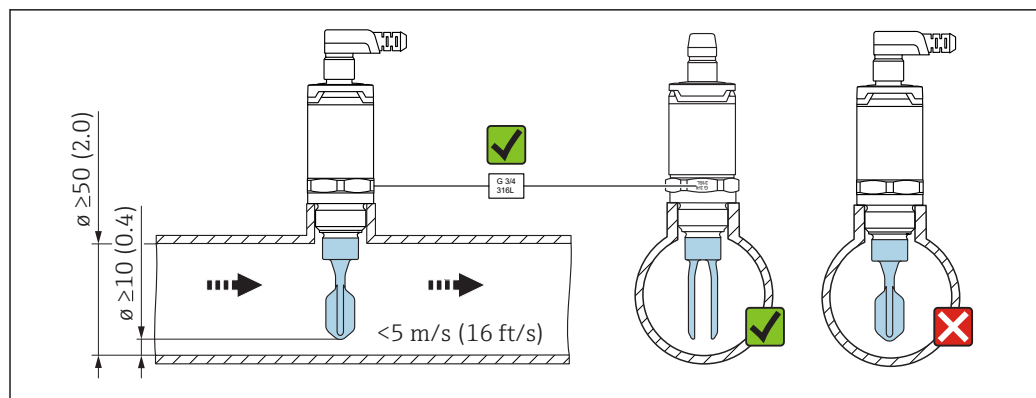
A0022122

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.



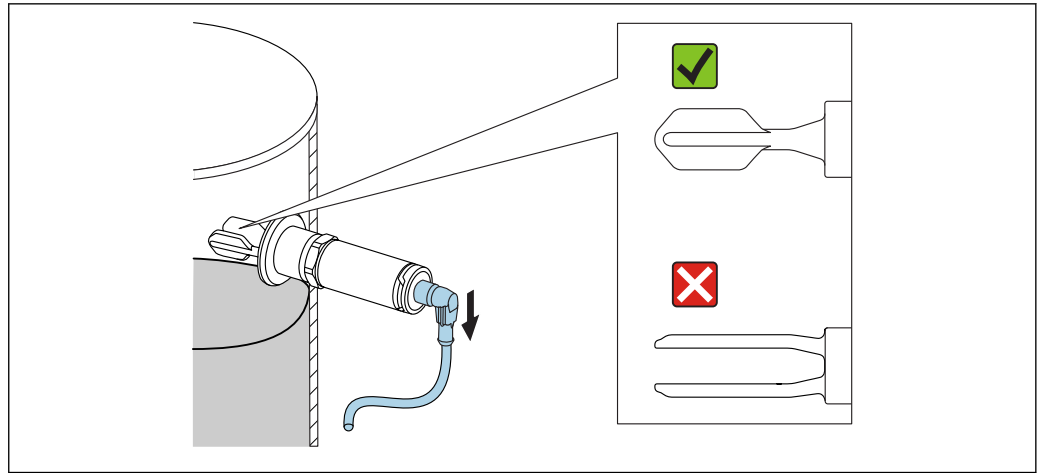
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Dimensions mm (in)

### 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 connector, should be pointing down with the cable. This can prevent moisture from penetrating.

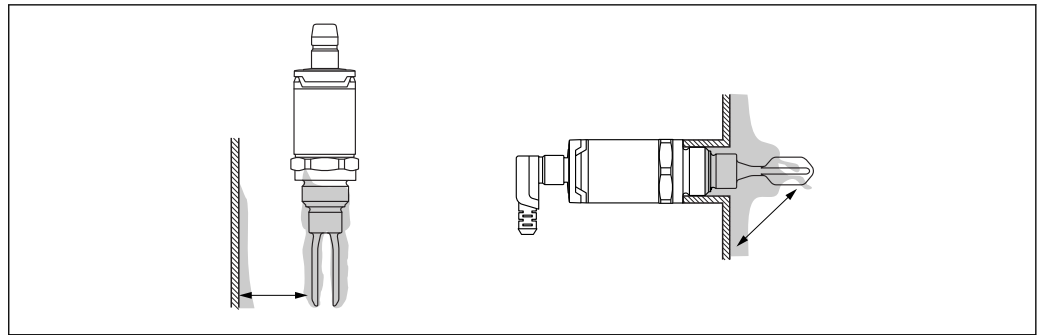


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4 Position of the fork in the case of horizontal installation in a vessel

**Distance from wall**

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



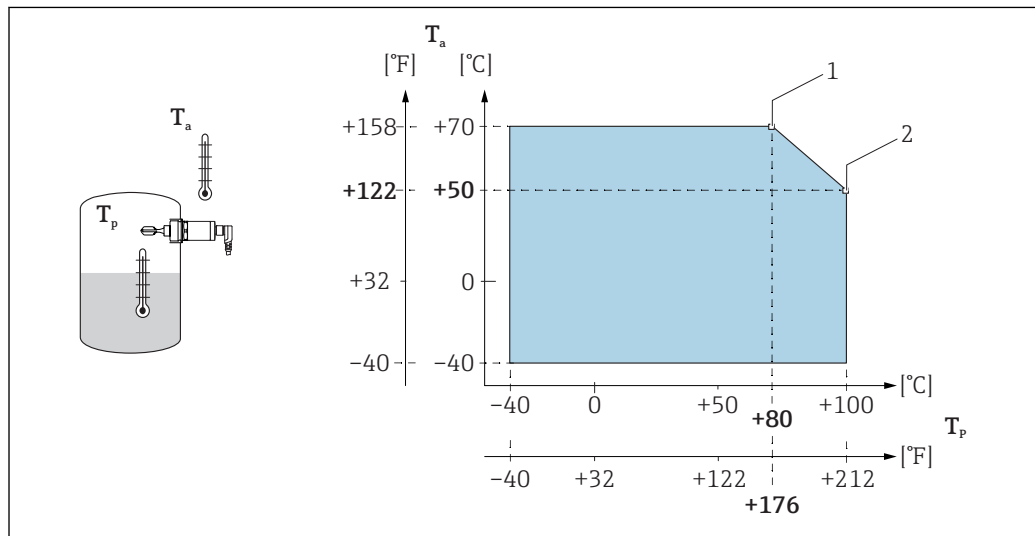
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**Length of connecting cable**

- to 1000 m (3 281 ft)
- max. 25  $\Omega$ /wire, total capacitance < 100 nF

## Environment

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



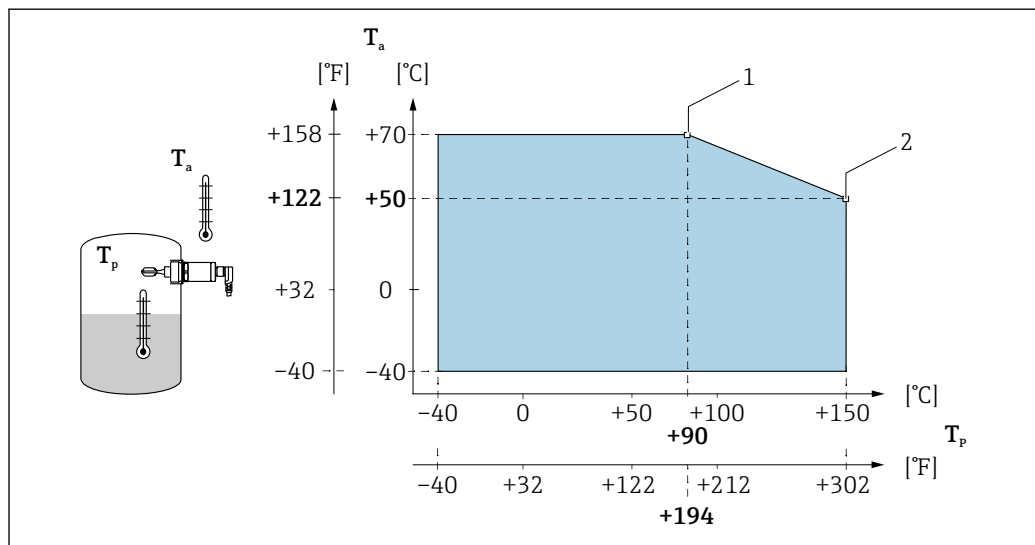
5 Derating curve: 100 °C (212 °F)

1  $I_{max}$ : 200 mA (DC-PNP), 250 mA (AC/DC)

2  $I_{max}$ : 150 mA (DC-PNP), 150 mA (AC/DC)

$T_a$  Ambient temperature range

$T_p$  Process temperature



6 Derating curve: 150 °C (302 °F)

1  $I_{max}$ : 200 mA (DC-PNP), 250 mA (AC/DC)

2  $I_{max}$ : 150 mA (DC-PNP), 150 mA (AC/DC)

$T_a$  Ambient temperature range

$T_p$  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

<b>Degree of protection</b>	<ul style="list-style-type: none"> <li>■ IP65/67 NEMA Type 4X Enclosure (M12 connector)</li> <li>■ IP66/68/69 <sup>1)</sup> NEMA Type 4X/6P Enclosure (M12 plug for metallic housing cover)</li> <li>■ IP65 NEMA Type 4X Enclosure (valve plug)</li> <li>■ IP66/68 NEMA Type 4X/6P Enclosure (cable)</li> </ul> <p>1) The IP69K protection class is defined in accordance with DIN 40050 Part 9. This standard was withdrawn on November 1, 2012 and replaced by DIN EN 60529. The name of the IP protection class changed to IP69 as part of this.</p>
<b>Shock resistance</b>	<p>a = 300 m/s<sup>2</sup> = 30 g, 3 planes x 2 directions x 3 shocks x 18 ms, as per test Ea, prEN 60068-2-27:2007</p>
<b>Vibration resistance</b>	<p>a(RMS) = 50 m/s<sup>2</sup>, ASD = 1.25 (m/s<sup>2</sup>)<sup>2</sup>/Hz, f = 5 to 2000 Hz, t = 3 x 2 h, as per test Fh, EN 60068-2-64:2008</p>
<b>Cleaning</b>	<p>Resistant to typical cleaning agents from the outside. Passed Ecolab test.</p>
<b>Electromagnetic compatibility</b>	<p>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: <a href="http://www.endress.com">www.endress.com</a> → Downloads.</p>
<b>Reverse polarity protection</b>	<p><b>3-wire DC-PNP and IO-Link</b> Integrated. In the event of reverse polarity, the device is deactivated automatically.</p>
<b>Short-circuit protection</b>	<p><b>3-wire DC-PNP and IO-Link</b></p> <ul style="list-style-type: none"> <li>■ Overload protection/short-circuit protection at I &gt; 250 mA; the sensor is not destroyed.</li> <li>■ If both switch outputs are active: 105 mA per switch output.</li> </ul> <p>Intelligent monitoring: Testing for overload at intervals of approx. 1.5 s; normal operation resumes once the overload/short-circuit has been rectified.</p>

## Process

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

---

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

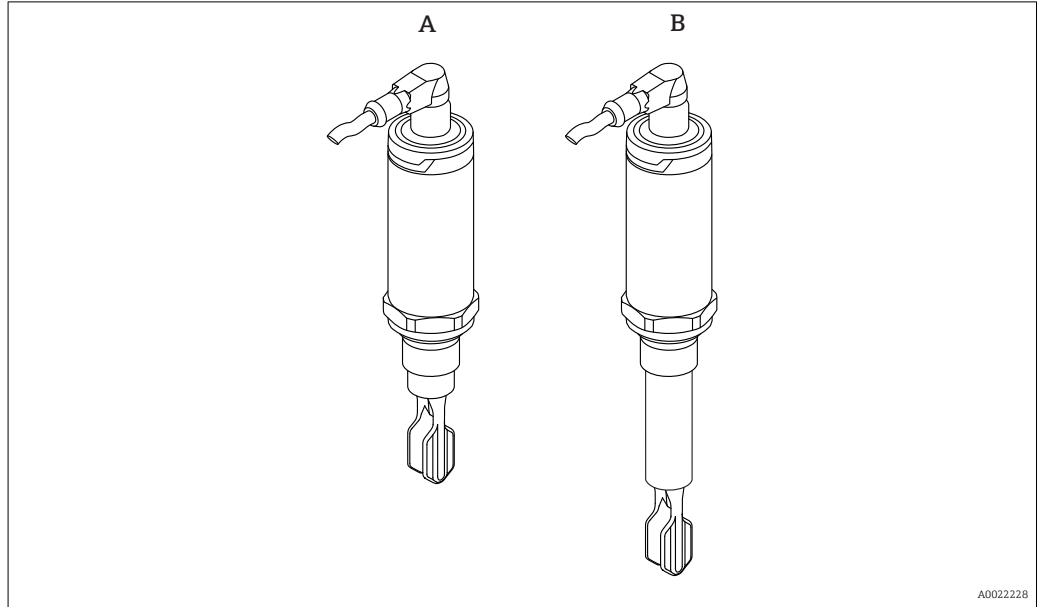
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## Mechanical construction


### 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

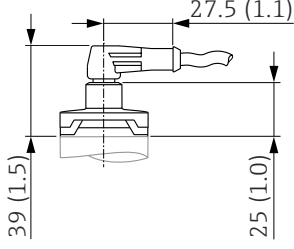
 For detailed information on the process connections, see the "Sensor type" section.

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

**Connector**

**Dimensions**

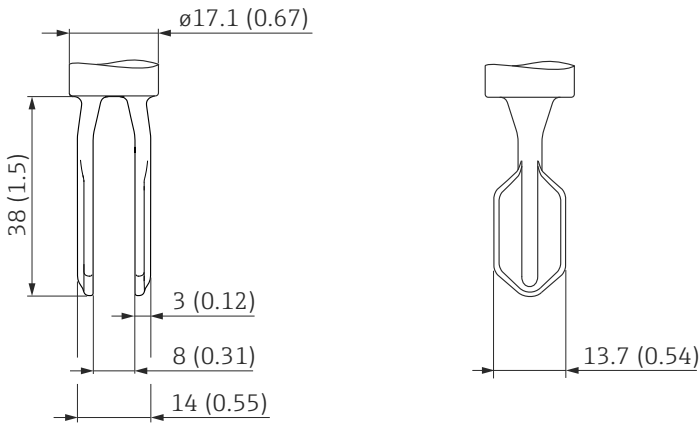
Dimensions mm (in)

Electrical connection with housing cover	Designation
	<p>M12 plug for housing cover: PPSU plastic (IP65/67)</p>

**Vibrating beam**

**Dimensions**

Dimensions mm (in)


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Sensor type


Dimensions

Dimensions mm (in)

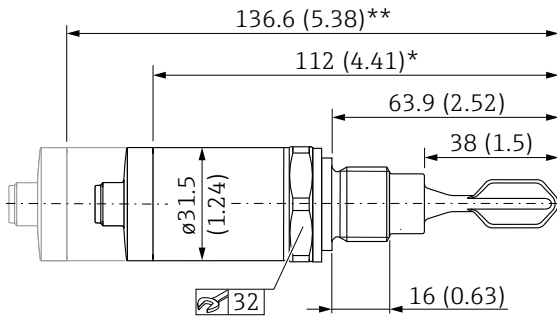
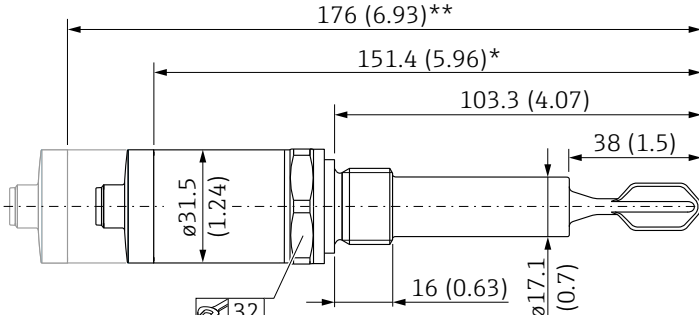
The total dimensions of the device can vary depending on the connector selected. To determine the total dimensions, please refer also to the "Electrical connection" section .

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.

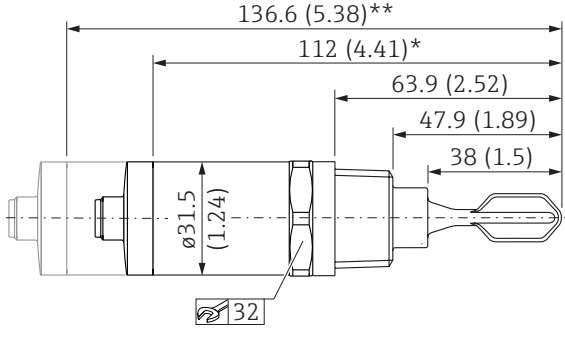
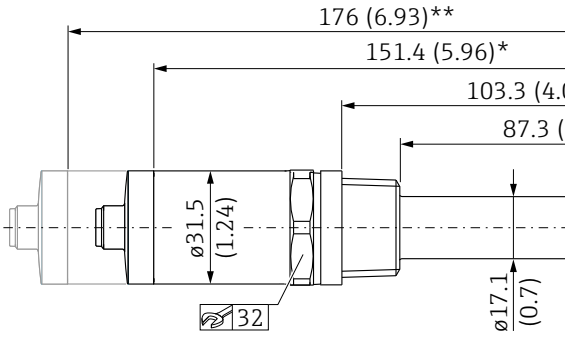
 For information on weld-in adapters, see "Technical Documentation" for weld-in adapters, process adapters and flanges

Available in Downloads area of the Endress+Hauser website ([www.endress.com/downloads](http://www.endress.com/downloads)).

Dimensions	Version	Description
 <p><b>7</b> Compact version, example G 1/2"</p> <p style="text-align: right;"><small>A0021787</small></p>	<p>WBJ WCJ</p> <p><b>Thread ISO 228 G 1/2"</b> <b>Thread ISO 228 G 3/4"</b></p> <ul style="list-style-type: none"> <li>■ Material: 316L</li> <li>■ Scope of delivery: flat seal (FA)</li> <li>■ Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F)</li> </ul>	<p>W5J</p> <p><b>Thread ISO 228 G 3/4" for flush-mounted installation in weld-in adapter</b></p> <ul style="list-style-type: none"> <li>■ Material: 316L</li> <li>■ Scope of delivery: flat seal (FA)</li> </ul> <p>Accessory: weld-in adapter</p> <ul style="list-style-type: none"> <li>- Scope of delivery: seal (VMQ)</li> <li>- Pressure and temperature (maximum): +25 bar (+352 psi) at +150 °C (+302 °F) +40 bar (+580 psi) at +100 °C (+212 °F)</li> </ul> <p>The dimensions apply for G 1/2"; G 3/4" and G 3/4" for flush-mounted installation.</p>
 <p><b>8</b> Short tube version, example G 1/2"</p> <p style="text-align: right;"><small>A0021883</small></p>		

Dimensions	Version	Description
<p>9 Compact version</p> <p>10 Short tube version</p>	<p>WDJ</p>	<p><b>Thread ISO 228 G 1"</b></p> <ul style="list-style-type: none"> <li>Material: 316L</li> <li>Scope of delivery: flat seal (FA)</li> <li>Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F)</li> </ul>

Dimensions	Version	Description
<p>11 Compact version</p> <p>12 Short tube version</p>	<p>WSJ</p>	<p><b>Thread ISO 228 G 1"</b> <b>for flush-mounted installation in weld-in adapter</b></p> <ul style="list-style-type: none"> <li>Material: 316L</li> <li>Scope of delivery: flat seal (FA)</li> </ul> <p>Accessory: weld-in adapter</p> <ul style="list-style-type: none"> <li>Scope of delivery: seal (VMQ)</li> <li>Pressure and temperature (maximum): +25 bar (+362 psi) at +150 °C (+302 °F)</li> <li>+40 bar (+580 psi) at +100 °C (+212 °F)</li> </ul>

Dimensions	Version	Description
 <p data-bbox="159 616 566 649">13 Compact version, example MNPT 3/4"</p>  <p data-bbox="159 1030 582 1064">14 Short tube version, example MNPT 3/4"</p>	<p data-bbox="933 257 981 280">VAJ</p> <p data-bbox="933 302 981 324">VBJ</p> <p data-bbox="933 347 981 369">XBJ</p> <p data-bbox="933 392 981 414">XCJ</p>	<p data-bbox="1021 257 1252 280"><b>Thread ASME MNPT 1/2"</b></p> <p data-bbox="1021 302 1252 324"><b>Thread ASME MNPT 3/4"</b></p> <p data-bbox="1021 347 1236 369"><b>Thread EN10226 R 1/2"</b></p> <p data-bbox="1021 392 1236 414"><b>Thread EN10226 R 3/4"</b></p> <p data-bbox="1021 436 1380 481">Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F)</p> <p data-bbox="1021 504 1492 548">The dimensions apply for MNPT 1/2", MNPT 3/4"; R 1/2" and R 3/4".</p>

Dimensions	Version	Description
<p>15 Compact version, example MNPT 1" <span style="float: right;">A0022330</span></p> <p>16 Short tube version, example MNPT 1" <span style="float: right;">A0022331</span></p>	VCJ	<b>Thread ASME MNPT 1"</b>
	XDJ	<b>Thread EN10226 R 1"</b> Pressure and temperature (maximum): +40 bar (+580 psi) at +150 °C (+302 °F) The dimensions apply for MNPT 1" and R 1".

**i** 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
Vibrating beam	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*

<b>Component part</b>	<b>Material</b>
Housing cover with M12 connector (IP65/67)	PPSU
Housing cover with valve plug (IP65)	
Housing cover with cable (IP66/68)	
Cable gland	PVDF
Design ring	PBT/PC
Housing	316L (1.4404/1.4435)
Nameplate	Plastic foil (attached to housing)

**Surface roughness**

Metallic surface in contact with process:

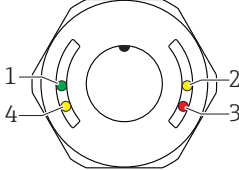
Ra ≤ 3.2 μm (126 μin)




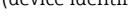
The surface is not defined in the area of the welding seam.

## Operability

### LED indicator



A0036944

Position	LED color	Description of function
1	green (gn)	Status/communication <ul style="list-style-type: none"> <li>▪ lit: SIO mode</li> <li>▪ flashing: Active communication, flash frequency </li> <li>▪ flashes with increased luminosity: Device search (device identification), flash frequency </li> </ul>
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 <sup>1)</sup> With IO-Link communication in accordance with customer calibration: sensor is covered by medium .

1) Activated only if both switch outputs are active.

**i** On the metal housing cover (IP69), there is no external signaling via LEDs. A connecting cable with an M12 connector and LED display can be ordered as an accessory .

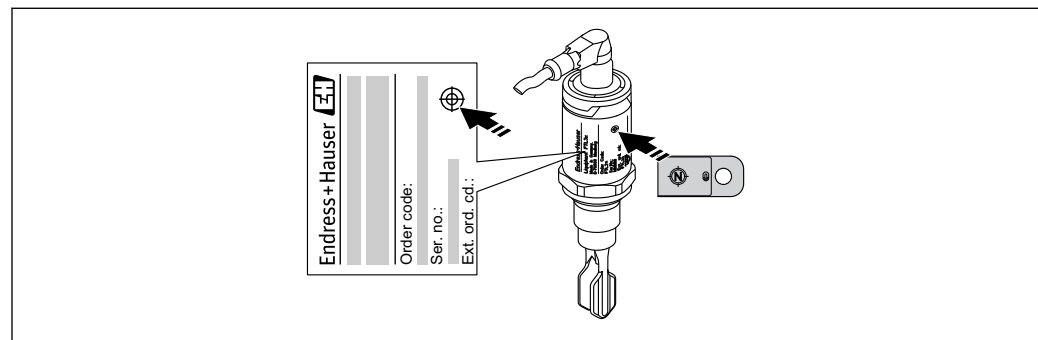
### Function test with test magnet

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

- ▶ Hold the test magnet against the marking on the housing for at least 2 seconds.
  - ↳ 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 seconds, the red LED will flash: The device returns automatically to the current switch status.

**i** The test magnet is not included in the scope of delivery. It can be ordered as an optional accessory .



**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](http://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



EHEDG



- 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 in accordance with the design principles of EHEDG, Document 37 "Hygienic Design and Application for Sensors" and Document 16 "Hygienic Pipe Connections".
- Suitable connections and seals must be used in order to guarantee a hygienic design in accordance with the specifications of 3-A and EHEDG.
- Information on 3-A and EHEDG-approved weld-in adapters can be found in the "Weld-in adapters, process adapters and flanges" documentation, TI00426F/00.
- 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**

Information on 3-A and EHEDG-approved weld-in adapters can be found in the "Weld-in adapters, process adapters and flanges" documentation, TI00426F/00.

The versions can be selected via the product structure in the Product Configurator, see also →  25.

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	WSJ	✓	✓
Thread ISO 228 G ¾, 316L, weld-in adapter installation accessory	W5J	✓	✓
Thread M24, 316L, installation, adapter accessory	X2J	✓	✓
Thread ASME MNPT ½", 316L	VAJ	-	-
Thread ASME MNPT ¾", 316L	VBJ	-	-
Thread ASME MNPT 1", 316L	VCJ	-	-
DIN 11851 DN25 PN40 without slotted nut, 316L	1GJ	✓	✓
DIN 11851 DN32 PN40 without slotted nut, 316L	1HJ	✓	✓
DIN 11851 DN40 PN40 without slotted nut, 316L	1JJ	✓	✓
Tri-Clamp ISO 2852 DN25-38 (1 to 1-½"), 316L, DIN 32676 DN25-40	3CJ	✓	✓
Tri-Clamp ISO 2852 DN40-51 (2"), 316L, DIN 32676 DN50	3EJ	✓	✓
Flush-mounted, 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 OF16950.5C on the nameplate. You can find further details on the maximum pressure values in 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))
- Surface roughness test report 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 the following sources:

- In the Product Configurator on the Endress+Hauser website: [www.endress.com](http://www.endress.com) -> Click "Corporate" -> Select your country -> Click "Products" -> Select the product using the filters and search field -> Open product page -> The "Configure" button to the right of the product image opens the Product Configurator.
- From your Endress+Hauser Sales Center: [www.addresses.endress.com](http://www.addresses.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:

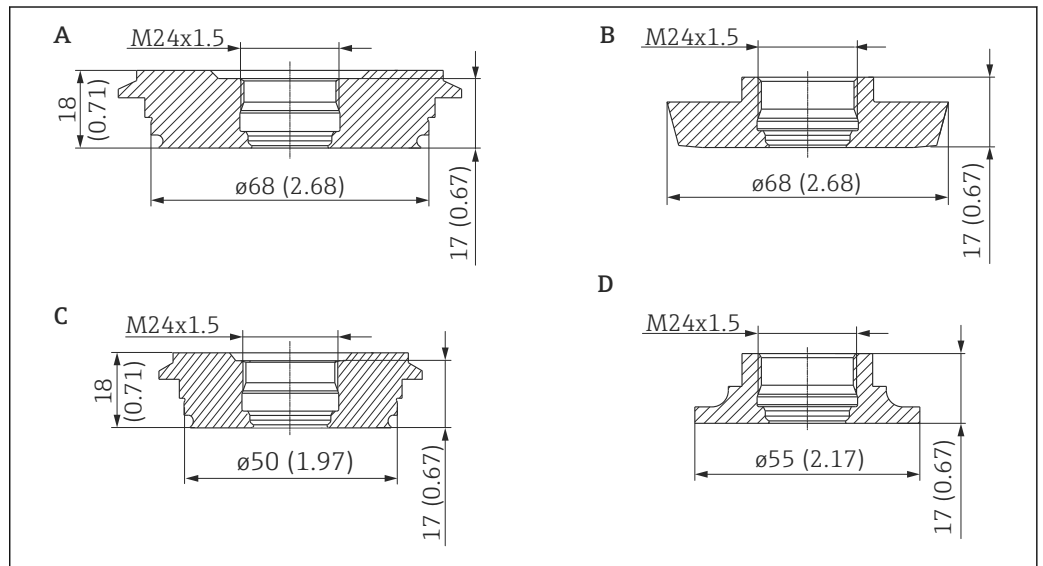
- Cleaned of oil+grease
- Density setting > 0.5 g/cm<sup>3</sup>
- Switching delay setting

## Accessories

 The adapters are optionally available with inspection certificate 3.1 EN10204.

### Process adapter M24

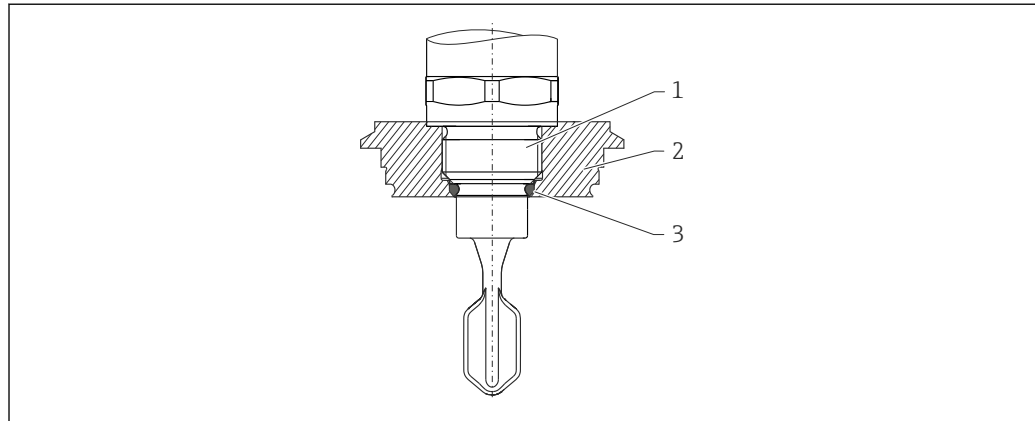
The following process adapters are available for process connection M24. Please pay attention to the material specifications.



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

View	Process adapter M24 for:	Pressure rating PN	Order number	Order number with 3.1 inspection certificate
C	Varivent F	40	52023996	52024003
D	SMS 1½"	25	52026997	52026999



A0022261

- 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
<p>1 Leakage hole</p> <p>A0023557</p>	<b>G ¾"</b> ø29 pipe installation ø50 vessel installation FDA-listed materials as per 21 CFR Part 175-178
	<b>G 1"</b> ø53 pipe installation ø60 vessel installation
	<b>M24</b> ø65 vessel installation
	<b>Rd52</b> 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 on accessories, see "Technical Information".


Available in Downloads area of the Endress+Hauser website ([www.endress.com/downloads](http://www.endress.com/downloads)).

### Slotted nut

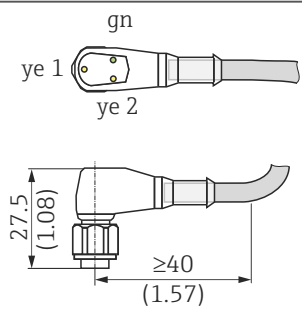
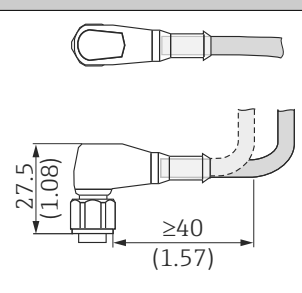
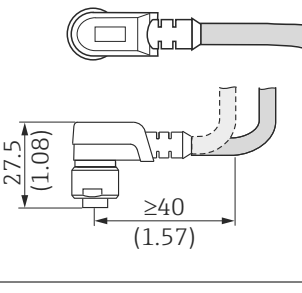
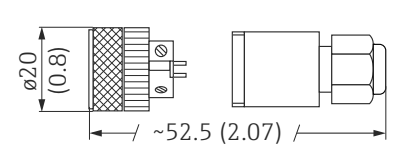
The slotted nuts can be ordered optionally as an accessory.

View (example)	Process adapter DIN11851 (dairy pipe)	PN	Order number
<p>A0023556</p>	DIN11851 F25 (also for process adapter, flush-mounted)	40	52021715
	DIN11851 F32	40	71258359
	DIN11851 F40	40	71258361
	Material: 304 (1.4307)		

**Plug-in jack, cable**

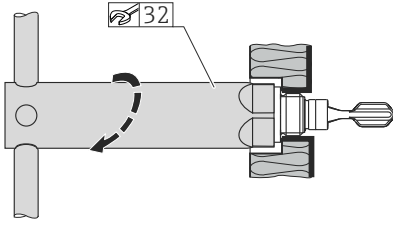
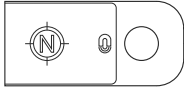
 The plug-in jacks listed are suitable for use in the temperature range -25 to +70 °C (-13 to +158 °F).

Engineering unit mm (in)

Plug-in jack M12 IP69 with LED	Description	Order number
	<ul style="list-style-type: none"> <li>Elbowed 90°</li> <li>terminated at one end</li> <li>5 m (16 ft) PVC cable (orange)</li> <li>Slotted nut 316L</li> <li>Body: PVC (transparent)</li> </ul>	52018763
	<ul style="list-style-type: none"> <li>terminated at one end</li> <li>Elbowed 90°</li> <li>5 m (16 ft) PVC cable (orange)</li> <li>Slotted nut 316L (1.4435)</li> <li>Body: PVC (orange)</li> </ul>	52024216
	<ul style="list-style-type: none"> <li>Elbowed 90°</li> <li>5 m (16 ft) PVC cable (gray)</li> <li>Slotted nut Cu Sn/Ni</li> <li>Body: PUR (blue)</li> </ul>	52010285
	<ul style="list-style-type: none"> <li>Self-terminated connection to M12 connector</li> <li>Slotted nut Cu Sn/Ni</li> <li>Body: PBT</li> </ul>	52006263

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

## Additional accessories

Socket wrench for mounting	Description	Order number
 <p>A0022273</p>	<ul style="list-style-type: none"><li>▪ Hexagonal</li><li>▪ Size across flats AF32</li></ul>	52010156
Test magnet	Description	Order number
 <p>A0021732</p>	Information in "Operation" section	71267011

## Supplementary documentation



The following document types are available in the Download Area of the Endress+Hauser website: [www.endress.com](http://www.endress.com) → Downloads.

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### Operating Instructions

Liquiphant FTL33 IO-Link → BA01934F/00

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### Additional documentation

TI00426F/00 → Weld-in adapters, process adapters and flanges (overview)

SD01622Z/00 → Weld-in adapter (installation instructions)

SD00356F/00 → Valve plug (installation instructions)

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### Certificates

ZE01010F/00 → Overfill protection

ZE01011F/00 → Leaks

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[www.addresses.endress.com](http://www.addresses.endress.com)

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