Point level switch for liquids

# Liquiphant FTL31


Complete product information:
www.e-direct.endress.com/ftl31

- Robust stainless steel housing (316L)
- External function test with test magnet
- Onsite function check possible thanks to LED display

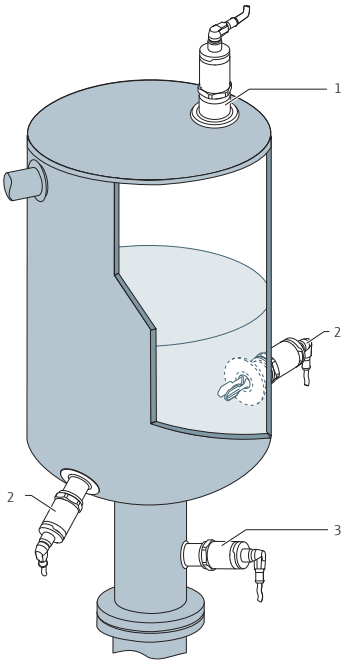
**Specs at a glance:**

- **Product:**
  Liquids
- **Mounting:**
  Vessels and pipes from DN25
- **Product density:**
  >0.7 g/cm³ (>0.5 g/cm³ as option)
- **Product temperature:**
  –40 to +100 °C (–40 to +212 °F)/ +150 °C (+302 °F)
- **Product viscosity:**
  ≤10 000 mm²/s (cSt)
- **Process pressure:**
  Max. 40 bar (580 psi)

**Application** The Liquiphant FTL31 is a point level switch for liquids and is used in tanks, vessels and pipes. It is used for overfill prevention or pump protection in cleaning and filter systems as well as in cooling and lubrication vessels, for instance. Ideal for applications in which float switches or conductive, capacitance and optical sensors have been used up to now. The Liquiphant FTL31 also works in areas where these measuring principles are not suitable due to conductivity, buildup, turbulence, flow conditions or air bubbles.

**Function** A piezoelectric drive causes the tuning fork of the Liquiphant FTL31 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. A signal is output via the DC-PNP or AC/DC electrical connection.

## Application example




The point level switch can be installed in any position in a vessel, pipe or tank, e.g., as overfill prevention or upper level detection (1), lower level detection (2) or dry running protection for pumps (3)

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## Technical data

| DC-PNP version | |
|---|---|
| Supply voltage | 10 to 30 V DC, 3-wire |
| Switching capacity | 200 mA |
| Current consumption | <15 mA |
| Electrical connection | M12 connector, valve plug, cable |

| AC/DC-Variante | |
|---|---|
| Supply voltage | 20 to 253 V AC/DC, 2-wire |
| Switching capacity | 250 mA |
| Current consumption | <3.8 mA<br>(in cut-off torque <1 mA for 100 ms) |
| Electrical connection | Valve plug, cable |

| Output general | |
|---|---|
| Switching delay | 0.5 s when tuning fork is covered<br>1.0 s when tuning fork is uncovered |
| Hysteresis | max. 3 mm (0.12 in) |
| Process connections | Thread ISO 228 G½"; G¾"; G1";<br>Thread ISO 228 G¾" and G1" for flush-mounted installation in weld-in adapter;<br>Thread ASME MNPT½"; ¾"; 1";<br>EN10226 R½"; R¾"; R1" |

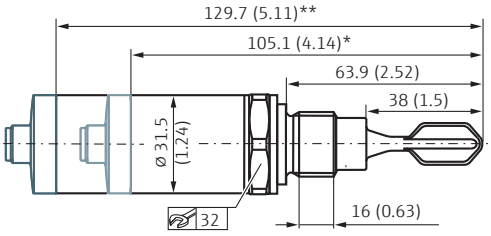
| Operating conditions | |
|---|---|
| Orientation | As required |
| Switch point | Vertical installation: 13 mm (0.51 in)±1 mm<br>horizontal installation: 10.5 mm (0.4)<br>(water +25 °C (+77 °F), 1 bar (14.5 psi)) |
| Pipe extension | 103 mm (4.05) |
| Surface roughness | metallic surface in contact with process:<br>$R_a$ ≤3.2 µm (126 µin) |
| Ambient temperature | –40 to +70 °C (–40 to +158 °F) |
| Process temperature | –40 to +100 °C (–40 to +212 °F),<br>optionally to 150 °C (to +302 °F) |
| Process pressure | –1 to +40 bar (–14.5 to +580 psi) |
| Storage temperature | –40 to +85 °C (–40 to +185 °F) |
| Climate class | DIN EN 60068-2-38/IEC 68-2-38:<br>test Z/AD |
| Density | >0.7 g/cm³ (optionally available: >0.5 g/cm³) |
| Viscosity | 1 to 10 000 mPa·s, dynamic viscosity |
| Degree of protection | IP65/67 NEMA Type 4X Enclosure (M12 connector);<br>IP65 NEMA Type 4X Enclosure (valve plug);<br>IP66/68 NEMA Type 4X/6P Enclosure (cable) |
| 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. |

| Approvals | |
|---|---|
| WHG | Overfill detection system: Z-65.11-531<br>Leak detection system: Z-65.40-532 |

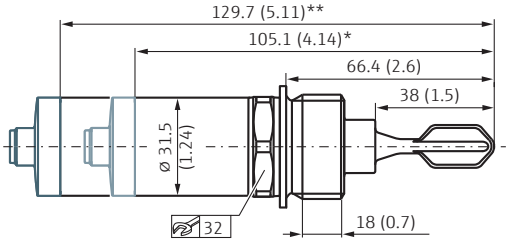
## Dimensions in mm (inches)

### Compact version

**Thread ISO 228 G½"; G¾"**

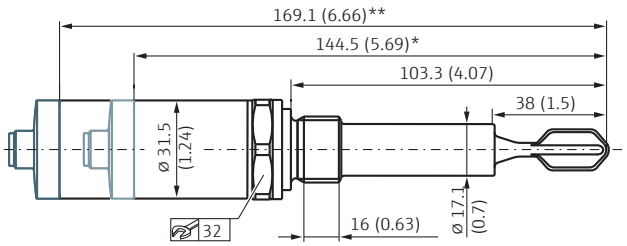



**Thread ISO 228 G1"**

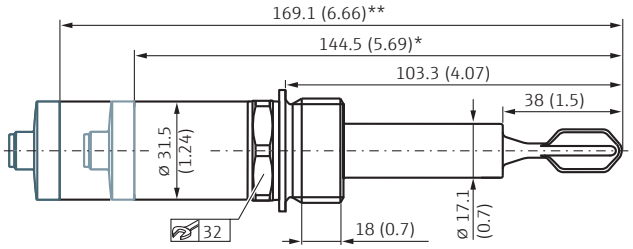



### Short tube version

**Thread ISO 228 G½"; G¾"**




**Thread ISO 228 G1"**




* Dimension for process temperature max. 100 °C (212 °F)
** Dimension for process temperature max. 150 °C (302 °F)

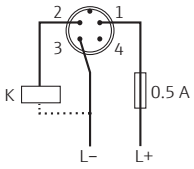
**Installation according to instruction manual.**

## Electrical connection

### Electronic version 3-wire DCPNP

**M12 connector**

MAX

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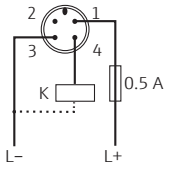
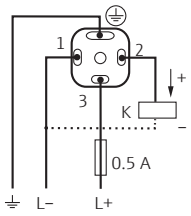



**Valve plug**

MAX

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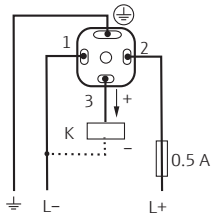
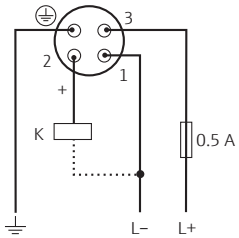



**Cable**

MAX

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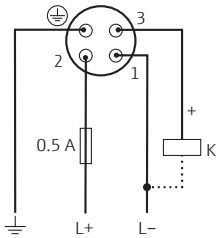
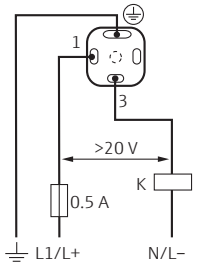



### Electronic version 2-wire AC/DC

**Valve plug**

MAX

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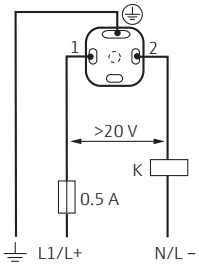
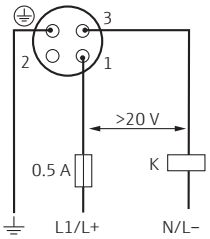



**Cable**

MAX

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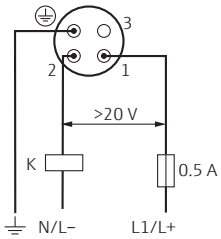

## Price table

**Electrical connection**

| Code | Connector |
|---|---|
| U | Valve plug ISO 4400 M16 (IP65) |
| V | Valve plug ISO 4400 NPT½ (IP65) |

| **Liquiphant FTL31** (20 to 253 V AC / DC) | | | **Order no.** | **Price/pcs. in €** | | |
|---|---|---|---|---|---|---|
| Fork design | Process temperature | Process connection | | 1 to 3 | 4 to 10 | 11 to 35 |
| Compact version | max. 100 °C | ISO 228 G½ | FTL31-AA1□2AAWBJ | 147.– | 133.– | 121.– |
| | | ISO 228 G¾ | FTL31-AA1□2AAWCJ | 147.– | 133.– | 121.– |
| | | ISO 228 G1 | FTL31-AA1□2AAWDJ | 157.– | 141.– | 128.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1□2AAWSJ | 158.– | 143.– | 130.– |
| | max. 150 °C | ISO 228 G½ | FTL31-AA1□3AAWBJ | 162.– | 146.– | 133.– |
| | | ISO 228 G¾ | FTL31-AA1□3AAWCJ | 162.– | 146.– | 133.– |
| | | ISO 228 G1 | FTL31-AA1□3AAWDJ | 171.– | 154.– | 140.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1□3AAWSJ | 173.– | 156.– | 142.– |
| Short tube version | max. 100 °C | ISO 228 G½ | FTL31-AA1□2BAWBJ | 158.– | 142.– | 130.– |
| | | ISO 228 G¾ | FTL31-AA1□2BAWCJ | 158.– | 142.– | 130.– |
| | | ISO 228 G1 | FTL31-AA1□2BAWDJ | 168.– | 151.– | 137.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1□2BAWSJ | 169.– | 152.– | 139.– |
| | max. 150 °C | ISO 228 G½ | FTL31-AA1□3BAWBJ | 173.– | 156.– | 142.– |
| | | ISO 228 G¾ | FTL31-AA1□3BAWCJ | 173.– | 156.– | 142.– |
| | | ISO 228 G1 | FTL31-AA1□3BAWDJ | 182.– | 164.– | 149.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1□3BAWSJ | 184.– | 166.– | 151.– |

**Electrical connection**

| Code | Connector |
|---|---|
| M | M12 connector (IP65/67) |
| U | Valve plug ISO 4400 M16 (IP65) |
| V | Valve plug ISO 4400 NPT½ (IP65) |

| **Liquiphant FTL31** (10 to 30 V DC) | | | **Order no.** | **Price/pcs. in €** | | |
|---|---|---|---|---|---|---|
| Fork design | Process temperature | Process connection | | 1 to 3 | 4 to 10 | 11 to 35 |
| Compact version | max. 100 °C | ISO 228 G½ | FTL31-AA4□2AAWBJ | 147.– | 133.– | 121.– |
| | | ISO 228 G¾ | FTL31-AA4□2AAWCJ | 147.– | 133.– | 121.– |
| | | ISO 228 G1 | FTL31-AA4□2AAWDJ | 157.– | 141.– | 128.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA4□2AAWSJ | 158.– | 143.– | 130.– |
| | max. 150 °C | ISO 228 G½ | FTL31-AA4□3AAWBJ | 162.– | 146.– | 133.– |
| | | ISO 228 G¾ | FTL31-AA4□3AAWCJ | 162.– | 146.– | 133.– |
| | | ISO 228 G1 | FTL31-AA4□3AAWDJ | 171.– | 154.– | 140.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA4□3AAWSJ | 173.– | 156.– | 142.– |
| Short tube version | max. 100 °C | ISO 228 G½ | FTL31-AA4□2BAWBJ | 158.– | 142.– | 130.– |
| | | ISO 228 G¾ | FTL31-AA4□2BAWCJ | 158.– | 142.– | 130.– |
| | | ISO 228 G1 | FTL31-AA4□2BAWDJ | 168.– | 151.– | 137.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA4□2BAWSJ | 169.– | 152.– | 139.– |
| | max. 150 °C | ISO 228 G½ | FTL31-AA4□3BAWBJ | 173.– | 156.– | 142.– |
| | | ISO 228 G¾ | FTL31-AA4□3BAWCJ | 173.– | 156.– | 142.– |
| | | ISO 228 G1 | FTL31-AA4□3BAWDJ | 182.– | 164.– | 149.– |
| | | ISO 228 G1, flush-mounted* | FTL31-AA4□3BAWSJ | 184.– | 166.– | 151.– |

* for installation in weld-in adapter

| **Accessories** | **Order no.** | **Price/pcs. in €** |
|---|---|---|
| Weld-in adapter G¾, d=50, 316L | 71258355 | 21.75 |
| Weld-in adapter G¾, d=29, 316L | 71258357 | 21.75 |
| Weld-in adapter G1, d=60, 316L | 52001051 | 30.95 |
| Weld-in adapter G1, d=53, 316L | 71258358 | 30.95 |
| 5 m cable with M12×1 plug | 52010285 | 6.82 |
| Straight plug, without cable (self wired) | 52006263 | 14.99 |
| Test magnet | 71267011 | 6.82 |

Prices are applicable for Ireland until 31.08.2018, in Euro per unit. At Endress+Hauser sales and delivery terms excluding value added tax (VAT), cost of packing and despatch. Delivery times: 48 hours or 5 working days – please check www.e-direct.endress.com for exact delivery times. Endress+Hauser retains the right to change or modify pricing at any time. Prices can be verified prior to ordering on www.e-direct.endress.com.

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www.e-direct.endress.com/ftl31

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