

Point level switch for liquids

Liquiphant FTL31



€ 128.-
11-35 pcs.

 IO-Link



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

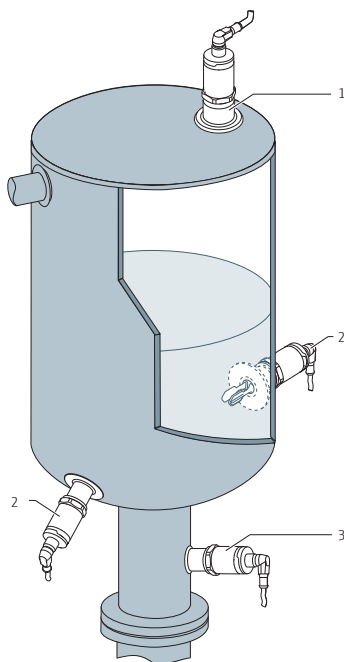
Specs at a glance:

- **Product:**
Liquids
- **Mounting:**
Vessels and pipes from DN50
- **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 overflow 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, AC/DC or IO-Link electrical connection.

Application example



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

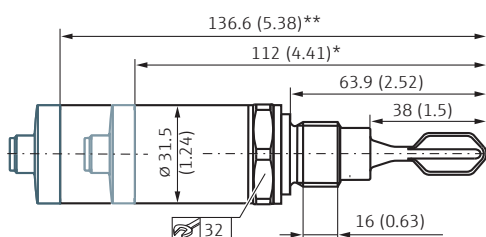
Technical data

| | | | |
|------------------------|--|--|--|
| DC-PNP version | | Operating conditions | |
| Supply voltage | 10 to 30 V DC, 3-wire | Orientation | As required |
| Switching capacity | 200 mA | Switch point | Vertical installation: 13 mm (0.51 in)±1 mm horizontal installation: 10.5 mm (0.4) (water +25 °C (+77 °F), 1 bar (14.5 psi)) |
| Current consumption | <15 mA | Surface roughness | metallic surface in contact with process: $R_a \leq 3.2 \mu\text{m}$ (126 μin) |
| Electrical connection | M12 connector, valve plug, cable | Ambient temperature | -40 to +70 °C (-40 to +158 °F) |
| AC/DC version | | Process temperature | -40 to +100 °C (-40 to +212 °F), optionally to 150 °C (to +302 °F) |
| Supply voltage | 20 to 253 V AC/DC, 2-wire | Process pressure | -1 to +40 bar (-14.5 to +580 psi) |
| Switching capacity | 250 mA | Storage temperature | -40 to +85 °C (-40 to +185 °F) |
| Current consumption | <3.8 mA (in cut-off torque <1 mA for 100 ms) | Climate class | DIN EN 60068-2-38/IEC 68-2-38: test Z/AD |
| Electrical connection | Valve plug, cable | Density | >0.7 g/cm ³ (optionally available: >0.5 g/cm ³) |
| IO-Link version | | Viscosity | 1 to 10 000 mPa·s, dynamic viscosity |
| Supply voltage | 18 to 30 V DC, 4-wire | Degree of protection | IP65/67 NEMA Type 4X Enclosure (M12 connector); IP65 NEMA Type 4X Enclosure (valve plug); IP66/68 NEMA Type 4X/6P Enclosure (cable) |
| Switching capacity | 105 mA (2 × PNP), 200 mA (1 × PNP) | 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. |
| Current consumption | >15 mA | Approvals | |
| Electrical connection | M12 connector | WHG | |
| Output general | | Overfill detection system: Z-65.11-531 | |
| Switching delay | - 0.5 s when tuning fork is covered - 1.0 s when tuning fork is uncovered - IO-Link from 0.3 to 60 s | Leak detection system: Z-65.40-532; | |
| Hysteresis | max. 3 mm (0.12 in) | Not available for IO-Link | |
| Process connections | Thread ISO 228 G $\frac{1}{2}$ "", G $\frac{3}{4}$ "", G1"; Thread ISO 228 G $\frac{3}{4}$ " and G1" for flush-mounted installation in weld-in adapter; Thread ASME MNPT $\frac{1}{2}$ "", $\frac{3}{4}$ ", 1", EN10226 R $\frac{1}{2}$ "", R $\frac{3}{4}$ ", R1" | | |

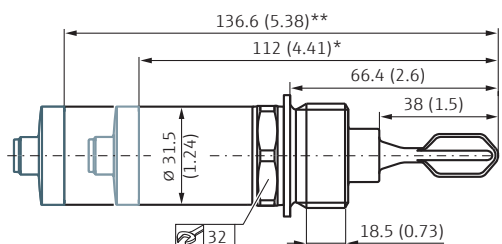
Dimensions in mm (inches)

Compact version

Thread ISO 228 G $\frac{1}{2}$ "", G $\frac{3}{4}$ "

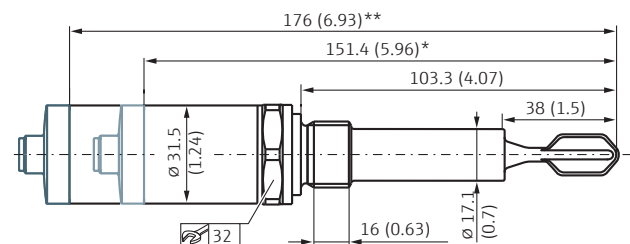


Thread ISO 228 G1"

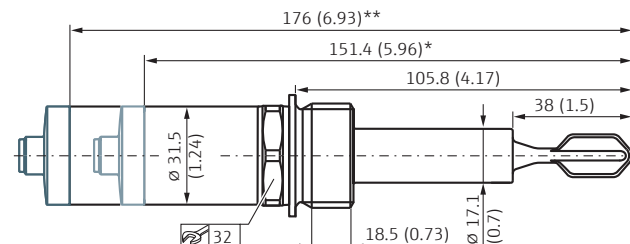


Short tube version

Thread ISO 228 G $\frac{1}{2}$ "", G $\frac{3}{4}$ "



Thread ISO 228 G1"

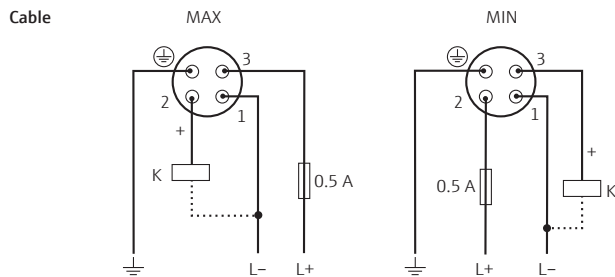
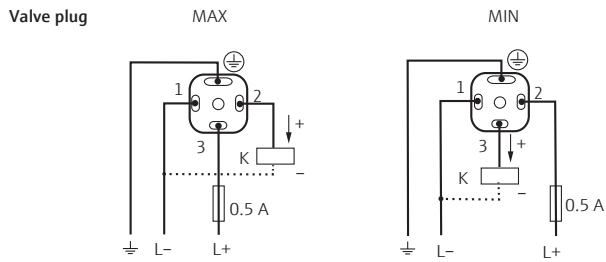
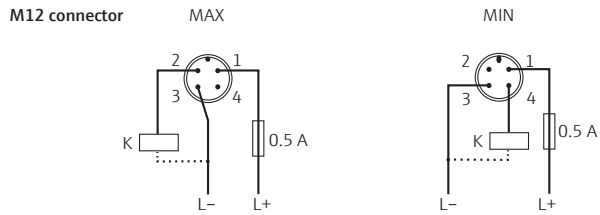


* Dimension for process temperature max. 100 °C (212 °F)
** Dimension for process temperature max. 150 °C (302 °F)

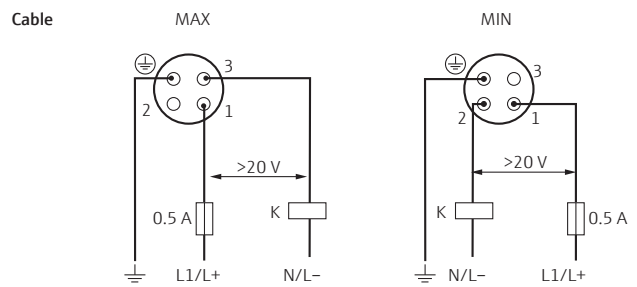
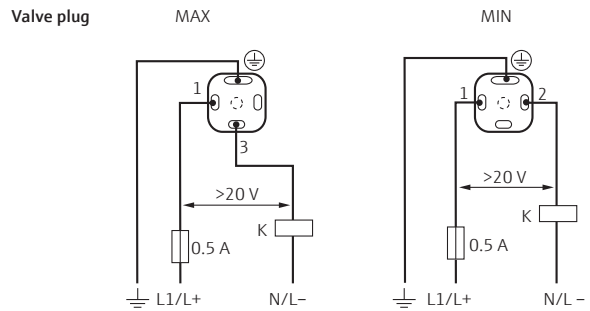
Installation according to instruction manual.

Electrical connection

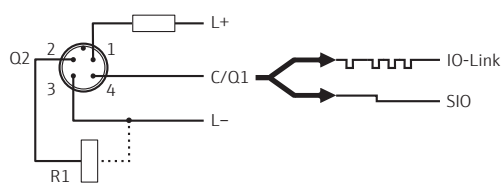
Electronic version 3-wire DCPNP



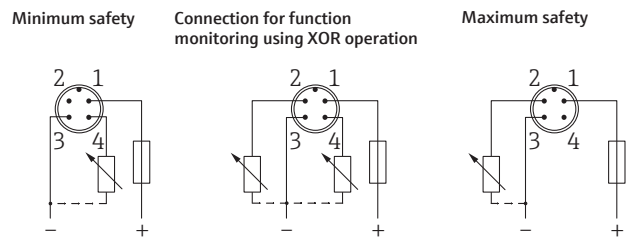
Electronic version 2-wire AC/DC



IO-Link with one switch output



Terminal assignment



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

Price table

Electrical connection

| Code | Connector |
|------|--|
| 4M | 10 to 30 V DC; 3-wire PNP, M12 connector (IP65/67) |
| 4U | 10 to 30 V DC; 3-wire PNP, Valve plug ISO 4400 M16 (IP65) |
| 4V | 10 to 30 V DC; 3-wire PNP, Valve plug ISO 4400 NPT½ (IP65) |
| 7M | DC-PNP, IO-Link; 4-wire, M12 connector (IP65/67) |

Liquiphant FTL31 (DC PNP / IO-Link)

| Fork design | Process temperature | Process connection | Order no. | Price/pcs. in € | | |
|--------------------|---------------------|----------------------------|--|-----------------|---------|----------|
| | | | | 1 to 3 | 4 to 10 | 11 to 35 |
| Compact version | max. 100 °C | ISO 228 G½ | FTL31-AA <input type="checkbox"/> 2AAWBJ | 157.- | 141.- | 128.- |
| | | ISO 228 G¾ | FTL31-AA <input type="checkbox"/> 2AAWCJ | 157.- | 141.- | 128.- |
| | | ISO 228 G1 | FTL31-AA <input type="checkbox"/> 2AAWDJ | 166.- | 150.- | 136.- |
| | max. 150 °C | ISO 228 G1, flush-mounted* | FTL31-AA <input type="checkbox"/> 2AAWSJ | 168.- | 151.- | 138.- |
| | | ISO 228 G½ | FTL31-AA <input type="checkbox"/> 3AAWBJ | 172.- | 155.- | 141.- |
| | | ISO 228 G¾ | FTL31-AA <input type="checkbox"/> 3AAWCJ | 172.- | 155.- | 141.- |
| Short tube version | max. 100 °C | ISO 228 G1 | FTL31-AA <input type="checkbox"/> 3AAWDJ | 182.- | 164.- | 149.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA <input type="checkbox"/> 3AAWSJ | 184.- | 166.- | 151.- |
| | | ISO 228 G½ | FTL31-AA <input type="checkbox"/> 2BAWBJ | 168.- | 151.- | 138.- |
| | max. 150 °C | ISO 228 G¾ | FTL31-AA <input type="checkbox"/> 2BAWCJ | 168.- | 151.- | 138.- |
| | | ISO 228 G1 | FTL31-AA <input type="checkbox"/> 2BAWDJ | 178.- | 160.- | 146.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA <input type="checkbox"/> 2BAWSJ | 180.- | 162.- | 148.- |
| | max. 100 °C | ISO 228 G½ | FTL31-AA <input type="checkbox"/> 3BAWBJ | 184.- | 165.- | 151.- |
| | | ISO 228 G¾ | FTL31-AA <input type="checkbox"/> 3BAWCJ | 184.- | 165.- | 151.- |
| | | ISO 228 G1 | FTL31-AA <input type="checkbox"/> 3BAWDJ | 194.- | 174.- | 159.- |
| | max. 150 °C | ISO 228 G1, flush-mounted* | FTL31-AA <input type="checkbox"/> 3BAWSJ | 196.- | 176.- | 160.- |
| | | ISO 228 G½ | FTL31-AA <input type="checkbox"/> 3BAWBJ | 184.- | 165.- | 151.- |
| | | ISO 228 G¾ | FTL31-AA <input type="checkbox"/> 3BAWCJ | 184.- | 165.- | 151.- |
| | max. 150 °C | ISO 228 G1 | FTL31-AA <input type="checkbox"/> 3BAWDJ | 194.- | 174.- | 159.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA <input type="checkbox"/> 3BAWSJ | 196.- | 176.- | 160.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA <input type="checkbox"/> 3BAWSJ | 196.- | 176.- | 160.- |

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)

| Fork design | Process temperature | Process connection | Order no. | Price/pcs. in € | | |
|--------------------|---------------------|----------------------------|---|-----------------|---------|----------|
| | | | | 1 to 3 | 4 to 10 | 11 to 35 |
| Compact version | max. 100 °C | ISO 228 G½ | FTL31-AA1 <input type="checkbox"/> 2AAWBJ | 157.- | 141.- | 128.- |
| | | ISO 228 G¾ | FTL31-AA1 <input type="checkbox"/> 2AAWCJ | 157.- | 141.- | 128.- |
| | | ISO 228 G1 | FTL31-AA1 <input type="checkbox"/> 2AAWDJ | 166.- | 150.- | 136.- |
| | max. 150 °C | ISO 228 G1, flush-mounted* | FTL31-AA1 <input type="checkbox"/> 2AAWSJ | 168.- | 151.- | 138.- |
| | | ISO 228 G½ | FTL31-AA1 <input type="checkbox"/> 3AAWBJ | 172.- | 155.- | 141.- |
| | | ISO 228 G¾ | FTL31-AA1 <input type="checkbox"/> 3AAWCJ | 172.- | 155.- | 141.- |
| Short tube version | max. 100 °C | ISO 228 G1 | FTL31-AA1 <input type="checkbox"/> 3AAWDJ | 182.- | 164.- | 149.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1 <input type="checkbox"/> 3AAWSJ | 184.- | 166.- | 151.- |
| | | ISO 228 G½ | FTL31-AA1 <input type="checkbox"/> 2BAWBJ | 168.- | 151.- | 138.- |
| | max. 150 °C | ISO 228 G¾ | FTL31-AA1 <input type="checkbox"/> 2BAWCJ | 168.- | 151.- | 138.- |
| | | ISO 228 G1 | FTL31-AA1 <input type="checkbox"/> 2BAWDJ | 178.- | 160.- | 146.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1 <input type="checkbox"/> 2BAWSJ | 180.- | 162.- | 148.- |
| | max. 100 °C | ISO 228 G½ | FTL31-AA1 <input type="checkbox"/> 3BAWBJ | 184.- | 165.- | 151.- |
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| | | ISO 228 G¾ | FTL31-AA1 <input type="checkbox"/> 3BAWCJ | 184.- | 165.- | 151.- |
| | max. 150 °C | ISO 228 G1 | FTL31-AA1 <input type="checkbox"/> 3BAWDJ | 194.- | 174.- | 159.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1 <input type="checkbox"/> 3BAWSJ | 196.- | 176.- | 160.- |
| | | ISO 228 G1, flush-mounted* | FTL31-AA1 <input type="checkbox"/> 3BAWSJ | 196.- | 176.- | 160.- |

* for installation in weld-in adapter

Accessories

| | Order no. | Price/pcs. in € |
|---|-----------|-----------------|
| Weld-in adapter G¾, d=50, 316L | 71258355 | 26.52 |
| Weld-in adapter G¾, d=29, 316L | 71258357 | 26.75 |
| Weld-in adapter G1, d=60, 316L | 52001051 | 38.86 |
| Weld-in adapter G1, d=53, 316L | 71258358 | 38.87 |
| 5 m cable with M12×1 plug | 52010285 | 7.25 |
| Straight plug, without cable (self wired) | 52006263 | 15.55 |
| Test magnet | 71267011 | 7.25 |

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

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