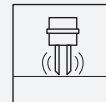




Vibration Limit Switch

LVL-A7H



- Limit switch in hygienic version for liquids
- External function test with test magnet
- Onsite function check possible thanks to LED indication
- Large selection of process connections for hassle-free installation in existing systems
- Easy to install even at points difficult to access due to compact design
- Rugged stainless steel housing
- Cost-saving plug connections
- Approval as overflow protection and leak detection system acc. to WHG



Function

The Vibracon LVL-A7H is a limit 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.

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

The device can be used for process temperatures up to:

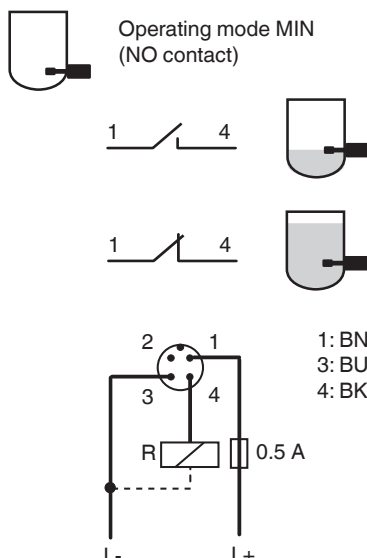
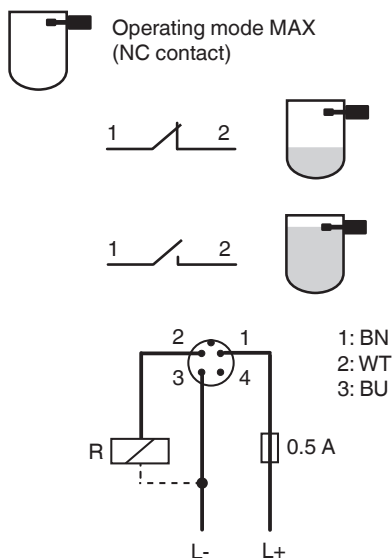
- 100 °C (212 °F), CIP capable
- 150 °C (302 °F), CIP and SIP capable
- CIP = Cleaning in Place, SIP = Sterilization in Place

The device is not suitable for use in hazardous areas.

Connection

Example: electrical connection with M12 plug

Further electrical connections see technical information (TI).



Technical Data

General specifications

| | | |
|-------------------|--|--|
| Measuring method | The tuning fork is brought to its resonance frequency by means of a piezoelectric drive. If the tuning fork is covered by liquid, this frequency changes. The electronics monitor the resonance frequency and indicate whether the tuning fork is freely vibrating or is covered by liquid. | |
| Construction type | | compact device device with short tube hygienic version |
| Operating mode | <p>MAX = maximum safety: The device keeps the electronic switch closed as long as the liquid level is below the fork. example application: overspill protection</p> <p>MIN = minimum safety: The device keeps the electronic switch closed as long as the fork is immersed in liquid. example application: dry running protection of pumps The electronic switch opens if the limit is reached, if a fault occurs or in the event of a power fails (quiescent current principle)</p> | |
| Series | | Vibracon LVL-A7 |

Supply

| | | |
|---------------------|----------------|---|
| Rated voltage | U _r | - DC-PNP: 10 ... 35 V DC, 3-wire - AC/DC: 20 ... 253 V AC/DC, 2-wire |
| Current consumption | | - DC-PNP: < 15 mA - AC/DC: < 3.8 mA |
| Power consumption | | - DC-PNP: < 975 mW - AC/DC: < 850 mW |

Input

| | | |
|-------------------|--|---|
| Measured variable | | density |
| Measurement range | | min. 0.7 g/cm ³ , optional > 0.5 g/cm ³ |

Output

| | | |
|-------------------|--|------------------|
| Output type | | switching output |
| Switching current | | max. 250 mA |

Directive conformity

| | | |
|-------------------------------|--|-------------------------------------|
| Electromagnetic compatibility | | |
| Directive 2014/30/EU | | EN 61326-1:2006 , EN 61326-2-3:2006 |
| Low voltage | | |
| Directive 2014/35/EU | | EN 61010-1:2010 |

Conformity

| | | |
|-------------------------------|--|-------------------------------|
| Electromagnetic compatibility | | NE 21 |
| Degree of protection | | IEC 60529 |
| Shock resistance | | EN 60068-2-27 |
| Vibration resistance | | EN 60068-2-64 |
| Climate class | | DIN EN 60068-2-38/IEC 68-2-38 |

Measurement accuracy

| | | |
|----------------------------------|--|---|
| Reference operating conditions | | <ul style="list-style-type: none"> - 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) |
| Measured value resolution | | < 0.5 mm |
| Measuring frequency | | approx. 1100 Hz in air |
| Switching point | | 13 mm ± 1 mm |
| Non-repeatability | | ± 1 mm acc. to DIN 61298-2 |
| Hysteresis | | max. 3 mm |
| Influence of ambient temperature | | negligible |
| Influence of medium temperature | | -25 µm/°C |
| Influence of medium pressure | | -20 µm/bar |
| Switching time | | <ul style="list-style-type: none"> - 0.5 s when tuning fork is covered - 1.0 s when tuning fork is uncovered - other switching times on request |

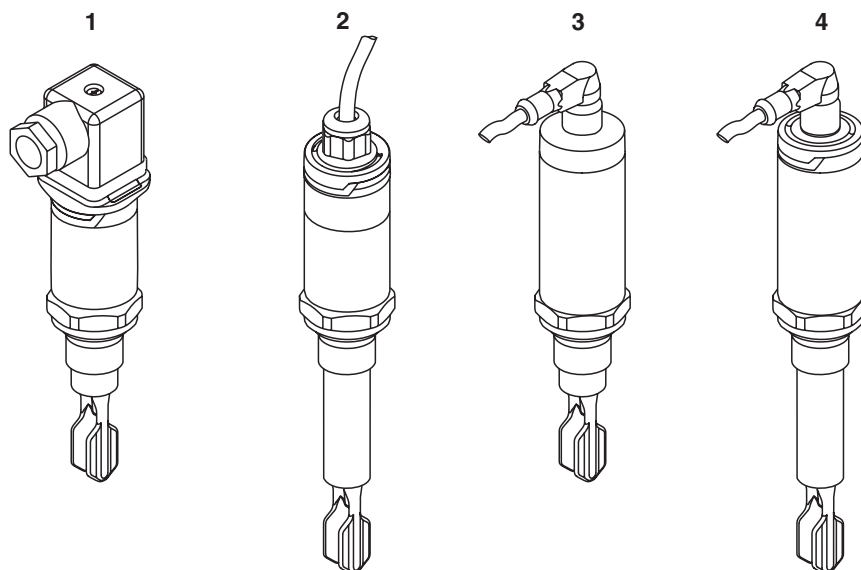
Operating conditions

| | | |
|-------------------------|--|--|
| Installation conditions | | |
|-------------------------|--|--|

Technical Data

| | |
|------------------------------------|--|
| Installation position | see section mounting position |
| Ambient conditions | |
| Ambient temperature | -40 ... 70 °C (-40 ... 158 °F) |
| Storage temperature | -40 ... 85 °C (-40 ... 185 °F) |
| Shock resistance | a = 300 m/s ² = 30 g, 3 planes x 2 directions x 3 shocks x 18 ms, as per test Ea |
| Vibration resistance | a(RMS) = 50 m/s ² , ASD = 1.25 (m/s ²) ² /Hz, f = 5 to 2000 Hz, t = 3 x 2 h |
| Process conditions | |
| Process temperature | -40 ... +100 °C (-40 ... +212 °F) -40 ... +150 °C (-40 ... +302 °F) |
| Process pressure (static pressure) | -1 ... +40 bar (-14.5 ... +580 psi) |
| State of aggregation | liquid |
| Density | min. 0.7 g/cm ³ , optional > 0.5 g/cm ³ |
| Viscosity | 1 ... 10000 mPa/s, dynamic viscosity |
| Solid contents | < Ø5 mm |
| Mechanical specifications | |
| Degree of protection | - IP65/67, NEMA 4X enclosure (plug M12) - IP65, NEMA 4X enclosure (valve plug) - IP65/68, NEMA 4X/6P enclosure (cable) - IP66/68/69, NEMA 4X/6P Enclosure (M12 plug for metal housing cover) |
| Connection | - cable 5 m - valve plug NPT1/2 - valve plug QUICKON - valve plug M16 - plug M12 |
| Material | see technical information (TI) |
| Surface quality | R _a < 1.5 µm (EHEDG) R _a < 0.76 µm (EHEDG, 3-A) |
| Mass | see technical information (TI) |
| Dimensions | see technical information (TI) |
| Process connection | - thread ISO 228 G1/2, G3/4, G1 - DIN 11851 DN25 PN40, DN32 PN40, DN40 PN40 - thread ASME MNPT1/2, MNPT3/4, MNPT1 - thread M24 x 1,5 for flush-mounted installation in adapter - DIN 11851 DN25 PN40, DN32 PN40, DN40 PN40 (dairy pipe) - Tri-Clamp ISO 2852 DN25-38, DN40-51 - Flush-mounting in weld-in adapter Rd52, tuning fork can be aligned |
| Indication and operation | |
| Display elements | The LED display is on the connection side. - green LED: indication of ready to operate - red LED: fault indication - yellow LED: operating mode indication |
| Function test | function test with test magnet (optional accessory) |
| Certificates and approvals | |
| Sanitary compatibility | EHEDG, see approval (ZE) |
| Overspill protection | Z-65.11-554 (overspill protection acc. to WHG) Z-65.40-555 (leak detection system acc. to WHG) If you need the approvals also in paper form, select the option WH in the type code. |
| General information | |
| Supplementary documentation | technical information (TI) manual (BA) approval (ZE) |
| Supplementary information | Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com . |
| Accessories | |
| Designation | see technical information (TI) |

Assembly



- 1 Compact version with valve plug
- 2 Short tube version with cable
- 3 Compact version with M12 plug for housing cover IP66/68/69
- 4 Short tube version with M12 plug for housing cover IP65/67

Further device versions see technical information (TI).

Type Code

This overview does not mark options which are mutually exclusive.
Option with ** = multiple options can be selected

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|-----|-----|-----|---|-----|-----|---|-----|
| L | V | L | - | A | 7 | H | - | (1) | (2) | (3) | - | (4) | (5) | - | (6) |
|---|---|---|---|---|---|---|---|-----|-----|-----|---|-----|-----|---|-----|

| LVL-A7H | Device |
|---------|--|
| LVL-A7H | Limit switch for liquids, hygienic version |

| (1) | Process temperature |
|-----|----------------------|
| A | max. 100 °C (212 °F) |
| B | max. 150 °C (302 °F) |

| (2) | Process connection |
|----------------|--|
| Threads | |
| G1 | G1/2, ISO 228, 316L |
| G2 | G3/4, ISO 228, 316L, for installation in weld-in adapter (accessory) |
| G4 | G1, ISO 228, 316L, fork length 77.4 mm (compact version) or 116.8 mm (short tube version), for installation in weld-in adapter (accessory) |
| G7 | M24, 316L, for installation in adapter (accessory) |
| N1 | MNPT1/2, ASME, 316L |
| N2 | MNPT3/4, ASME, 316L |
| N3 | MNPT1, ASME, 316L |
| Dairy pipes | |
| R4 | DN25 PN40, DIN 11851, without slotted nut, 316L |
| R5 | DN32 PN40, DIN 11851, without slotted nut, 316L |
| R6 | DN40 PN40, DIN 11851, without slotted nut, 316L |
| Flush-mounting | |
| S1 | Rd52, flush-mounted, 316L, without slotted nut, for installation in weld-in adapter (accessory) |
| Tri-Clamp | |
| T5 | DN25-38 (1 to 1-1/2 inch), Tri-Clamp ISO 2852, 316L, DIN 32676 DN25-40 |
| T6 | DN40-51 (2 inch), Tri-Clamp ISO 2852, 316L, DIN 32676 DN50 |
| XX | Special version |

| (3) | Sensor type |
|-----|---|
| C | Compact version, $R_a < 1.5 \mu\text{m}$, 316L |
| D | Compact version, $R_a < 0.76 \mu\text{m}$, 316L |
| E | Short tube version, $R_a < 1.5 \mu\text{m}$, 316L |
| F | Short tube version, $R_a < 0.76 \mu\text{m}$, 316L |
| X | Special version |

Release date: 2023-09-11 Date of issue: 2023-09-11 Filename: 275575_eng.pdf

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0002
pa-info@us.pepperl-fuchs.com

Germany: +49 621 776 2222
pa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
pa-info@sg.pepperl-fuchs.com

PEPPERL+FUCHS

Type Code

| (4) | Electrical output |
|-----|----------------------------|
| E5 | 3-wire, 10 to 35 V DC, PNP |
| WA | 2-wire, 19 to 253 V AC/DC |

| (5) | Electrical connection |
|-----|---|
| PC | Cable 5 m, IP65/68, NEMA 4X/6P |
| PK | Connector M12, IP66/68/69, NEMA 4X/6P |
| PN | Valve connector NPT1/2, ISO 4400, IP65, NEMA 4X |
| PS | Valve connector QUICKON, IP65, NEMA 4X |
| PU | Valve connector M16, ISO 4400, IP65, NEMA 4X |
| V1 | Connector M12, IP65/67, NEMA 4X |
| XX | Special version |

| (6) | Approval |
|-----|--|
| NA | Version for non-explosion-hazardous area inclusive approvals as overfill protection and leakage detection system acc. to WHG |
| CG | CSA General Purpose inclusive approvals as overfill protection and leakage detection system acc. to WHG |

Additional Options

| | Service ** |
|----|---|
| S1 | Cleaned from oil and grease |
| S2 | Density setting > 0.5 g/cm ² |
| S3 | Switching delay setting |
| S4 | Special service |

| | Test, certificate ** |
|----|--|
| S5 | Material certificate, wetted metallic parts, EN 10204-3.1 inspection certificate |
| S6 | Final inspection report |
| XX | Special version |

| | Additional documents |
|----|--|
| WH | Enclosed copies of approvals as overfill protection and leakage detection system acc. to WHG |

| | Accessory optional |
|------------------------|---|
| Weld-in adapter | |
| PA | G3/4, d = 50, 316L, vessel installation |
| PB | G3/4, d = 50, 316L, vessel installation, EN 10204-3.1 inspection certificate |
| PC | G3/4, d = 29, 316L, pipe installation |
| PD | G3/4, d = 29, 316L, pipe installation, EN 10204-3.1 inspection certificate |
| PE | G1, d = 60, 316L, vessel installation |
| PF | G1, d = 60, 316L, vessel installation, EN 10204-3.1 inspection certificate |
| PG | G1, d = 53, 316L, pipe installation |
| PH | G1, d = 53, 316L, pipe installation, EN 10204-3.1 inspection certificate |
| PM | M24, d = 65, 316L, vessel installation |
| PN | M24, d = 65, 316L, vessel installation, EN 10204-3.1 inspection certificate |
| PO | Rd52, 316L, without slotted nut, vessel installation |
| PQ | Rd52, 316L, without slotted nut, vessel installation, EN 10204-3.1 inspection certificate |
| Process adapter | |
| RA | M24 for Varivent N, 316L |
| RB | M24 for Varivent N, 316L, EN 10204-3.1 inspection certificate |
| RC | M24 for Varivent F, 316L |
| RD | M24 for Varivent F, 316L, EN 10204-3.1 inspection certificate |
| RE | M24 for DIN 11851 DN50, with slotted nut, 316L |
| RF | M24 for DIN 11851 DN50, with slotted nut, 316L, EN 10204-3.1 inspection certificate |
| RG | M24 for SMS1-1/2, with slotted nut, 316L |
| RH | M24 for SMS1-1/2, with slotted nut, 316L, EN 10204-3.1 inspection certificate |
| Slotted nut | |
| RM | F25, 304, DIN 11851 |
| RN | F32, 304, DIN 11851 |
| RT | F40, 304, DIN 11851 |
| Socket plug | |
| RW | M12, elbowed 90 °, IP69, 5 m cable, slotted nut 316L |
| RX | M12 with LED, elbowed 90 °, IP69, 5 m cable, slotted nut 316L |
| RZ | M12, elbowed 90 °, IP67, 5 m cable, slotted nut Cu Sn/Ni |
| R1 | M12, IP67, 5 m cable, slotted nut Cu Sn/Ni |
| Additional accessories | |
| R5 | Assembly socket wrench |
| ST | Test magnet |

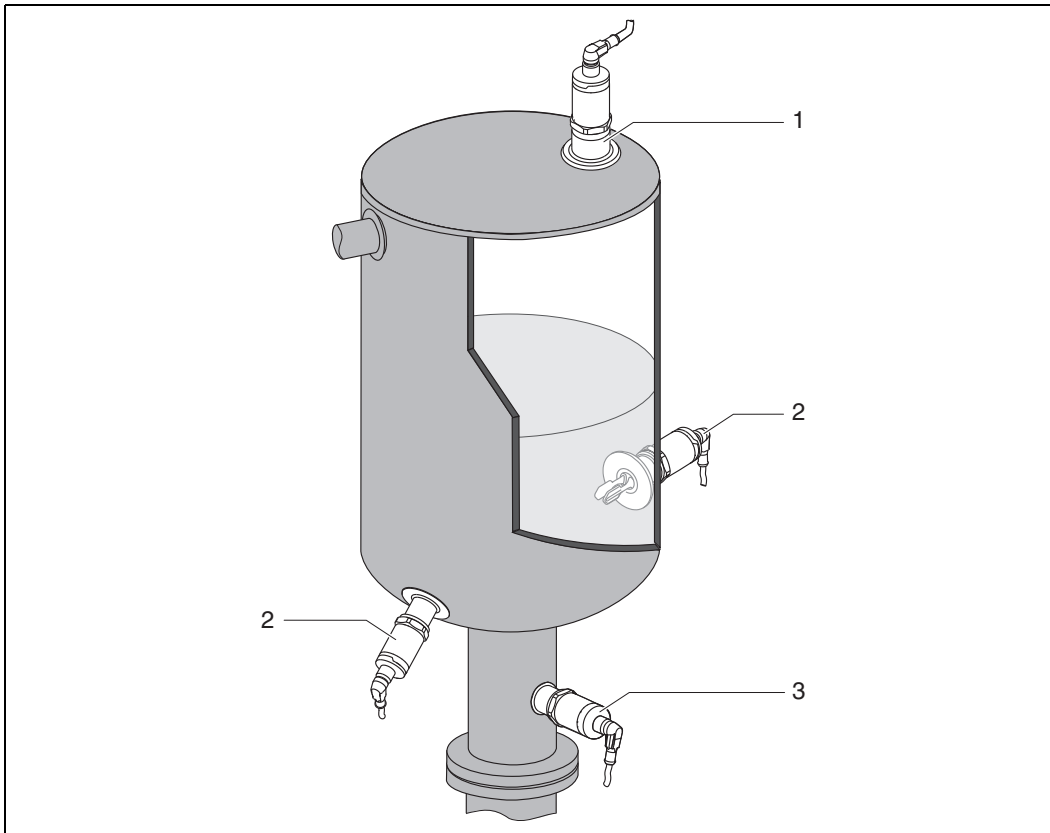
| Type Code | |
|--------------------|--|
| Accessory optional | |
| SZ | Special version |
| Marking | |
| S9 | Tagging (TAG), see additional specifications |

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Mounting

Mounting position

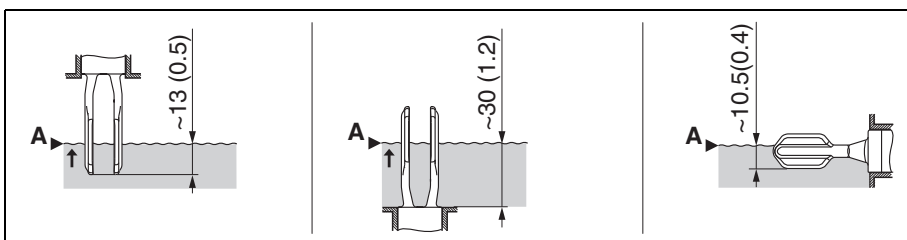
The device can be installed in any position in a vessel, pipe or tank. Foam formation does not affect the function.



- 1 Overfill prevention or upper level detection
- 2 Lower level detection
- 3 Dry running protection for pump

Installation Conditions

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



Vertical and horizontal orientation, dimensions in mm (inch)