

Датчики предельной вибрации LVL-A7H

Технические характеристики

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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:

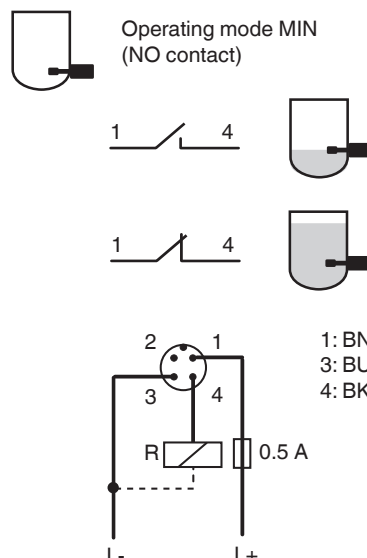
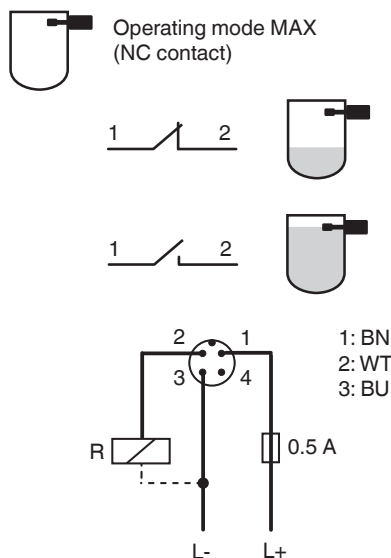
- 100 °C (212 °F), CIP capable
- 150 °C (302 °F), CIP and SIP capable
- CIP = Cleaning in Place, SIP = Sterilization in Place

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	MAX = maximum safety: The device keeps the electronic switch closed as long as the liquid level is below the fork. example application: overspill protection 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)	
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		- ambient temperature: 25 °C (+77 °F) - process pressure: 1 bar (14.5 psi) - fluid: water (density: approx. 1 g/cm ³ , viscosity: 1 mm ² /s) - medium temperature: 25 °C (+77 °F) - density setting: > 0.7 g/cm ³ - 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		- 0.5 s when tuning fork is covered - 1.0 s when tuning fork is uncovered - other switching times on request

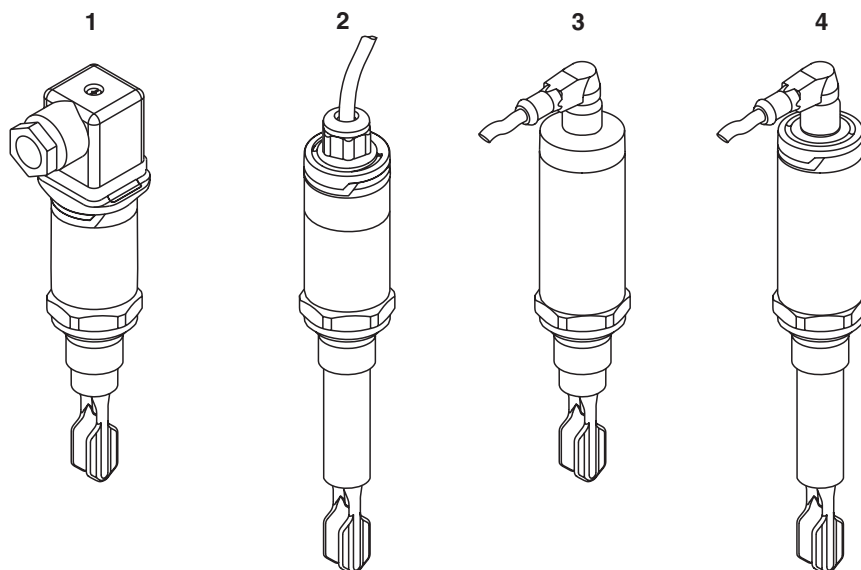
Operating conditions

Installation conditions		
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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)
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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

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

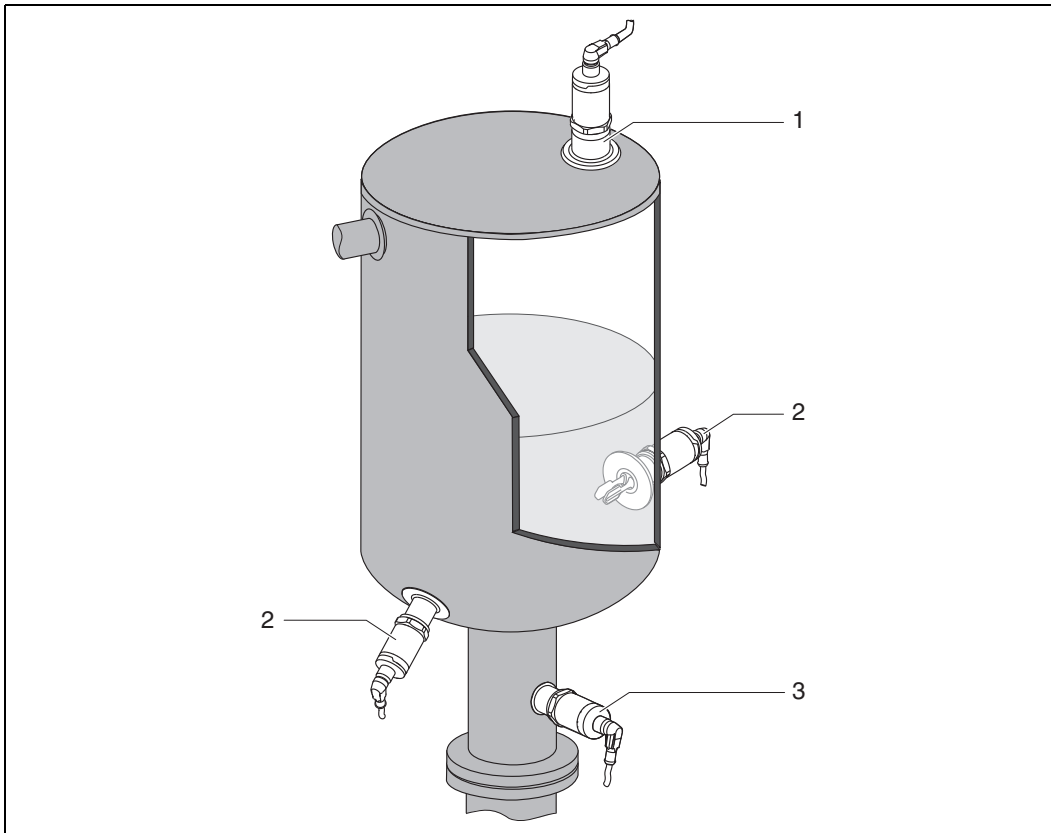
	Accessory optional
Weld-in adapter	
PA	G3/4, d = 50, 316L, vessel installation
PB	G3/4, d = 50, 316L, vessel installation, EN 10204-3.1 inspection certificate
PC	G3/4, d = 29, 316L, pipe installation
PD	G3/4, d = 29, 316L, pipe installation, EN 10204-3.1 inspection certificate
PE	G1, d = 60, 316L, vessel 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

Mounting

Mounting position

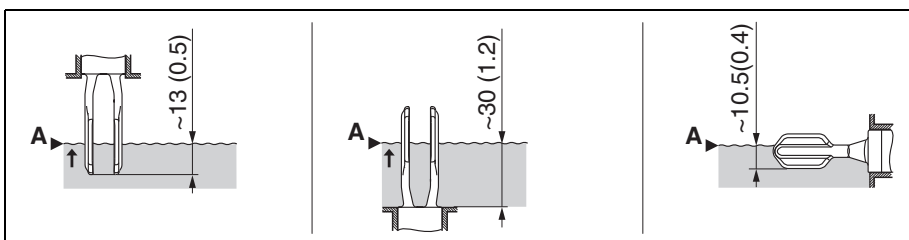
The device can be installed in any position in a vessel, pipe or tank. Foam formation does not affect the function.



- 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)

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