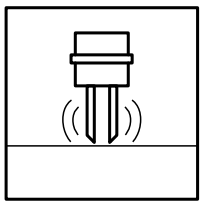
Vibration limit switch

Vibracon LVL-A1

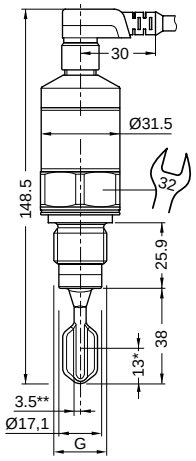


Features

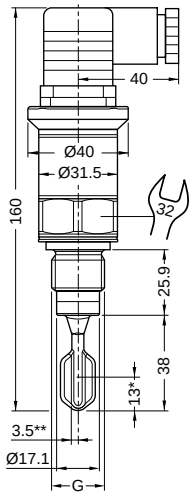
- Operational safety, reliablity and universal applicability through use of the vibrating fork measuring principle
- Function test with testing magnet under built-in condition
- Function control using external LED display
- Small, slender design allows low space requirement and easy mounting in places with limited access
- Rugged stainless steel housing, allows use in rough ambient conditions
- Low-cost plug connection

Dimensions

LVL-A1-V1



LVL-A1-P□



* Switch point for vertical installation
** Switch point for horizontal installation

Switch point at densitiy 1, 23 °C, 0 bar

Function

The Vibracon Mini LVL-A1 is a level limit switch for all kinds of fluids and is used in tanks, containers and pipelines. It is used in cleaning and filtering systems and coolant and lubricant tanks as an overspill protection or as a pump protector.

The LVL-A1 is ideal for applications which previously used float switches and conductive, capacitive and optical sensors.

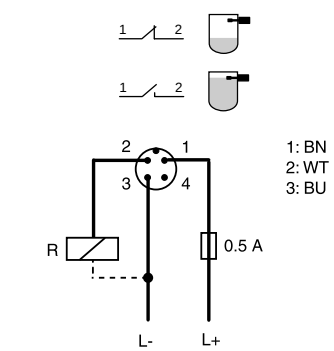
It also works in applications which are unsuitable for these measuring methods due to conductivity, build-ups, turbulence, flows or air bubbles.

The LVL-A1 is not suitable for hazardous areas, hygiene areas and areas where the liquid temperature is over 100 °C.

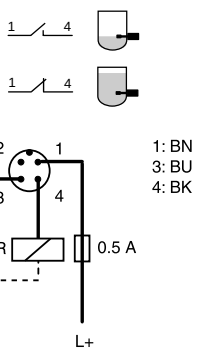
Electrical connection

Example: connection E5 (three-wire D.C. connection) with V1 connector M12 x 1
For more connection types see section electrical connections.

Operating mode MAX (NC contact)



Operating mode MIN (NO contact)



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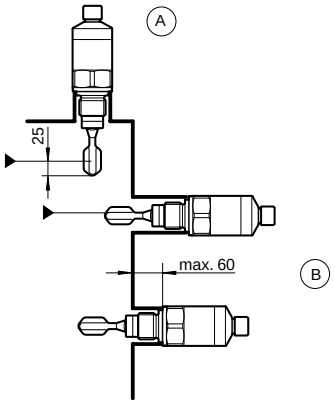
	Vibracon LVL-A1
Application	
Function principle	As in the case of a vibration fork the fork of the LVL-A1 is excited to its resonance frequency. This frequency changes when the fork is submerged in liquid. The built-in electronics monitors the resonance frequency and indicate whether the vibrating fork is oscillating freely or whether fluid is covering the vibration fork
Output characteristics	
Fail-safe mode	Minimum-/maximium-closed circuit safety The LVL-A1 can be connected in two operating modes. Depending on the operating mode selected (MAX or MIN safety), the LVL-A1 will switch off safely in the event of a fault (e. g. if the power supply line is interrupted). • MAX – maximum fail-safe mode The LVL-A1 keeps the electronic switch closed as long as the fluid level is below the fork. Example application: overspill protection • MIN – minimum fail-safe mode The LVL-A1 keeps the electronic switch closed as long as the fork is immersed in fluid. 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 failure.
Switching time	approx. 0.5 s when covering the vibration fork approx. 1.0 s when uncovering the vibration fork
Auxiliary energy	
Electrical connection	This device may be used with any sequential circuit, as long as the circuit can support the electrical circuit values of the switching elements.
Supply voltage	Output B3: 26.5 ... 31.9 V DC (AS-i) Output E5: 10 ... 35 V DC with safety extra-low voltage Output WA: 19 ... 253 V AC, 50/60 Hz
Current consumption	Output B3: 25 mA Output E5: 15 mA Output WA: 3.8 mA
Connectable load	Output B3: to EN 50295 and IEC 62026-2 Output E5: max. 250 mA (overload proof)) Output WA: max. 250 mA (automaticlly load verification on connection)
Accuracy of measurement	
Hysteresis	approx. 3 mm for vertical mounting approx. 2 mm for horizontal mounting
Operating conditions	
Mounting conditions	
Mounting position	any position  A) vertical installation B) horizontal installation ▶ Switch point depending on mounting direction
Installation instructions	Function test with test magnet: Put the testing magnet to the mark of nameplate. The vibration fork reactes with the test magnet as in the case of covering with fluid. Outputs E5, WA: on testing, the current state of the electronic switch is reversed. Output B3: on testing, D0 is inverted.
Ambient conditions	
Ambient temperature range	Outputs E5, WA: -40 ... +70 °C (-40 ... 160 °F) Output B3: -25 ... +70 °C (-25 ... 160 °F)
Storage temperature range	-40 ... +85 °C (-40 ... 185 °F)
Climatic class	Climatic protection to IEC 68, part 2-38, Fig. 2a
Protection class	Electrical connection V1: DIN EN 60529, IP65 Electrical connection P□: DIN EN 60529, IP65/IP67
Electromagnetic compatibility	Outputs E5, WA: Emitted interference to EN 61326, CLASS B equipment Interference immunity to EN 61326, appendix A (industrial application) and NAMUR EMC recommendation (NE 21) Output B3: EN 50295

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	Vibracon LVL-A1
Process conditions	
Medium temperature range	at ambient temperature ≤ 50 °C (122 °F): -40 ... +100 °C (-40 ... 212 °F) at ambient temperature > 50 °C (122 °F): -40 ... +80 °C (-40 ... 176 °F)
Process pressure range	-1 ... +40 bar
Density	min. 0.7 g/cm^3
Viscosity	max. 10000 mm^2/s (10000 cSt)
Mechanical Construction	
Dimensions	with electrical connection V1: diameter 31.5 mm, length 148.5 mm with electrical connection P☐: diameter 40 mm, length 160 mm
Weight	approx. 400 g
Materials	Vibration fork, process connection and housing: 1.4435 (AISI 316L), connection: PSU
Process connection	Thread G½, G¾, ½ NPT, ¾ NPT, R½, R¾
Connection	Electrical connection V1: pinning according to DIN EN 50044 Electrical connection P☐: valve plug, cross section max. 1.5 mm^2 (AWG 16), diameter 6 ... 9 mm Electrical connection PS: QUICKON valve plug, cross section 0.34 ... 0.75 mm^2, diameter 3.5 ... 6.5 mm
Indication and operation	
Display elements	The LED display is on the connection side of the LVL-A1. green light: indication of ready to operate red light: fault indication, mode indication (E5, WA) yellow light: mode indication (B3)
Programming	AS-i profile: S-1.A.E The address is defaulted to 0 (HEX). It is changeable via the bus master or programming unit. Parameter bits (P0 ... P3) are not used.
Certificates and approvals	
Application	The general authorisation by the board of surveyors must be obtained for the site of installation. It is accessible together with the technical description and the certificate from P+F.
Overspill protection	Z-65.11-314 (overspill protection WHG) Z-65.40-315 (leak detection system)
Other approvals	CSA certificate in preparation Certificate for AS-i version in preparation
General information	
Supplementary information	www.pepperl-fuchs.com
Accessories	
Model number	• V1-G-2M-PVC, mating connector straight, cable 2 m • V1-W-2M-PVC, mating connector, angled, cable 2 m • LVL-Z65, socket wrench AF32

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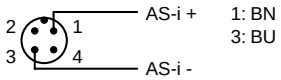
Electrical connection

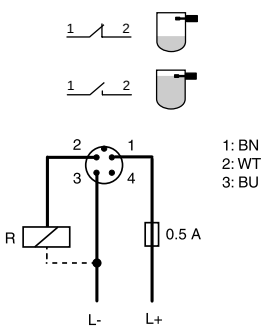
- Output B3 (AS-i) (only with V1 connector M12 x 1 available)
  Two-wire connection for separate switching unit



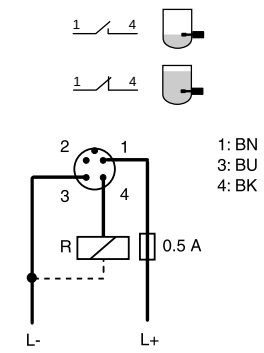
- Output E5
  Three-wire D.C. connection, switching the load via transistor (PNP) and separate connection

V1 connector M12 x 1

Operating mode MAX (NC contact)

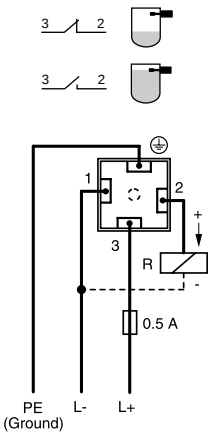


Operating mode MIN (NO contact)

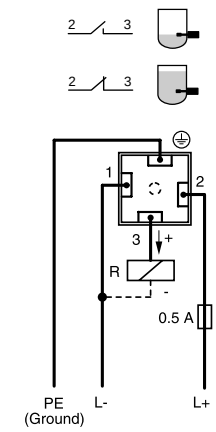


Valve plug

Operating mode MAX



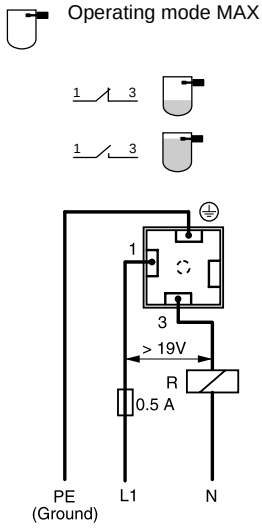
Operating mode MIN



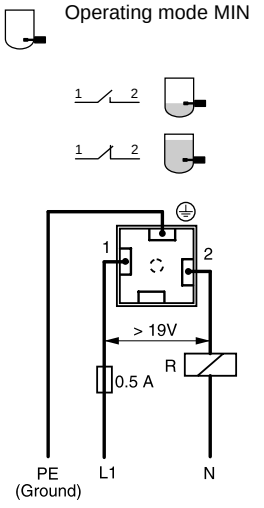
- Output WA
  Two-wire A.C. connection

Valve plug

Operating mode MAX



Operating mode MIN



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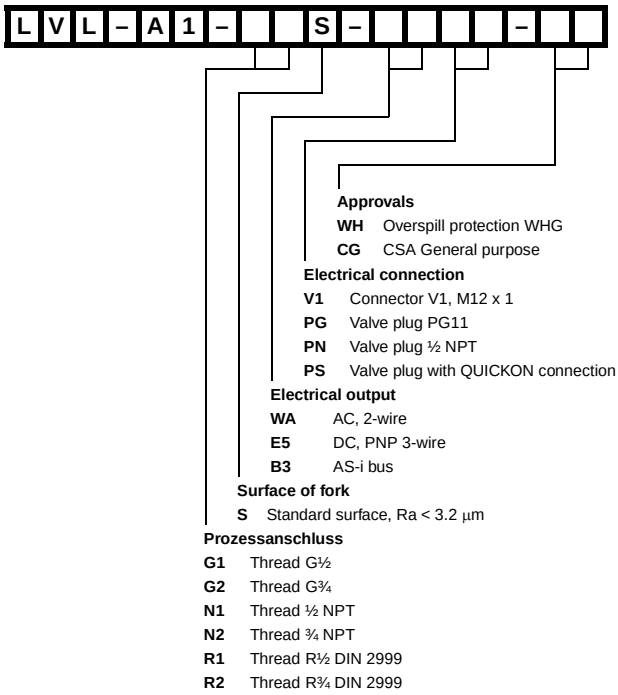
Type code/model number



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