

# Level measurement

## Point level measurement – Vibrating switches

### SITRANS LVL100

#### Overview



SITRANS LVL100 is a compact vibrating level switch for use in liquid and slurry applications such as overflow, high, low and demand applications, as well as pump protection. It is ideal for use in confined spaces.

#### Benefits

- Proven vibrating level switch technology for liquids
- Compact insertion length of 40 mm (1.57 inch) for confined space applications
- Fault monitoring for corrosion, loss of vibration, or line break to the piezo drive
- Integrated test function to confirm correct operation

#### Application

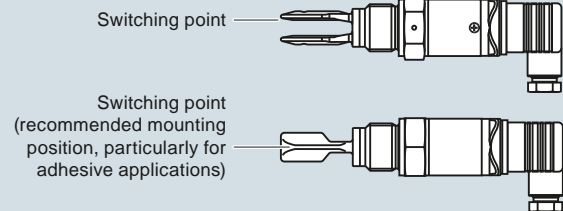
SITRANS LVL100 is a compact level switch designed for industrial use in all areas of process technology and can be used with liquids and slurries. With an insertion length of only 40 mm (1.57 inch), SITRANS LVL100 can be mounted in small pipes and confined space applications. It is virtually unaffected by the chemical and physical properties of the liquid. The LVL100 can be used in difficult conditions including turbulence, air bubbles, foam generation, buildup, or external vibration.

The tuning fork is piezoelectrically energized and vibrates at a mechanical resonance frequency of approximately 1 200 Hz. The vibration frequency changes when the tuning fork is covered by the medium. This change is detected by the integrated oscillator and converted into a switching command. The integrated electronics evaluate the level signal and output a switching signal to connected devices.

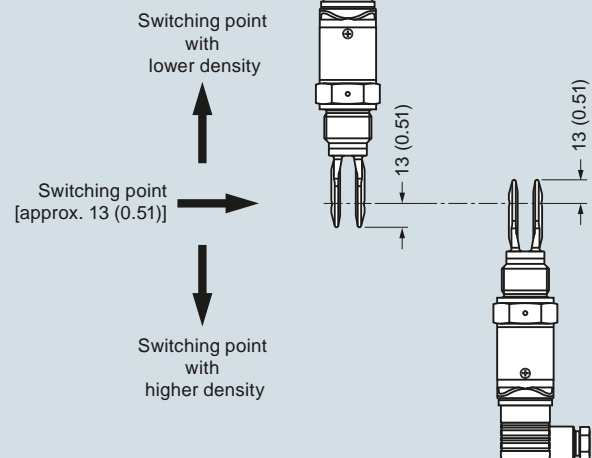
- Key Applications: For use in liquids and slurries, for level measurement, overflow, and dry run protection

#### Configuration

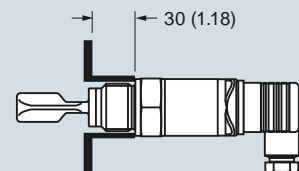
##### Horizontal mounting



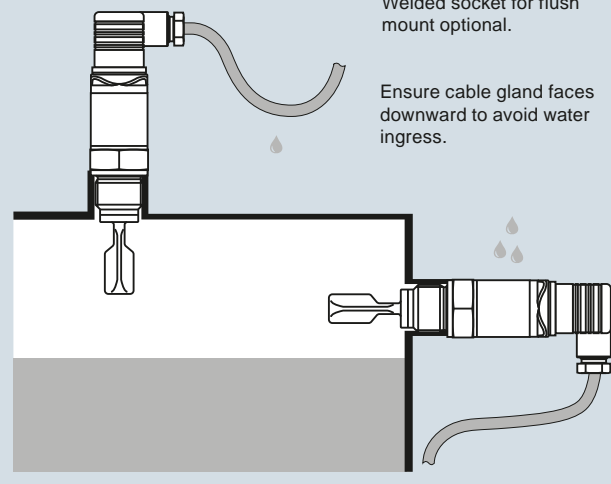
##### Vertical mounting



##### Horizontal mounting in viscous or adhesive applications



##### Moisture protection



SITRANS LVL100 Installation, dimensions in mm (inch)

# Level measurement

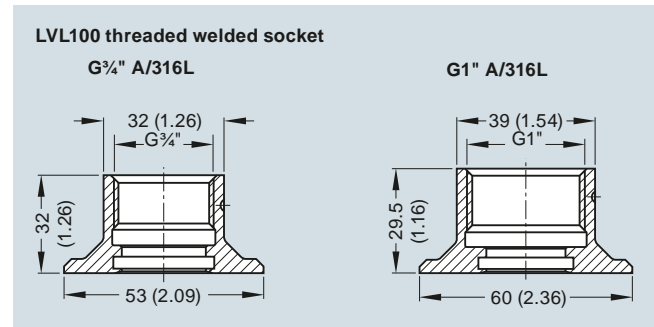
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### Technical specifications

<b>Mode of operation</b>	
Measuring principle	Vibrating point level switch
<b>Input</b>	
Measured variable	High and low and demand
<b>Output</b>	
Output options	Contactless electronic switch Transistor output PNP
<b>Measuring Accuracy</b>	
• Hysteresis	Approx. 2 mm (0.08 inch) with vertical installation
• Switching delay	Approx. 500 ms (on/off)
• Frequency	Approx. 1 200 Hz
<b>Rated operating conditions</b>	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +70 °C (-40 ... +158 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Temperature	
- Standard	-40 ... +100 °C (-40 ... +212 °F)
- High temperature option	-40 ... +150 °C (-40 ... +302 °F)
• Pressure (vessel)	-1 ... 64 bar g (-14.5 ... 928 psi g)
• Density	0.7 ... 2.5 g/cm <sup>3</sup> (0.025 ... 0.09 lb/in <sup>3</sup> )
<b>Design</b>	
Material	
• Enclosure	316L and Plastic PEI
• Tuning fork	316L (1.4404 or 1.4435)
• Process connection (threaded)	316L (1.4404 or 1.4435)
• Process seal	Klingsil C-4400
Process connection	
• Pipe thread, cylindrical (ISO 228 T1)	G ¾" A or G 1" A
• Pipe thread, tapered	¾" NPT or 1" NPT
• Hygienic fittings	Bolting DN 40 PN 40 Tri-clamp 1", 1½", 2" PN 10
Degree of protection	IP65/Type 4/NEMA 4 (with DIN 43650 valve plug), IP66/67 or IP68 (with M12 connector)
Conduit entry	1 x M12 [IP66/IP67 or IP68 (0.2 bar)]
Weight (housing)	250 g (9 oz)
<b>Power supply</b>	
Supply voltage	20 ... 253 V AC, 50/60 Hz 20 ... 253 V DC
Power consumption	1 ... 8 VA AC, approx. 1.3 W DC
<b>Certificates and approvals</b>	
	• Overfill protection (WHG) • Shipping approvals

### Options




SITRANS LVL100 welded socket, dimensions in mm (inch)


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### SITRANS LVL100

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
<b>SITRANS LVL100</b> Compact vibrating level switch for use in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. Ideal for use in confined spaces.	<b>7ML5745-</b> A 0	<b>Further designs</b> Please add "-Z" to Article No. and specify Order code(s).	
<b>Approvals</b> Without approvals Shipping approvals <sup>5)</sup> Overfill protection (WHG) <sup>1)</sup>	1 2 3	Cleaning including certificate (oil, grease and silicone free) Identification Label, foil laser marking Acceptance test certificate 3.1 for instrument Acceptance test Certificate 2.2 for material EN10204	W01 Y16 C12 C15
<b>Process temperature</b> Standard -40 ... +100 °C (-40 ... +212 °F) <sup>2)</sup> Extended -40 ... +150 °C (-40 ... +302 °F) <sup>2)</sup> Hygienic applications -40 ... +150 °C (-40 ... +302 °F) <sup>3)</sup>	A B C	<b>Additional Operating Instructions</b> <u>LVL100 (Contactless electronic switch)</u> • English • French • Spanish • German <u>LVL100 (Transistor PNP)</u> • English • French • Spanish • German This device is shipped with the Siemens Milltronics manual DVD containing the Operating Instructions library.	Article No. <b>7ML1998-5KN01</b> <b>7ML1998-5KN11</b> <b>7ML1998-5KN21</b> <b>7ML1998-5KN31</b> <b>7ML1998-5KP01</b> <b>7ML1998-5KP11</b> <b>7ML1998-5KP21</b> <b>7ML1998-5KP31</b>
<b>Process connection</b> Thread G $\frac{3}{4}$ " A PN 64/316L Thread G $\frac{3}{4}$ " A PN 64/316L Ra< 0.8 µm Thread $\frac{3}{4}$ " NPT PN 64/316L Thread $\frac{3}{4}$ " NPT PN 64/316L Ra< 0.8 µm Thread G1" A PN 64/316L Thread G1" A PN 64/316L Ra< 0.8 µm Thread 1" NPT PN 64/316L Thread 1" NPT PN 64/316L Ra< 0.8 µm Tri-Clamp 1" PN 16 DIN 32676/316L Ra< 0.8 µm Tri-Clamp 1½" PN 16 DIN 32676/316L Ra< 0.8 µm Tri-Clamp 2" PN 16 DIN 32676/316L Ra< 0.8 µm Bolting DN25 PN 40 DIN 11851/316L Ra< 0.8 µm Bolting DN40 PN 40 DIN 11851/316L Ra< 0.8 µm Bolting DN50 PN 25 DIN 11851/316L Ra< 0.8 µm SMS DN38 PN 6 316L Ra< 0.8 µm Hygienic fitting with compression nut F40 PN 25/316L Ra< 0.8 µm Thread G½" (DIN 3852-A) PN64 / 316L Thread G½" (DIN 3852-A) PN64 / 316L Ra< 0.8 µm Thread ½" NPT (ASME B1.20.1) PN 64 / 316L Thread ½" NPT (ASME B1.20.1) PN 64 / 316L Ra< 0.8 µm	A 0 A 1 A 2 A 3 A 4 A 5 A 6 A 7 A 8 B 0 B 1 B 2 B 3 B 4 B 5 B 6 C 0 C 1 C 2 C 3	<b>Spare Parts</b> <u>LVL100 Threaded Welded Socket</u> G $\frac{3}{4}$ " A/316L with FKM Seal G1" A/316L with FKM Seal M27x1.5/316L with FKM Seal G $\frac{3}{4}$ " A/316L with EPDM Seal G1" A/316L with EPDM Seal M27x1.5/316L with EPDM Seal	<b>7ML1930-1EE</b> <b>7ML1930-1EF</b> <b>7ML1930-1EG</b> <b>7ML1930-1EH</b> <b>7ML1930-1EJ</b> <b>7ML1930-1EK</b>
<b>Electronics</b> Contactless electronic switch 20 ... 250 V AC/DC <sup>4)</sup> Transistor output PNP 10 ... 55 V DC	1 2	• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol  . For details see page 9/5 in the appendix.	
<b>Housing</b> 316L	1		
<b>Electrical connection/Protection</b> M12x1/IP67 According to DIN 43650 including plug/IP65 Acc. to DIN 43650 incl. plug with QuickOn connection/IP65 M12x1 incl. 5 m cable/IP68 (0.2 bar)	A B C D		

- 1) Available with process connection A0, A2, A4, and A6 only  
2) Available with process connection A1, A3, A5, and A7 ... B6 only  
3) Available with Electrical connection/Protection option B and C only  
4) Available with Process Temperature option A only  
5) Available with Process Temperature option A only

• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

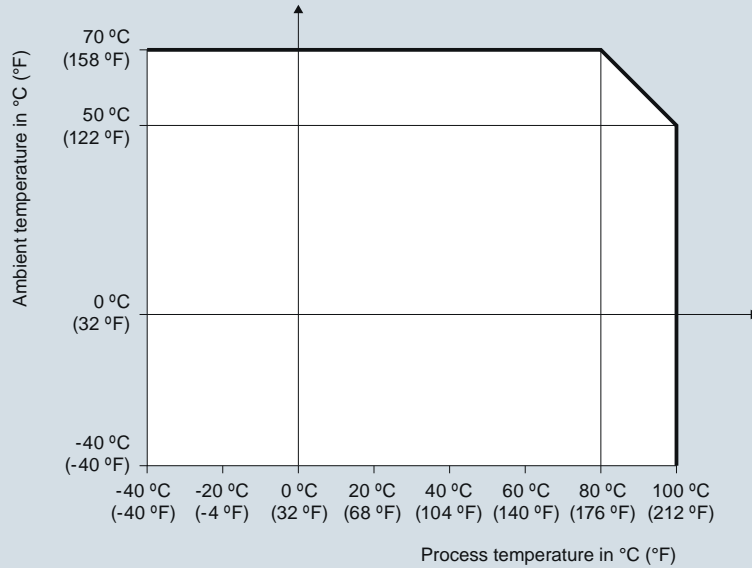
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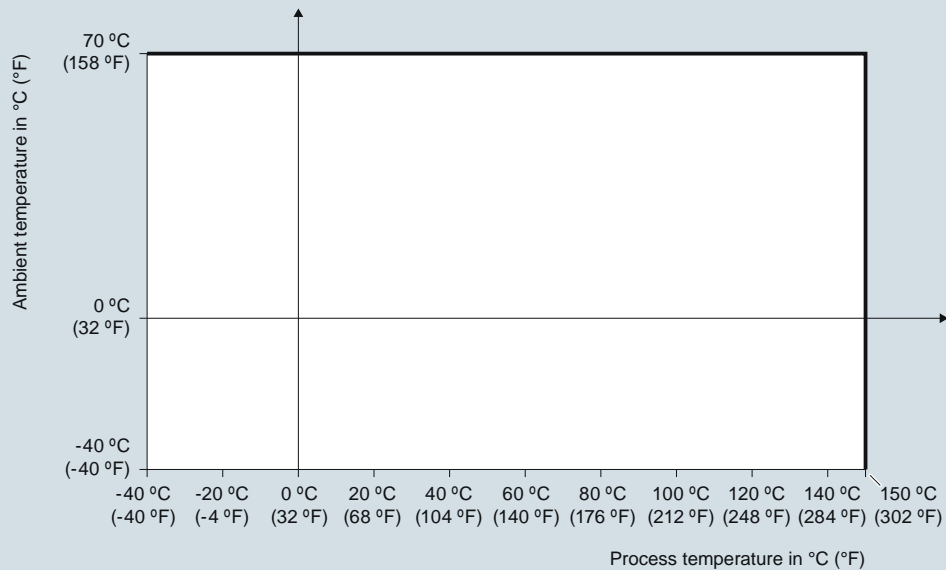
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### Characteristic curves

Ambient temperature to process temperature dependency  
(standard version)



Ambient temperature to process temperature dependency  
(high temperature version)



SITRANS LVL100 Ambient Temperature/Process Temperature derating curves

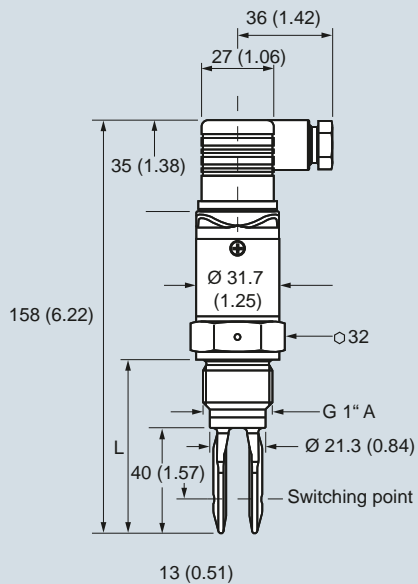
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#### Dimensional drawings

SITRANS LVL100 (standard)

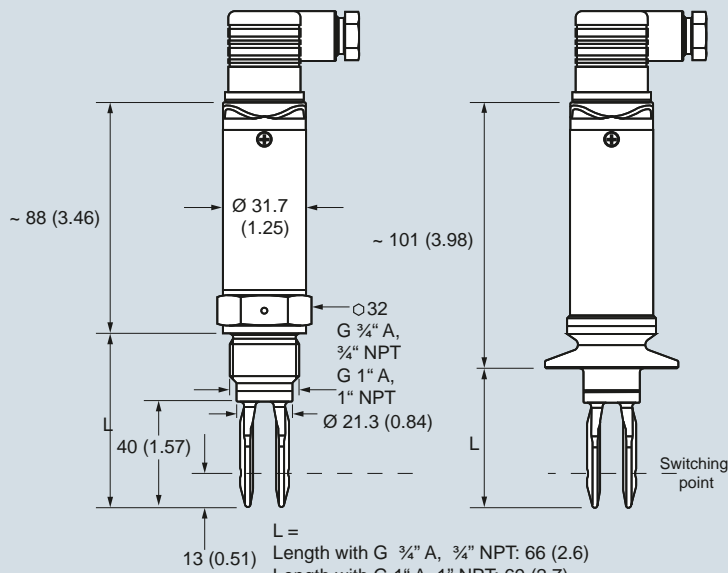


L =  
 Length with G 3/4" A, 3/4" NPT: 66 (2.6)  
 Length with G 1" A, 1" NPT: 69 (2.7)

SITRANS LVL100 (extended high temperature)

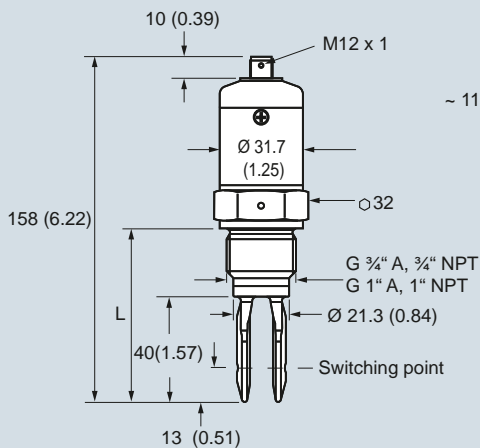
Thread G 3/4" A, G 1 inch A (DIN ISO 228/1),  
 3/4" NPT or 1" NPT (valve plug DIN 43650)

Tri-clamp (valve plug DIN 43650)



L =  
 Length with G 3/4" A, 3/4" NPT: 66 (2.6)  
 Length with G 1" A, 1" NPT: 69 (2.7)  
 Length with Tri-clamp: 53 (2.1)

SITRANS LVL100 (standard with M12 connector)

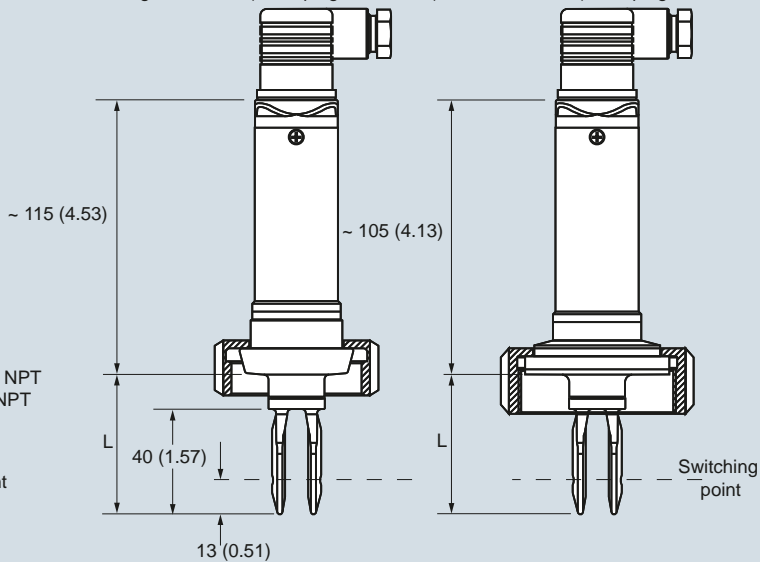


L =  
 Length with G 3/4" A, 3/4" NPT: 66 (2.6)  
 Length with G 1" A, 1" NPT: 69 (2.7)

SITRANS LVL100 (extended, high temperature)

Bolting DIN 11851 (valve plug DIN 43650)

SMS 1145 (valve plug DIN 43650)



L =  
 Length with bolting: 53 (2.1)  
 Length with SMS 1145: 53 (2)

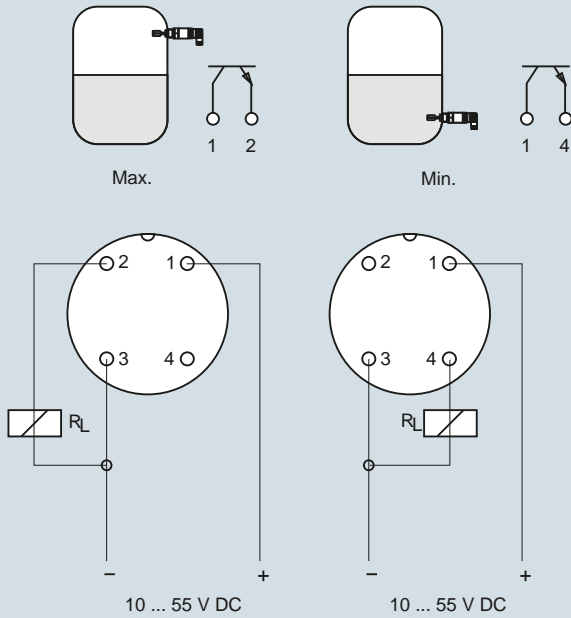
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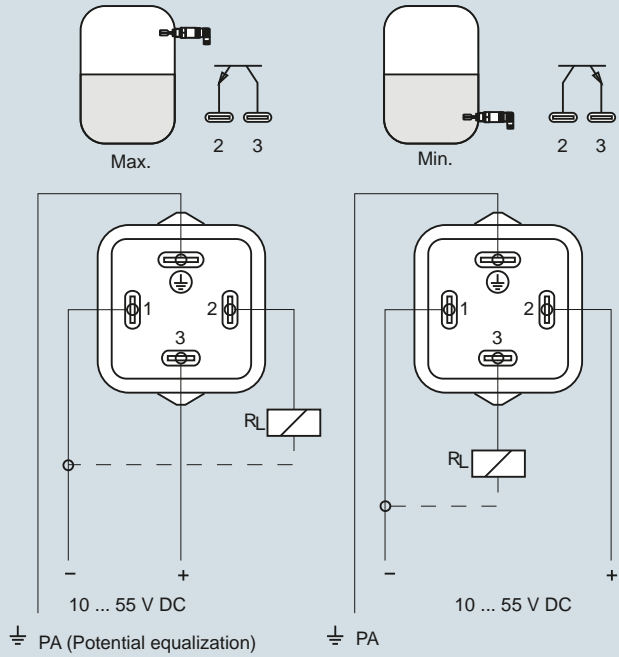
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### Schematics

Transistor PNP (M12 x 1 plug connection)



Transistor PNP (with valve plug DIN 43650)



Contactless electronic switch (valve plug DIN 43650)

