

## Level Measurement

Point level measurement

Vibrating switches

### SITRANS LVS300

#### Overview



SITRANS LVS300 is a vibrating rod point level switch for high, low, or demand level detection of bulk solids.

#### Benefits

- High resistance to mechanical forces.
- Adjustable sensitivity for varied applications including build-up.
- Rotatable enclosure for convenient wiring.
- Suitable for low density material: standard version, 20 g/l (1.3 lb/ft<sup>3</sup>).
- Customer desired extensions up to 4 000 mm (157 inch).
- 160 mm (6.3 inch) insertion length.
- Flexible, customer supplied, rods to 4 meters.
- Process connections starting at 1 inch.

#### Application

The standard LVS300 detects high, low, or demand levels of dry bulk solids in bins, silos, or hoppers.

A pipe extension version is available, separated by a customer supplied 1 inch pipe.

The LVS300 has a compact design and can be top, side or angle mounted. The vibrating rod design ensures the product will not be impacted by bridging of traditional forks in applications with buildup potential. A durable probe design ensures the product will withstand heavier materials without damage or bending.

A signal from the electronic circuit excites a crystal in the probe causing the rod to vibrate. If the rod is covered by material, the change in vibration is detected by the electronic circuitry which causes the output to change state after a one second delay. When the probe is free from material, full vibration resumes and the relay reverts to its normal condition.

- Key Applications: dry or bulk solids with buildup potential, in bins, silos, or hoppers, such as lime, molding sand, milk powder, flour, salt, and plastic granules.

#### Technical specifications

<b>Mode of operation</b>		<b>Rated operating conditions</b>	
Measuring principle	Vibrating point level switch	Installation conditions	Indoor/outdoor
<b>Input</b>		• Location	II
Measured variable	High, low, and demand	Ambient conditions	-40 ... +60 °C (-40 ... +140 °F)
Measuring frequency	330 Hz	• Ambient temperature	II
• Standard	330 Hz	• Installation category	2
<b>Output</b>		• Pollution degree	2
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected (reverse protection)	Medium conditions	-40 ... +150 °C (-40 ... +302 °F)
Relay	DPDT relay	• Process temperature	Max. 16 bar g (232 psi g) European Pressure Directive 2014/68/EU: Category 1
Signal delay	• Probe uncovered to covered: approximately 1 second • Probe covered to uncovered: approximately 1 ... 2 seconds	• Pressure (vessel)	Approx. 20 g/l (1.2 lb/ft <sup>3</sup> )
Relay fail-safe	High or low, switch selectable	• Minimum material density	
Alarm output	• Relay 8 A at 250 V AC, non-induc- tive • Relay 5 A at 30 V DC, non-inductive	<b>Design</b>	
<b>Sensitivity</b>		Material	Aluminum powder coat
Four sensitivity settings, switch selectable		• Enclosure	
		Process connection	• G 1", G 1 1/4", G 1 1/2" DIN 228; NPT 1", NPT 1 1/4", NPT 1 1/2" ANSI B 1.20.1 • Flange: according to selection 1.4541 (321) or 1.4404 (316L) • Tri-clamp: stainless steel 1.4301 (304) or 1.4404 (316L) • 2" (DN 50) ISO 2852
		Probe material	• Oscillator material: stainless steel 1.4404 (316L) • Stainless steel 1.4301 (304)/1.4541 (321) or 1.4404 (316L) (process connection and tube extension)
		Degree of protection	IP67 (EN 60529), NEMA Type 4X
		Conduit entry	2 x M20 x 1.5 or 2 x 1/2" NPT
		Weight	• Standard version: 1.3 kg (2.9 lb) +1.3 kg/m (+2.9 lb per 39.3 inch) extension • Customer supplied pipe: 1.8 kg (4.0 lb) +1.3 kg/m (+2.9 lb per 39.3 inch) extension
		<b>Power supply</b>	• Relay DPDT 21 ... 230 V, 50 ... 60 Hz, ± 10 %* 22 VA, 22 ... 45 V DC, ± 10 %* 2W *incl. ± 10 % of EN 61010 • 3-wire PNP 20 ... 40 V DC, ± 10 %* *incl. ± 10 % of EN 61010
		<b>Certificates and approvals</b>	CE, ATEX, FM

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Selection and Ordering data	Article No.
<b>SITRANS LVS300 Vibrating rod point level switch, compact design</b> Level and material detection in solids. Compact, with 160 mm (6.30 inch) insertion. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	<b>7ML5736-</b>
<b>Power supply</b> Relays DPDT 21 ... 230 V AC 22 ... 45 V DC PNP 20 ... 40 V DC	1 2
<b>Process temperature</b> Without temperature isolator [up to T <sub>process</sub> = 150 °C (302 °F) at Tamb < 40 °C (104 °F)] With temperature isolator [up to T <sub>process</sub> = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]	A B
<b>Process connection</b> <u>Threaded</u> Thread G 1½" (BSPP) EN ISO 228-1 Thread G 1¼" (BSPP) EN ISO 228-1 Thread G 1" (BSPP) EN ISO 228-1 Thread NPT 1½" (Taper) ANSI B1.20.1 Thread NPT 1¼" (Taper) ANSI B1.20.1 Thread NPT 1" (Taper) ANSI B1.20.1 Triclamp 2" (DN 50) ISO 2852 <u>Flanged</u> Flange DN 100 PN6, EN1092-1 <sup>1)</sup> Flange DN 100 PN16, EN1092-1 2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5	A B C D E F G H J K L M
<b>Extension length</b> Standard length, 160 mm (6.3 inch)	1 1
<b>Material process connection/extension</b> Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) Stainless steel 316 L (1.4404)	1 2
<b>Approvals</b> CE ATEX II 1/2D Ex ta/tb IIIC TI Da/Db IP6X FM <sub>US</sub> and FM <sub>C</sub> General Purpose FM <sub>US</sub> and FM <sub>C</sub> DIP Class II, III Div.1 Groups E, F, G	A B C D

Selection and Ordering data	Order code
<b>Further designs</b> Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [(70 mm x 13 mm (2.76 x 0.51 inch)): Measuring-point number/identification (max. 27 characters) specify in plain text Signal bulb inserted in M20 cable gland <sup>2)</sup> Factory test certificate - M to DIN 55350, Part 18	<b>Y14</b> <b>A20</b> <b>C11</b>
<b>Operating Instructions</b> All literature is available to download for free, in a range of languages, at <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a>	

1) Max. 6 bar (87 psi).

2) Available only with Approval option A.

Selection and Ordering data	Article No.
<b>SITRANS LVS300 Vibrating rod point level switch, pipe extended design</b> Level and material detection in solids. Extension options up to 4 m (13.12 ft). ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	<b>7ML5737-</b>
<b>Power supply</b> Relays DPDT 21 ... 230 V AC 22 ... 45 V DC PNP 20 ... 40 V DC	1 2
<b>Process temperature</b> Without temperature isolator [up to T <sub>process</sub> = 150 °C (302 °F) at Tamb < 40 °C (104 °F)] With temperature isolator [up to T <sub>process</sub> = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]	A B
<b>Process connection</b> <u>Threaded</u> Thread G 1½" (BSPP) EN ISO 228-1 Thread G 1¼" (BSPP) EN ISO 228-1 Thread G 1" (BSPP) EN ISO 228-1 Thread NPT 1½" (Taper) ANSI B1.20.1 Thread NPT 1¼" (Taper) ANSI B1.20.1 Thread NPT 1" (Taper) ANSI B1.20.1 Tri-clamp 2" (DN50) ISO 2852 <u>Flanged</u> Flange DN 100 PN6, EN1092-1 <sup>1)</sup> Flange DN 100 PN16, EN1092-1 2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5	A B C D E F G H J K L M
<b>Extension length</b> <u>Extension length Stainless steel threads</u> 304 (1.4301), flanges 321 (1.4541) 200 ... 500 mm (7.87 ... 19.69 inch) 501 ... 750 mm (19.72 ... 29.53 inch) 751 ... 1 000 mm (29.57 ... 39.37 inch) 1 001 ... 1 250 mm (39.41 ... 49.21 inch) 1 251 ... 1 500 mm (49.25 ... 59.06 inch) 1 501 ... 1 750 mm (59.09 ... 68.90 inch) 1 751 ... 2 000 mm (68.94 ... 78.74 inch) 2 001 ... 2 250 mm (78.78 ... 88.58 inch) 2 251 ... 2 500 mm (88.62 ... 98.43 inch) 2 501 ... 2 750 mm (98.46 ... 108.27 inch) 2 751 ... 3 000 mm (108.31 ... 118.11 inch) 3 001 ... 3 250 mm (118.15 ... 127.95 inch) 3 251 ... 3 500 mm (127.99 ... 137.80 inch) 3 501 ... 3 750 mm (137.83 ... 147.64 inch) 3 751 ... 4 000 mm (147.68 ... 157.48 inch) <u>Extension length Stainless steel 316 L (1.4404)</u> 200 ... 500 mm (7.87 ... 19.69 inch) 501 ... 750 mm (19.72 ... 29.53 inch) 751 ... 1 000 mm (29.57 ... 39.37 inch) 1 001 ... 1 250 mm (39.41 ... 49.21 inch) 1 251 ... 1 500 mm (49.25 ... 59.06 inch) 1 501 ... 1 750 mm (59.09 ... 68.90 inch) 1 751 ... 2 000 mm (68.94 ... 78.74 inch) 2 001 ... 2 250 mm (78.78 ... 88.58 inch) 2 251 ... 2 500 mm (88.62 ... 98.43 inch) 2 501 ... 2 750 mm (98.46 ... 108.27 inch) 2 751 ... 3 000 mm (108.31 ... 118.11 inch) 3 001 ... 3 250 mm (118.15 ... 127.95 inch) 3 251 ... 3 500 mm (127.99 ... 137.80 inch) 3 501 ... 3 750 mm (137.83 ... 147.64 inch) 3 751 ... 4 000 mm (147.68 ... 157.48 inch)	1 2 1 3 1 4 1 5 1 6 1 7 1 8 2 1 2 2 2 3 2 4 2 5 2 6 2 7 2 8 4 2 4 3 4 4 4 5 4 6 4 7 4 8 5 1 5 2 5 3 5 4 5 5 5 6 5 7 5 8

Selection and Ordering data	Article No.
<b>SITRANS LVS300 Vibrating rod point level switch, pipe extended design</b> Level and material detection in solids. Extension options up to 4 m (13.12 ft).	<b>7ML5737-</b> 
<b>Material process connection/extension</b> Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) <sup>2)</sup> Stainless steel 316 L (1.4404) <sup>3)</sup>	1 2
<b>Approvals</b> CE ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X FM <sub>US</sub> and FM <sub>C</sub> General Purpose FM <sub>US</sub> and FM <sub>C</sub> DIP Class II, III Div.1, Groups E, F, G	A B C D

Selection and Ordering data	Order code
<b>Further designs</b> Please add <b>"-Z"</b> to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)	<b>Y01</b>
Stainless steel tag [(70 mm x 13 mm (2.76 x 0.51 inch)): Measuring-point number/identification (max. 27 characters) specify in plain text	<b>Y14</b>
Signal bulb inserted in M20 cable gland <sup>4)</sup>	<b>A20</b>
Sliding sleeve, for application without overpressure max. 150 °C (302 °F), min. length 501 mm (19.72 inch) <sup>5)6)7)</sup>	<b>P12</b>
Sliding sleeve, for application with overpressure, max. 16 bar (232 psi), max. 150 °C (302 °F), min. length 501 mm (19.72 inch) <sup>6)</sup>	<b>P13</b>
Factory test certificate - M to DIN 55350, Part 18	<b>C11</b>
<b>Operating Instructions</b> All literature is available to download for free, in a range of languages, at <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a>	
<b>Spare parts</b> Replacement Electronics Modules are available. Contact factory for pricing.	

<sup>1)</sup> Max. 6 bar (87 psi).

<sup>2)</sup> Available with extension length 12.



<sup>3)</sup> Available with extension length 42.

<sup>4)</sup> Available only with Approval option A.

<sup>5)</sup> Available only with Approval options A and C.

<sup>6)</sup> Available only with Process connection options A, D, H, J, K, L, M, not available with extension length 12 and 42.

<sup>7)</sup> Available only with Material Process connection/extension option 1.

Selection and Ordering data	Article No.
<b>SITRANS LVS300 Vibrating rod point level switch, customer supplied tube</b> Level and material detection in solids. Requires flexible, customer supplied, pipe extensions with insertion to 4 m (13.12 ft).	<b>7ML5738-</b> 
 Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Power supply</b> Relays DPDT 21 ... 230 V AC 22 ... 45 V DC PNP 20 ... 40 V DC	1 2
<b>Process temperature</b> Without temperature isolator [up to T <sub>process</sub> = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]	A
<b>Process connection</b> <b>Threaded</b> Thread G 1½ " (BSPP) EN ISO 228-1 Thread NPT 1½ " (Taper) ANSI B1.20.1 Tri-clamp 2" (DN 50) ISO 2852	A D G
<b>Flanged</b> Flange DN 100 PN6, EN1092-1 <sup>1)</sup> Flange DN 100 PN16, EN1092-1	H J K L M
2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5	
<b>Extension length</b> 1 500 mm (59 inch), adjustable cable length 4 000 mm (157 inch), adjustable cable length	1 1 1 2
<b>Material process connection/extension</b> Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) Stainless steel 316 L (1.4404)	1 2
<b>Approvals</b> CE ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X FM <sub>US</sub> and FM <sub>C</sub> General Purpose FM <sub>US</sub> and FM <sub>C</sub> DIP Class II, III Div.1, Groups E, F, G	A B C D

Selection and Ordering data	Order code
<b>Further designs</b> Please add <b>"-Z"</b> to Article No. and specify Order code(s).	
Stainless steel tag [(70 mm x 13 mm (2.76 x 0.51 inch)): Measuring-point number/identification (max. 27 characters) specify in plain text	<b>Y14</b>
Signal bulb inserted in M20 cable gland <sup>2)</sup>	<b>A20</b>
Factory test certificate - M to DIN 55350, Part 18	<b>C11</b>
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<sup>1)</sup> Max. 6 bar (87 psi).

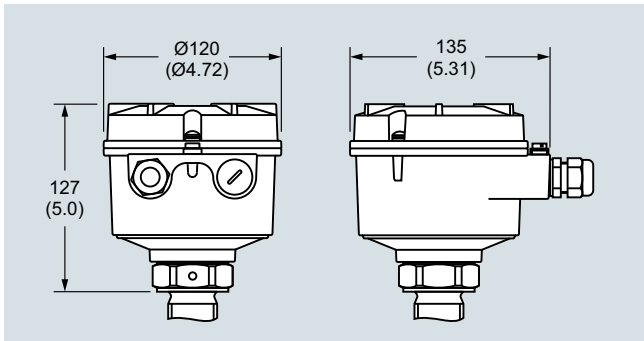
<sup>2)</sup> Available only with Approval option A.

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#### Dimensional drawings

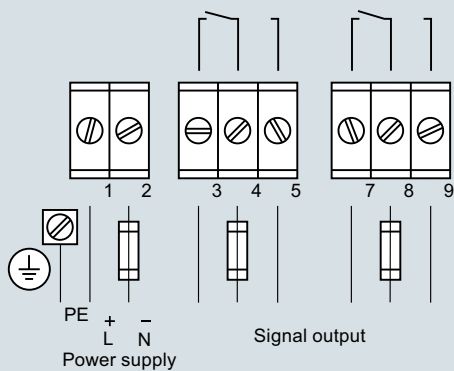


SITRANS LVS300 enclosure, dimensions in mm (inch)

4

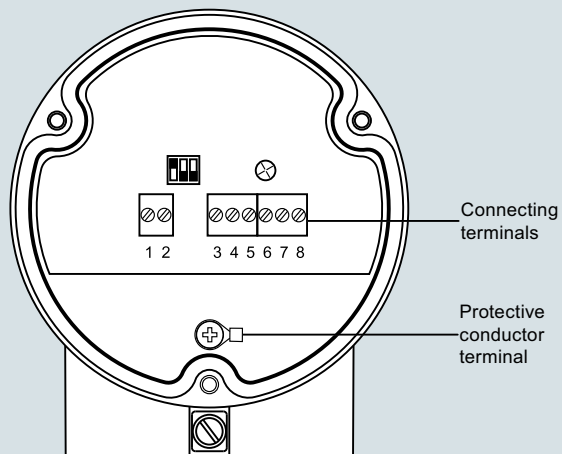
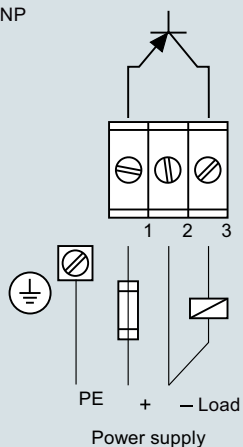
#### Universal voltage

Relay DPDT



#### 3-wire

PNP

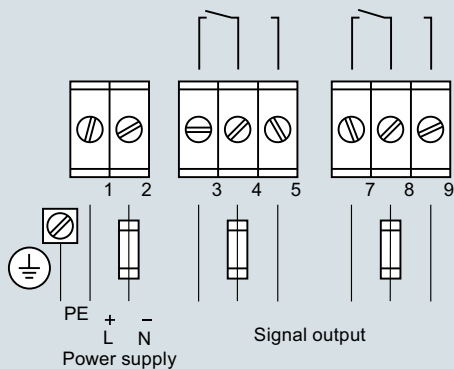


SITRANS LVS300, dimensions in mm (inch)

**Circuit diagrams**

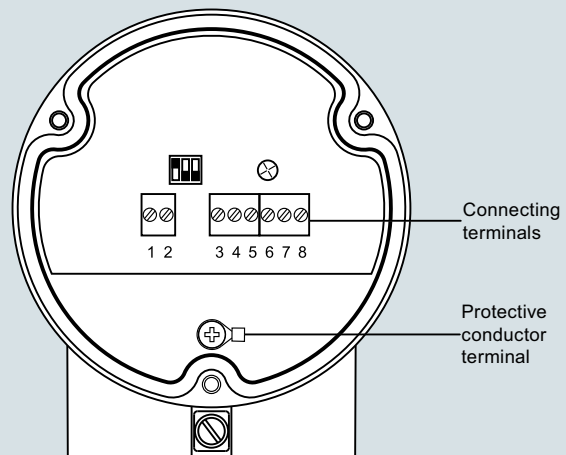
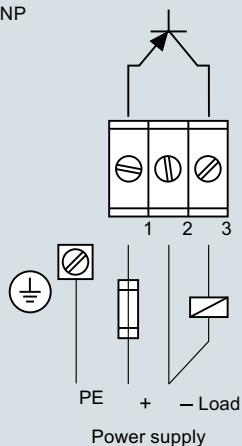
**Universal voltage**

Relay DPDT



**3-wire**

PNP



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SITRANS LVS300 connections