

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/ft³).
- 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.

Selection and ordering data

SITRANS LVS300 Vibrating rod point level switch, compact design Level and material detection in solids. Compact, with 160 mm (6.30 inch) insertion.	Article No. 7ML5736-●●●●●-●●	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Power supply		
Relays DPDT 21 ... 230 V AC 22 ... 45 V DC	1	
PNP 20 ... 40 V DC	2	
Process temperature		
Without temperature isolator [up to T _{process} = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]	A	
With temperature isolator [up to T _{process} = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]	B	
Process connection		
<u>Threaded</u>		
Thread G 1½" (BSPP) EN ISO 228-1		A
Thread G 1¼" (BSPP) EN ISO 228-1		B
Thread G 1" (BSPP) EN ISO 228-1		C
Thread NPT 1½" (Taper) ANSI B1.20.1		D
Thread NPT 1¼" (Taper) ANSI B1.20.1		E
Thread NPT 1" (Taper) ANSI B1.20.1		F
Tri-clamp 2" (DN50) ISO 2852		G
<u>Flanged</u>		
Flange DN 100 PN6, EN1092-1 ¹⁾		H
Flange DN 100 PN16, EN1092-1		J
2" ASME 150 lb B16.5		K
3" ASME 150 lb B16.5		L
4" ASME 150 lb B16.5		M
Extension length		
Standard length, 160 mm (6.3 inch)		1 1
Material process connection/extension		
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301)		1
Stainless steel 316 L (1.4404)		2
Approvals		
CE		A
ATEX II 1/2D Ex ta/tb IIIC TI Da/Db IP6X		B
FM _{US} and FM _C General Purpose		C
FM _{US} and FM _C DIP Class II, III Div. 1 Groups E, F, G		D

Selection and Ordering data	Order code
Further designs	
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	Y14
Signal bulb inserted in M20 cable gland ²⁾	A20
Factory test certificate - M to DIN 55350, Part 18	C11
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

¹⁾ Max. 6 bar (87 psi).

²⁾ Available only with Approval option A.

SITRANS LVS300 Vibrating rod point level switch, pipe extended design Level and material detection in solids. Extension options up to 4 m (13.12 ft).	Article No. 7ML5737-●●●●●-●●	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Power supply		
Relays DPDT 21 ... 230 V AC 22 ... 45 V DC	1	
PNP 20 ... 40 V DC	2	

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Selection and ordering data (continued)

SITRANS LVS300 Vibrating rod point level switch, pipe extended design Level and material detection in solids. Extension options up to 4 m (13.12 ft).		Article No. 7ML5737- ● ● ● ● ● - ● ●	
Process temperature			
Without temperature isolator [up to T _{process} = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]		A	
With temperature isolator [up to T _{process} = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]		B	
Process connection			
Threaded			
Thread G 1½" (BSPP) EN ISO 228-1		A	
Thread G 1¼" (BSPP) EN ISO 228-1		B	
Thread G 1" (BSPP) EN ISO 228-1		C	
Thread NPT 1½" (Taper) ANSI B1.20.1		D	
Thread NPT 1¼" (Taper) ANSI B1.20.1		E	
Thread NPT 1" (Taper) ANSI B1.20.1		F	
Tri-clamp 2" (DN50) ISO 2852		G	
Flanged			
Flange DN 100 PN6, EN1092-1 ¹⁾		H	
Flange DN 100 PN16, EN1092-1		J	
2" ASME 150 lb B16.5		K	
3" ASME 150 lb B16.5		L	
4" ASME 150 lb B16.5		M	
Extension length			
Extension length Stainless steel threads 304 (1.4301), flanges 321 (1.4541)			
200 ... 500 mm (7.87 ... 19.69 inch)			1 2
501 ... 750 mm (19.72 ... 29.53 inch)			1 3
751 ... 1 000 mm (29.57 ... 39.37 inch)			1 4
1 001 ... 1 250 mm (39.41 ... 49.21 inch)			1 5
1 251 ... 1 500 mm (49.25 ... 59.06 inch)			1 6
1 501 ... 1 750 mm (59.09 ... 68.90 inch)			1 7
1 751 ... 2 000 mm (68.94 ... 78.74 inch)			1 8
2 001 ... 2 250 mm (78.78 ... 88.58 inch)			2 1
2 251 ... 2 500 mm (88.62 ... 98.43 inch)			2 2
2 501 ... 2 750 mm (98.46 ... 108.27 inch)			2 3
2 751 ... 3 000 mm (108.31 ... 118.11 inch)			2 4
3 001 ... 3 250 mm (118.15 ... 127.95 inch)			2 5
3 251 ... 3 500 mm (127.99 ... 137.80 inch)			2 6
3 501 ... 3 750 mm (137.83 ... 147.64 inch)			2 7
3 751 ... 4 000 mm (147.68 ... 157.48 inch)			2 8
Extension length Stainless steel 316 L (1.4404)			
200 ... 500 mm (7.87 ... 19.69 inch)			4 2
501 ... 750 mm (19.72 ... 29.53 inch)			4 3
751 ... 1 000 mm (29.57 ... 39.37 inch)			4 4
1 001 ... 1 250 mm (39.41 ... 49.21 inch)			4 5
1 251 ... 1 500 mm (49.25 ... 59.06 inch)			4 6
1 501 ... 1 750 mm (59.09 ... 68.90 inch)			4 7
1 751 ... 2 000 mm (68.94 ... 78.74 inch)			4 8
2 001 ... 2 250 mm (78.78 ... 88.58 inch)			5 1
2 251 ... 2 500 mm (88.62 ... 98.43 inch)			5 2
2 501 ... 2 750 mm (98.46 ... 108.27 inch)			5 3
2 751 ... 3 000 mm (108.31 ... 118.11 inch)			5 4
3 001 ... 3 250 mm (118.15 ... 127.95 inch)			5 5
3 251 ... 3 500 mm (127.99 ... 137.80 inch)			5 6
3 501 ... 3 750 mm (137.83 ... 147.64 inch)			5 7
3 751 ... 4 000 mm (147.68 ... 157.48 inch)			5 8
Material process connection/extension			
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) ²⁾			1
Stainless steel 316 L (1.4404) ³⁾			2
Approvals			
CE			A
ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X			B
FM _{US} and FM _C General Purpose			C
FM _{US} and FM _C DIP Class II, III Div. 1, Groups E, F, G			D

Selection and ordering data (continued)

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)	Y01
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	Y14
Signal bulb inserted in M20 cable gland ⁴⁾	A20
Sliding sleeve, for application without overpressure max. 150 °C (302 °F), min. length 501 mm (19.72 inch) ⁵⁾⁶⁾⁷⁾	P12
Sliding sleeve, for application with overpressure, max. 16 bar (232 psi), max. 150 °C (302 °F), min. length 501 mm (19.72 inch) ⁶⁾	P13
Factory test certificate - M to DIN 55350, Part 18	C11
Operating Instructions	
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Spare parts	
Replacement Electronics Modules are available. Contact factory for pricing.	

¹⁾ Max. 6 bar (87 psi).

²⁾ Available with extension length 12.

³⁾ Available with extension length 42.

⁴⁾ Available only with Approval option A.

⁵⁾ Available only with Approval options A and C.

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

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

SITRANS LVS300 Vibrating rod point level switch, customer supplied tube	Article No.								
Level and material detection in solids. Requires flexible, customer supplied, pipe extensions with insertion to 4 m (13.12 ft).	7ML5738-	●	●	●	●	●	-	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.									
Power supply									
Relays DPDT 21 ... 230 V AC 22 ... 45 V DC	1								
PNP 20 ... 40 V DC	2								
Process temperature									
Without temperature isolator [up to T _{process} = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]	A								
Process connection									
Threaded									
Thread G 1½" (BSPP) EN ISO 228-1								A	
Thread NPT 1½" (Taper) ANSI B1.20.1								D	
Tri-clamp 2" (DN50) ISO 2852								G	
Flanged									
Flange DN 100 PN6, EN1092-1 ¹⁾								H	
Flange DN 100 PN16, EN1092-1								J	
2" ASME 150 lb B16.5								K	
3" ASME 150 lb B16.5								L	
4" ASME 150 lb B16.5								M	
Extension length									
1 500 mm (59 inch), adjustable cable length						1	1		
4 000 mm (157 inch), adjustable cable length						1	2		
Material process connection/extension									
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301)								1	
Stainless steel 316 L (1.4404)								2	
Approvals									
CE									A
ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X									B
FM _{US} and FM _C General Purpose									C
FM _{US} and FM _C DIP Class II, III Div.1, Groups E, F, G									D

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Selection and Ordering data	Order code
Further designs	
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	Y14
Signal bulb inserted in M20 cable gland ²⁾	A20
Factory test certificate - M to DIN 55350, Part 18	C11
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare parts	
Replacement Electronics Modules are available. Contact factory for pricing.	

¹⁾ Max. 6 bar (87 psi).

²⁾ Available only with Approval option A.

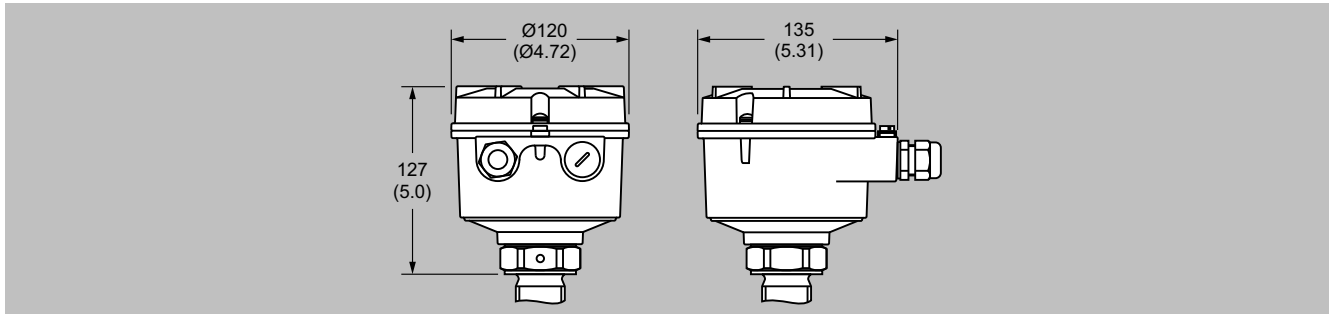
Technical specifications

SITRANS LVS300	
Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High, low, and demand
Measuring frequency	
• Standard	330 Hz
Output	
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected (reverse protection)
Relay	DPDT relay
Signal delay	<ul style="list-style-type: none"> Probe uncovered to covered: approximately 1 second Probe covered to uncovered: approximately 1 ... 2 seconds
Relay fail-safe	High or low, switch selectable
Alarm output	<ul style="list-style-type: none"> Relay 8 A at 250 V AC, non-inductive Relay 5 A at 30 V DC, non-inductive
Sensitivity	Four sensitivity settings, switch selectable
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	II
• Pollution degree	2
Medium conditions	
• Process temperature	-40 ... +150 °C (-40 ... +302 °F)
• Pressure (vessel)	Max. 16 bar g (232 psi g) European Pressure Directive 2014/68/EU: Category 1
• Minimum material density	Approx. 20 g/l (1.2 lb/ft ³)
Design	
Material	
• Enclosure	Aluminum powder coat

Technical specifications (continued)

SITRANS LVS300	
Process connection	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
Power supply	<ul style="list-style-type: none"> 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
Certificates and approvals	CE, ATEX, FM

Dimensional drawings



SITRANS LVS300 enclosure, dimensions in mm (inch)

Compact version

Pipe extension

Pipe extension - customer mounted

①	Approval	Process connection	Thread on extension pipe
	CE, ATEX	G 1½"	R 1"
	FM	NPT 1½"	NPT 1"
②	Approval	Thread on extension pipe	
	CE, ATEX	R 1"	
	FM	NPT 1"	
③	Approval	Process connection	Thread on extension pipe
	CE, ATEX	Flange DN	R 1"
		Flange ANSI	NPT 1"
	FM	Flange DN	NPT 1"
Flange ANSI		NPT 1"	

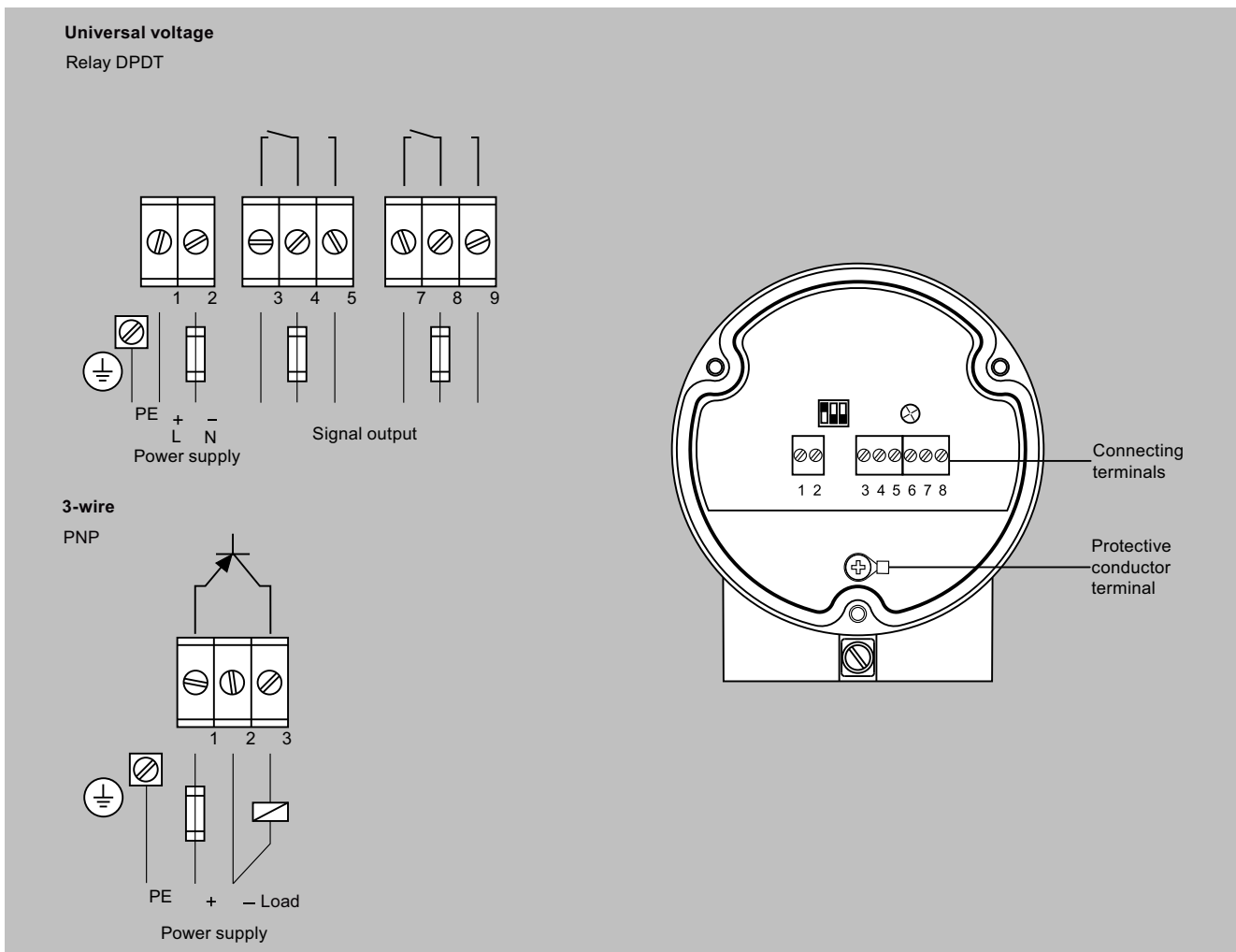
SITRANS LVS300, dimensions in mm (inch)

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Circuit diagrams



SITRANS LVS300 connections