

Level Measurement

Point level measurement

Vibrating switches

SITRANS LVS200

Overview



SITRANS LVS200 is a vibrating point level switch for high, low, or demand level detection of bulk solids.

Benefits

- High resistance to mechanical forces
- Strong vibration resistance to high bulk material loads
- Rotatable enclosure for convenient wiring
- Suitable for low density material: standard version, 20 g/l (1.3 lb/ft³); liquid/solid interface version, 50 g/l (3 lb/ft³) and low density option min. 5 g/l (0.3 lb/ft³)
- Customer desired extensions up to 20 000 mm (787 inch)
- Optional detection of solids within liquid
- Durable short fork option with 165 mm (6.5 inch) insertion length

Application

The standard LVS200 detects high, low, or demand levels of dry bulk solids in bins, silos, or hoppers. The liquid/solid interface version can also detect settled solids within liquids or solids within confined spaces such as feed pipes. It is designed to ignore liquids in order to detect the interface between a solid and a liquid.

A pipe extension version is available with either the standard or liquid/solid interface electronics and fork, separated by a customer supplied 1 inch pipe.

SITRANS LVS200 has an optional 4 to 20 mA output for monitoring buildup on the fork to determine when preventative maintenance should be performed in sticky applications.

The LVS200 has a compact design and can be top, side or angle mounted. The vibrating fork design ensures the tines are kept clean. The unique design of the fork and crystal assembly eliminates false high level readings even if tines become damaged.

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

- Key Applications: dry bulk solids in bins, silos, hoppers or settled solids within liquids (interface version)

Technical specifications

Mode of operation		Rated operating conditions	
Measuring principle	Vibrating point level switch	Installation conditions	Indoor/outdoor
Input		• Location	
Measured variable	High, low, and demand	Ambient conditions	
Measuring frequency		• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• Standard	125 Hz	• Installation category	III
• Liquid/solid interface and short fork version	350 Hz	• Pollution degree	2
Output		Medium conditions	
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected Turn-on voltage: max. 50 V (reverse protection)	• Process temperature	• All except CSA Class II, Group G: -40 ... +150 °C (-40 ... +302 °F) • CSA Class II, Group G: -40 ... +140 °C (-40 ... +284 °F), CSA temperature code T3B
2-wire without contact	Load current: • Min. 10 mA • Max. 500 mA permanent • Max. 2A < 200 ms • Max. 5A < 50 ms Voltage drop on the electronic module: max. 7 V with closed electric circuit Cut-off current with open electric circuit: max. 5 mA	• Max. threaded bushing temperature • Max. enclosure surface temperature (Category 2D) • Max. extension surface temperature (Category 1D) • Pressure (vessel)	80 °C (176 °F) 90 °C (194 °F) 150 °C (302 °F) Max. 10 bar g (145 psi g) European Pressure Directive 2014/68/EU: Category 1
Relays	SPDT relay DPDT relay	• Minimum material density	• Standard version: approx. 20 g/l (1.2 lb/ft³) • Liquid/solid interface version: approx. 50 g/l (3 lb/ft³) • Optional low density version: approx. 5 g/l (0.3 lb/ft³)
• Version with 1 relay		Design	
• Version with 2 relays		Material	
Relay delay	• From loss of vibration: approximately 1 second • From resumption of vibration: approximately 1 ... 2 seconds	• Enclosure	Epoxy coated aluminum
Signal delay	• Probe uncovered to covered: approximately 1 second • Probe covered to uncovered: approximately 1 ... 2 seconds	Process connection	• Thread 1½" NPT [(Taper), ANSI/ASME B1.20.1], R ½" [(BSPT), EN 10226], and flange options • Optional sliding bushing with 2" NPT [(Taper), ANSI/ASME B1.20.1] or BSP thread • Thread material: stainless steel 303 (1.4301)
Relay fail-safe	High or low, switch selectable	Tine material	Stainless steel 316L (1.4404), PTFE-coated tines are available upon special request
Alarm output	• Relay 8 A at 250 V AC, non-inductive • Relay 5 A at 30 V DC, non-inductive	Degree of protection	IP65/Type 4/NEMA 4
mA output	8/16 mA or 4 ... 20 mA	Conduit entry	2 x M20 x 1.5 or 2 x ½" NPT
• Resolution	4 ... 20 mA ± 0.1 mA	Weight	• Standard version, no extensions: approx. 2.0 kg (4.4 lb) • Solids/liquids version, no extensions: approx. 1.9 kg (4.2 lb)
Sensitivity	High or low, switch selectable	Power supply	• 19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA • 19 ... 55 V DC, +10 %, 1.5 W
		Certificates and approvals	• CSA/FM General Purpose • CE • CSA/FM Dust Ignition Proof • RCM • ATEX II 1/2 D • CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class I, Aex ia IIC, CSA Class I, Ex ia IIC, available only with power supply options 5 and 6 • ATEX II 1G and 1/2 G Eex ia IIC; ATEX II 1D and 1/2 D, available only with power supply option 5

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Selection and Ordering data

Article No.

SITRANS LVS200, standard

SITRANS LVS200 is a vibrating point level switch for high, low, or demand level detection of bulk solids.

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Power supply

19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)¹⁾

19 ... 230 V AC, 19 ... 55 V DC, two relay outputs (DPDT)¹⁾

18 ... 50 V DC PNP¹⁾

19 ... 230 V AC/DC without contact, 2-wire loop powered¹⁾

7 ... 9 V DC (requires NAMUR switch amplifier)

NAMUR IEC 60947-5-6, 2-wire²⁾

8/16 mA or 4 ... 20 mA; 12.5 ... 35 V DC, 2-wire³⁾

19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT) basic version⁴⁾

Process temperature

Without temperature isolator

With temperature isolator

Separated enclosure - cable length 1.5 m (4.92 ft)

[max. temperature process 150 °C (302 °F)/
max. temperature electronics 60 °C (140 °F)]

Separated enclosure - cable length 4.0 m (13.12 ft)

[max. temperature process 150 °C (302 °F)/
max. temperature electronics 60 °C (140 °F)]

Process connection

Threaded

R 1½" [(BSPT), EN 10226]

1½" NPT [(Taper), ANSI/ASME B1.20.1]

G 2" [(BSPP), EN ISO 228-1], sliding sleeve
[min. length 500 mm (19.69 inch)]⁶⁾

2" NPT [(Taper), ANSI/ASME B1.20.1],
sliding sleeve [min. length 500 mm (19.69 inch)]⁶⁾

Flanged

DN 100 PN 6, EN 1092-1⁷⁾

DN 100 PN 16, EN 1092-1

2" ASME 150 lb B16.5

3" ASME 150 lb B16.5

4" ASME 150 lb B16.5

2" Tri-clamp (DN 50) ISO 2852

Extension length

Stainless steel 304 (1.4301)

Standard length, 235 mm (9.25 inch)

Add Order code Y01 and plain text:

"Insertion length ... mm"

- 300 ... 500 mm (11.81 ... 19.69 inch) 12
- 501 ... 750 mm (19.72 ... 29.53 inch) 13
- 751 ... 1 000 mm (29.57 ... 39.37 inch) 14
- 1 001 ... 1 250 mm (39.41 ... 49.21 inch) 15
- 1 251 ... 1 500 mm (49.25 ... 59.06 inch) 16
- 1 501 ... 1 750 mm (59.09 ... 68.90 inch) 17
- 1 751 ... 2 000 mm (68.94 ... 78.74 inch) 18
- 2 001 ... 2 250 mm (78.78 ... 88.58 inch) 21
- 2 251 ... 2 500 mm (88.62 ... 98.43 inch) 22
- 2 501 ... 2 750 mm (98.46 ... 108.27 inch) 23
- 2 751 ... 3 000 mm (108.31 ... 118.11 inch) 24
- 3 001 ... 3 250 mm (118.15 ... 127.95 inch) 25
- 3 251 ... 3 500 mm (127.99 ... 137.80 inch) 26
- 3 501 ... 3 750 mm (137.83 ... 147.64 inch) 27
- 3 751 ... 4 000 mm (147.68 ... 157.48 inch) 28

Selection and Ordering data

Article No.

SITRANS LVS200, standard

SITRANS LVS200 is a vibrating point level switch for high, low, or demand level detection of bulk solids.

Stainless steel 316L (1.4404)

Standard length, 235 mm (9.25 inch)

Add Order code Y01 and plain text:

"Insertion length ... mm"

- 300 ... 500 mm (11.81 ... 19.69 inch) 31
- 501 ... 750 mm (19.72 ... 29.53 inch) 32
- 751 ... 1 000 mm (29.57 ... 39.37 inch) 33
- 1 001 ... 1 250 mm (39.41 ... 49.21 inch) 34
- 1 251 ... 1 500 mm (49.25 ... 59.06 inch) 35
- 1 501 ... 1 750 mm (59.09 ... 68.90 inch) 36
- 1 751 ... 2 000 mm (68.94 ... 78.74 inch) 37
- 2 001 ... 2 250 mm (78.78 ... 88.58 inch) 38
- 2 251 ... 2 500 mm (88.62 ... 98.43 inch) 41
- 2 501 ... 2 750 mm (98.46 ... 108.27 inch) 42
- 2 751 ... 3 000 mm (108.31 ... 118.11 inch) 43
- 3 001 ... 3 250 mm (118.15 ... 127.95 inch) 44
- 3 251 ... 3 500 mm (127.99 ... 137.80 inch) 45
- 3 501 ... 3 750 mm (137.83 ... 147.64 inch) 46
- 3 751 ... 4 000 mm (147.68 ... 157.48 inch) 47

Material process connection/extension

Stainless steel threads 304 (1.4301),

flanges 321 (1.4541), Tri-clamp 304 (1.4301)⁸⁾

Stainless steel 316L (1.4404)⁹⁾

Approvals

CSA/FM Dust Ignition Proof, RCM

ATEX II 1/2 D, RCM

CSA/FM General Purpose, RCM, CE

CE, RCM

CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D,

E, F, G, FM Class I, Aex ia IIC, CSA Class I,

Ex ia IIC, RCM

ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and

1/2D, RCM

IEC-Ex t IIIC Da/Db

EAC Ex ta/tb IIIC Da/Db, Ex ta IIIC Da

EAC Ex Ga/Gb Ex ia IIC, 0Ex ia IIC Ga; Ex ta/tb

IIIC Da/Db, Ex ta IIIC Da

¹⁾ Available with Approval options A ... D, G only.

²⁾ Available with Approval options D, E, F only.

³⁾ Available with Approval options B, D, G only.

⁴⁾ Available with configurations 7ML5731-7AA11-1BA0 or 7ML5731-7AB11-1AA0 only.

⁵⁾ Basic version is cost effective and offers fast delivery.

⁶⁾ Not available with extension length options 11, 12, 31, 32.

⁷⁾ Max. 6 bar (87 psi).

⁸⁾ Available with option extension length 11 ... 28.

⁹⁾ Available with option extension length 31 ... 48.