Technical Specification

LSV

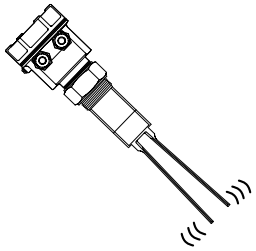
Vibrating Fork Point Level Switch for Solids & Powders

Trumen®
sensing matters

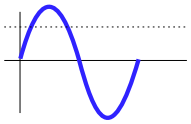
Product Overview

Trumen vibrating fork point level switch model LSV is suitable for solid and powder even with low bulk density material and use in all process industries like cement, pvc, food grains, coal, steel and many more. Trumen model LSV is available in 3 different fork length(s) depending upon the material bulk density i.e. D1 (150mmm), D2 (125mm) and D3 (100mm). All these three different length of tuning fork have different operating frequencies depending upon their length.

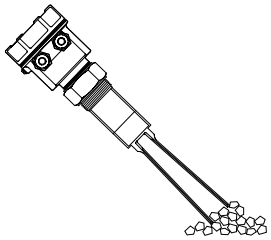
Operating Principle



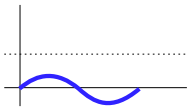
Electronics of LSV excites the piezo-electric- crystals inside the tuning fork, which makes the fork tines vibrate at their natural resonance frequency in free air.



Amplitudes of vibration are above threshold when the tines are free to vibrate.



When material touches the fork tines, vibration stops as resonance gets disturbed.

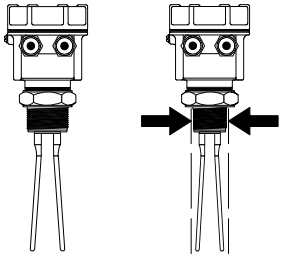


Amplitudes of vibration, as sensed by the electronics falls below the threshold-strength, and material presence is thus detected.

Applications

- Vibrating fork level switch is used in different applications like
  - Free flowing powders
  - Fly ash
  - Cement
  - PVC powder
  - Wheat grains
  - Coal
  - Rice husk
  - Food grains
  - Pulses
  - Polyester chips
- Material having granuels size less than 10mm.

Compact Process Connection



starting from:-
1" & M30

Features

- Compact size
- Fast switching response 2 sec (0.8 sec and 1.5 sec available on demand)
- Low power consumption (0.5 to 0.7VA)
- Calibration-less operation
- Durable construction
- Immune to External Vibrations
- Tropicalized & potted electronics module
- Suitable for side as well as top mounting
- Minimum and maximum failsafe field selectable
- Ingress protection: IP 67/68 (as per IS/IEC 60529:2001)
- Process temperature max 250°C
- Process pressure max. 20 bar
- 1" threaded mountings available
- Threaded / flanged / customized process connections
- Remote electronics with standard 10 meters cable length

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Performance Specifications

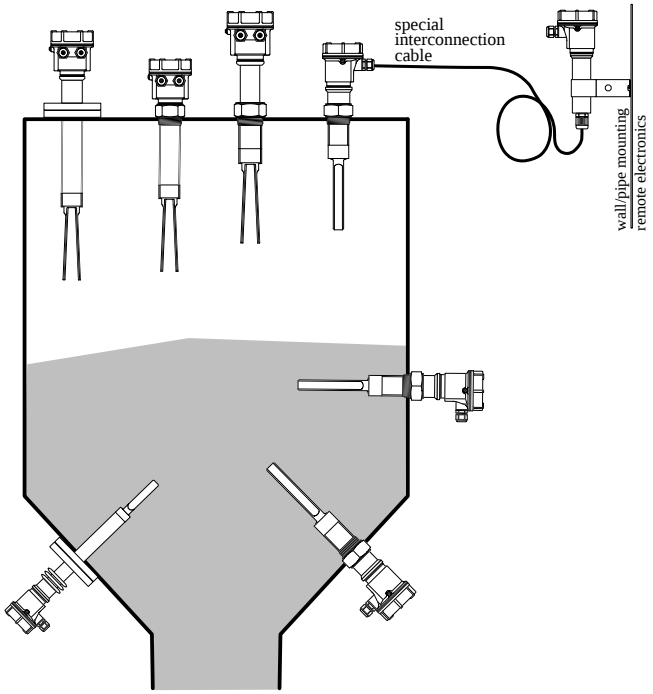
Parameter	Description
General	
Min. Density	50 gram/litre for D1 (Length 150mm), 200 gram/litre for D2 (Length 125mm), 300 gram/litre for D3 (Length 100mm)
Maximum measured error	Max. ±1 mm (at reference operating conditions)
Repeatability	0.1 mm
Switching response	2 sec
Hysteresis	Approx. 2 mm
Influence of medium temperature	Max +2 to -3 mm (-20 to +150 °C)
Influence of medium density	Max +5 to -4 mm (1.0 to 2.5 g/cm^3)
Influence of medium pressure	Max 0 to -3 mm (-1 to 20 bar)
Sensor Cable	Remote electronics require special cable from fork to controller, 10 meter standard length (Longer length max. upto 15m)
Process	
Ambient Temperature	-20°C ... 70°C (-4°F ... 158 °F)
Process Temperature	-20°C ... 80°C (-4°F ... 176 °F)
Extended Process Temperature	-30°C ... 250°C (-22°F ... 482 °F) (extensions & heat sinks required)
Process Pressure	Absolute / max. 20 bar
Physical Specifications	
Wetted Parts	SS 316 or SS 316L
Process Connections	NPT / BSP 1", 1/2", 1-1⁄4", 1-1⁄2", 2", Triclover 1", 1-1/2", 2" and Flanged ANSI / JIS / DIN / ASA / custom
Extensions Tube & Material	SS 304, SS 316, SS 316L
Insertion Length	125mm to 3,000mm

Approvals & Certifications

ISO Certification	ISO 9001:2015
CE certification	All product comply as per directives 2014/35/EU Low Voltage Directive & 2014/30/EU Electromagnetic Compatibility Directive
RoHS Certification	RoHS Compliance as per RoHS Directive (2011/65/EU); Certificate No. RoHS-TTPL-2021-0305
Ingress Protection	IP67/68 as per IS/IEC 60529:2001
Ex-proof (Ex d T6 IIC)	Flameproof as per IS/IEC 60079-1:2014, Ingress Protection (IP-67) as per IS/IEC 60529:2001 Suitable for Gas Group: IIC, Suitable for Zone 1 & 2 atmospheres and Dust hazardous area Zone 21 & 22
Ex-ia Approval	Intrinsically safe according to the requirement of IS/IEC 60079-0:2011, IS/IEC 60079-11:2006 & IS/IEC 60529: 2001
EMC Certification	EMC Certified as per Standard IEC 61000-4-3, IEC 61000-4-2, IEC 61000-4-6, IEC 61000-4-29, IEC 61000-4-4, IEC 61000-4-5, CISPR 11
Vibration Test Certificate	Vibration complied as per IEC 60068 part 2-6 sinusoidal, 10-55Hz, 0.15mm

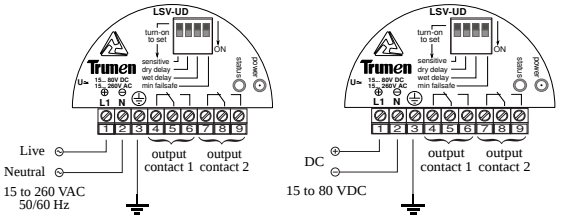
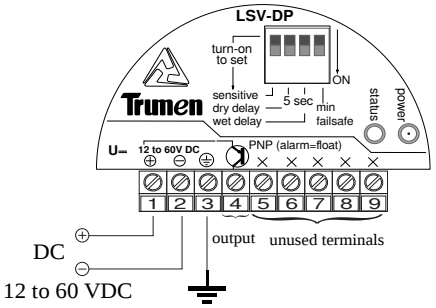
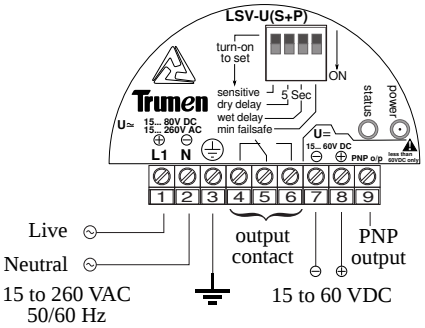
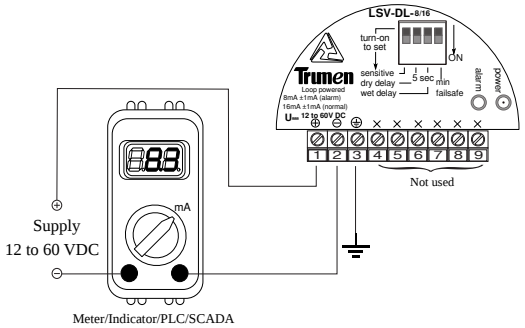
Specifications are subject to change without prior notice

Typical Installation



LSV: Vibrating Fork Level Switch for Solids & Powders

Performance Specifications

Parameter	Description	Electrical Connection
Electrical		
EIUD / ERUD	Integral / Remote Electronics	
Supply	Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz	
Output	1 DPDT potential free relay contact output	
Relay Rating	5 A each @ 24VDC or 220VAC	
EIDP / ERDP	Integral / Remote Electronics	
Supply	12 to 60 VDC	
Output	PNP output	
Output Limit	250mA max. Short Circuit Safe	
EIUSP / ERUSP	Integral / Remote Electronics	
Supply	Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz	
Output	Potential free SPDT relay contact O/P	
Relay Rating	5 A each @ 24VDC or 220VAC	
DC Supply	15 to 60 VDC for PNP O/P	
PNP Output	250mA max. Short Circuit Safe	
EIDL	Integral Electronics 4-20mA Loop Powered	
Supply	12 to 60 VDC	
Output	Two Wire DC 8 / 16mA & 4 / 20mA output	
Output Limit	8mA (±1mA max) / 16mA (±1mA max)	
EIFS / ERFS	Integral / Remote Electronics specially designed with special output	Electrical connection depends on selected model code.

LSV: Vibrating Fork Level Switch for Solids & Powders

Ordering Information

LSV Hxx – Tx – Sx – Gx – Px – Cx – Exxx – Dx – Lxxxx

Enclosure
HAN: Aluminum Non-Hazardous IP-67/68
HAX: Aluminum Flameproof IIa, IIb and IIc
HSN: Stainless steel
HPN: Polycarbonate (Plastic)
HES: Specially designed as per customer requirement

Material Temperature
T1: max 80°C
T2: max 200°C
T3: max 250°C
TS: Customer specified special designed

Sensing Surface Material
S6: SS 316
SL: SS 316L
ST: PTFE Coated
SF: PFA Coated
SS: Special Surface

Sensor Extension Material
G0: None
G4: SS 304
G6: SS 316
GL: SS 316L
GT: PTFE Coated
GF: PFA Coated
GS: Special Surface

Process Connection Type
PB1: 1" BSP
PB2: 1-1/2" BSP
PB4: 1-1/4" BSP
PB5: 2" BSP
PB6: 1/2" BSP
PN1: 1" NPT
PN2: 1-1/2" NPT
PN4: 1-1/4" NPT
PN5: 2" NPT
PN6: 1/2" NPT
PT1: 1", 1-1⁄2" Triclover/Triclamp
PT2: 2" Triclover/Triclamp
PFL: Flanged Type (Fxxx)
F001: 1/2" B16.5 ANSI/ASA 150#RF
F002: 3/4" B16.5 ANSI/ASA 150#RF
F003: 1" B16.5 ANSI/ASA 150#RF
F004: 1-1/4" B16.5 ANSI/ASA 150#RF
F005: 1-1/2 " B16.5 ANSI/ASA 150#RF
F006: 2" B16.5 ANSI/ASA 150#RF
F007: 2-1/2" B16.5 ANSI/ASA 150#RF
F008: 3" B16.5 ANSI/ASA 150#RF
F009: 4" B16.5 ANSI/ASA 150#RF
F010: 5" B16.5 ANSI/ASA 150#RF
F011: 6" B16.5 ANSI/ASA 150#RF
PCS: Special Process Connection

Insertion Length
125mm to 3000mm

Fork Length
D1:150mm (Min. Density 50g/L)
D2:125mm (Min. Density 200g/L)
D3:100mm (Min. Density 300g/L)

Electronics (Refer page 3 for detail description)
EIUD: 1 DPDT relay O/P
EIDP: PNP O/P
EIUSP: 1 SPDT relay+PNP O/P
EIDL: 8/16mA & 4-20mA O/P
EIFS: Special O/P
ERUD: Remote Electronics with 1 DPDT relay O/P
ERDP: Remote Electronics with PNP O/P
ERUSP: Remote Electronics with 1 SPDT relay+PNP O/P
ERFS: Remote Electronics with special O/P

Process Connection Material
C4: SS 304
C6: SS 316
CL: SS 316L
CT: PTFE Coated
CF: PFA Coated
CS: Special Surface

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