



## LSVR

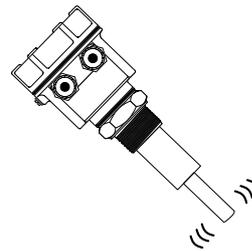
### Vibrating Rod Point Level Switch for Solids & Powders



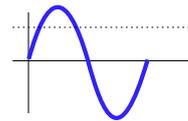
#### Product Overview

Trumen vibrating rod point level switch model LSVR is suitable for solid and powder & use in all process industries like cement, pvc, food grains, coal and steel. Trumen vibrating rod is a single element tuned mechanical level sensing device.

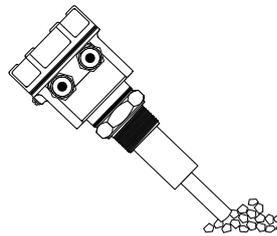
#### Operating Principle



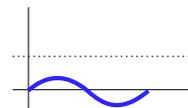
Electronics of LSVR excites the piezo-electric-crystals inside the tuning rod, which makes the rod vibrate at its natural resonance frequency in free air.



Amplitudes of vibration are above threshold when rod is free to vibrate.



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

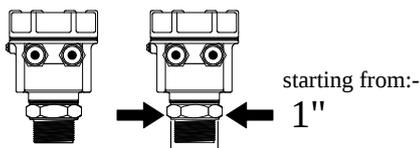


Amplitudes of vibration, as sensed by the electronics falls below the threshold, material presence is thus detected by observing the amplitude of vibration.

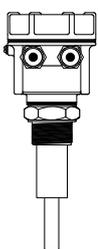
#### Applications

- Vibrating rod level switch is used in different applications like
  - Free flowing solids
  - Fly ash
  - Cement
  - Powder
  - Clinker
  - Salt
  - Calcium carbonate
  - Food grains
  - Steel
  - Coal
  - PVC
  - Sand
- Granuels size should not be more than 25mm.

#### Compact Process Connection



#### Immune to Material Properties



Works Independent of Material's ~

- ~ Dielectric Constant
- ~ Conductivity
- ~ Stickiness

#### 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
- Settable switching delay as a standard feature
- 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 as standard 10 meters cable length

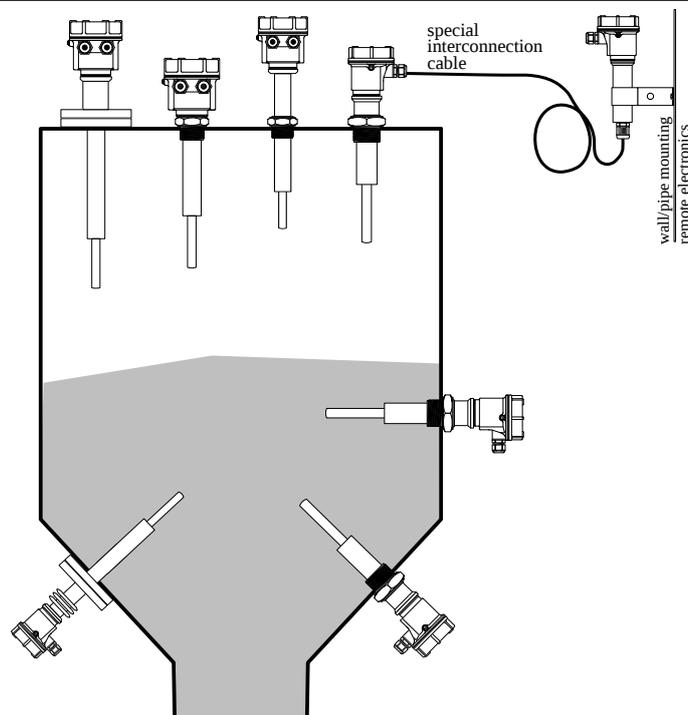
# LSVR: Vibrating Rod Level Switch for Solids & Powders

## Performance Specifications

Parameter	Description
<b>General</b>	
Min. Density	>=300 gram/litre, not fluidized
Maximum measured error	Max. ±1 mm (at reference operating conditions)
Repeatability	0.1 mm
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 <sup>3</sup> )
Influence of medium pressure	Max 0 to -3 mm (-1 to 20 bar)
Sensor Cable	Remote electronics require special cable from rod to controller, 10 meter standard length (Longer length max. upto 15m)
<b>Process</b>	
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
<b>Physical Specifications</b>	
Wetted Parts	SS 316 or SS 316L
Process Connections	NPT / BSP 1/2", 1", 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	250mm to 3,000mm
<b>Approvals &amp; Certifications</b>	
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

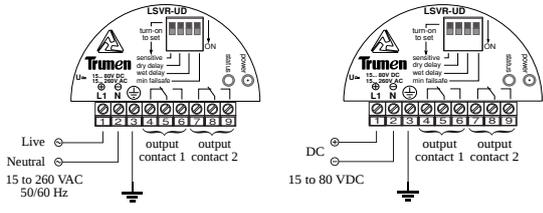
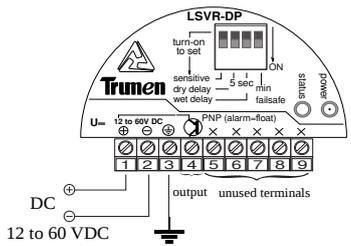
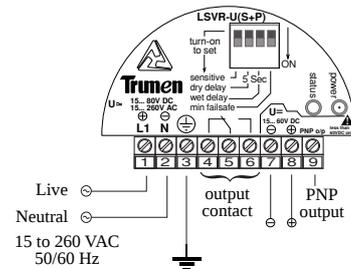
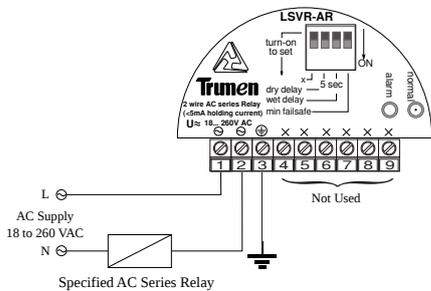
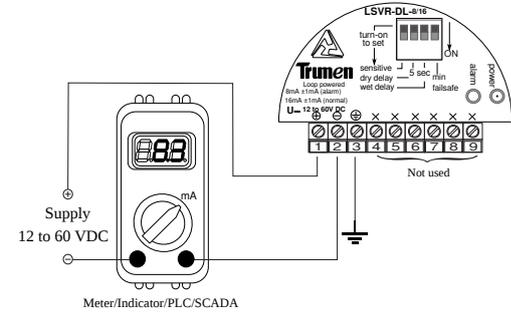
Specifications are subject to change without prior notice

## Typical Installation



# LSVR: Vibrating Rod Level Switch for Solids & Powders

## Performance Specifications

Parameter	Description	Electrical Connection
<b>Electrical</b>		
<b>EIUD / ERUD</b> Supply Output Relay Rating	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz 1 DPDT potential free relay contact output 5 A each @ 24VDC or 220VAC	
<b>EIDP / ERDP</b> Supply Output Output Limit	Integral / Remote Electronics 12 to 60 VDC PNP output 250mA max. Short Circuit Safe	
<b>EIUSP / ERUSP</b> Supply Output Relay Rating DC Supply PNP Output	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz Potential free SPDT relay contact output 5 A each @ 24VDC or 220VAC 15 to 60 VDC for PNP output 250mA max. Short Circuit Safe	
<b>EIAR</b> Supply Output Output Limit	Integral Electronics 18 to 260 VAC Two Wire AC series relay not less than 4mA to release external relay maximum 150mA to magnetize relay Use relays/contactors will more than 4mA holding current	
<b>EIDL</b> Supply Output Output Limit	Integral Electronics 4-20mA Loop Powered 15 to 60 VDC Two Wire DC 8 / 16mA & 4 / 20mA 8mA (±1mA max) / 16mA (±1mA max)	
<b>EIFS / ERFS</b>	Integral / Remote Electronics specially designed with special output	Electrical connection depends on selected model code.

## Ordering Information

LSVR **Hxx** - **Tx** - **Sx** - **Gx** - **Px** - **Cx** - **Exxx** - **Lxxxx**

### Enclosure

**HAN:** Aluminum Non-Hazardous IP-66/68  
**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

**S4:** SS 304  
**S6:** SS 316  
**SL:** SS 316L  
**SS:** Special Surface

### Sensor Extension Material

**G4:** SS 304  
**G6:** SS 316  
**GL:** SS 316L  
**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

250mm to 3000mm

### Electronics (Refer page 3 for detail description)

**EIUD:** 1 DPDT relay O/P  
**EIDP:** PNP O/P  
**EIUSP:** 1 SPDT relay+PNP O/P  
**EIAR:** Two Wire AC series relay 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  
**CS:** Special Surface