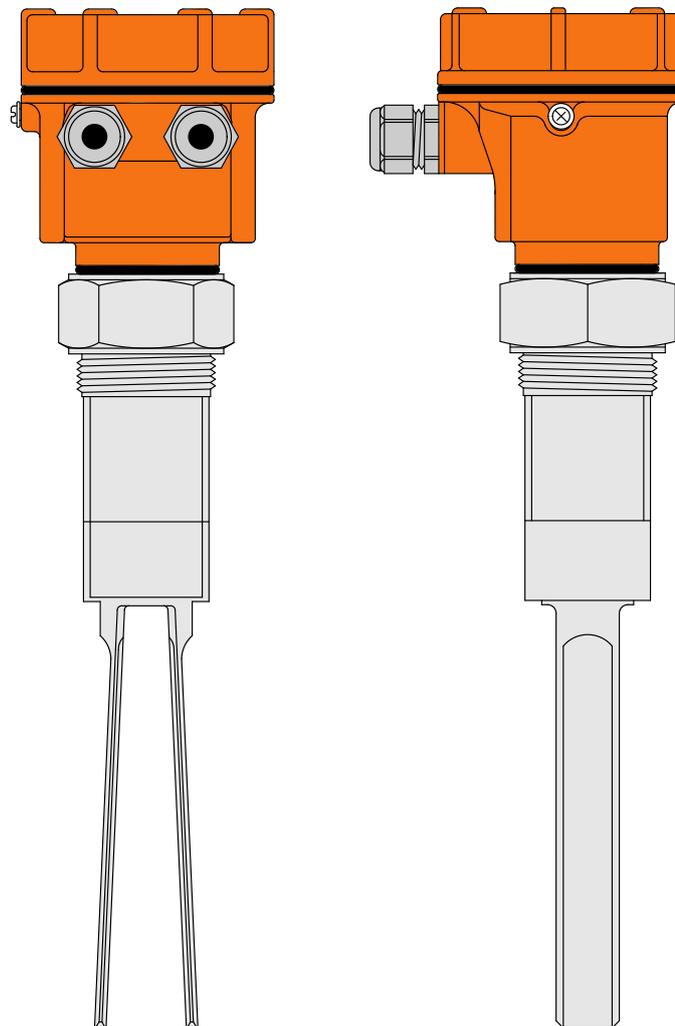


LSV:  
Vibrating Fork Level  
Limit Switch for Solids



# Instruction Manual



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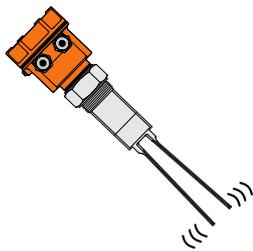
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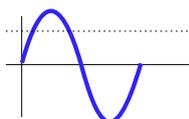
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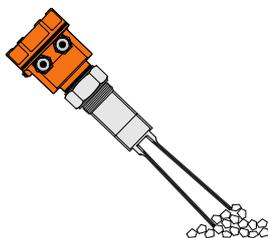
# Operating Principle



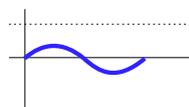
Electronics of LSV excites the piezo-electric-crystals inside the tuning fork, which makes the fork tines vibrate at their natural resonance frequency in free air.



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



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



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

# Technical Specification

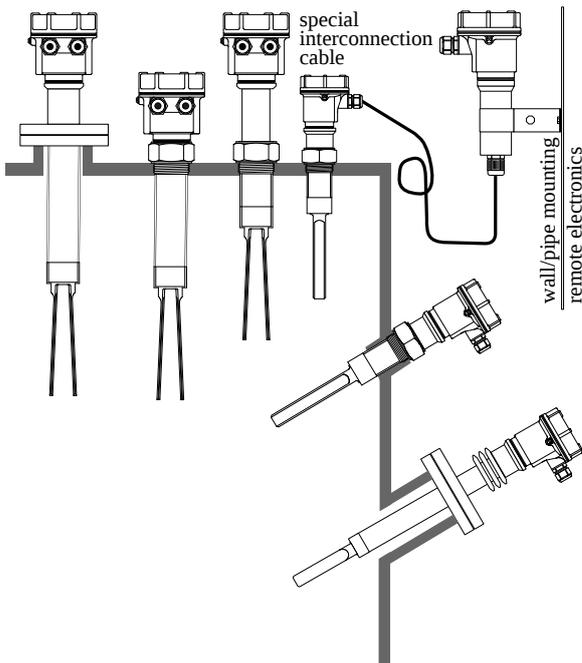
## Features

1. Fast Switching Response 2 sec  
(0.8 sec and 1.5 sec available on demand)
2. 1" screw mountings available
3. High pressure 15 bar forks
4. High Temperature up-to 250°C available
5. Calibration-less operation
6. Remote electronics with std 10 meters cable length
7. Tropicalized & potted electronics module
8. Threaded & Flanged Mountings
9. Electronic Inserts support all requirements
10. Ingress protection : IP 68/66 (as per IS-13947)
11. Ex-proof (Ex d T6 IP-66 IIC )
  - Flameproof as per IS/IEC 60079-1:2007
  - Weatherproof (IP-66) as per IS/IEC 60529:2001
  - Suitable for Gas Group : IIC
  - Suitable for Zone 1 & 2 atmospheres
12. Compact size
13. Low power consumption (0.5 to 0.7VA)

## Applications

1. Free flowing powders and granules (size max. 10mm)
2. Suitable for side as well as top mounting
3. Minimum and maximum failsafe field selectable
4. Process temperature max 250°C
5. Process pressure max. 15 bar

## Typical Mountings



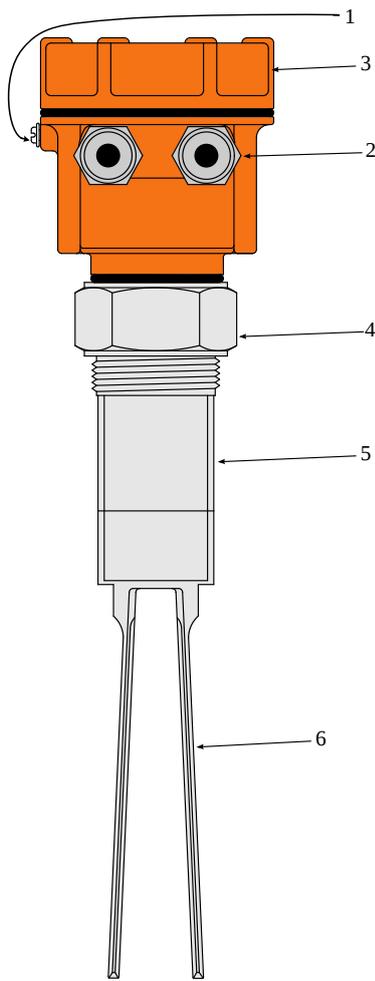
## Specifications

<b>EIUD / ERUD</b> Supply & Output	Integral / Remote Electronics Universal Power Supply, DPDT Relay Output 15 to 80 VDC and 15 to 260 VAC 50/60Hz
Relay Type and Rating	Potential Free DPDT Relay Output 5 A each @ 24VDC or 220VAC
<b>EIDP / ERDP</b> Supply & Output Output Limit	Integral / Remote Electronics for PNP Output 12 to 60 VDC, PNP 250mA max. Short Circuit Safe
<b>EIUSP / ERUSP</b> Supply & Output	Integral / Remote Electronics SPDT + PNP Output Universal Supply for SPDT Output 15 to 80 VDC 15 to 260 VAC 50/60Hz DC Supply for PNP Output 15 to 60 VDC
Relay Type and Rating	Potential Free DPDT Relay Output 5 A each @ 24VDC or 220VAC
PNP Output	250mA max. Short Circuit Safe
<b>EIAR</b> Supply & Output	Integral Electronics AC series relay Two Wire 18 to 260 VAC, Series Relay not less than 4mA to release external relay maximum 150mA to magnetize relay
Output Limit	Use relays/contactors will more than 4mA holding current
<b>EIDL</b> Supply & Output	Integral Electronics 4-20mA Loop Powered Two Wire DC 8 / 16 mA 12 to 60 VDC
Output Limit	8mA (±1mA max) / 16mA (±1mA max)
Sensor Cable	Remote electronics require special cable from fork to controller. 10 meter standard length more available on demand
Min. Density	15 gram/litre for D1 (Fork length 150mm) 75 gram/litre for D2 (Fork length 125mm) 500 gram/litre for D3 (Fork length 100mm)
Ambient Temp.	-20°C ... 70°C (-4°F ... 158 °F)
Process Temp.	-20°C ... 80°C (-4°F ... 176 °F)
Extended Process Temperature	-30°C ... 200°C (-22°F ... 392 °F) {250°C available on request} (extensions & heat sinks required)
Process Pressure	absolute / max. 15 bar
Wetted Parts	SS 316 or SS 316L
Mountings	NPT / BSP 1", 1¼", 1½", 2" etc Flanged : ANSI/JIS/DIN/ASA/custom
Extensions Tube Material & Length	SS 304, SS 316, SS 316L 125mm to 3,000mm

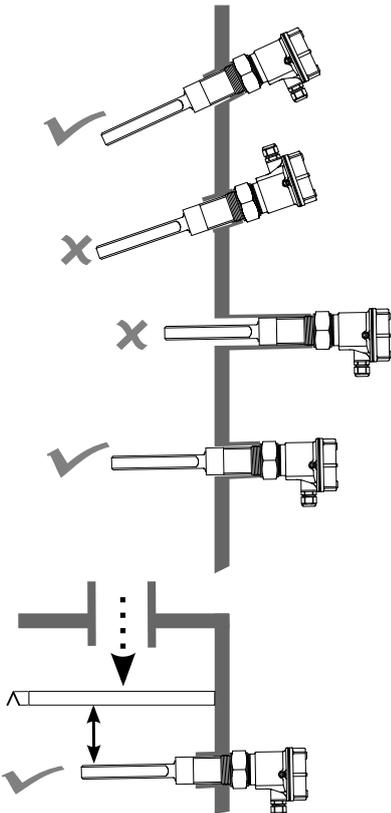
Specifications are subject to change without prior notice

# Do's and Don'ts

## Installation Precaution



1. Always connect the "Earth" to the external "Earthing" screw
2. Tighten the cable entries & glands properly
3. Secure the top aluminium cover at its place properly once the electrical connections and other settings are completed
4. Always tighten the process connection using proper wrench never try to tight by rotating the aluminium housing
5. Make sure process connection is same as that in hopper/tank
6. Vibrating fork tines:-
  - 6.1 Should never be bent closer
  - 6.2 Should never be bent apart
  - 6.3 Should never be cut or machined in any way
  - 6.4 Should never be extended by welding or machining

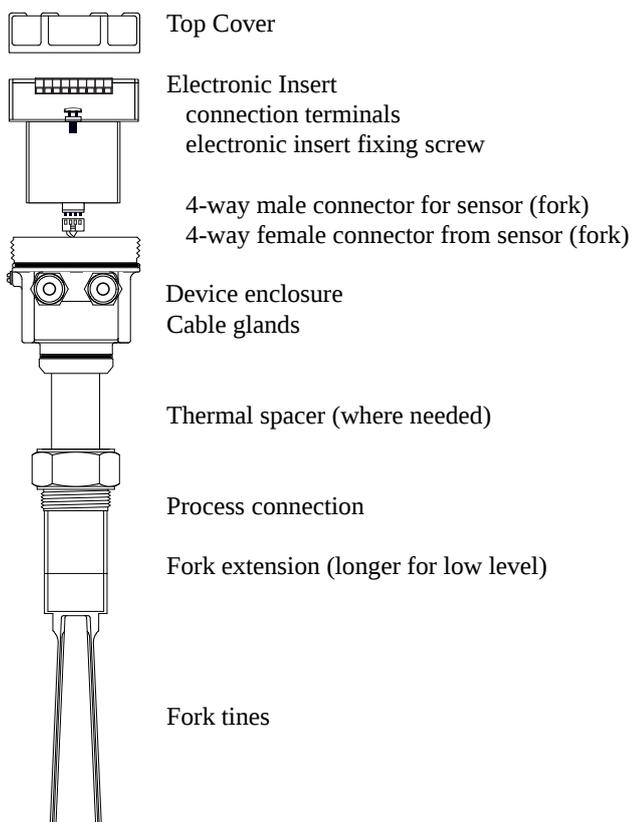


7. Cable entries must face downwards only
8. Nozzles should never be longer than the fork extension
9. If mounted directly under the material entry, always install a canopy of suitable strength at proper height from the fork
10. Never climb either by gripping or stepping over either the fork tines or its aluminium housing
11. Observe other safety precautions as required at the place of application

# Troubleshooting

Indication	Probable cause	Work-around	Solution
No switching output or sensor is permanently in alarm  Proper voltage is available but 'power' LED is still OFF	Power is not available  Power section of sensor electronic insert is failed	See if 'power' LED is ON  If power LED is OFF check voltage on terminal 1 and 2	Sensor electronic insert is needed to be replaced.
Fork is not vibrating when fork tines are touched by hand  Fork is vibrating but no switching output when fork tines are touched by hand	Sensor electronic insert fork oscillator failed  Sensor electronic insert evaluation section failure		
Abrupt switching	Material is agitated	Set time delay to 5 second in both dry and wet condition (turn switch 2, 3 ON)	Time delay solves switching issues in agitated materials.
Device shows no material after some time even when fork is inside the material	Material fluffy or fork rate-holes the material due to its own vibrations	Set device in sensitive mode (turn switch 1 ON)	Sensitive setting reduces vibrational strength and makes switching point at lower amplitude.
Fork settings are all OK but fork fails to switch to 'no material' at random times	Power supply carrying extra noise and fork amplifier picking the noise	Make necessary arrangements to filter the noise in power-line before being fed to the device  Provide an exclusive earthing to terminal# 3, fork enclosure earthing screw and fork process connection (device mounting screw or flange)	Device contains sufficient filtering of power supply noise inside, but sometimes external earth is needed to make filters sink the extra power supply noise back to earth.
Device worked for few months / years but now fails to switch with respect to material while power conditions are all same	Device senses fork frequency and amplitude to ascertain presence/absence of material. Possible reasons are  1. Fork frequency shift due to fork wear/erosion by service material  2. Material deposition on fork leads  3. Over temperature of service material causing fork drive damage	Select proper fork surface while ordering as per service material to mitigate fork erosion as well as deposition  Order device of proper thermal grade for proper service life of device  Clean up deposited materials on fork tines as a part of maintenance schedule	Care is needed to be taken while ordering.  Scheduled cleaning of fork tines in sticky material application is recommended.  In case of fork tine wear or temperature stress, fork sensor is needed to be replaced.

# Maintenance and Spares



Shown on the left are various parts of LSV level switch.

Separatable parts are

1. Electronic insert in short called 'electronics'
2. Fork + Enclosure + Cover + Glands collectively called 'mechanical'

For maintenance issues involving replacement of 'electronics', just a single fixing screw is needed to be released.

Lift the electronics slowly by holding electronics with one hand and mechanical with other, as wires are connected using rigid 4-way connectors to it.

Disconnect 4-way connector by holding electronics with one hand and female of connector by other hand, while the rest of the device is at rest.

Connect the new replaced sensor. 4-way connector is unidirectional and only connects in proper direction.

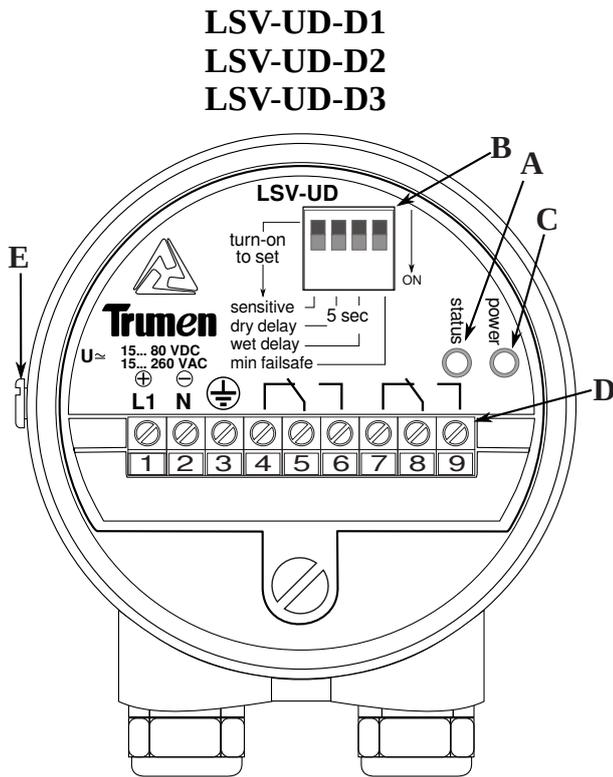
Set the electronics properly to its position.

Match the mounting screw hole of electronics with that of enclosure and fix the screw.

For mechanical issues please send the entire device back to Trumen.

# Annexure-1

## Introduction - LSV-UD-D1/D2/D3 (EIUD / ERUD)



### controls & indicators

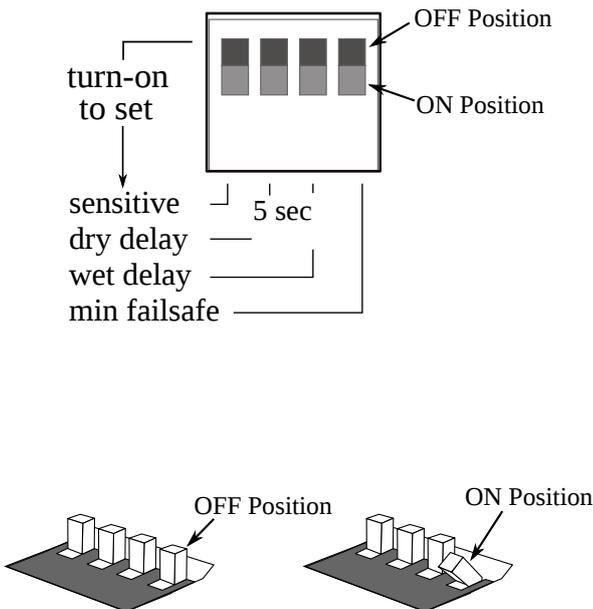
- A Alarm Indicating LED
- B Configuration Switches
- C Power ON LED Indicator
- D Connecting Terminals
- E External Earthing Terminal

### connection terminals

- 1 + of DC or Live of AC Supply input
  - 2 - of DC or Neutral of AC Supply input
- Supply:  
15 to 80VDC or 15 to 260VAC 50/60Hz
- 3 Earth terminal for safety
  - 4 Normally connected terminal of contact 1
  - 5 Common terminal of contact 1
  - 6 Normally open terminal of contact 1
  - 7 Normally connected terminal of contact 2
  - 8 Common terminal of contact 2
  - 9 Normally open terminal of contact 2

### configuration switches

#### LSV-UD-D1/D2/D3



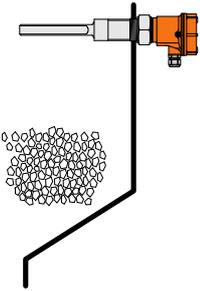
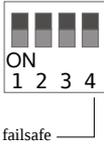
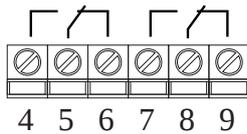
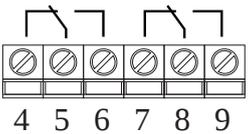
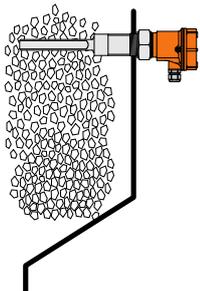
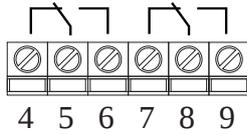
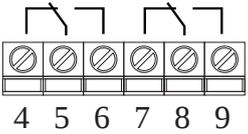
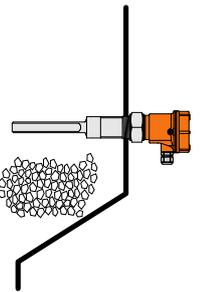
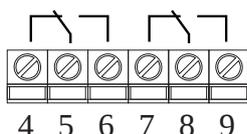
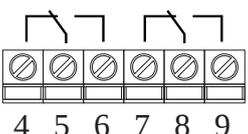
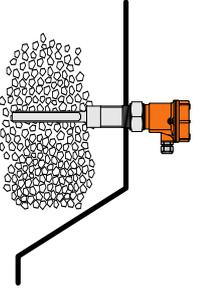
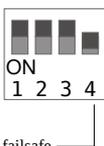
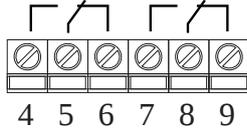
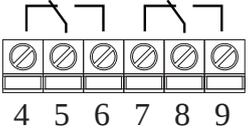
Example of Switch in On and Off Positions

- 1 sensitivity control  
sensitive setting for low density materials  
(turn-on for fluffy/low density powders etc)  
(keep turned-off for normal density materials)
- 2 “dry” (or uncovered) delay (5 second delay) setting  
(turn-on when 5 second more time is needed for  
fork out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay) setting  
(turn-on when 5 second more time is needed for  
fork dipped in the material confirmation)
- 4 minimum failsafe select  
Failsafe means alarm is same as power failure.  
Turn on for underflow detection (min. failsafe)  
Keep turned off for overflow detection  
(max. failsafe)

# Annexure-1

## Operation Matrix - LSV-UD-D1/D2/D3 (EIUD / ERUD)

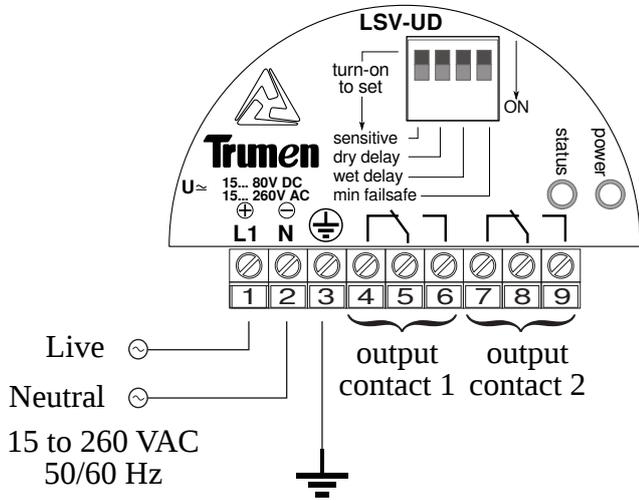
Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

Material & Installation	Material Status	Failsafe Setting	Status LED	DPDT Relay Contacts		
				Power ON	Power OFF	
High level / overflow detection		No material at high level.	 <p>Switch no. 4 is off, failsafe high/maximum</p>	 <b>Off</b> Indicating normal or healthy status.	 <p>Relay ON normal or healthy contacts.</p>	 <p>Relay OFF alarm contacts. (due to power failure)</p>
		Material is above the high level or fork is covered with material.	 <p>Switch no. 4 is off, failsafe high/maximum</p>	 <b>On</b> Indicating alarm status.	 <p>Relay OFF alarm contacts.</p>	 <p>Relay OFF alarm contacts. (as it is)</p>
Low level / underflow detection		No material at low level.	 <p>Switch no. 4 is on, failsafe low/minimum</p>	 <b>On</b> Indicating alarm status.	 <p>Relay OFF alarm contacts.</p>	 <p>Relay OFF alarm contacts. (as it is)</p>
		Material is above the low level or fork is covered with material.	 <p>Switch no. 4 is on, failsafe low/minimum</p>	 <b>Off</b> Indicating normal or healthy status.	 <p>Relay ON normal or healthy contacts.</p>	 <p>Relay OFF alarm contacts. (due to power failure)</p>

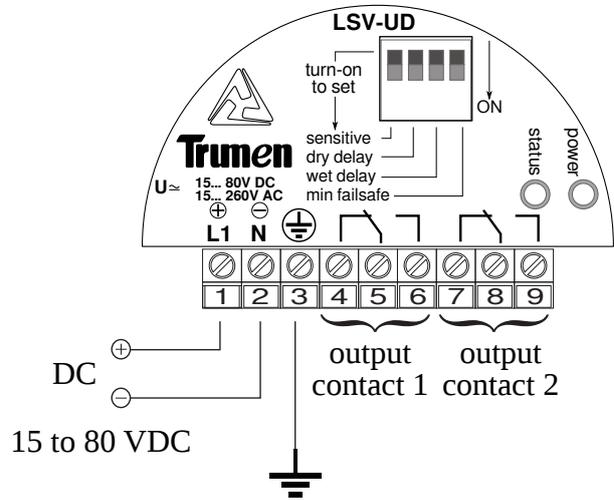
# Annexure-1

## Electrical Connections - LSV-UD-D1/D2/D3 (EIUD / ERUD)

### electrical connections (AC)



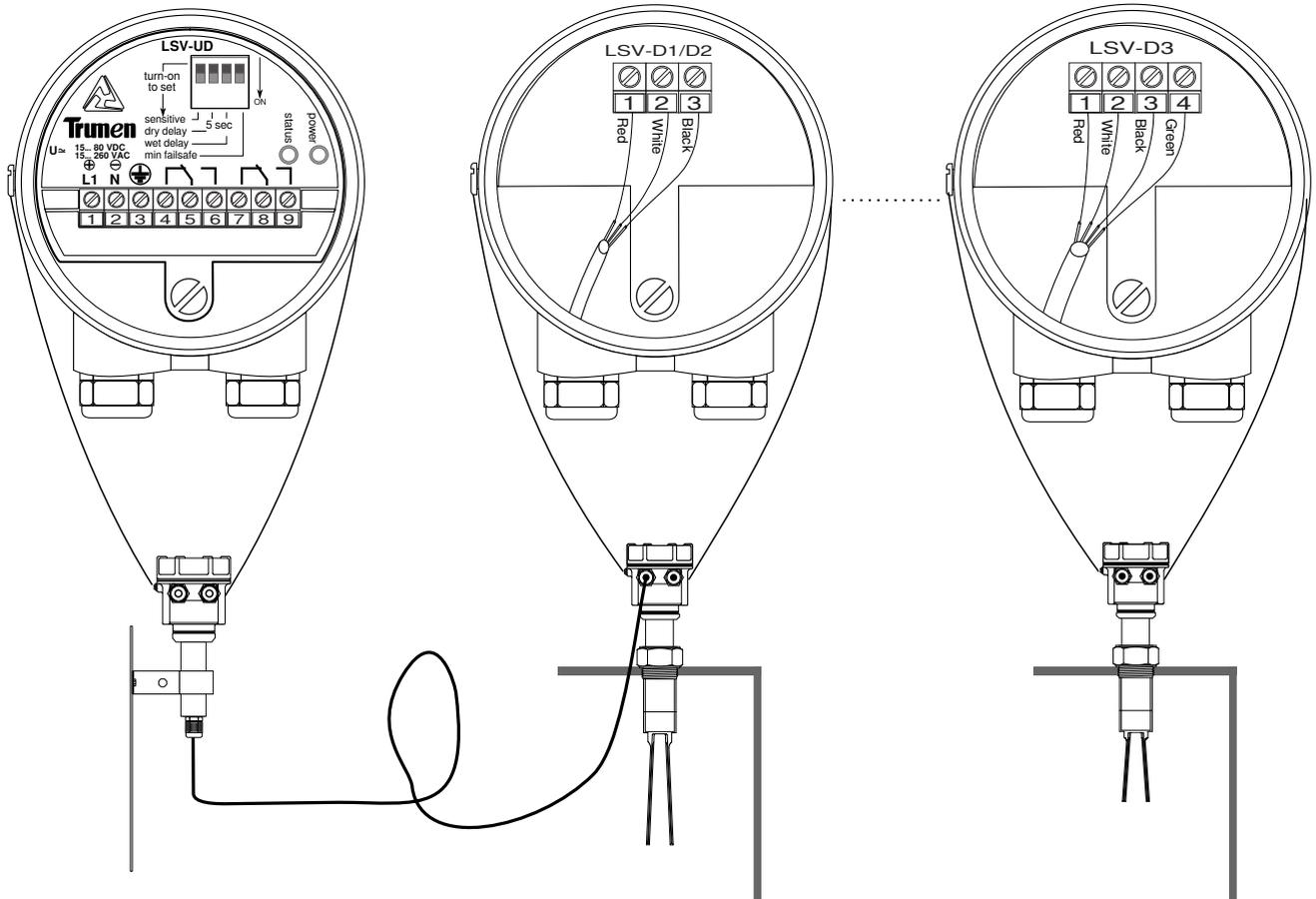
### electrical connections (DC)



### Remote probe connections for

#### LSV-UD-D1/D2 (ERUD)

#### LSV-UD-D3 (ERUD)

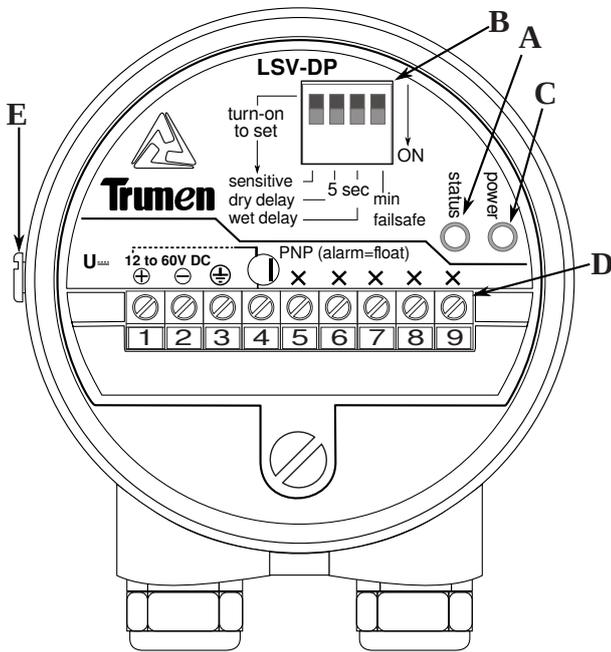


**Proper connection to supply earth terminal (3) and the external earth terminal (screw) is must.**

# Annexure-2

## Introduction - LSV-DP-D1/D2/D3 (EIDP / ERDP)

LSV-DP-D1  
LSV-DP-D2  
LSV-DP-D3



### controls & indicators

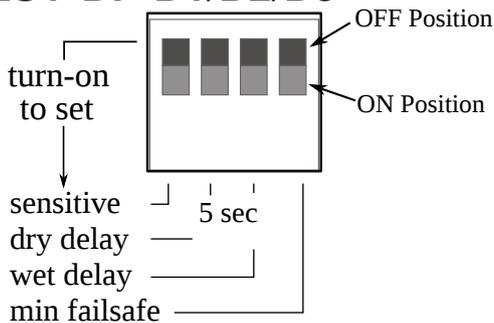
A	Alarm Indicating LED
B	Configuration Switches
C	Power ON LED Indicator
D	Connecting Terminals
E	External Earthing Terminal

### connection terminals

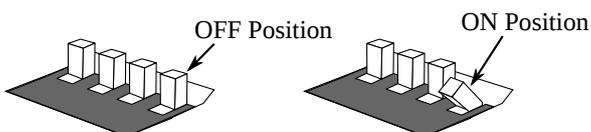
1	+ of DC Supply input
2	- of DC Supply input
Supply: 12 to 60VDC	
3	Earth terminal for safety
4	PNP output is supplied with voltage 12 to 60VDC

### configuration switches

#### LSV-DP-D1/D2/D3



- 1 sensitivity control  
sensitive setting for low density materials  
(turn-on for fluffy/ low density powders etc)  
(keep turned-off for normal density materials)
- 2 “dry” (or uncovered) delay (5 second delay) setting  
(turn-on when 5 second more time is needed for  
fork out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay) setting  
(turn-on when 5 second more time is needed for  
fork dipped in the material confirmation)
- 4 minimum failsafe select  
Failsafe means alarm is same as power failure.  
Turn on for underflow detection (min. failsafe)  
Keep turned off for overflow detection (max. failsafe)

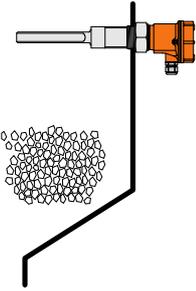
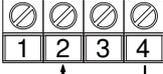
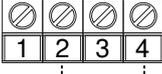
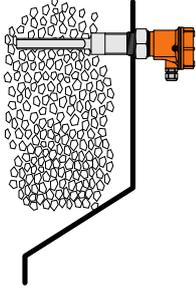
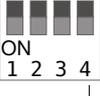
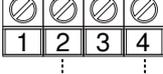
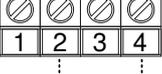
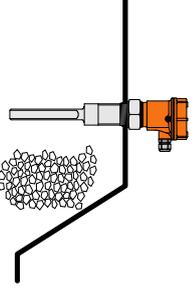
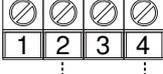
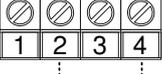
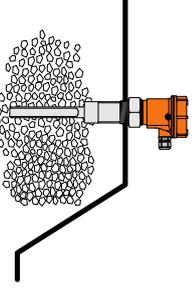
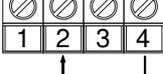
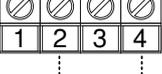


Example of Switch in On and Off Positions

## Annexure-2

### Operation Matrix - LSV-DP-D1/D2/D3 (EIDP / ERDP)

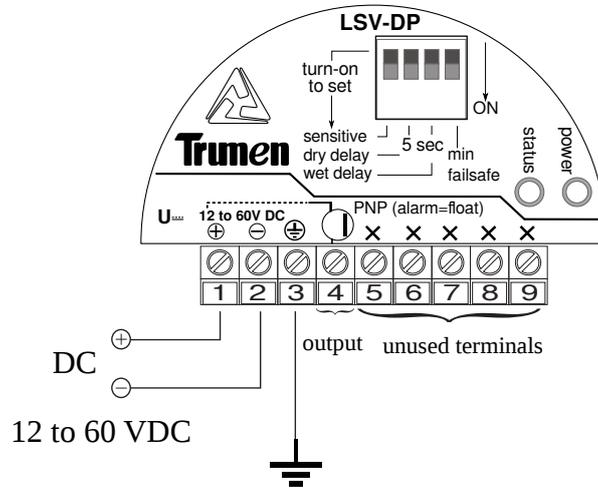
Vibrating fork is a single element tuned mechanical element type level sensing device. Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

Material & Installation		Material Status	Failsafe Setting	Status LED	PNP Output	
					Power ON	Power OFF
High level / overflow detection		No material at high level.	 <p>Switch no. 4 is off, failsafe high/maximum.</p>	 <b>Off</b> Indicating normal or healthy status.	 <p><math>I_{L(max)} = 250mA</math> Normal or healthy output.</p>	 <p><math>I_{leak} \leq 0.1mA</math> Alarm output. (due to power failure)</p>
		Material is above the high level or fork is covered with material.	 <p>Switch no. 4 is off, failsafe high/maximum.</p>	 <b>On</b> Indicating alarm status.	 <p><math>I_{leak} \leq 0.1mA</math> Alarm output.</p>	 <p><math>I_{leak} \leq 0.1mA</math> Alarm output. (as it is)</p>
Low level / underflow detection		No material at low level.	 <p>Switch no. 4 is on, failsafe low/minimum.</p>	 <b>On</b> Indicating alarm status.	 <p><math>I_{leak} \leq 0.1mA</math> Alarm output.</p>	 <p><math>I_{leak} \leq 0.1mA</math> Alarm output. (as it is)</p>
		Material is above the low level or fork is covered with material.	 <p>Switch no. 4 is on, failsafe low/minimum.</p>	 <b>Off</b> Indicating normal or healthy status.	 <p><math>I_{L(max)} = 250mA</math> Normal or healthy output.</p>	 <p><math>I_{leak} \leq 0.1mA</math> Alarm output. (due to power failure)</p>

# Annexure-2

## Electrical Connections - LSV-DP-D1/D2/D3 (EIDP / ERDP)

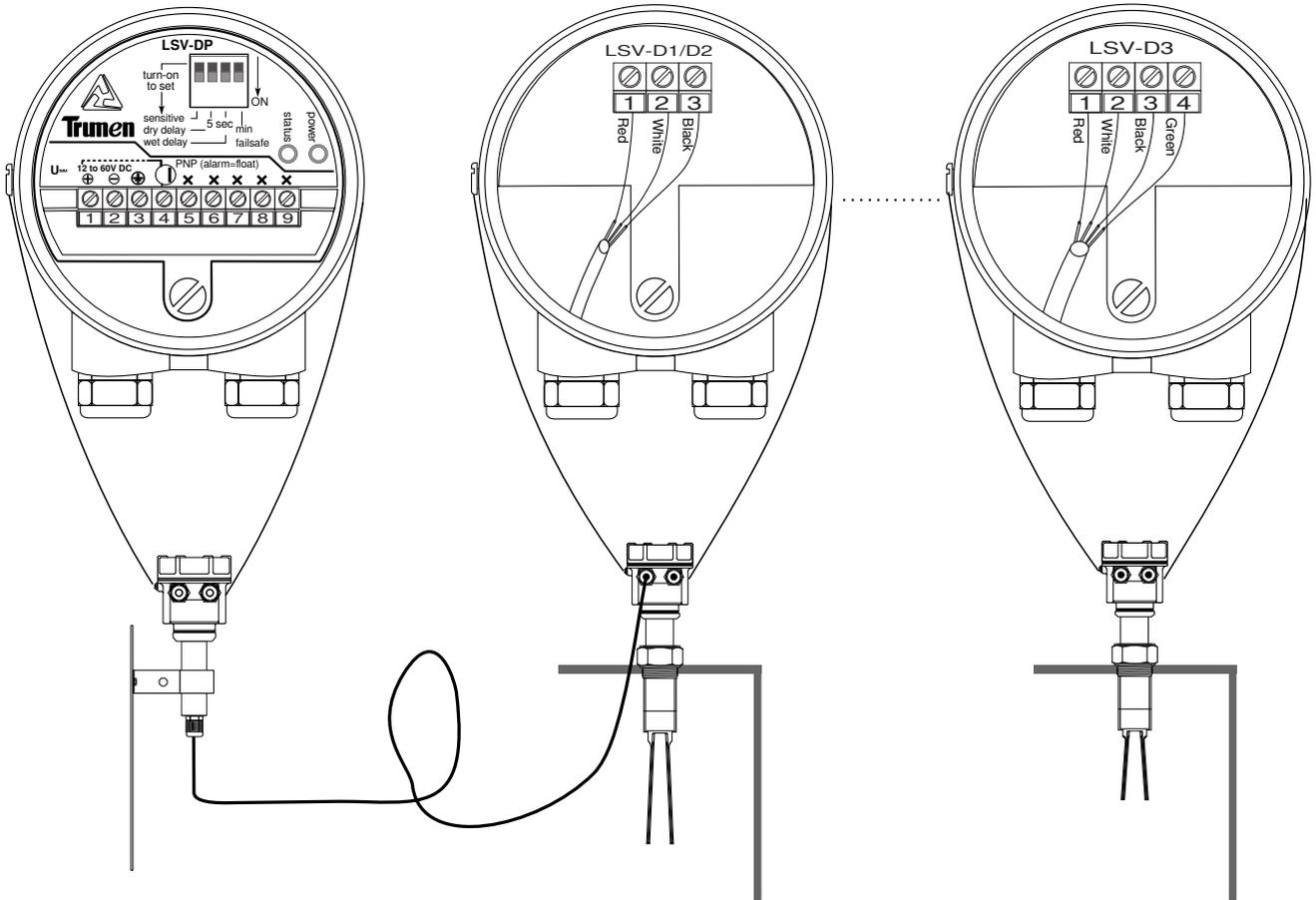
### electrical connections (DC)



### Remote probe connections for

#### LSV-DP-D1/D2 (ERDP)

#### LSV-DP-D3 (ERDP)

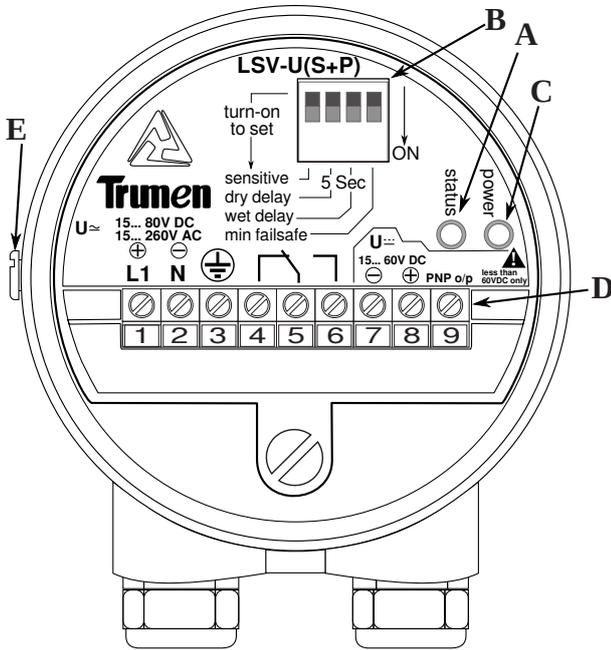


**Proper connection to supply earth terminal (3) and the external earth terminal (screw) is must.**

# Annexure-3

## Introduction - LSV-U(S+P)-D1/D2/D3 (EIUSP / ERUSP)

LSV-U(S+P)-D1  
LSV-U(S+P)-D2  
LSV-U(S+P)-D3



### controls & indicators

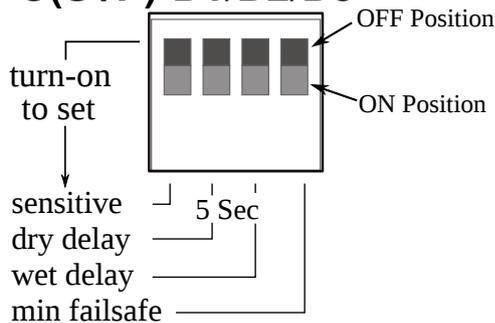
- A Alarm Indicating LED
- B Configuration Switches
- C Power ON LED Indicator
- D Connecting Terminals
- E External Earthing Terminal

### connection terminals

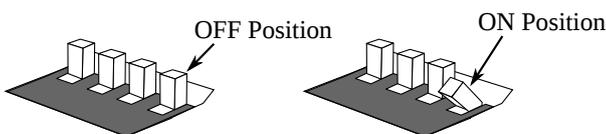
- 1 (+) of DC or Live of AC Supply input
- 2 (-) of DC or Neutral of AC Supply input  
Supply:  
15 to 80VDC or 15 to 260VAC 50/60Hz
- 3 Earth terminal for safety
- 4 Normally connected terminal of SPDT contact
- 5 Common terminal of SPDT contact
- 6 Normally open terminal of SPDT contact
- 7 (-) of DC for PNP output
- 8 (+) of DC for PNP output
- 9 DC PNP output with respect to -ve of DC  
▲ Supply should be within 15 to 60VDC for PNP output

### configuration switches

#### LSV-U(S+P)-D1/D2/D3



- 1 sensitivity control  
sensitive setting for low density materials  
(turn-on for fluffy/low density materials)  
(keep turned-off for normal materials)
- 2 “dry” (or uncovered) delay (5 second delay)  
(turn-on when 5 second more time is needed for  
fork out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay)  
(turn-on when 5 second more time is needed for  
fork dipped in the material confirmation)
- 4 minimum failsafe select  
Failsafe means alarm is same as power failure.  
Turn on for underflow detection (min. failsafe)  
Keep turned off for overflow detection  
(max. failsafe)

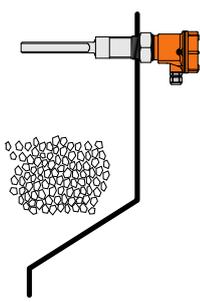
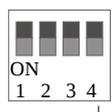
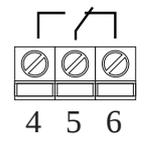
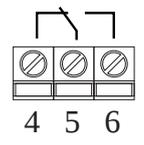
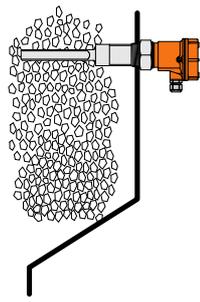
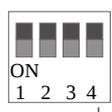
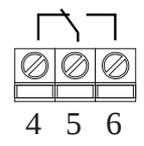
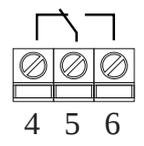
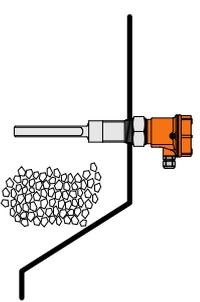
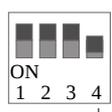
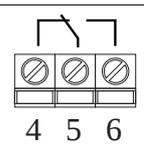
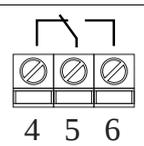
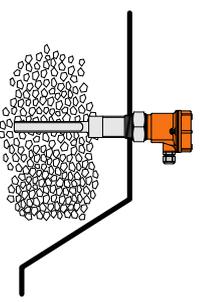
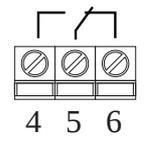
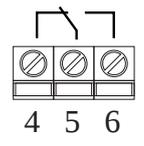


Example of Switch in On and Off Positions

# Annexure-3

## Operation Matrix - LSV-U(S+P)-D1/D2/D3 (EIUSP / ERUSP)

Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

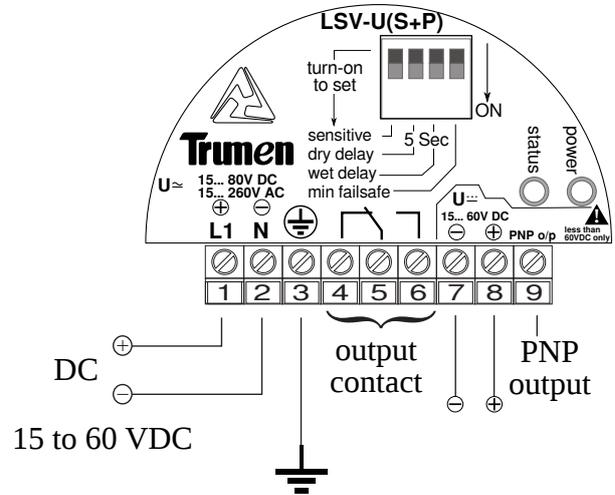
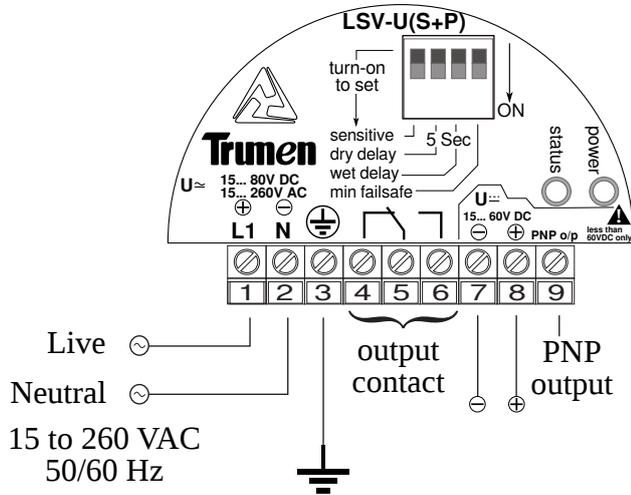
	Material & Installation	Material Status	Failsafe Setting	Status LED	Relay Contacts & PNP Output	
					Power ON	Power OFF
High level / overflow detection		No material at high level.	 <p>Switch no. 4 is off, failsafe high/maximum</p>	 <b>Off</b> Indicating normal or healthy status.	 <p>Relay ON normal or healthy contacts.</p>  <p>Relay OFF alarm contacts. (due to power failure)</p>	
		Material is above the high level or fork is covered with material.	 <p>Switch no. 4 is off, failsafe high/maximum</p>	 <b>On</b> Indicating alarm status.	 <p>Relay OFF alarm contacts.</p>  <p>Relay OFF alarm contacts. (as it is)</p>	
Low level / underflow detection		No material at low level.	 <p>Switch no. 4 is on, failsafe low/minimum</p>	 <b>On</b> Indicating alarm status.	 <p>Relay OFF alarm contacts.</p>  <p>Relay OFF alarm contacts. (as it is)</p>	
		Material is above the low level or fork is covered with material.	 <p>Switch no. 4 is on, failsafe low/minimum</p>	 <b>Off</b> Indicating normal or healthy status.	 <p>Relay ON normal or healthy contacts.</p>  <p>Relay OFF alarm contacts. (due to power failure)</p>	

# Annexure-3

## Electrical Connections - LSV-U(S+P)-D1/D2/D3 (EIUSP / ERUSP)

electrical connections (AC)

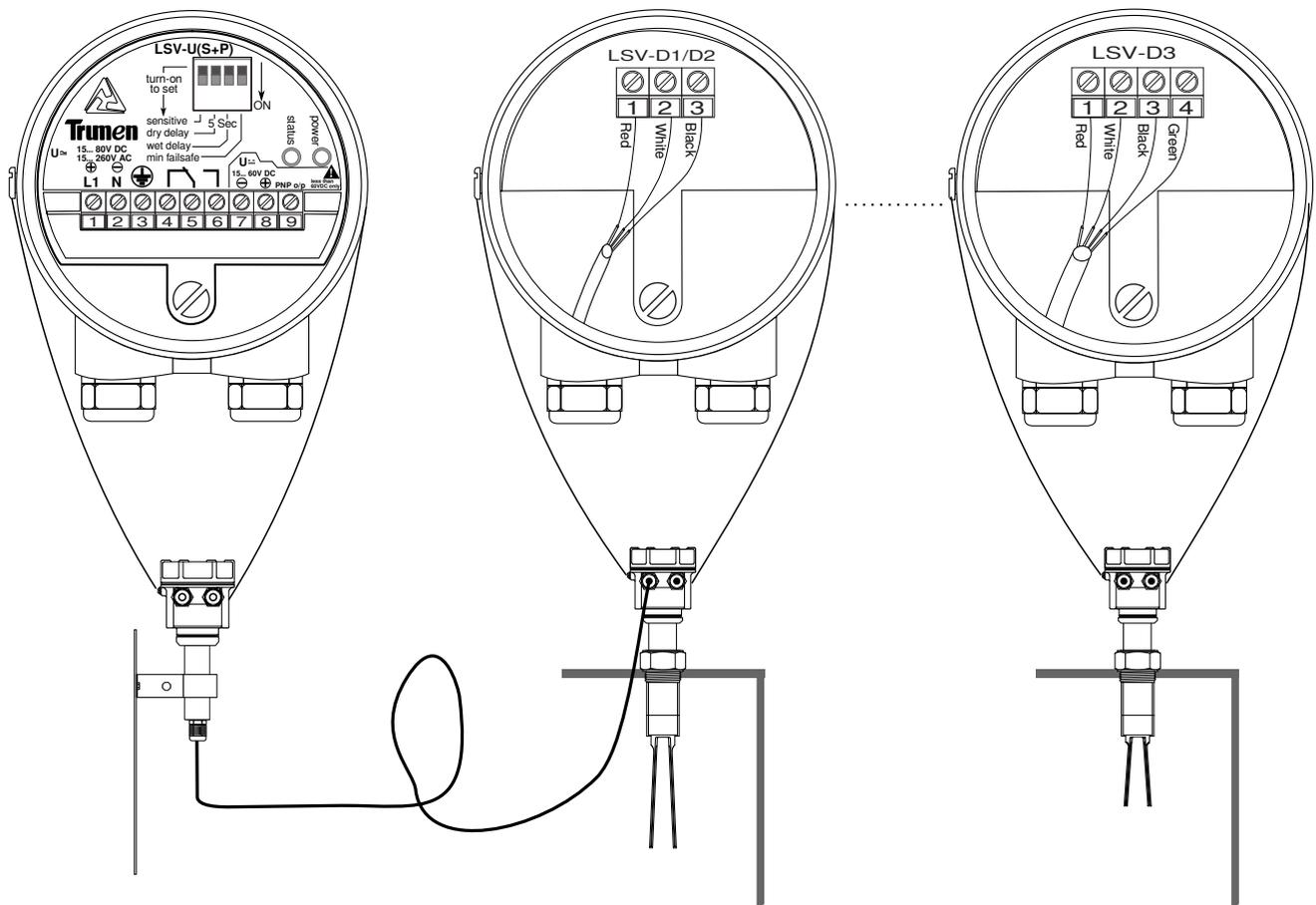
electrical connections (DC)



### Remote probe connections for

LSV-U(S+P)-D1/D2 (ERUSP)

LSV-U(S+P)-D3 (ERUSP)



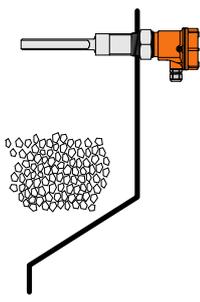
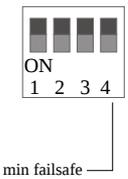
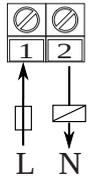
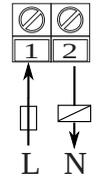
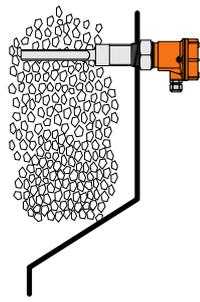
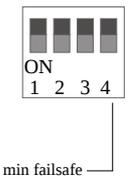
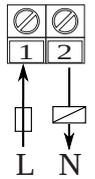
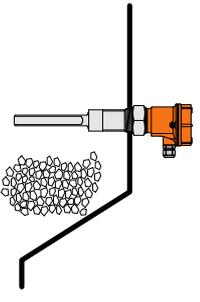
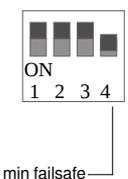
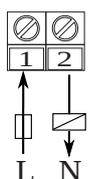
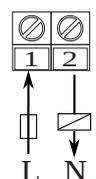
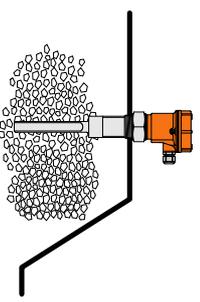
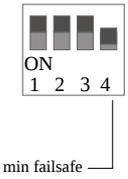
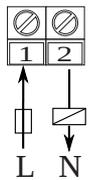
Proper connection to supply earth terminal (3) and the external earth terminal (screw) is must.



# Annexure-4

## Operation Matrix - LSV-AR-D1/D2/D3 (EIAR)

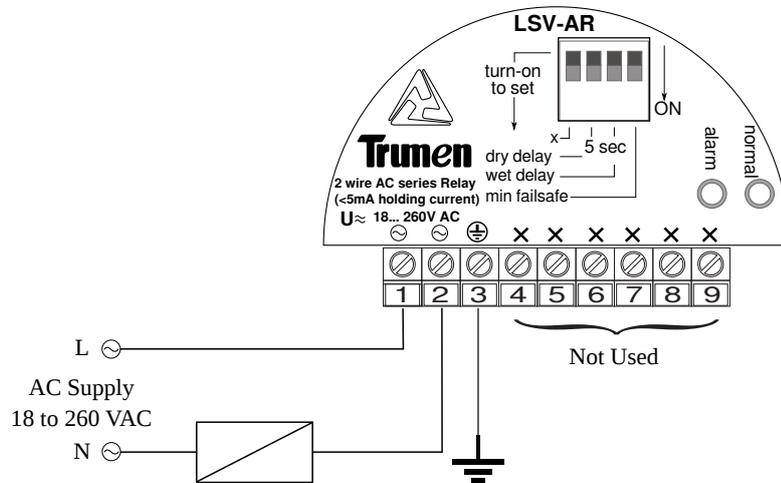
Series relay will be energized in normal or healthy condition. Series relay will be de-energized in alarm condition. Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

Material & Installation	Switching Operation	Failsafe Setting	Status LED	Alarm/Normal	Series Relay Status	
					Power ON	Power OFF
High level / overflow detection	 <p>When switch no. 4 is off (failsafe high / maximum). output status shows normal when there is no material at high switch point or fork is out of the material.</p>		<p>Red ○ Off</p> <p>Green ☀ On</p>	Normal or healthy	 <p>Series relay on</p>	 <p>Series relay off (due to power failure)</p>
	 <p>When switch no. 4 is off (failsafe high / maximum). output status shows alarm if fork is dipped in material at high switch point.</p>		<p>Red ☀ On</p> <p>Green ○ Off</p>		Alarm	 <p>Series relay off</p>
Low level / underflow detection	 <p>When switch no. 4 is on (failsafe low / minimum). output status shows alarm when there is no material at low switch point or fork is out of the material.</p>		<p>Red ☀ On</p> <p>Green ○ Off</p>	Alarm	 <p>Series relay off</p>	 <p>Series relay off (as it is)</p>
	 <p>When switch no. 4 is on (failsafe low / minimum). output status shows normal if fork is dipped in material at low switch point.</p>		<p>Red ○ Off</p> <p>Green ☀ On</p>		Normal or healthy	 <p>Series relay on</p>

# Annexure-4

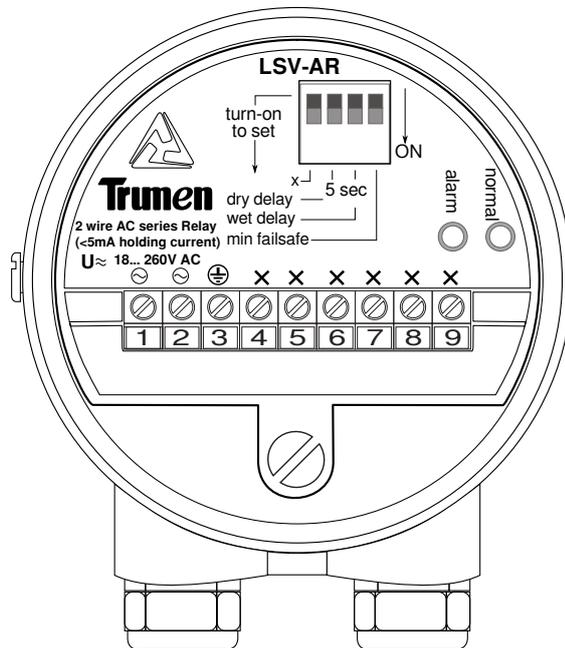
## Electrical Connections - LSV-AR-D1/D2/D3 (EIAR)

### electrical connections (AC)



#### Specified AC Series Relay

Use AC relay / contactor having maximum 150mA to magnetize and holding current should not be less than 4mA. Voltage rating of AC relay should be as per input supply voltage.



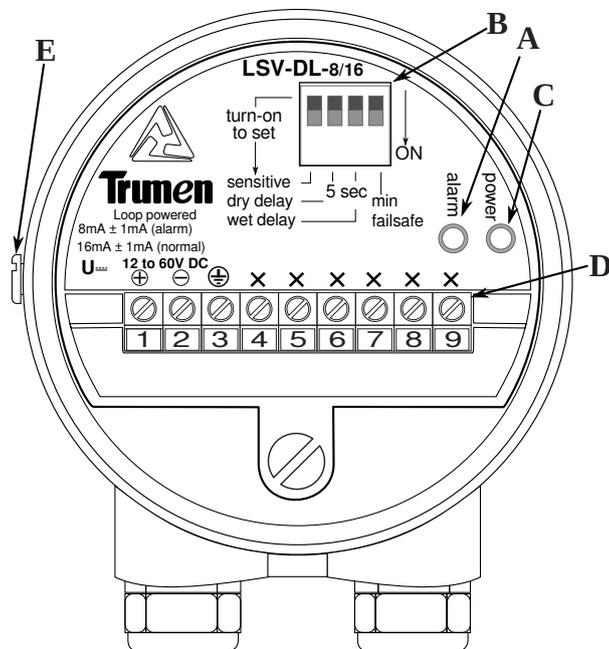
**Proper connection to supply earth terminal (3) and the external earth terminal (screw) is must.**

# Annexure-5

## Introduction - LSV-DL-D1/D2/D3 (EIDL)

### 8/16 mA Output

LSV-DL-D1  
LSV-DL-D2  
LSV-DL-D3



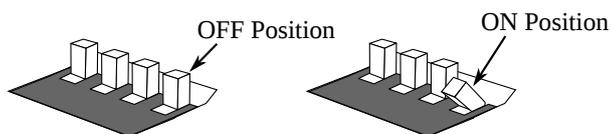
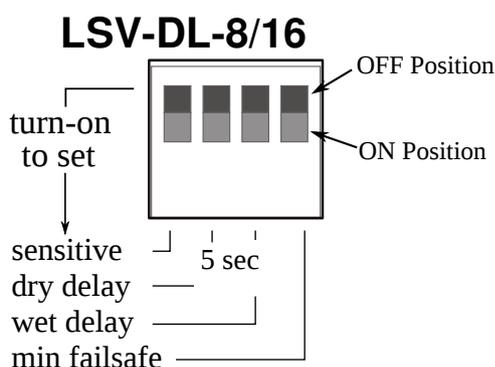
### controls & indicators

- A Alarm Indicating LED
- B Configuration Switches
- C Power ON LED Indicator
- D Connecting Terminals
- E External Earthing Terminal

### connection terminals

- 1 (+) of DC Supply input
- 2 (-) of DC Supply input  
DC Supply: 12 to 60VDC
- 3 Earth terminal for safety
- 4,5,6,7,8,9 Not used

### configuration switches



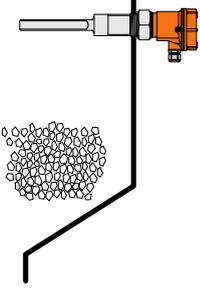
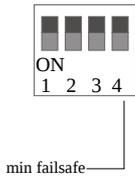
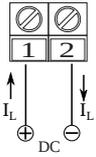
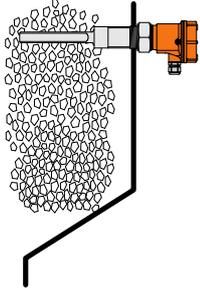
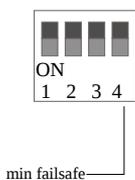
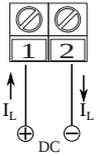
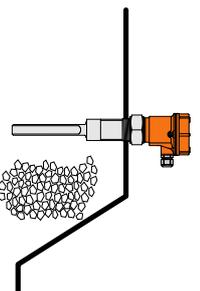
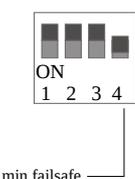
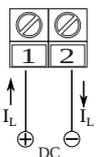
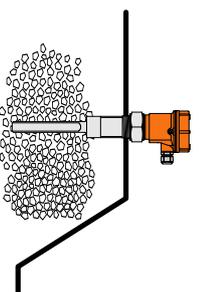
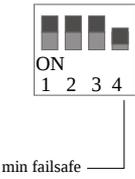
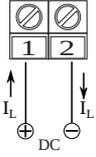
Example of Switch in On and Off Positions

- 1 sensitivity control  
sensitive setting for low density materials  
(turn-on for fluffy / low density materials etc.)  
(keep turned-off for normal density materials)
- 2 “dry” (or uncovered) delay (5 second delay) setting  
(turn-on when 5 second more time is needed for  
fork out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay) setting  
(turn-on when 5 second more time is needed for  
fork dipped in the material confirmation)
- 4 minimum failsafe select  
Failsafe means alarm is same as power failure.  
Turn on for underflow detection (min. failsafe)  
Keep turned off for overflow detection  
(max. failsafe)

# Annexure-5

## Operation Matrix - LSV-DL-D1/D2/D3 (EIDL)

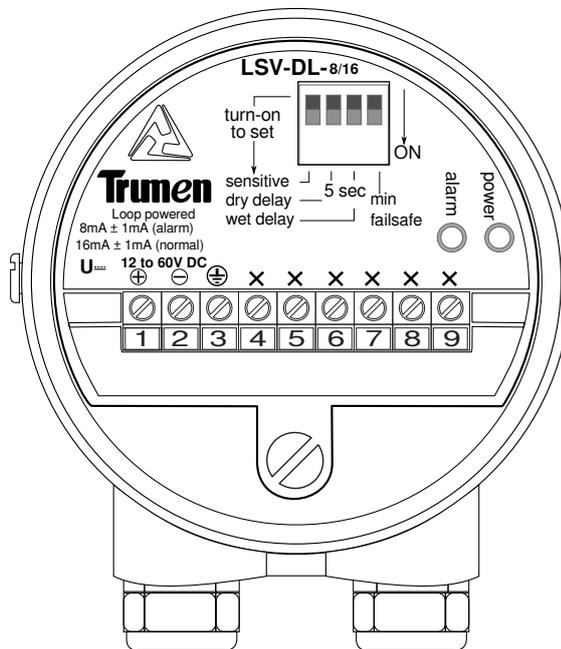
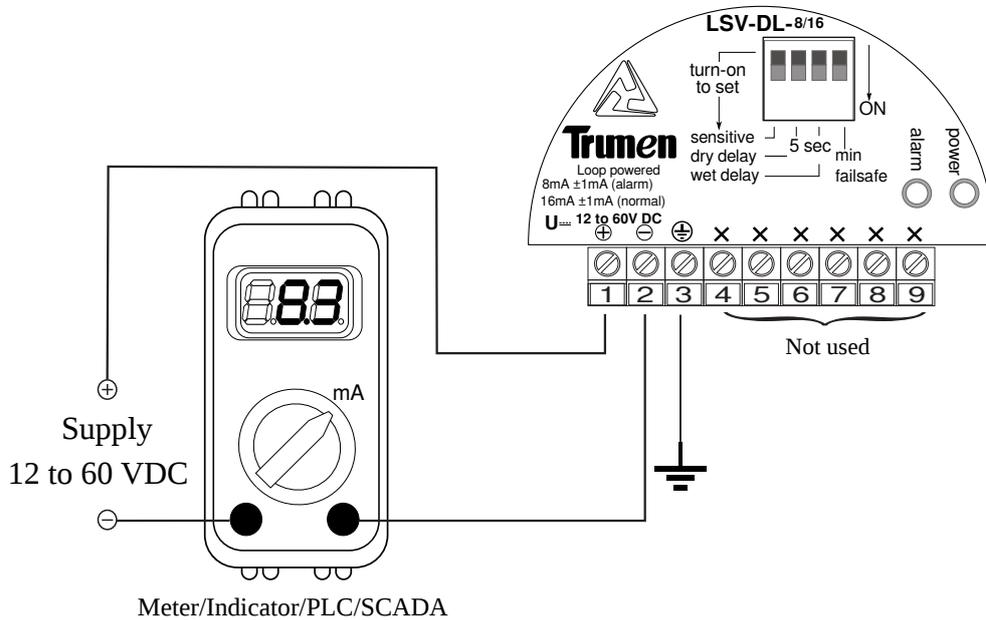
Miliampere output 16 is supplied in normal or healthy condition. Miliampere output 8 is supplied in alarm condition. Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

Material & Installation	Switching Operation	Failsafe Setting	Status LED	Miliampere Output Status	
High level / overflow detection		When switch no. 4 is off (failsafe high / maximum). output status shows normal when there is no material at high switch point or fork is out of the material.		 <b>Off</b> <b>Normal</b>	 $I_L = 16\text{mA}$
		When switch no. 4 is off (failsafe high / maximum). output status shows alarm if fork is dipped in material at high switch point.		 <b>On</b> <b>Alarm</b>	 $I_L = 8\text{mA}$
Low level / underflow detection		When switch no. 4 is on (failsafe low / minimum). output status shows alarm when there is no material at low switch point or fork is out of the material.		 <b>On</b> <b>Alarm</b>	 $I_L = 8\text{mA}$
		When switch no. 4 is on (failsafe low / minimum). output status shows normal if fork is dipped in material at low switch point.		 <b>Off</b> <b>Normal</b>	 $I_L = 16\text{mA}$

# Annexure-5

## Electrical Connections - LSV-DL-D1/D2/D3 (EIDL)

### electrical connections (DC)



**Proper connection to supply earth terminal (3) and the external earth terminal (screw) is must.**