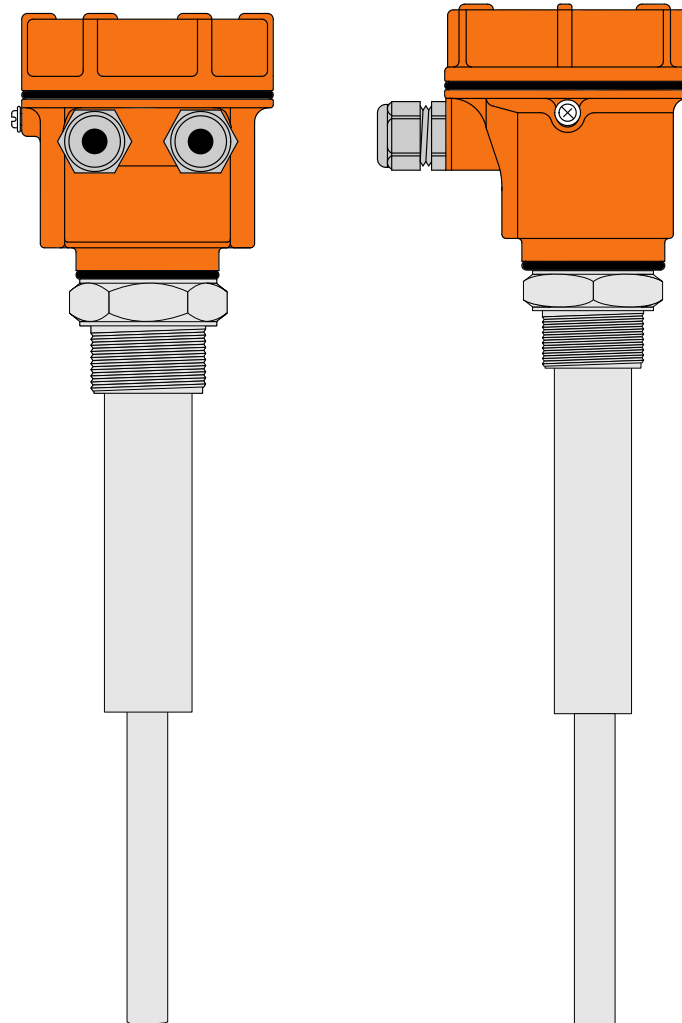


LSVR: Vibrating Rod Level Switch for Solids



Instruction Manual



Trumen Technologies Pvt. Ltd.

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Customer Support

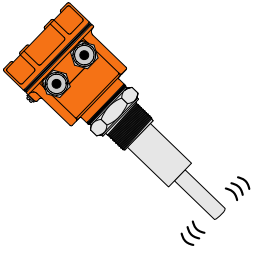
Phone: +91-731-656 2425
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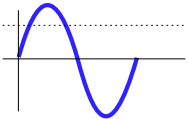
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Operating Principle

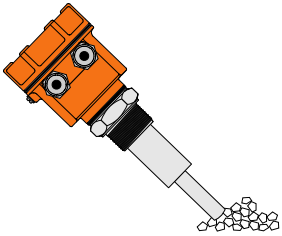


LSVR Vibrating rod is a single element tuned mechanical element-type level sensing device.

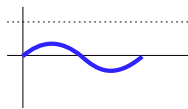
Electronics of LSVR excites the piezo-electric-crystals inside the tuning rod, which makes the rod vibrate at its natural resonance frequency in free air.



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



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



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

Technical Specification

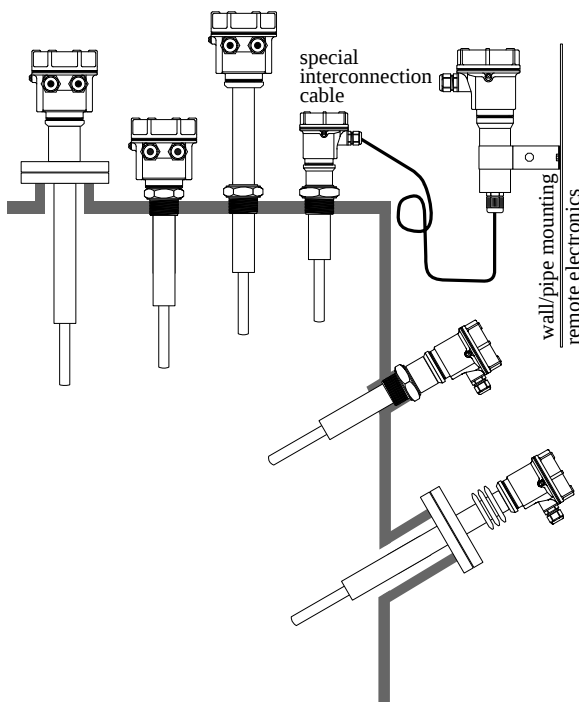
Features

1. Fast Switching Response
2. 1" screw mountings available
3. High pressure 15 bar
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 0.7 VA)
14. Settable switching delay as a standard feature

Applications

1. Free flowing powders and granules
2. Suitable for side as well as top mounting
3. Minimum and maximum failsafe field selectable
4. Process temperature max 200°C
5. Process pressure max. 15 bar

Typical Mountings



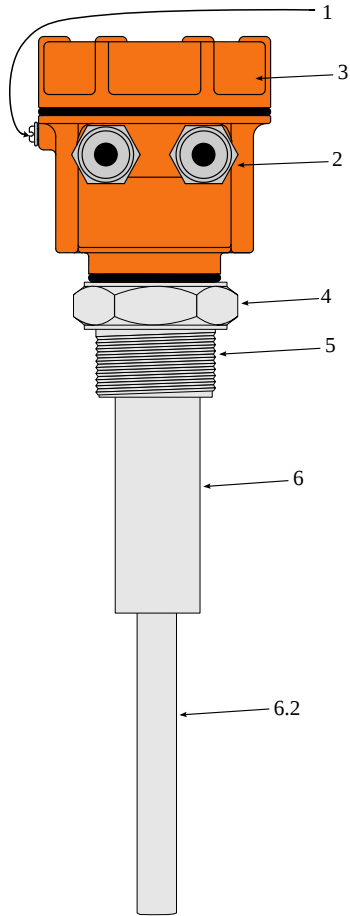
Specifications

EIUD / ERUD 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
EIDP / ERDP Supply & Output	Integral / Remote Electronics for PNP Output 12 to 60 VDC, PNP
Output Limit	250mA max. Short Circuit Safe
EIUSP / ERUSP 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 250mA max. Short Circuit Safe
EIAR 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 Use relays/contactors will more than 4mA holding current
Output Limit	
EIDL Supply & Output	Integral Electronics 4-20mA Loop Powered Two Wire DC 8 / 16 mA 15 to 60 VDC
Output Limit	8mA (±1mA max) / 16mA (±1mA max)
Sensor Cable	Remote electronics require special cable from rod to controller. 10 meter standard length more available on demand
Min. Density	>=350 gram/litre, not fluidized
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 ... 250°C (-22°F ... 482 °F) (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 250mm to 3,000mm
Power Consumption	0.5 VA max.

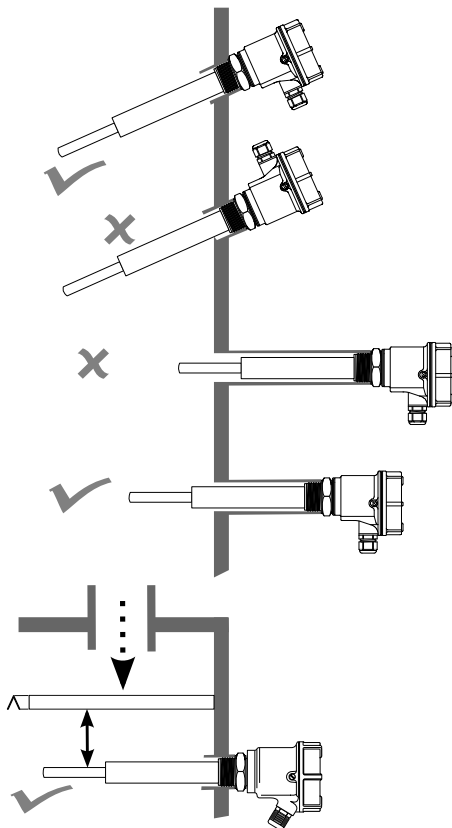
Specifications are subject to change without prior notice

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 rod probe:-
 - 6.1 Should never be bent
 - 6.2 Should never be held from thin part
 - 6.3 Should never be cut or machined in any way
 - 6.4 Should never be extended by welding or machining

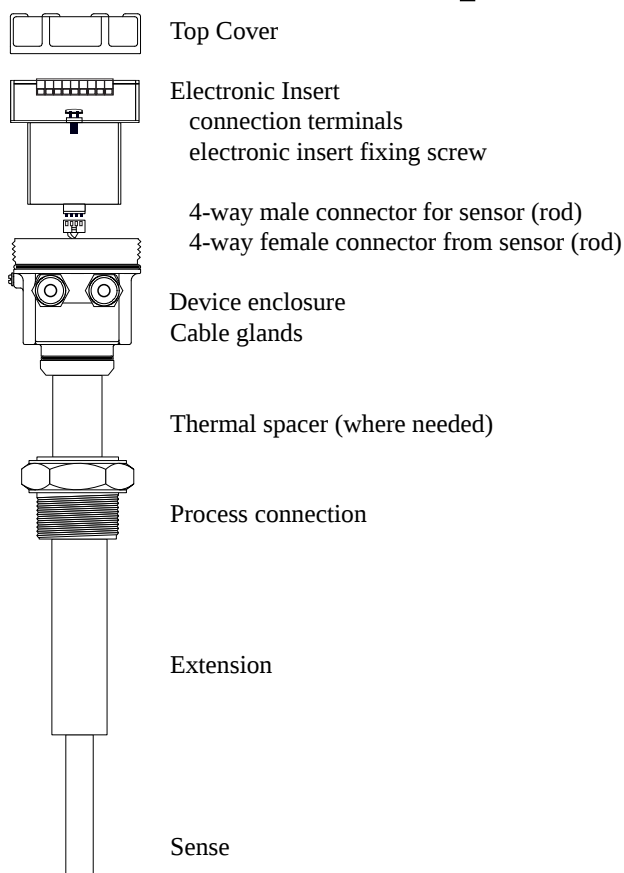


7. Cable entries must face downwards only
8. Nozzles should never be longer than the rod sense
9. If mounted directly under the material entry, always install a canopy of suitable strength at proper height from the rod
10. Never climb either by gripping or stepping over either the rod sense or its aluminium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

Troubleshooting

Indication	Probable cause	Work-around	Solution
<p>No switching output or sensor is permanently in alarm</p> <p>If proper voltage is available but 'power' LED is still OFF</p>	<p>Power is not available</p> <p>Sensor electronic insert internal power section is failed</p>	<p>See if 'power' LED is ON</p> <p>If power LED is OFF check voltage on terminal 1 and 2</p>	<p>Sensor electronic insert is needed to be replaced.</p>
<p>Rod is not vibrating when rod sense are touched by hand</p> <p>Rod is vibrating but no switching output when for rod sense are touched by hand</p>	<p>Sensor electronic insert rod oscillator circuit failed</p> <p>Sensor electronic insert evaluation section failure</p>		<p>Sensor electronic insert is needed to be replaced.</p>
<p>Abrupt switching</p>	<p>Material is agitated</p>	<p>Set time delay to 5 second in both dry and wet condition (turn switch 2, 3 ON)</p>	<p>Time delay solves switching issues in agitated materials.</p>
<p>Device shows no material after some time even when rod is inside the material</p>	<p>Material fluffy or rod rate-holes the material due to its own vibrations</p>	<p>Set device in sensitive mode (turn switch 1 ON)</p>	<p>Sensitive setting reduces vibrational strength and makes switching point at lower amplitude.</p>
<p>Rod settings are all OK but rod fails to switch to 'no material' at random times</p>	<p>Power supply carrying extra noise and rod amplifier picking the noise</p>	<p>Make necessary arrangements to filter the noise in power-line before being fed to the device</p> <p>Provide an exclusive earthing to terminal# 3, rod enclosure earthing screw and rod process connection (device mounting screw)</p>	<p>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.</p>
<p>Device worked for few months / years but now fails to switch with respect to material while power conditions are all same</p>	<p>Device senses rod frequency and amplitude to ascertain presence / absence of Material. Possible reasons are</p> <ol style="list-style-type: none"> 1. Rod frequency shift due to rod wear / erosion by service material 2. Material deposition on rod leads 3. Over temperature of service material causing rod drive damage 	<p>Select proper rod surface while ordering as per service material to mitigate rod erosion as well as deposition</p> <p>Order device of proper thermal grade for proper service life of device</p> <p>Clean up deposited materials on rod sense as a part of maintenance schedule</p>	<p>Care is needed to be taken while ordering.</p> <p>Scheduled cleaning of rod sense in sticky material application is recommended.</p> <p>In case of temperature stress, rod sensor is needed to be replaced.</p>

Maintenance and Spares



Shown on the left are various parts of LSVR level switch. Separatable parts are

1. Electronic insert in short called 'electronics'
2. Rod + 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.

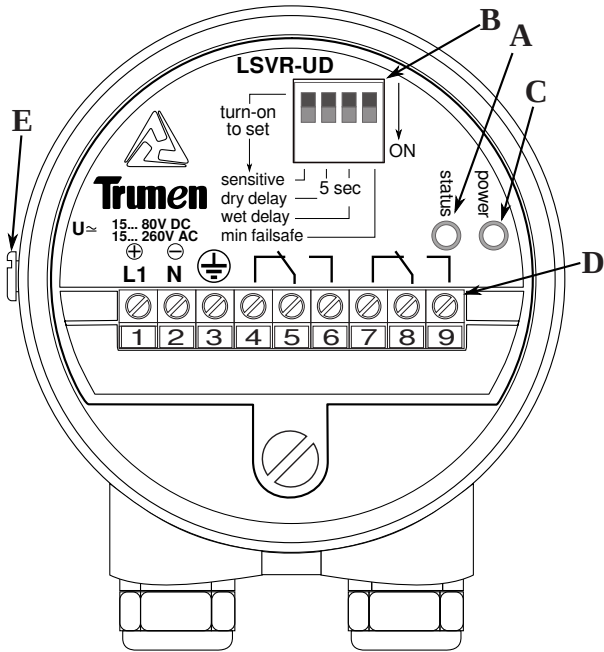
Set the electronics properly to its position.

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 - LSVR-UD (EIUD / ERUD)



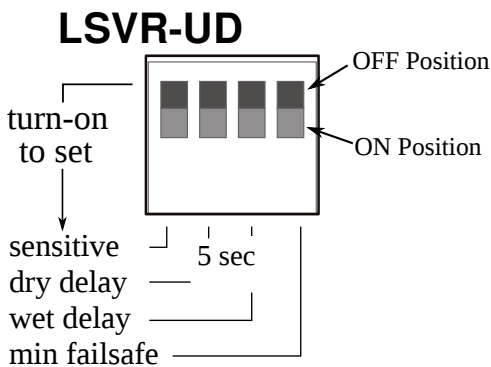
controls & indicators

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

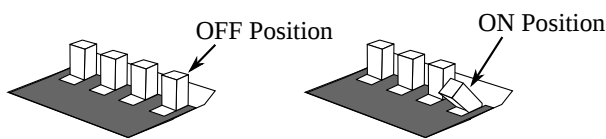
connection terminals

- 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



- 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
rod out of solid confirmation)
- 3 “wet” (or covered) delay (5 second delay) setting
(turn-on when 5 second more time is needed for
rod 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)

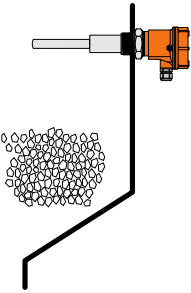


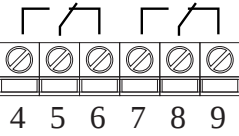
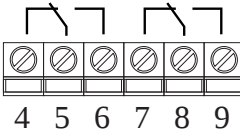
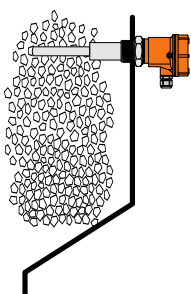
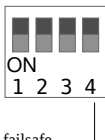

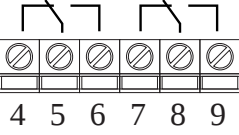
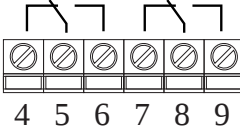
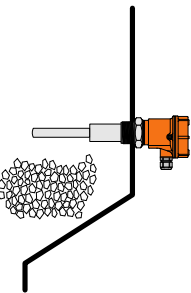
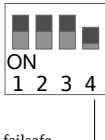

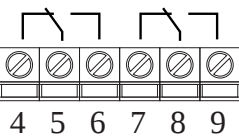
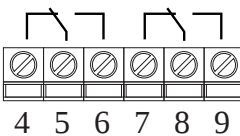
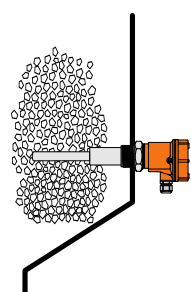


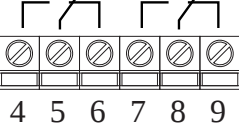
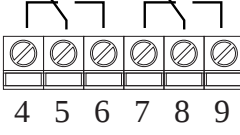


Example of Switch in On and Off Positions

Annexure-1

Operation Matrix - LSVR-UD (EIUD / ERUD)

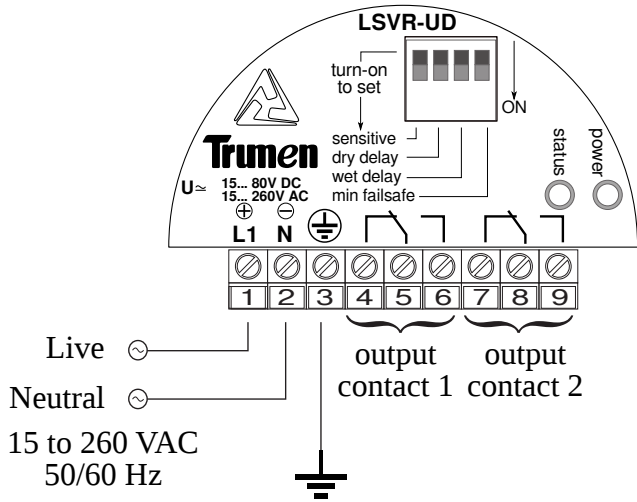
Vibrating rod is a single element tuned mechanical element type level sensing device. Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

Material & Installation		Material Status	Failsafe Setting	Status LED	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>	 Off 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 rod is covered with material.	 <p>Switch no. 4 is off, failsafe high/maximum.</p>	 On 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>	 On 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 rod is covered with material	 <p>Switch no. 4 is on, failsafe low/minimum.</p>	 Off Indicating normal or healthy status.	 <p>Relay ON normal or healthy contacts.</p>	 <p>Relay OFF alarm contacts. (due to power failure)</p>

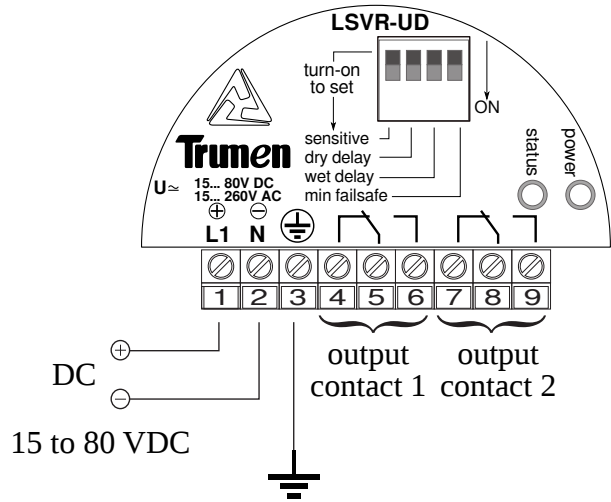
Annexure-1

Electrical Connections - LSVR-UD (EIUD / ERUD)

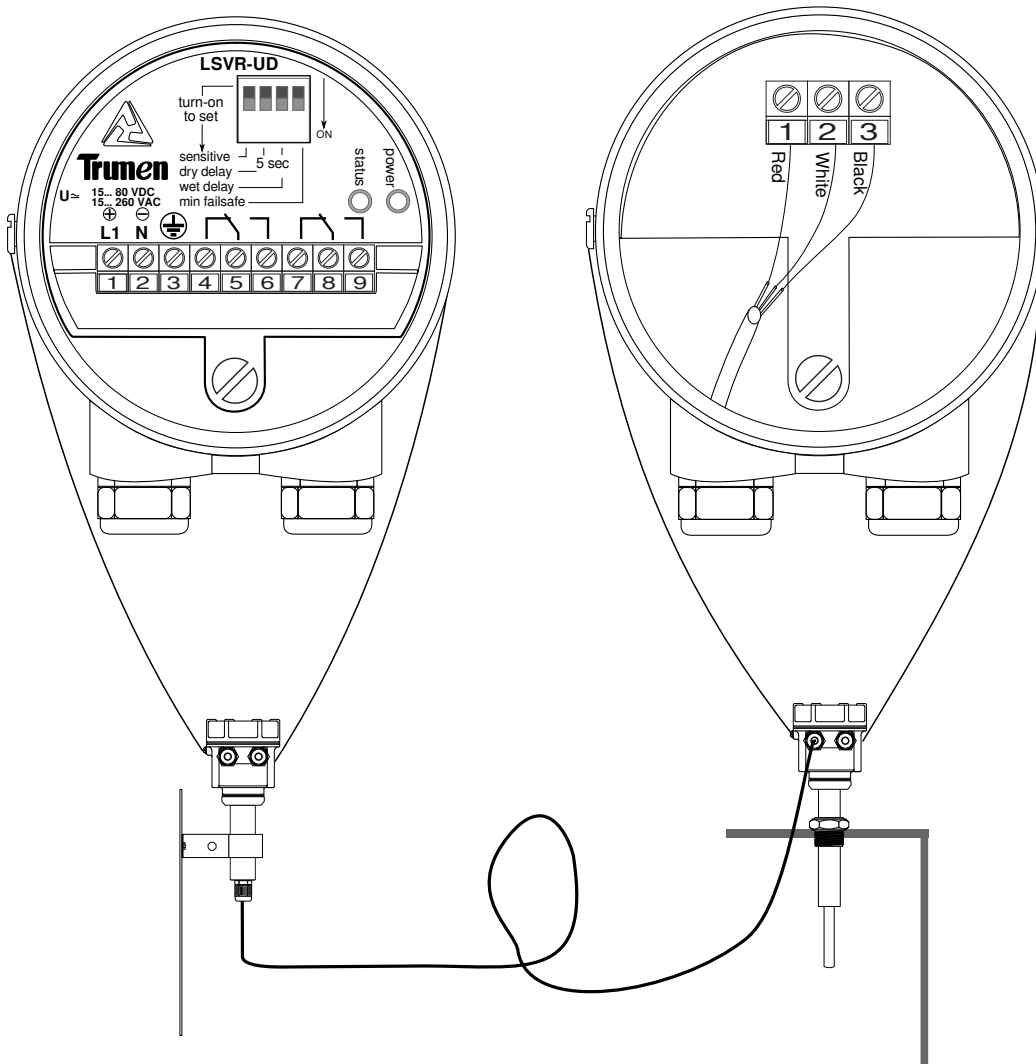
electrical connections (AC)



electrical connections (DC)



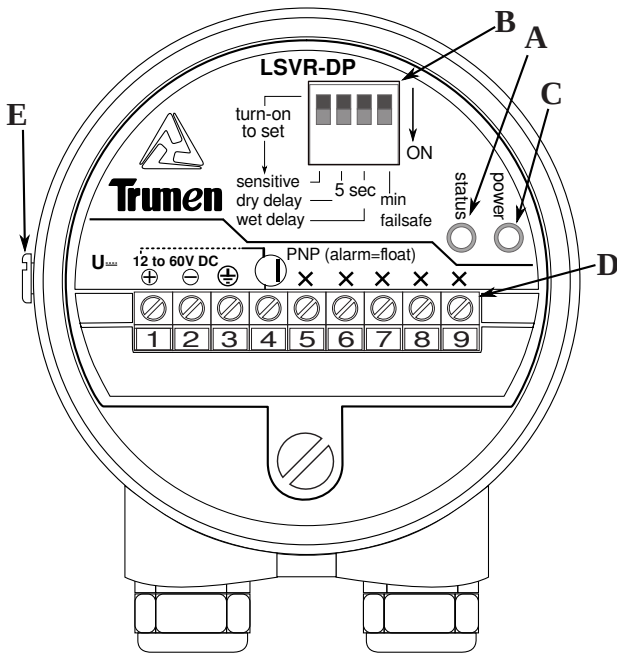
Remote probe connections for LSVR-UD (ERUD)



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

Annexure-2

Introduction - LSVR-DP (EIDP / ERDP)



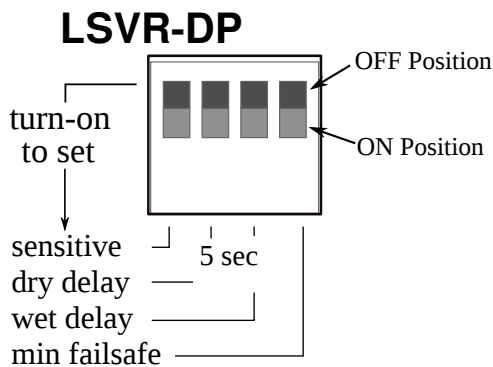
controls & indicators

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

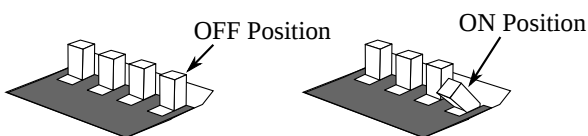
connection terminals

- 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



- 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
rod out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay) setting
(turn-on when 5 second more time is needed for
rod 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)

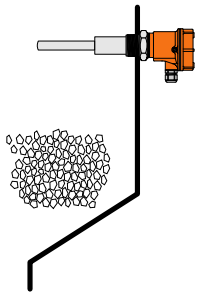


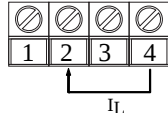
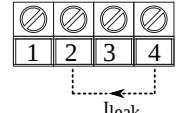
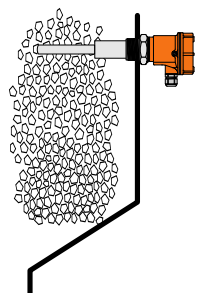
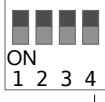

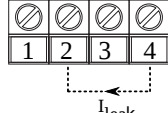
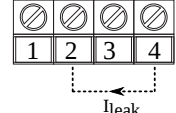
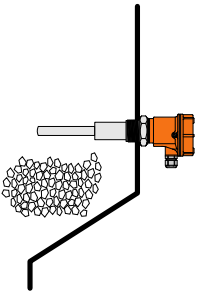


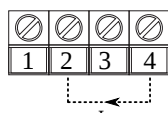
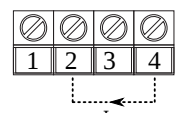
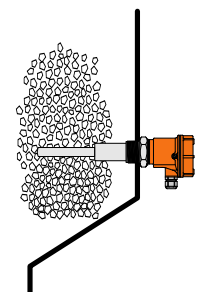


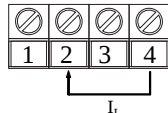
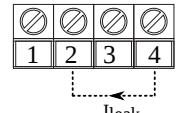


Example of Switch in On and Off Positions

Annexure-2

Operation Matrix - LSVR-DP (EIDP / ERDP)

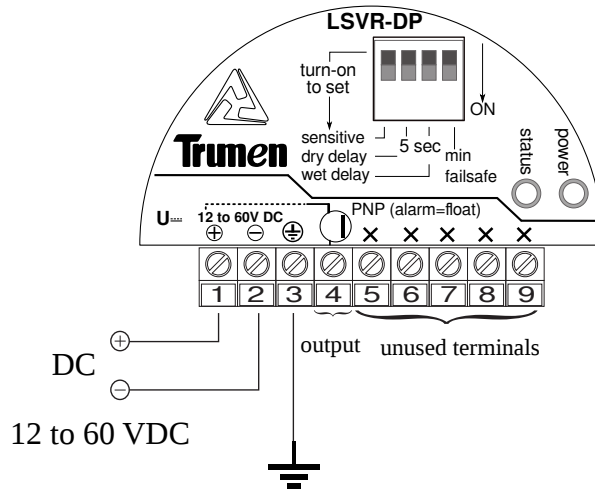
Vibrating rod is a single element tuned mechanical element type level sensing device. Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

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>	 Off Indicating normal or healthy status.	 <p>$I_L(\text{max}) = 250\text{mA}$ Normal or healthy output.</p>	 <p>$I_{\text{leak}} \leq 0.1\text{mA}$ Alarm output. (due to power failure)</p>
		Material is above the high level or rod is covered with material.	 <p>Switch no. 4 is off, failsafe high/maximum.</p>	 On Indicating alarm status.	 <p>$I_{\text{leak}} \leq 0.1\text{mA}$ Alarm output.</p>	 <p>$I_{\text{leak}} \leq 0.1\text{mA}$ 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>	 On Indicating alarm status.	 <p>$I_{\text{leak}} \leq 0.1\text{mA}$ Alarm output.</p>	 <p>$I_{\text{leak}} \leq 0.1\text{mA}$ Alarm output. (as it is)</p>
		Material is above the low level or rod is covered with material.	 <p>Switch no. 4 is on, failsafe low/minimum.</p>	 Off Indicating normal or healthy status.	 <p>$I_L(\text{max}) = 250\text{mA}$ Normal or healthy output.</p>	 <p>$I_{\text{leak}} \leq 0.1\text{mA}$ Alarm output. (due to power failure)</p>

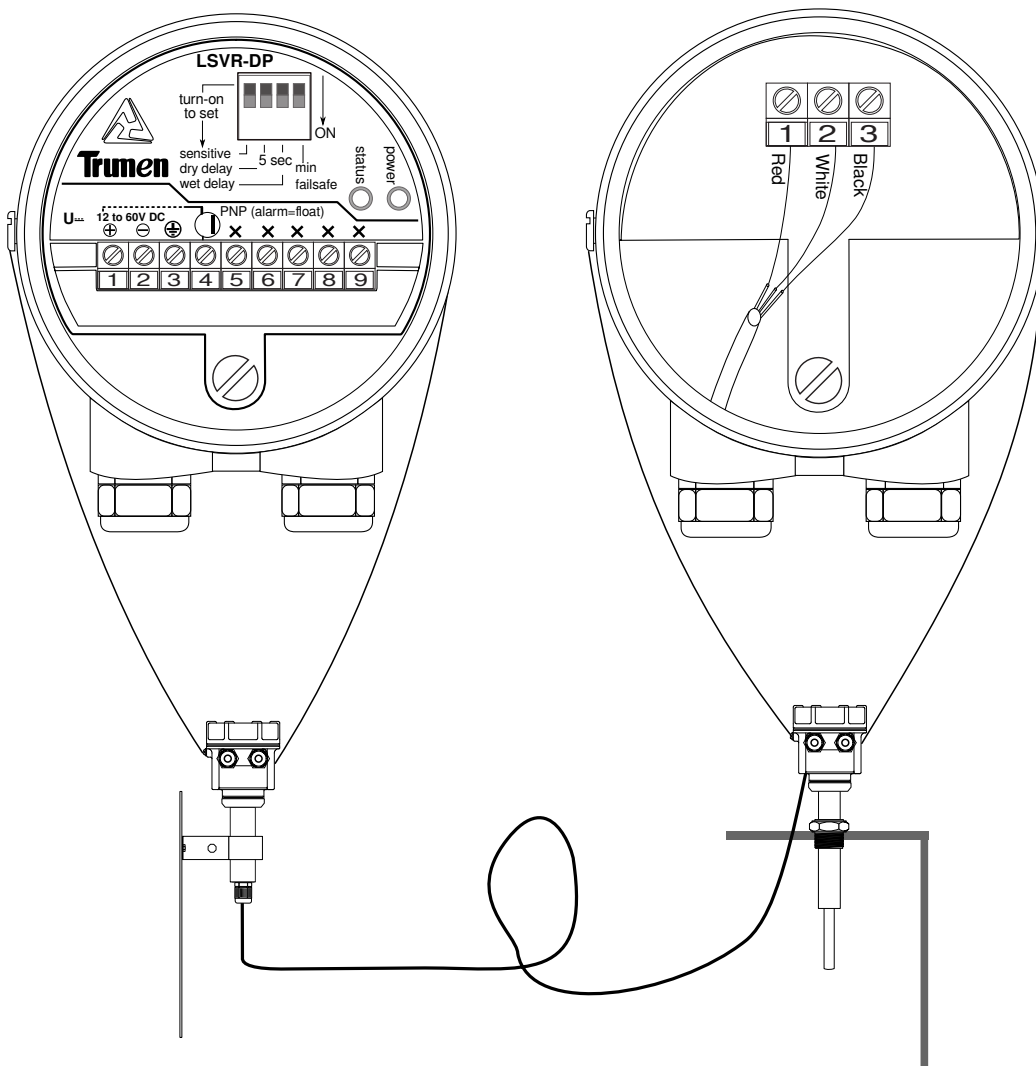
Annexure-2

Electrical Connections - LSVR-DP (EIDP / ERDP)

electrical connections (DC)



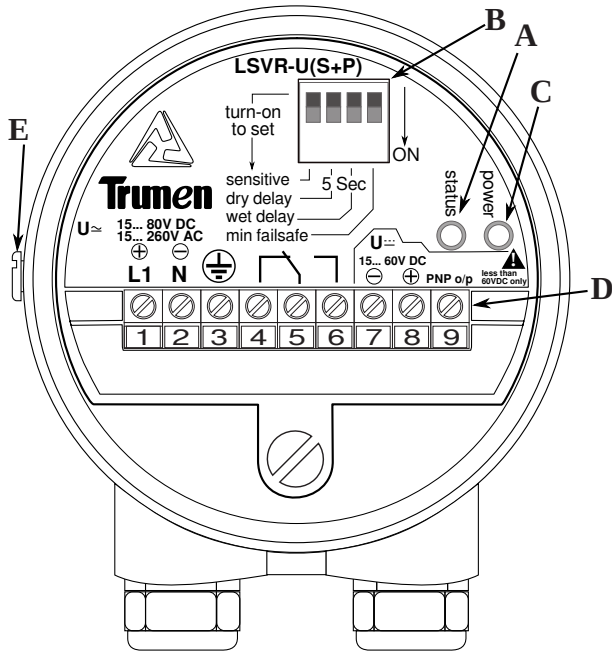
Remote probe connections for LSVR-DP (ERDP)



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

Annexure-3

Introduction - LSVR-U(S+P) (EIUSP / ERUSP)



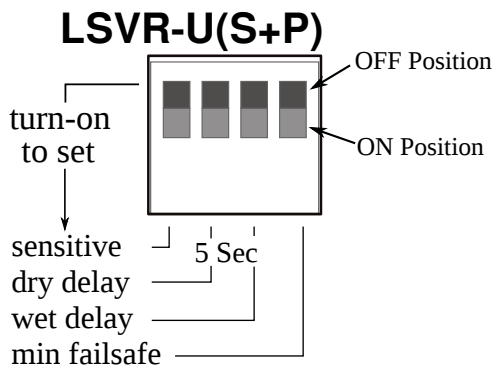
controls & indicators

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

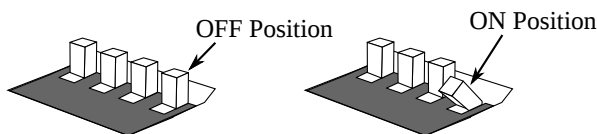
connection terminals

- 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



- 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 rod out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay)
(turn-on when 5 second more time is needed for rod 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)

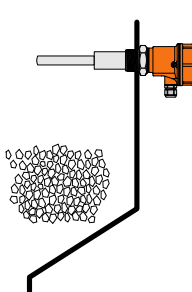
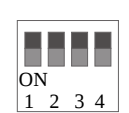

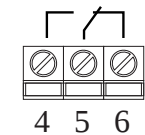
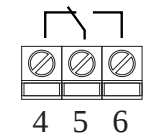
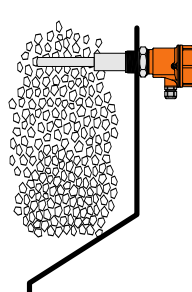


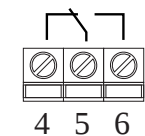
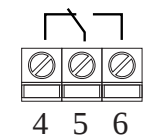
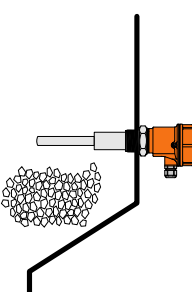
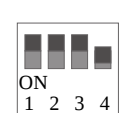

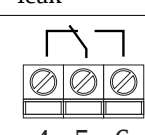
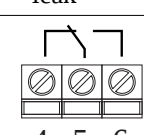
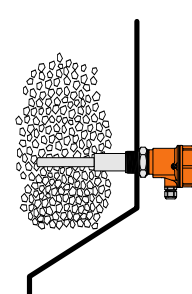


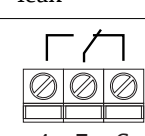
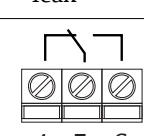


Example of Switch in On and Off Positions

Annexure-3

Operation Matrix - LSVR-U(S+P) (EIUSP / ERUSP)

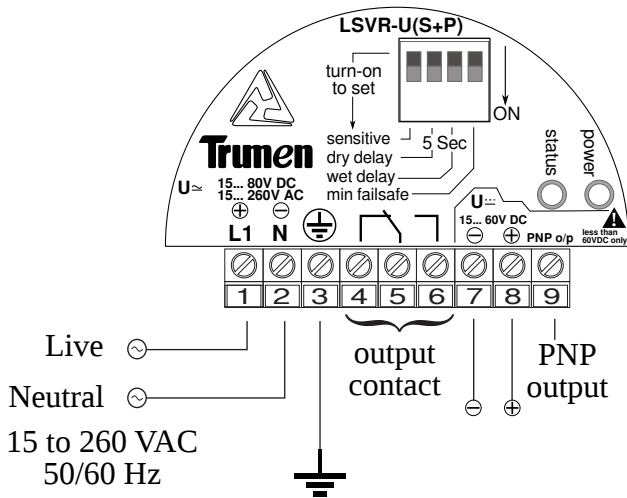
Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following matrix.

	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>	 Off 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 rod is covered with material.	 <p>Switch no. 4 is off, failsafe high/maximum</p>	 On 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>	 On 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 rod is covered with material.	 <p>Switch no. 4 is on, failsafe low/minimum</p>	 Off Indicating normal or healthy status.	 <p>Relay ON normal or healthy contacts.</p>	 <p>Relay OFF alarm contacts. (due to power failure)</p>

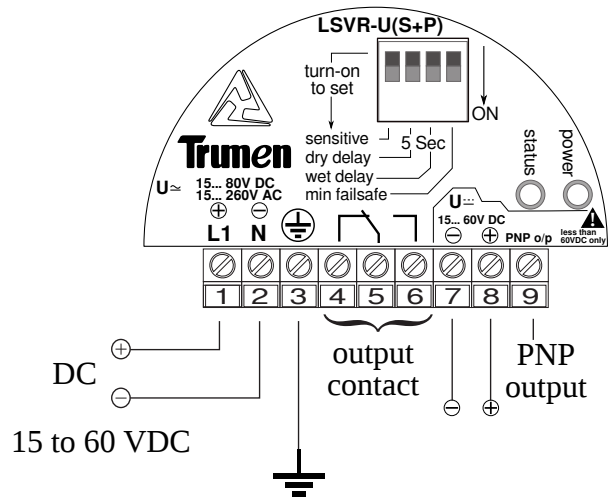
Annexure-3

Electrical Connections - LSVR-U(S+P) (EIUSP / ERUSP)

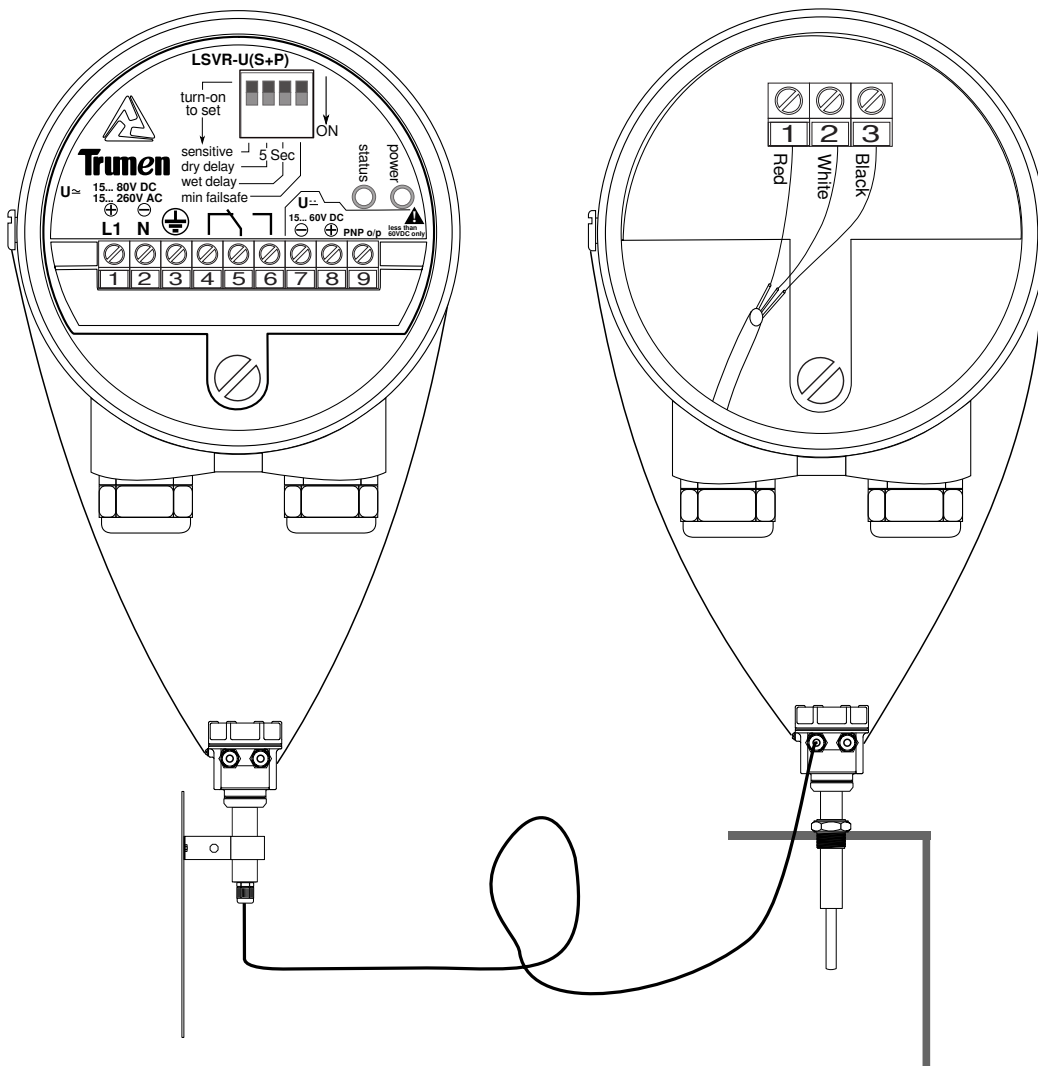
electrical connections (AC)



electrical connections (DC)



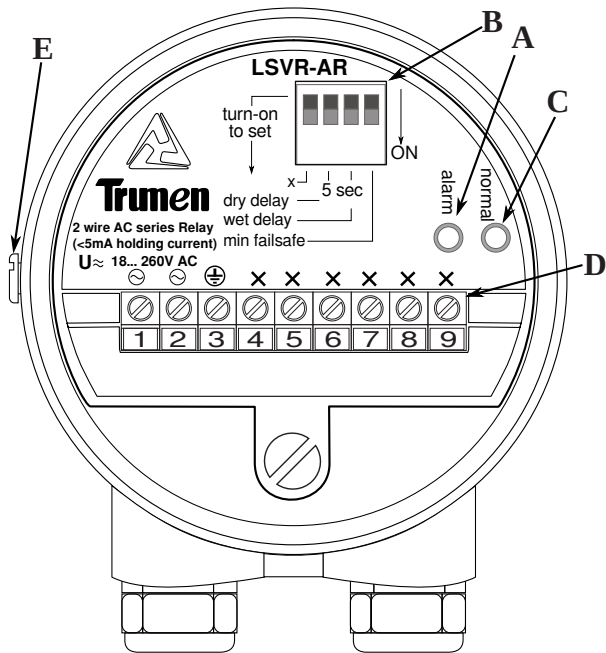
Remote probe connections for LSVR-U(S+P) (ERUSP)



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

Annexure-4

Introduction - LSVR-AR (EIAR)



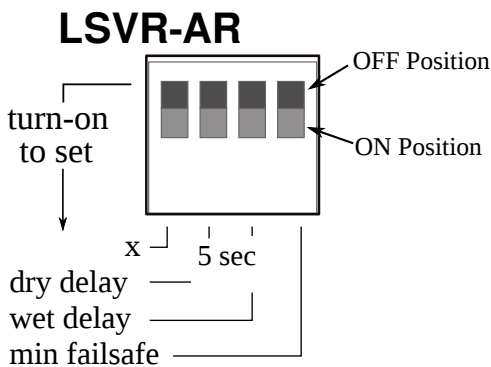
controls & indicators

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

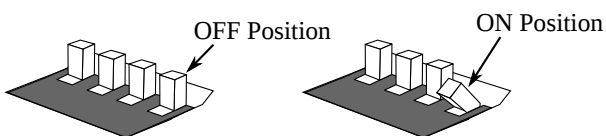
connection terminals

- 1 Live of AC Supply through fuse
- 2 Neutral of AC Supply input through specified series relay 18 to 260VAC 50/60 Hz series
- 3 Earth terminal for safety
- 4,5,6,7,8,9 Not used

configuration switches



- 1 Not used
- 2 “dry” (or uncovered) delay (5 second delay) setting (turn-on when 5 second more time is needed for rod out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay) setting (turn-on when 5 second more time is needed for rod 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)

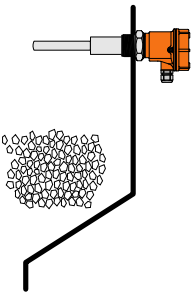
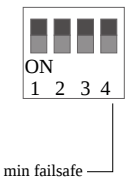
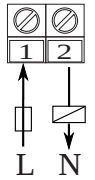
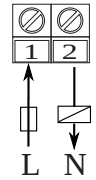
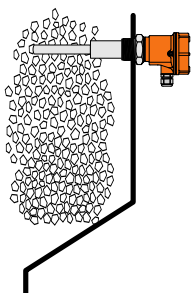
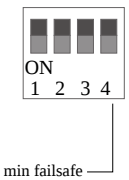
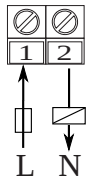
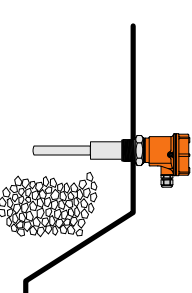
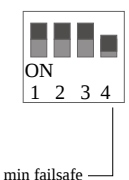
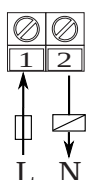
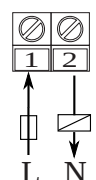
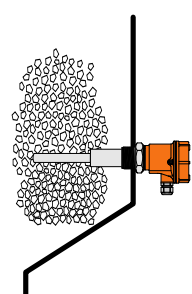
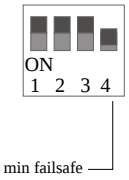
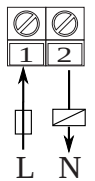
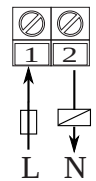


Example of Switch in On and Off Positions

Annexure-4

Operation Matrix - LSVR-AR (EIAR)

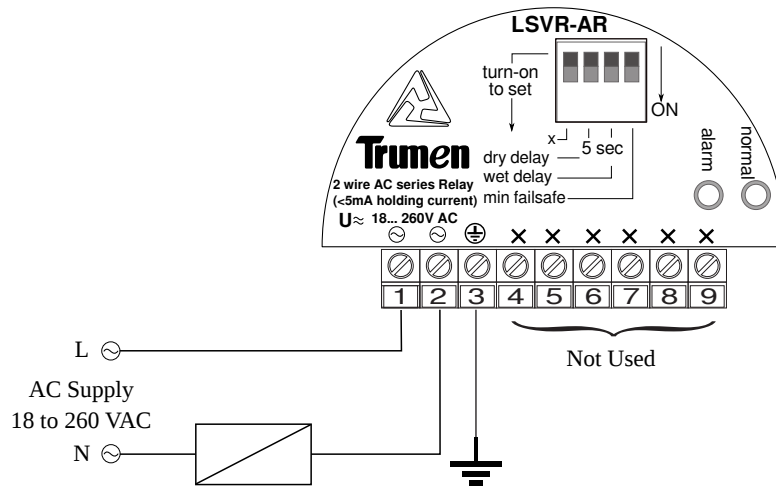
Series relay will be energized in normal or healthy condition. Series relay will be de-energized in alarm condition. Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following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

Annexure-4

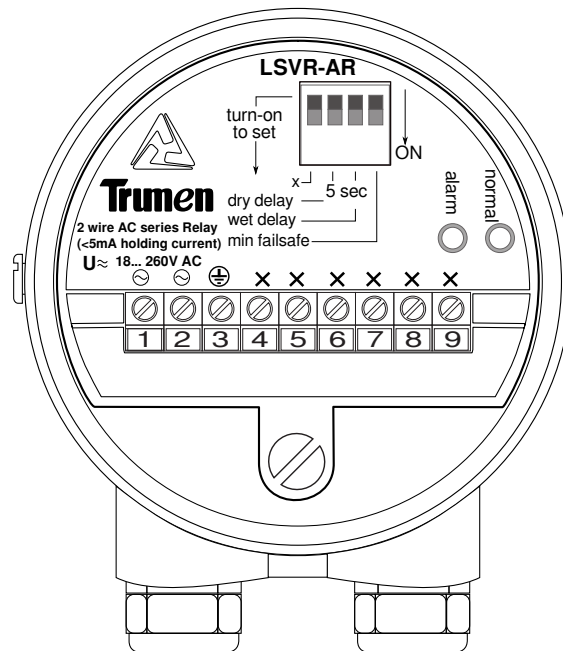
Electrical Connections - LSVR-AR (EIAR)

electrical connections (AC)



Specified AC Series Relay

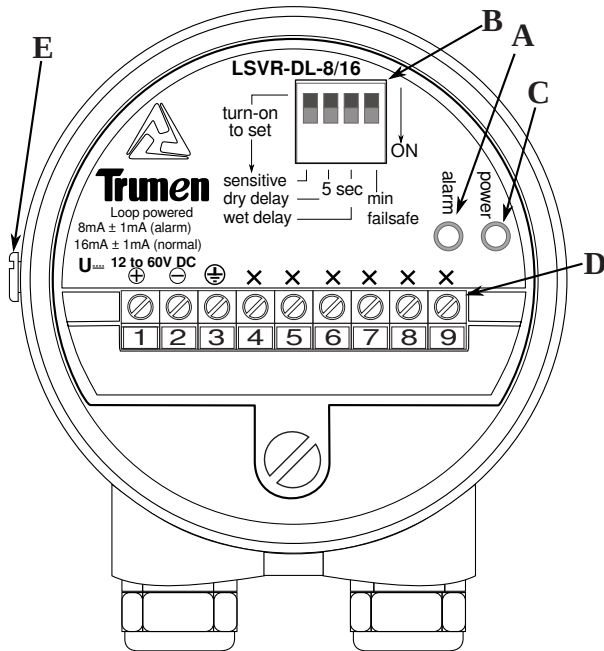
Use AC relay / contactor having maximum 150mA to magnetize and holding current should not be less than 4mA. Voltage rating of AC relay should be as per input supply voltage.



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

Annexure-5

Introduction - LSVR-DL (EIDL) 8/16 mA Output



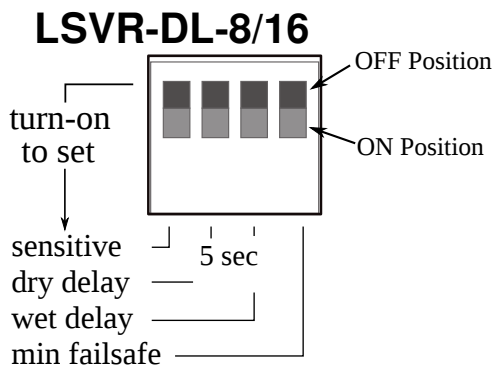
controls & indicators

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

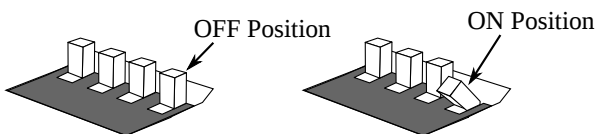
connection terminals

- 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



- 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
rod out of material confirmation)
- 3 “wet” (or covered) delay (5 second delay) setting
(turn-on when 5 second more time is needed for
rod 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)

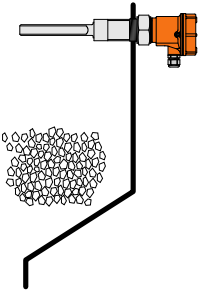
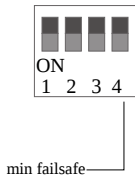
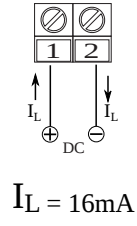
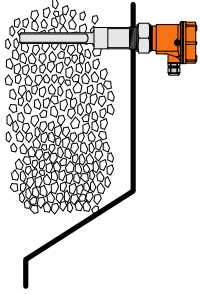
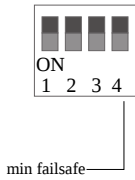
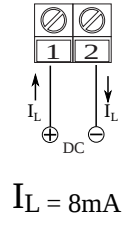
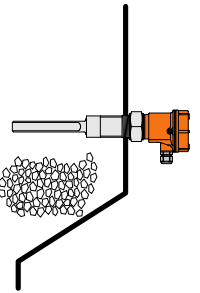
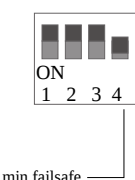
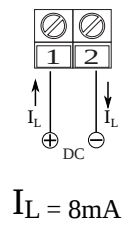
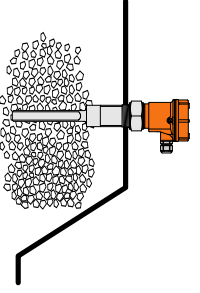

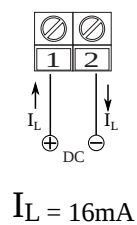


Example of Switch in On and Off Positions

Annexure-5

Operation Matrix - LSVR-DL (EIDL)

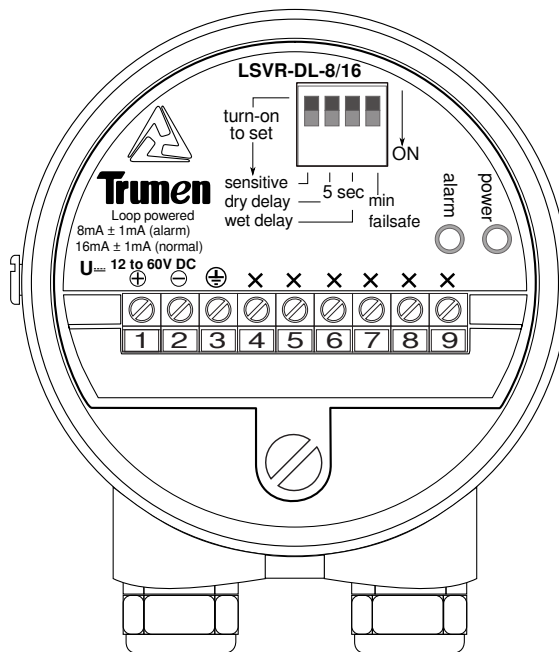
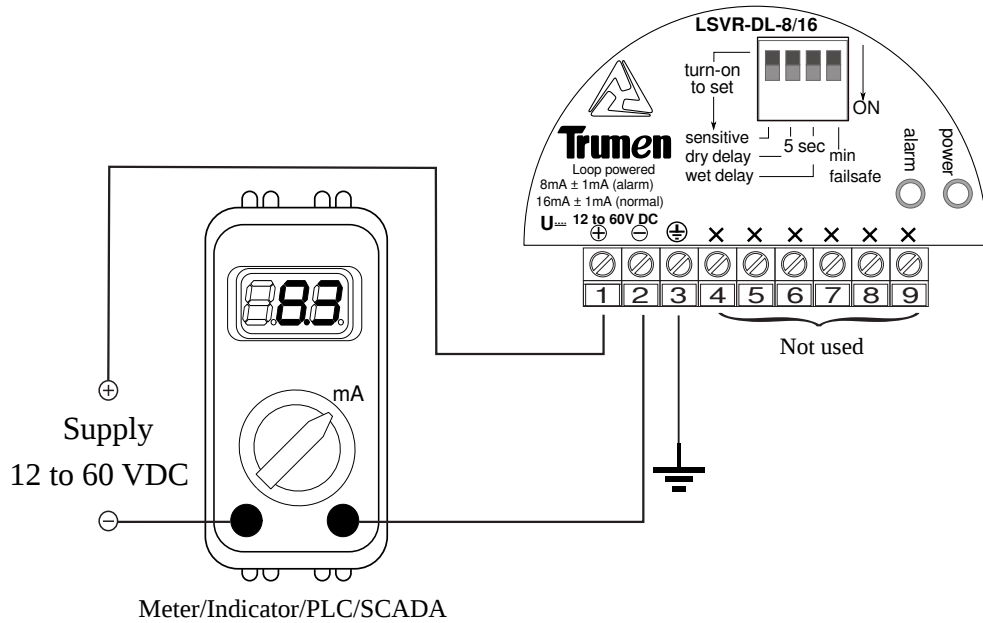
Miliampere output 16 is supplied in normal or healthy condition. Miliampere output 8 is supplied in alarm condition. Failsafe defines that the alarm and power failure / device failure conditions are same to the external system. Failsafe operation is best understood with the type of installation and following 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 rod is out of the material.		○ Off Normal	 $I_L = 16\text{mA}$
		When switch no. 4 is off (failsafe high / maximum). output status shows alarm if rod is dipped in material at high switch point.		☀ On Alarm	 $I_L = 8\text{mA}$
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 rod is out of the material.		☀ On Alarm	 $I_L = 8\text{mA}$
		When switch no. 4 is on (failsafe low / minimum). output status shows normal if rod is dipped in material at low switch point.		○ Off Normal	 $I_L = 16\text{mA}$

Annexure-5

Electrical Connections - LSVR-DL (EIDL)

electrical connections (DC)



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