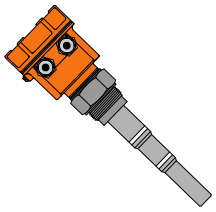


LSY...

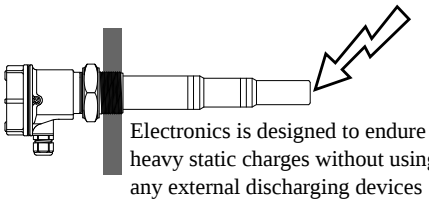
Technical Specification Document

Admittance Level Switch for Solids & Powders

Approvals & Certifications:

Trumen® sensing matters

Static Charge Safe



Electronics is designed to endure heavy static charges without using any external discharging devices

Compact Size

Durable Construction

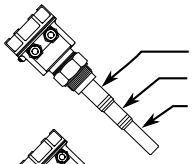
Easy Installation

Order Code

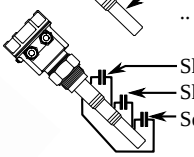
LSY	Admittance Level Switch for Solids
Hxx	Enclosure: HAN: Aluminum Non-Hazardous IP-65/68, HAX: Aluminum Flameproof IIa, IIb and IIc, HSN: Stainless steel, HES: Specially designed enclosure as per customer requirement
Tx	Material Temperature (T1: max 100°C, T2: max 200°C, T3: max 250°C, T4: max 600°C, TS: Specially designed)
Rx	Sensor rigid/flexible type, RD : Rigid Rod Sensor, RP : Flexible Rope Sensor, RS : Specially designed sensor
Sx	Sensing Rod/Rope Material (S4: SS-304, S6:SS-316, SL, SS-316L, SS: Special material)
Ix	Insulation type : IP: Partly PTFE insulated, IT: Full PTFE insulated, IC: Partly ceramic insulated,
Gx	Sensor Extension Material (G4: SS-304, G6: SS-316, GL: SS-316-L, GS: special material)
Px	Process Connection Type (PFL: Flanged Type – description of flange - FL -at the end of order code) (PB1: BSP 1", PB2: BSP 1½", PB4: BSP 1¼", PB5: BSP2") (PN1: NPT 1", PN2: NPT 1½", PN4: NPT 1¼", PN5: NPT2") (PT1: Triclover/Triclamp 1..1½", PT2: Triclover/Triclamp 2")(PCS: Special Process Connection)
Cx	Process Connection Material : (C4: SS-304, C6: SS-316, CL: SS-316L, CS: Special material)
	Electronic Power Supply and Outputs:-
EIUD	Integral Electronics with Universal supply (15-80V DC & 15-260V AC) & 1 DPDT potential-free relay output
EIDP	Integral Electronics with DC power supply (15-80V DC) & one short circuit safe PNP output
EIDL	Integral Electronics with Two wire DC supply with 8/16mA current output suitable for 4-20mA analog inputs
EIFS	Integral Electronics Specially designed with special output
ERUD	Remote Electronics with Universal supply (15-80V DC & 15-260V AC) & 1 DPDT potential-free relay output with 10 meter special admittance cable.
ERFS	Specially Designed Remote Electronics
Lxxxx	Insertion length (100mm to 3000mm)
FLxx	Flange type and bore size specified for ASA/ANSI/JIS/DIN/Custom

Operating Principle

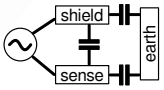
The three elements of Admittance probe has three elements:-



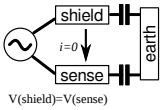
Earth Extension (body)
Compensation Shield
Sensing Rod
.. which from the capacitances:-



Shield Earth Capacitance
Shield Sense Capacitance
Sense Earth Capacitance

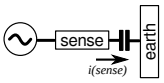


A Sine wave of high frequency is fed into both Sensing Rod as well as Compensation Shield.

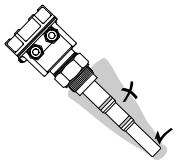


V(shield)=V(sense)

Voltage at shield is equal to the voltage at sense, no effective current flows between sense and shield.



This removes shield-sense capacitance from the measurement.

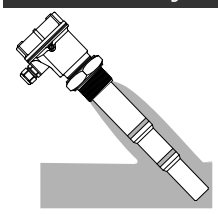


shield-earth capacitance is simply ignored by not measuring it.

This removes the effect of material coating on probe.

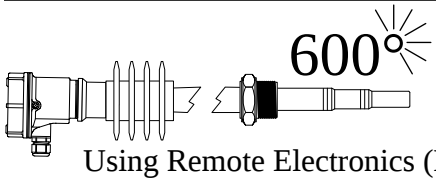
Material is detected by measuring sense-earth capacitance.

Trend Analyzing Algorithm



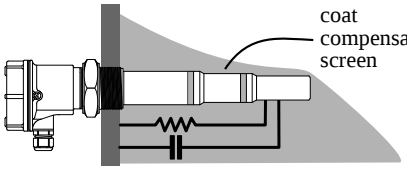
sensor tracks the material trend and coating behavior to further enhance the dependability of the device against false alarm due to material coating on probe

High Temperature Probes

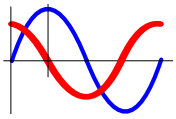


Using Remote Electronics (ER)

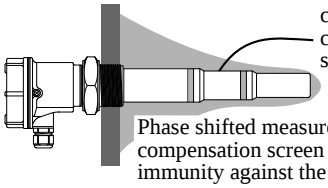
Tru-Admittance Measurement



Bulk Material forms resistive path as well as capacitive path between sense and earth. The phase of current is 90° ahead in capacitor than that of voltage applied to it.

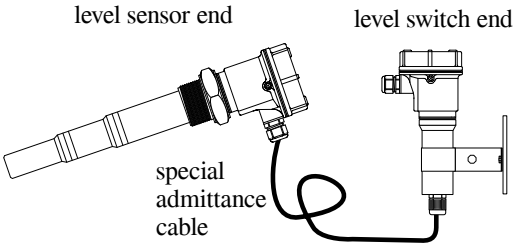


90° shifted measurement of sense RF current flowing through the material removes the measurement error caused by resistive path in the material (e.g. mositure etc.)

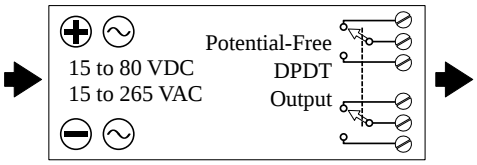


Phase shifted measurement along with compensation screen provides inherent immunity against the material coating

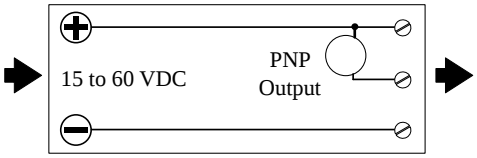
Remote Electronics



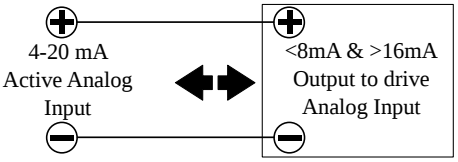
Universal In DPDT Output



PNP with DC Supply



Two wire 8/16 mA Signal



Technical Specification

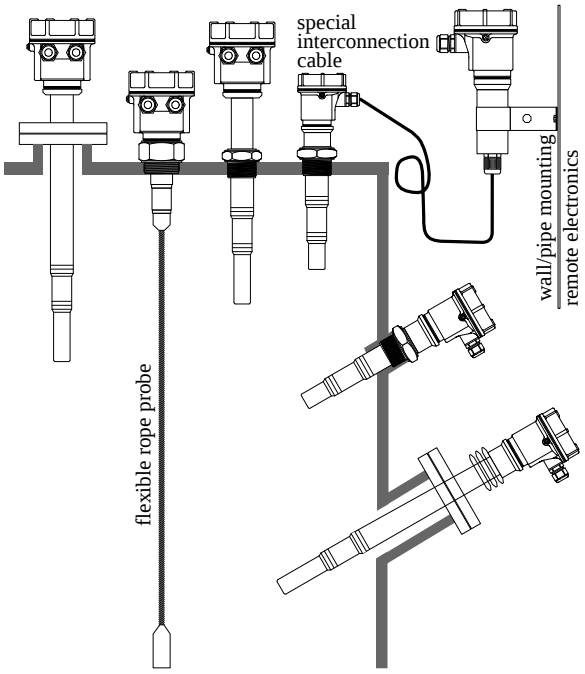
Features

1. Fast Switching Response 2 sec
2. High temperature endurable probes
3. 90° Phase shifted admittance measurement
4. Easy calibration with or without material
5. Remote electronics with std 10 meters cable length
6. Electrostatic discharge protected electronics
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. Vibration complied as per IEC 60068 part 2-6
14. Low power consumption
15. Active shield compensation against material build-up

Applications

1. Suitable for all sticky/non-sticky bulk solids & liquids
2. Suitable for side as well as top mounting
3. Minimum and maximum failsafe field selectable
4. Process temperature max 600°C (ceramic insulation)
5. Process pressure max. 15 bar

Typical Mountings



Specifications

EIUD / ERUD	Integral / Remote Electronics DPDT Output
Supply & Output	Universal Power Supply, DPDT Relay Output 15 to 80 VDC and 15 to 260 VAC 50/60Hz Potential Free DPDT Relay Output
Relay Type	5 A each @ 24VDC or 220VAC
EIDP / ERDP	Integral / Remote Electronics for PNP Output
Supply & Output	15 to 60 VDC, PNP
Output Limit	250mA max. Short Circuit Safe
Sensor Cable	Remote electronics require special admittance cable from probe to controller. 10 meter standard length more available on demand
Min. Dielectric Constant	1.6 (non-hygroscopic)
Ambient Temp.	-20 °C ... 80 °C (-4 °F ... 176 °F)
Process Temp.	-20 °C ... 100 °C (-4 °F ... 212 °F)
Extended Process Temperature	PTFE Insulation: -30 °C ... 250 °C (-22 °F ... 482 °F) Ceramic Insulation: -30 °C ... 600 °C (-22°F ... 1,112 °F) (extensions & heat sinks required)
Process Pressure	absolute / max. 15 bar (with PTFE insulation) absolute / max. 2.5 bar (with Ceramic insulation)
Wetted Parts	SS-304, SS 316, SS-316L, PTFE, part ceramic
Process Connection	NPT / BSP 1", 1¼", 1½", 2" etc Flanged : ANSI/JIS/DIN/ASA/custom
Vibration Test	As per IEC 60068 part 2-6 sinusoidal, 10-55Hz, 0.15mm
Probe Insertion Length:	
Rigid Rod	50mm to 3,000mm
Flexible Rope	100mm to 20,000mm

Specifications are subject to change without prior notice

Trumen®
sensing matters

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