

CAPACITANCE TYPE LEVEL SWITCH FOR LIQUIDS & SOLIDS



IPS-LS-06

TECHNICAL SPECIFICATION

PRODUCT OVERVIEW

IPSPL capacitance type point level switch model IPS-LS-06 is suitable for conductive and nonconductive liquid, solid and powder & use in all process industries like food, beverages, chemical, pharma, oil & gas, water treatment plant, cement, and many more. IPSPL IPS-LS-06 is fully, partially PTFE & ceramic insulated and available in rigid rod probe & flexible rope probe for point level detection of bulk solids and liquids. LMC is available for various service temperatures from regular 80 °C to 600 °C.

OPERATING PRINCIPLE

Capacitance type limit switch is a static level sensor, its sensing parts are:-

- Earth Extension (body)
- Sensing Rod (or Rope as per application)

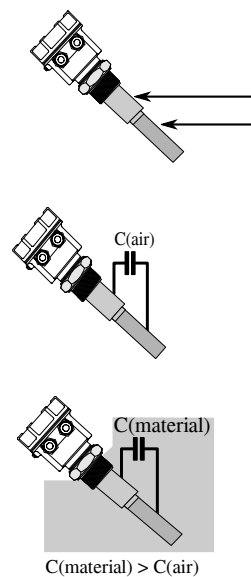
The capacitance is formed by the sense rod and earth extension.

When material is absent, the capacitance is analogically a multiple of probe dimension and dielectric constant of air $\{\epsilon(\text{air}) \approx 1\}$.

When material is present, the capacitance gets multiplied by dielectric constant of the material.

This variation in capacitance, which is due to the dielectric property of material, is then translated into switching output by the device.

With two point independent type switches, two different values are mapped to two different outputs and thus only one level switch can provide two different level outputs.



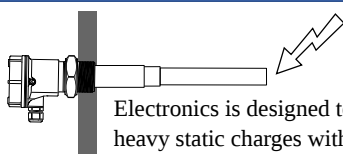
APPLICATIONS

Capacitance level switch probe is used in different applications like

- Water
- Paints
- Animal feed
- Rice plants
- Soya plants
- Dye powder
- Edible oil
- Milk powder

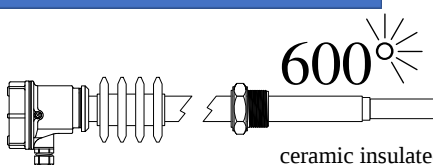
- Chemical
- Cement
- Food & Beverages
- Diesel
- Pharma liquids
- Resins
- Gypsum
- Corrosive liquid

Static Charge Safe



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

High Temperature Probes



ceramic insulated probe for 600°C applications

FEATURES

- Compact size
- Fast switching response
- Low power consumption
- Durable construction
- Easy calibration via DIP switch
- Single sensor allows pump-control & multi-point switching
- High temperature endurable probes
- External indication LED available
- Ingress protection : IP 67/68 (as per IS/IEC 60529:2001)
- Electronic inserts support all requirements
- Process temperature max 600°C
- Process pressure max. 20 bar
- Rigid rod / flexible rope probe version
- Threaded / flanged / customized process connections
- Remote electronics with as standard 10 meters cable length

Performance Specifications

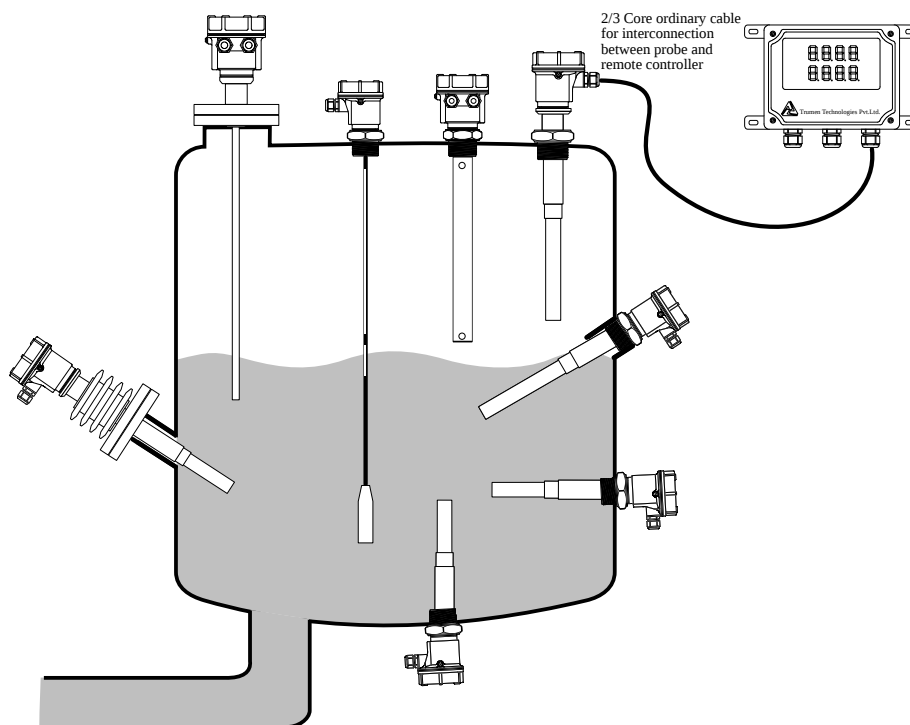
Parameter	Description
General	
Min. Dielectric Constant	1.6 (non-hygroscopic)
Reproducibility	±0.1 %
Accuracy	±0.3 %
Influence of medium temperature	Max +2 to -3 mm (-20 to +150 °C)
Sensor Cable	Remote electronics require special interconnection cable from probe to controller 5 meter standard length
Process	
Ambient Temperature	-20°C ... 70°C (-4°F ... 158 °F)
Process Temperature	-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	(*Note- Ceramic part insulation probe suitable for non-conductive or low dielectric material only) Absolute / max. 20 bar
Physical Specifications	
Wetted Parts	SS 316, SS 316L, PTFE, Part ceramic
Process Connections	NPT / BSP 1", 1-1/4", 1-1/2", 2" & Triclover 1-1/2", 2" and Flanged ANSI / JIS / DIN / ASA / custom
Probe Insertion Length	Rigid Rod Probe: 50mm to 3,000mm, Flexible Rope Probe: 100mm to 20,000mm

Approvals & Certifications

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

Specifications are subject to change without prior notice

Typical Installation



Performance Specifications

Parameter	Description	Electrical Connection
Electrical		
EIUDD / ERUDD Supply Output Relay Rating	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz 1 DPDT potential free relay contact output 5 A each @ 24VDC or 220VAC	
EIUSI / ERUSI Supply Output Relay Rating	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz 2 SPDT relay contact output for 2 single point independent sensing 6 A each @ 24VDC or 230VAC	
EIUSP/ERUSP Supply Output Relay Rating	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz 2 SPDT relay output for 2 individual pump control switching 6 A each @ 24VDC or 230VAC	
EIDPD / ERDPD Supply Output Output Limit	Integral / Remote Electronics 12 to 60 VDC PNP output 1 single / 1 pump control field settable 250mA max. Short Circuit Safe	
EIUISH / ERUSH Supply Output Relay Rating	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz 2 SPDT relay output for 1 single point and 1 pump control 6 A each @ 24VDC or 230VAC	
EINL Supply Output	NAMUR (L-H / H-L) as per IEC-60947-5-6 8.2 VDC ≤1.2mA & ≥2.1mA NAMUR output, 1KΩ series resistance	
EIDL Supply Output Output Limit	Integral Electronics 15 to 60 VDC 4-20mA loop powered single / pump settable two wire DC 8 / 16 mA 8mA (-1mA max) / 16mA (+1mA max)	
ER2SR/ER3SR Supply Output Relay Rating	Remote Electronics 80-270VAC, 50/60Hz Dual / Three SPDT relay output, normal shielded cable 5 A each @ 24VDC or 220VAC	Electrical connection depends on selected model code
EIFDS/ERFDS	Integral /Remote Electronics Specially designed with special output	Electrical connection depends on selected model code

Ordering Information

IPS-LS-06 **Hxx** - **Tx** - **Rx** - **Sx** - **Ix** - **Gx** - **Wx** - **Px** - **Cx** - **Exxx** - **Lxxxx**

Enclosure

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

Material Temperature

T1 = max 80°C
 T2 = max 200°C
 T3 = max 250°C
 T4 = max 600°C
 TS = Customer Specified Special designed

Sensor rigid / flexible type

RD1 = Single Rigid Rod Probe
 RD2 = 2 in 1 Rod Probe
 RL1 = Single Flexible Rope Probe for Liquids (5mm)
 RL2 = 2 in 1 Rope Probe
 RPS = Flexible Rope Probe for Solids (6mm)
 RPT = Flexible Rope Probe for Solids (12mm)
 RS = Specially designed probe

Sensing Rod/Rope Material

S4 = SS 304
 S6 = SS 316
 SL = SS 316L
 SS = Special Surface

Insulation type

I0 = None
 IP = Partly PTFE insulated
 IT = Full PTFE insulated
 IC = Partly ceramic insulated

Inactive Length or Sensor Extension Material

G0 = None
 G4 = SS 304
 G6 = SS 316
 GL = SS 316L
 GS = Special material

Stilling Well Material

W0 = None
 W4 = SS 304
 W6 = SS 316
 WL = SS 316L
 WS = Special material

Insertion Length

Rigid Rod Probe:
 50mm to 3,000mm
Flexible Rope Probe:
 100mm to 20,000mm

Electronics (Refer page 3 for detail description)

EIUDD = 1 DPDT relay O/P
 EIUSI = 2 SPDT relay O/P for 2 single point
 EIUSP = 2 SPDT relay O/P for 2 individual pump control switching
 EIUSH = 2 SPDT relay O/P for 1 single point and 1 pump control
 EIDPD = PNP O/P for 1 single / 1 pump control
 EINL = ≤1.2mA NAMUR (L-H) & ≥2.1mA NAMUR (H-L) O/P
 EIDL = 4-20mA loop powered O/P
 EIFDS = Special O/P
 ERUDD = Remote Electronics with 1 DPDT relay O/P
 ERUSI = Remote Electronics with 2 SPDT relay O/P
 ERUSP = Remote Electronics with 2 SPDT relay O/P
 ERUSH = Remote Electronics with 2 SPDT relay O/P
 ERDPD = Remote Electronics with PNP O/P
 ERFDS = Remote Electronics with special O/P
 ER2SR = Remote Electronics with Dual SPDT O/P
 ER3SR = Remote Electronics with Three SPDT O/P

Process Connection Material

C4 = SS 304
 C6 = SS 316
 CL = SS 316L
 CS = Special Material

Process Connection Type

PB1 = 1" BSP
 PB2 = 1-1/2" BSP
 PB3 = 3/4" BSP
 PB4 = 1-1/4" BSP
 PB5 = 2" BSP
 PB6 = 1/2" BSP
 PN1 = 1" NPT
 PN2 = 1-1/2" NPT
 PN3 = 3/4" NPT
 PN4 = 1-1/4" NPT
 PN5 = 2" NPT
 PN6 = 1/2" NPT
 PT1 = 1-1/2" Triclover / Triclamp
 PT2 = 2" Triclover / Triclamp
 PFL = Flanged Type (Fxxx)
 F001 = 1/2" B16.5 ANSI/ASA 150#RF
 F002 = 3/4" B16.5 ANSI/ASA 150#RF
 F003 = 1" B16.5 ANSI/ASA 150#RF
 F004 = 1-1/4" B16.5 ANSI/ASA 150#RF
 F005 = 1-1/2" B16.5 ANSI/ASA 150#RF
 F006 = 2" B16.5 ANSI/ASA 150#RF
 F007 = 2-1/2" B16.5 ANSI/ASA 150#RF
 F008 = 3" B16.5 ANSI/ASA 150#RF
 F009 = 4" B16.5 ANSI/ASA 150#RF
 F010 = 5" B16.5 ANSI/ASA 150#RF
 F011 = 6" B16.5 ANSI/ASA 150#RF
 PCS = Special Process Connection



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CIN : U52399MH2021PTC368555