Capacitance Type Level Switch for Liquids - CPS

Techtrol™
Innovating Level Controls Since 1984

Salient Features :

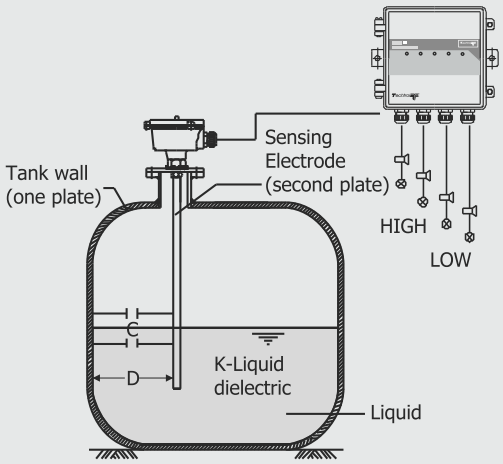
- ☑ Cost effective with no moving parts.
- ☑ Easy to install with field adjustable switch points.
- ☑ Settable fail safe mode.
- ☑ Variety of electrode constructions to suit wide range of services.

Construction & Operation (Fig. 1) :

The switch is available in two versions - Integral & Two Part. In the integral system, the controller is integral with the probe. In two part system, the controller is separate from the probe and can be mounted remotely. The probe is top / side (inclined) mounted.

The measuring principle is based on the value of capacitance formed between the sensing and metallic tank wall (ground electrode), which varies with the liquid level. The capacitance is sensed and converted into voltage signal for relay actuation.

Fig 1



$$C = \frac{K A}{D}$$

K= Dielectric constant
A= Area of sensing electrode
D= Distance between the plates
C= Capacitance

Specifications :

Sensing Probe

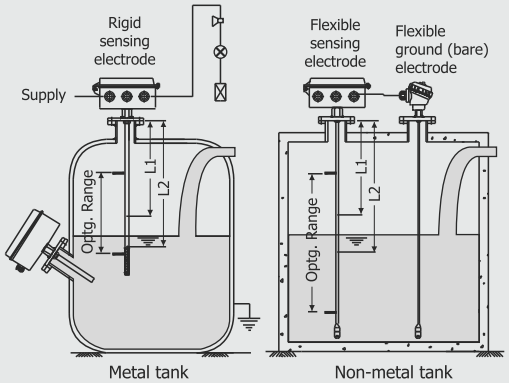
Enclosure	:	Cast Al IP66 or ABS x IP65
Cable Gland	:	PG11, Polyamide
Probe Type	:	Rigid Electrode- Range : 200-1500mm, Flexible Electrode - Range : 1500-5000mm Concentric Pipe Electrode - Range : 200-1500mm. (for low dielectric liquids)
Installation	:	Top / Side
Sensing Electrode	:	SS304 or SS316 PTFE insulated.
Ground Electrode	:	Bare or PTFE insulated for corrosive applications.
Process Conn.	:	40 NB flange / 50 mm triclover ferrule for metal tanks. 65 NB flange / 80 mm triclover ferrule for non-metal tanks.
Max Temperature	:	60°C
Max Pressure	:	5Kg/cm²

Controller

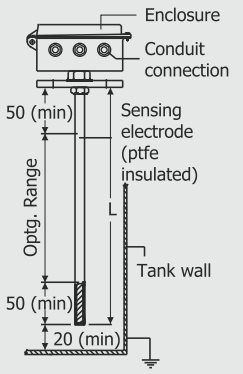
Enclosure	:	Cast Al IP 65
Enclosure Dimns	:	Sq. 147mm x 75mm Ht
Conduit Conn.	:	Polyamide PG 11
Power Supply	:	90-270 VAC, 50-60 Hz or 24 VDC
Control Set Points	:	Max. Four
Output	:	SPDT 5A, 250 VAC / DPDT(Optional)
Operating Diff.	:	15 to 20mm
Indication	:	LED indication for power & relay status
Safety Operation	:	Field selectable failsafe high & low
Capacitance Range	:	100 to 5000 pf
Dielectric constant	:	> 1.8
Accuracy	:	±1%
Repeatability	:	±0.5%

Installation :

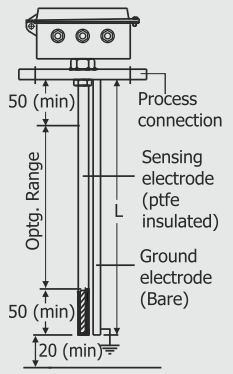
Fig 2



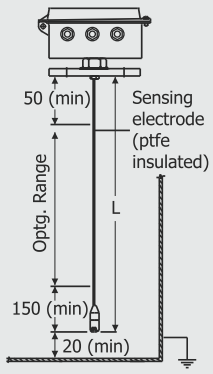
Electrode construction : Fig. 3



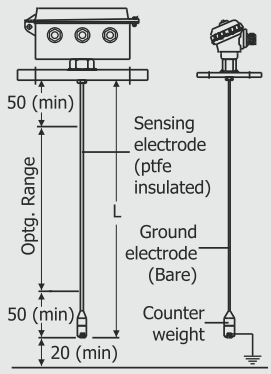
Sensing electrode for metal tanks.



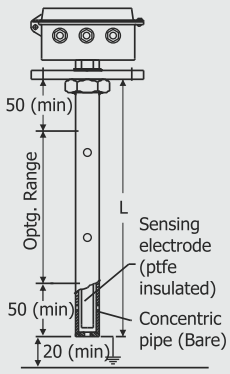
Sensing + ground electrode for non-metal tanks.



Sensing electrode for metal tanks.



Sensing & ground electrode for non-metal tanks. (separate mtg)



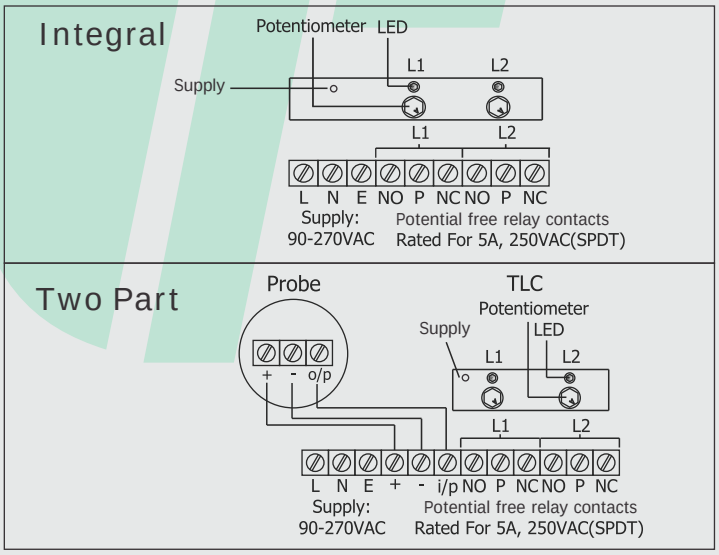
Sensing + ground concentric pipe for metal & non-metal tanks.

Field Setting of Switch Points :

Each Switch Point should be set individually at site, based on the actual dielectric constant of the process liquid, under operating conditions as per following procedure :

1. Wire the capacitance switch as per fig.4 & install it on the tank.
2. The tank should be filled with actual process medium under operating conditions, upto the desired switch point for the respective switch to be set. Rotate the potentiometer of the switch in question clockwise or anticlockwise, till its corresponding "LED" glows.
3. Repeat (2) for all switch points.
4. Empty the tank and refill it, to verify the correctness of all switch points under site conditions. Now, the instrument is set for desired switch points and ready for use.

Termination & Wiring : Fig. 4



Ordering Information :

Model No. along with Probe Length, Optg. Pressure & Temp. and Dielectric Constant of Liquid.

Applications :

Water, Milk, Oil, Syrup, Pulp

Model Identification :

CPS - [ ][ ][ ][ ][ ][ ][ ][ ]

System
- Integral — I
- Two part — T

Enclosure (Electrode x Control Unit)
- Cast Al, IP65 (Syst-I) — 1
- Cast Al, IP65 x Cast Al, IP65 (Syst-T) — 2
- ABS IP65 X Cast Al, IP 65 (Syst-T) — 3
- Others — O

Electrode Construction
- Rigid sensing electrode — A
- Rigid sensing + ground electrode — B
- Flexible sensing electrode — C
- Flexible sensing & ground electrode (separate mtg) — D
- Rigid sensing +ground concentric pipe — E

Electrode MOC
- SS 304 — N
- SS 316 — S
- Others — O

Electrode Insulation
- PTFE — T
- Others — O

Process Conn. MOC
- SS 304 — N
- SS 316 — S
- Others — O

Process Connection Size
- 40 NB ANSI 150 # (electrode config A & C) — 1
- 65 NB ANSI 150 # (electrode config B, D & E) — 2
- 50mm Triclover Ferrule (electrode config A & C) — 3
- 80mm Triclover Ferrule (electrode config B,D & E) — 4
- Others — O

Set Points x O/P Contacts
- One x SPDT — 1
- One x DPDT — 2
- Two x SPDT — 3
- Two x DPDT — 4
- Three x SPDT — 5
- Four x SPDT — 6
- Others — O

*All dimensions are in mm except specified

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