

# INSTRUCTION & MAINTENANCE MANUAL

## Capacitance Type Level Switch for Liquids-"CPS"



Innovating Level Controls since 1984

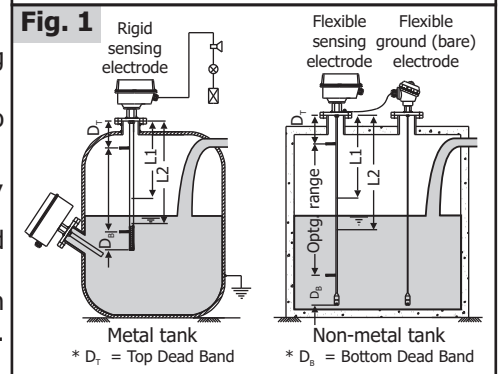
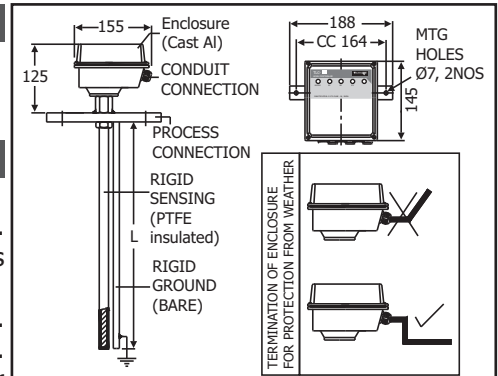
### Pre Installation Check :

- Ensure that the probe insulation is not damaged in transit.
- Ensure that there is not any damage to electronics.
- Ensure probe received is as per specifications.

### Installation :

Probe is installed top / side (inclined) mounted.

1. Select suitable location for probe on tank where turbulence are minimum.
2. Probe should be located such that direct flow of material on the probe is avoided.
3. Ensure that process connection of level switch match with those on tank.
4. Sensing electrode should be parallel to ref. probe / tank wall.
5. Electronics should be protected from direct sunlight in case of outdoor installation.
6. In two part system, controller is wall mtg. and fitted via two mounting holes provided on enclosure.
7. Ensure that mounting surface for controller is flat and not subjected to vibrations.
8. Controller should not be in close proximity with high voltage cables, contractor / drive control.
9. It should not be mounted in confined space where temperature may exceed the rated temperature.
10. Controller is provided with 8 pin DIP switch. Various combinations of switch can be used for FSH, FSL and latching operation between the level set points. Follow the table below for the same.



### DIP Switch Setting and Logic Combinations :

Condition	Set.pt.	DIP Switch setting	Relay / LED Status
FSL	1 & 2	DIP1  ON (SW2 for set pt.2)	Relay / LED 1 & 2 are intially OFF
	3 & 4	DIP2  ON (SW7 for set pt.3)	Relay / LED 3 & 4 are intially OFF
Latch	1 & 2	DIP1  ON	Relay / LED 2 is intially ON
	3 & 4	DIP2  ON	Relay / LED 4 is intially ON
FSH	1 & 2	DIP2  ON (SW1 for set pt.2)	Relay / LED 1 & 2 are intially ON
	3 & 4	DIP1  ON (SW8 for set pt.3)	Relay / LED 3 & 4 are intially ON

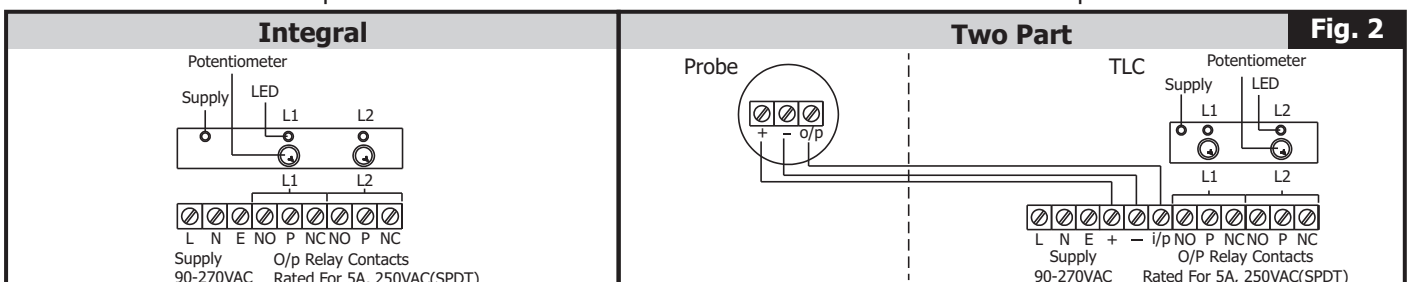
**LED ON = Relay energised**

**FSH (Fail safe high) :** When level reaches at and above set point, relay will be de-energised and LED off.

**FSL (Fail safe low) :** When level reaches at and below set point, relay will be de-energised and LED off.

### Termination & Wiring :

1. Connect proper Supply of (90-270VAC) / 24VDC to switch. In case of 24VDC supply, ensure polarity is correct.
2. While wiring, power supply should be strictly OFF.
3. In case of two part system, connect wires from probe to controller with correct polarity.
4. Ensure distance between probe and controller is < 500mtrs and wired thru 3 core x 1.5mm<sup>2</sup> pvc insulatd cable.



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## Precautions :

- Ensure switch is duly earthed.
- Supply wiring should run away from power cable, contactor, motor.
- Enclosure of probe and controller is closed with its cover & gasket, there is no gap between 'cable OD' and 'cable gland ID'.
- Before turning on the power supply, ensure all the wiring is correct and completed.
- In case of Inductive load use of suitable snubber across contactor / relay coil and MOV across NO contact of relay is recommended.

## Field Setting of Switch Point :

Each switch point should be set individually at site with the actual dielectric constant of the process medium under operating conditions by using following procedure.

1. Wire the capacitance switch (refer fig. 2.)
2. The tank should be filled with actual process medium under operating conditions, upto the desired level where the respective switch to be set. Rotate the potentiometer of the switch in question clockwise or anticlockwise till its corresponding LED glows.
3. Repeat pt. 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.

## Periodic Maintenance :

- Tighten the terminals and check electric connections if loose.
- Tighten nuts and bolts of process connection.
- Visually check for any damage to electrode insulation and clean electrode periodically.
- After maintenance, close enclosure with its cover and gasket for weather proofness.

## Trouble Shooting :

Fault / Defect	Cause	Solution
Switch not working / Dead.	a. Improper Supply. b. Fuse blown.	a. Check power supply connection. b. Replace fuse (500mA for 230VAC) (250mA for 24VDC).
No detection	a. Loose connections a. Improper of switch setting b. Incorrect installation of probe c. Wrong DIP switch setting d. No signal from probe e. Electrode insulation damaged. f. Twisting of electrode in case of flexible electrode. g. Dielectric constant of liquid is too low. h. Build up of material on electrode	a. Tighten the terminals. a. Refer switch setting procedure. b. Refer installation procedure. c. Refer DIP switch setting. d. Check wiring. e. Contact factory. f. Remove twisting of electrode and adjust spacer. g. Contact factory. h. Clean electrodes periodically.
Relay chattering	a. Loose electric connections inside the controller. b. Loose probe mounting. c. Variation in dielectric constant. d. Turbulance in liquid.  e. Electronics faulty.	a. Tighten the terminals.  b. Tighten bolts of process connection. c. Consult factory. d. Select suitable location on tank or use still well. e. Consult factory.

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