

PUNE TECHTROL PVT LTD

**Instruction and
Maintenance Manual
for Submersible
Level Transmitter -
SLT**

**INSTALLATION, OPEARTION and MAINTENANCE MANUAL
FOR SUBMERSIBLE LEVEL TRANSMITTER 'SLT'
AND HYDROSTATIC LEVEL TRANSMITTER 'HLT'**



It is an accurate & reliable transmitter for continuous level measurement of clean, non- aggressive liquids in bore wells, reservoirs, sumps & dams under atmospheric conditions.

Construction and Working:

It is a piezo resistive level transmitter consisting of a highly stable sensor with relevant electronics mounted inside a stainless steel housing. The extended polyurethane cable containing one capillary tube and two electrical wires is tightly sealed to the probe housing to provide leak proof joint . (fig 1a) The SS diaphragm (sensor) inside the probe is protected through a cap, which allows free access of liquid to the diaphragm. When installed in a tank, hydrostatic pressure proportional to submerged depth acts on diaphragm, which is compared with atmospheric pressure in the capillary tube and converted into an electrical signal to be amplified into 4-20mA output. Probe housing provided with IP68 protection can be continuously submerged into liquid without any problem.

Refer Fig 1b for side mounted type transmitter.

Unpacking, storage and handling:

1. Unpack the box carefully so that protective casing of transmitter cable does not get damaged.
2. Visually check & ensure that transmitter & its cable is not damaged in transit.
3. Pl. ensure that transmitter’s cable length is as ordered.

Fig 1a

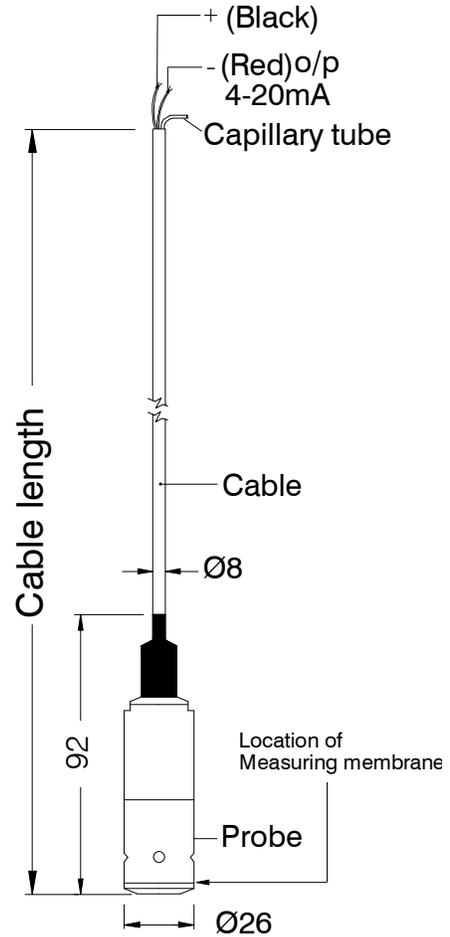
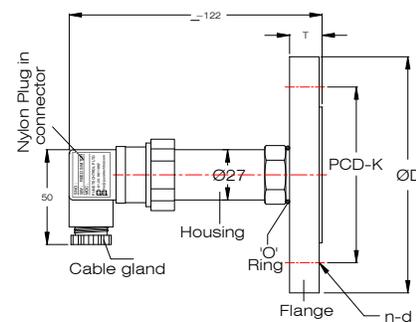


fig 1b



4. Transmitter should be stored in dry & non corrosive area at ambient temperature.
5. During transportation, the probe cable should be wound in 300mm dia. circle to ensure capillary tube inside the cable is not damaged mechanically

Specifications :

1	Standard Ranges	1, 2, 3, 5, 8, 10, mtrs (Larger range available on request)
2	Out put	4 - 20 mA, 2 wire
3	Supply voltage	12 - 28 VDC
4	Accuracy	0.5% FS
5	Long term stability	0.5% / year
6	Max temperature	80°C
7	Cable MOC	Polyurethane
8	Probe MOC	SS316
9	Protection	IP 68
10	Diaphragm MOC	SS316L
11	Over Pressure Limit	2 times FS
12	Load (Ohm)	$<(\text{Supply Volt} - 12)/0.02$

Precautions before installation:

1. Before installation, ensure that static hydro pressure inside the tank is within maximum pressure range of respective x'mitter.
2. Pl. ensure that MOC of x'mitter is compatible with liquid.
3. Pl. ensure that measuring liquid does not contain any sharp suspended particles, as they may damage diaphragm resulting in wrong output.
4. During installation handle the transmitter probe assembly carefully to prevent its cable from any mechanically damage.
5. The extended cable provided with probe should not be cut/shortened at site.

Installation:

1. Mounting location should be away from turbulence, strong flow, pump suction area, to ensure that suspended cable remains stationary and not subjected to any undue motion and get damaged in the process.

Top mounting-

2. Whenever the cable may be subjected to above conditions(1) or tank depth is very large, cable should be reinforced by running a nylon rope along its length (fig 3) or use still well (fig 2)
3. In case of transmitter without process connection, the upper cable end should be securely located at the tank top by a suitable clamp or hanger. (fig 2)
4. Ensure tank nozzle flange is matching with instrument process flange.
5. Use appropriate gasket between the process flange to ensure no leakage.
6. Cable length can be extended through a weather proof junction box by using standard signal cable.
7. The transmitter probe cable should be terminated in a weather proof junction box, ensuring that the capillary tube is properly vented to atmosphere w/o any water or other contaminants entering the capillary tube. (fig 3)

Side mounting -

8. In case of installation of side mounted transmitter, fig 4. it is recommended to use isolation valve for safety and removal of transmitter for repairs and maintenance.
9. Bolt one side of ball valve on the tank nozzle flange with appropriate gasket between the two flanges and other side of valve with transmitter flange.

Note - Mount x'mitter in such a way that bottom of probe remains above the sediment level, (approx 100mm) as deposition of sediments on the sensor will give incorrect output. fig 3

Installation Methods

A) Installation Top Mounting

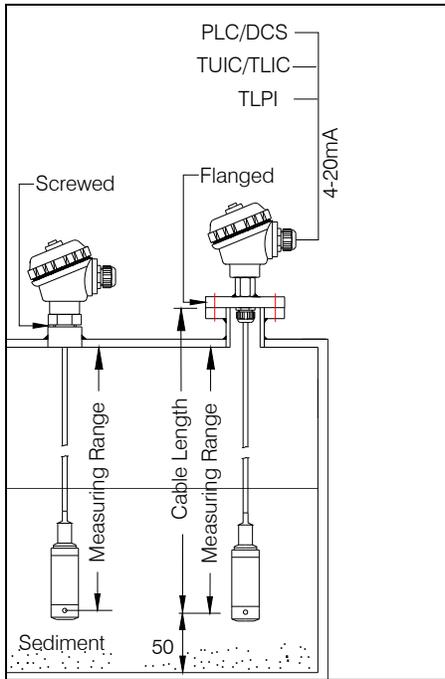
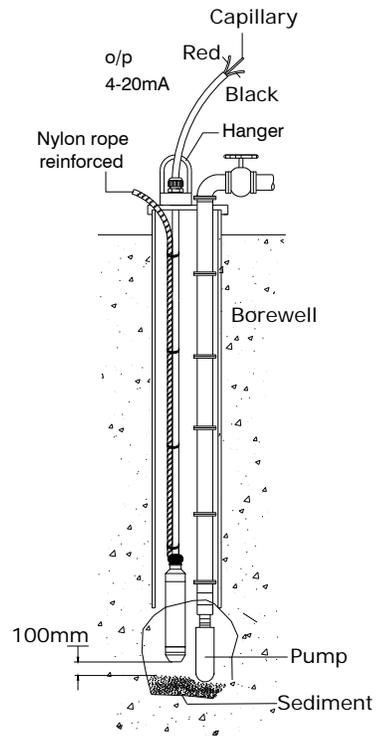


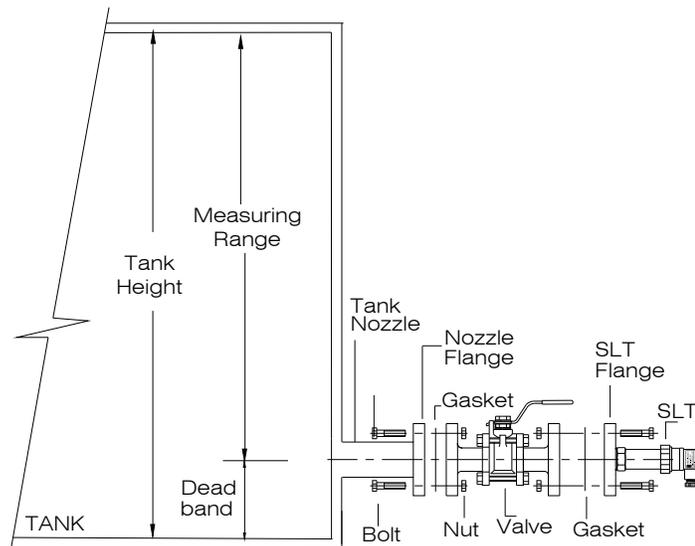
fig 2

fig 3



B) Installation Side Mounting

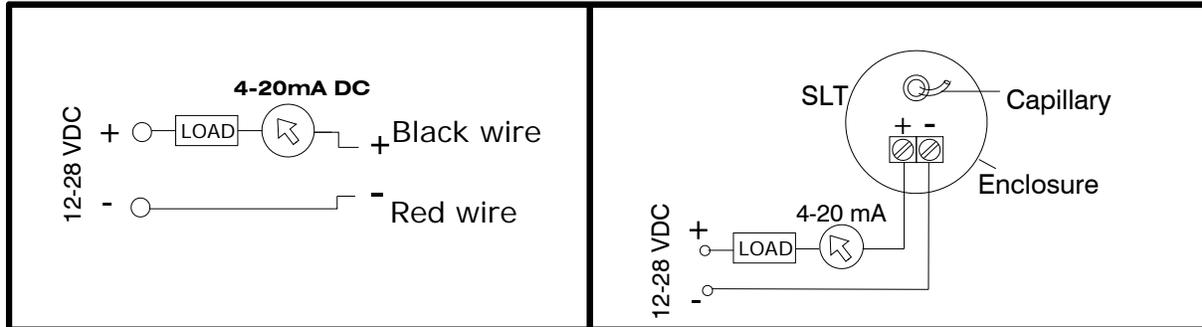
fig 4



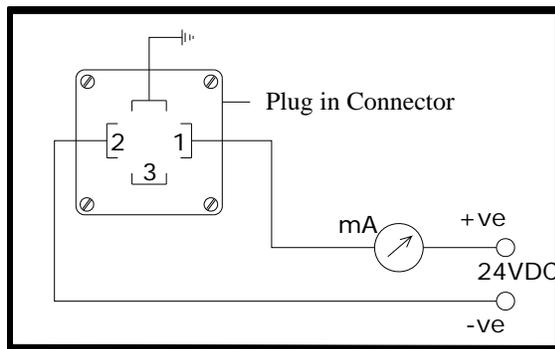
Terminations:

Fig 5

a) SLT (Top Mtd) supplied w/o enclosure b) SLT (Top Mtd) supplied with enclosure



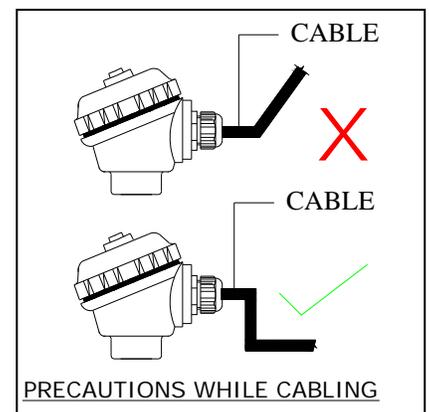
c) SLT (Side Mtd)



Precautions:

1. Before switching on the supply, please ensure that electrical wiring is done with correct polarity.
2. Transmitter cable should be kept at a distance from power cable, contactors / motors.
3. Ensure enclosure is closed properly along with its gasket in place and there is no gap between 'cable OD' and 'cable gland ID' to maintain weather proofness (IP65), to prevent water or other contaminants from reaching the capillary tube.
4. Refer terminations for wiring, fig 5a for top mounted SLT

Fig 6



without enclosure, fig 5b for top mounted SLT with enclosure and fig 5c for side mounted SLT with nylon plug in connector.

5. After wiring, ensure cable is routed downward before cable gland to prevent seepage of water in the enclosure. (fig 6)
6. Do not bend transmitter cable at sharp angle to prevent damage of capillary tube.
7. In case of side mounted

Preventive maintenance:

1. Ensure enclosure is closed properly along with its gasket in place.
2. Clean diaphragm periodically with soft cotton. Do not clean with hard wire brush
3. Do not apply excessive pressure on diaphragm or use high pressure water jets while cleaning.
4. Check cable for any cracks or breakages.

Troubleshooting:

SL	Fault	Cause	Remedy
1.	No output	1. Incorrect wiring 2. Loose terminals	1. Check and connect wires with correct polarity. (fig 4) 2. Check and tighten loose terminals
2	Incorrect output	1. Incorrect supply 2. Capillary tube not open to atmosphere due to bend or entry of water in it	1. Ensure supply is within 12-28VDC. 2a. Remove bend 2b. Remove water from capillary tube
3	Variation in o/p current	1. Liquid turbulence	1a. Use still well 1b. Re-enforce x'mitter cable with nylon rope 1c. Locate it in turbulence free location.