

INSTRUCTION AND MAINTENANCE MANUAL

Techtrol Ultrasonic Level Transmitter for Liquids - **Ultratrol**

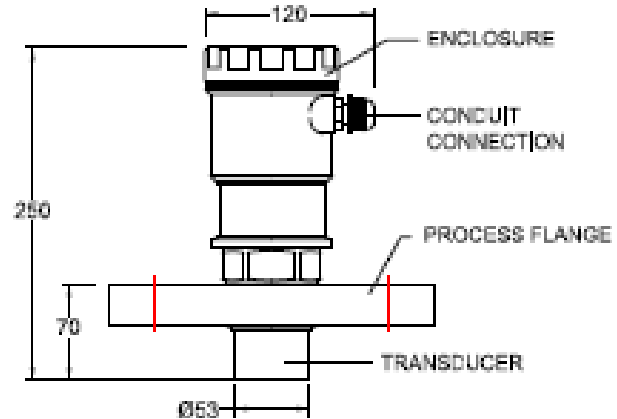


Fig 1

Pre- Installation Check

- Unpack the box carefully and visually check & ensure that transmitter is not damaged in transit.
- Ensure that the supplied transmitter is as per ordered.

Installation Guidelines

Ensure the following during location and mounting of transmitter

General

- Installation must be carried out by trained personnel
- Ensure that the ambient temperature and process temp must be within specified limits.

Location of transmitter

- In outdoor location, transmitter electronics should be protected from severe weather conditions and direct sunlight, by use of canopy.
- The location should not have any strong wind/ breeze or turbulence in vessel which may disturb ultrasonic signal.
- Distance between tank wall and transmitters center line should be at least 110mm/ meter of its measuring range. (fig 3)
- In closed tank with concave cover, transmitter should be mounted 'off-centre' and 'vertical' to minimize creation of unwanted echoes.(fig 4)
- Obstructions like(ladder, agitator, jutting tank wall) should not come in the way of ultrasonic beam (fig 5)

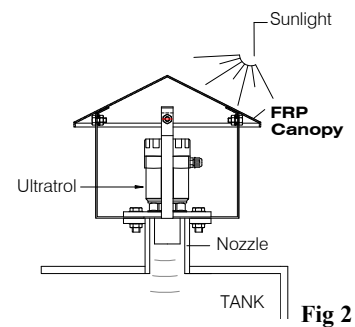


Fig 2

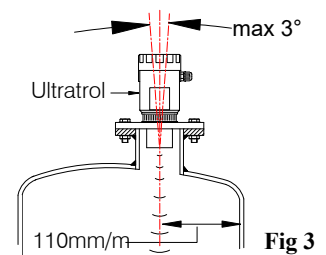


Fig 3

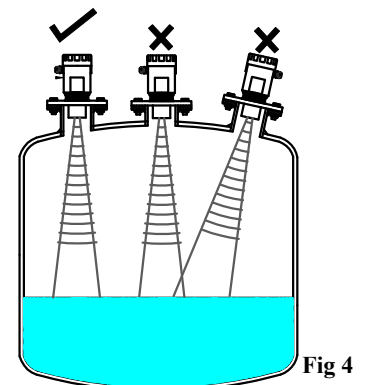
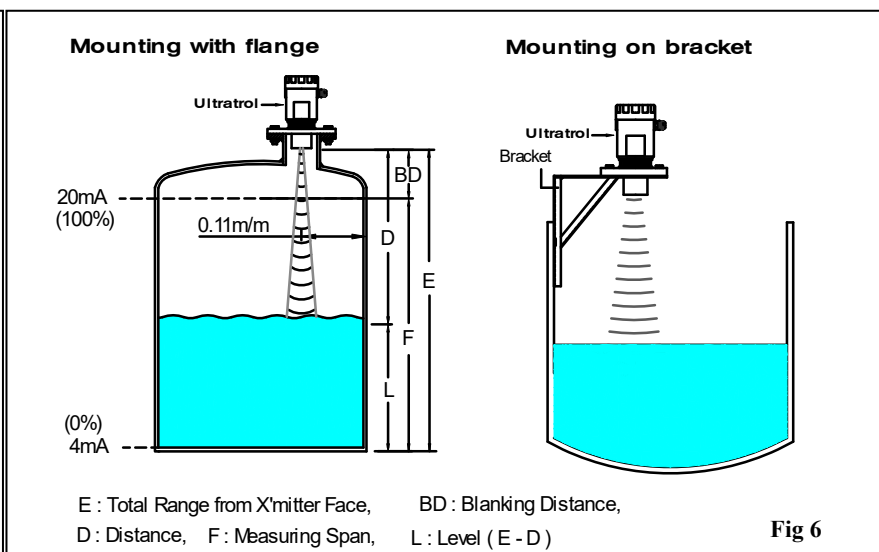
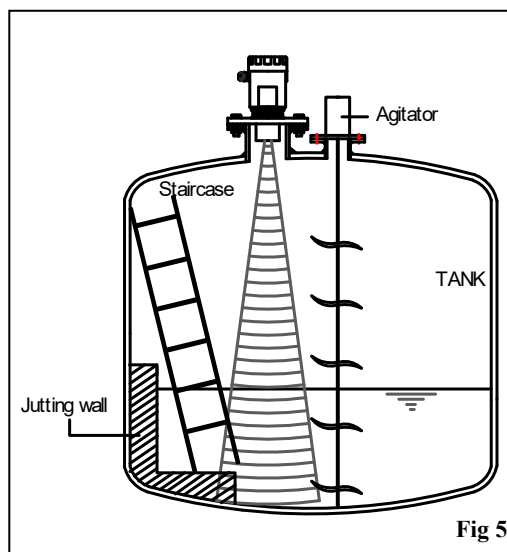


Fig 4

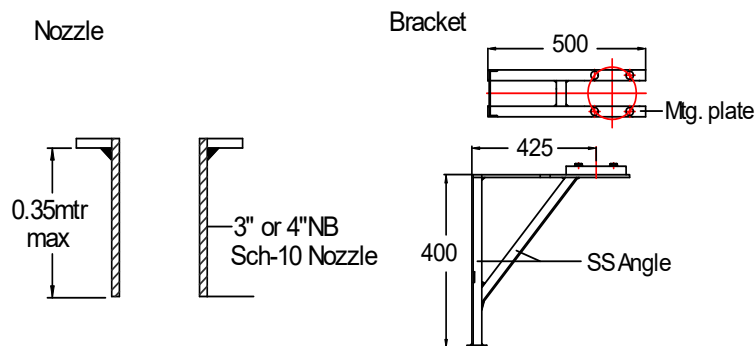
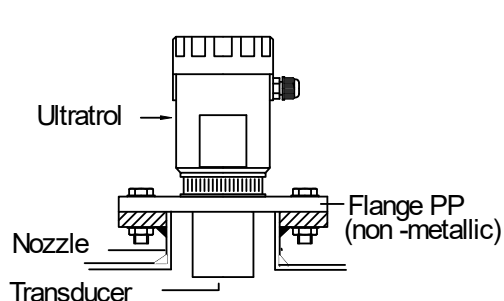
Liquid surface conditions

- In case of excessive turbulence in liquid, use of **still well** is suggested.
- Not suitable for foaming liquids and application where heavy condensation could form on the transducer face.



Mounting considerations

- Away from a source of electrical noise like variable speed drive or other high powered electrical devices.
- Transmitter flange should be of PP material (non-metal) and equivalent to counter flange on tank. (fig 7)
- While mounting the transmitter on nozzle, ensure that its face protrudes at least 5 mm into the tank. (fig.7) If this is not possible, ensure nozzle dimensions are as indicated in (fig.8)
- The mounting nozzle should be welded in plumb to the tank and be free from internal weld beads or other projections.
- Ensure maximum liquid level does not come within blanking distance (dead zone) of transmitter.
- Fixing of bracket to the tank should be in right angle to ensure mounting of Ultratrol is perpendicular. (Fig 6 & 8)
- Mount transmitter perpendicular to liquid surface to ensure good echo from liquid surface.



Termination & Wiring

- During wiring of transmitter, supply should be kept **off**.
- Open the enclosure cover and wire transmitter to power supply 24VDC + 10 % with **correct polarity** by using 2 core screen cable and its output 4-20 mA can be used further to interface with PLC or SCADA. (fig 9)

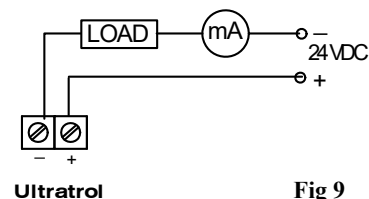


Fig 9

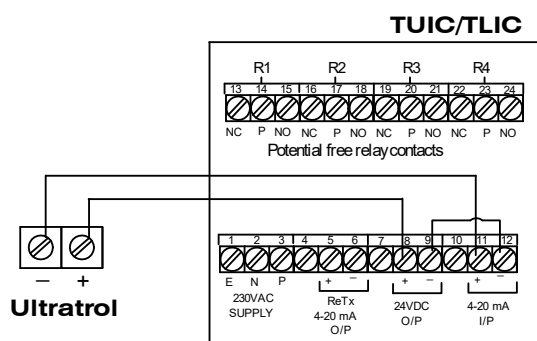


Fig 10

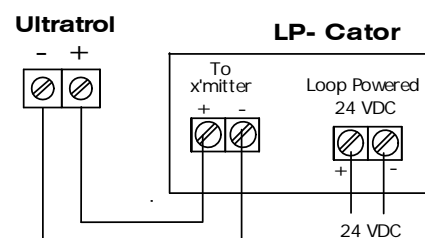


Fig 11

- Refer figure 10 & 11 for wiring of transmitter to Techtrol Indicator Controller (TUIC/TLIC) and Loop Powered Indicator (LP-Cator)
- **Max Cable run** from Ultratrol to control room should be **< 100 mtrs**

Precautions

- Before power on, ensure device is connected with correct polarity
- Ensure x'mitter enclosure is closed properly with its cover & gasket.
- After wiring, ensure cable is routed downward before cable gland to prevent seepage of water in the enclosure. (fig 12)
- Ensure cable should be full tight in gland zero gap between 'cable gland ID' and 'cable OD'.

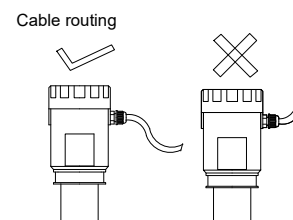


Fig 12

Programming

Transmitter is programmed through keys, in conjunction with display. Correct programming is essential for obtaining accuracy, reliable performance and measurement.

Quick Programming Flow Chart for Ultratrol

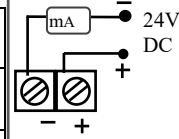
Key Functions

- FN** Not in use
- SET** SET - To enter in program menu or save changes or move to next sub menu
- ▲** INC - Scroll up to increment value; shift up
- ▼** DEC - Scroll down to decrement value; shift down

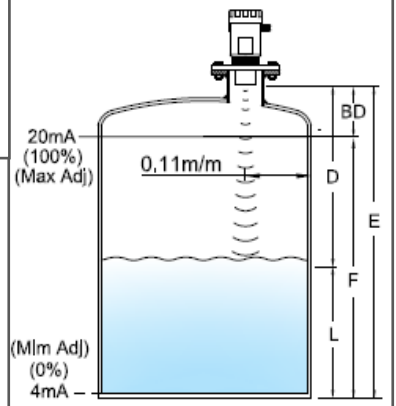
Table 1

	Measuring Range	Blanking Distance
Ultratrol 1	5 mtrs	300 mm
Ultratrol 2	10 mtrs	400 mm

Termination



Level Measurement



BD= Dead band (Blanking Distance), D= Distance
Input Bottom Distance (E) = (BD + F) = Total Span
F = Measuring Range, L= Level (E-D)

Run Mode Display

L : 10.032 m ← Level in mtr
D : 0.468 m ← Distance in mtr
19.99 mA 29.7 °C ← Temp
running

SET Long Press for 2 Sec

0 Quit
1 Factory Set
2. User Set



Parameter Set

SET
Input Bottom Distance
5.000 m

Edit Value

▲ ▼
Input Bottom Distance
5.000 m

SET

Input Bottom Dist. = Total Span (E)
= Blanking Distance+ Measuring Range
= 300 + 4700 mm = 5000 mm
Refer Table 1 and figure

SET
Measurement Type
Level/Distance
Level

Choose Level

▲ ▼
Measurement Type
Level/Distance
Level

SET

SET
4 mA Point
0 m

Edit Value of level corresponding to 4 mA

▲ ▼
4 mA Point
0 m

SET

SET
20 mA Point
4.70 m

Edit Value of level corresponding to 20mA

▲ ▼
20 mA Point
4.70 m

SET

SET
Quit

Select

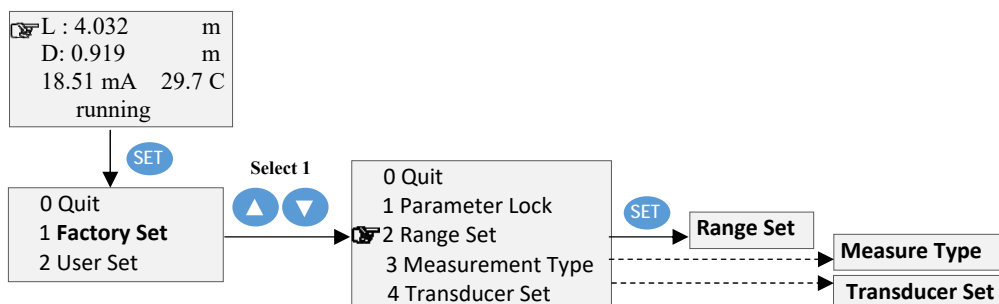
▲ ▼
Quit
Yes
Quit
No

SET

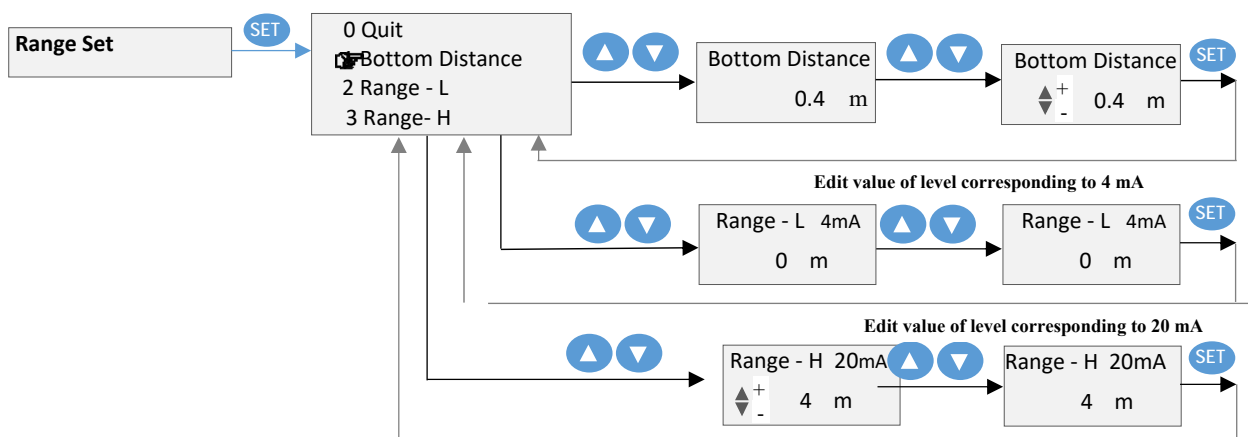
SET

Factory Set Programming Flow Chart

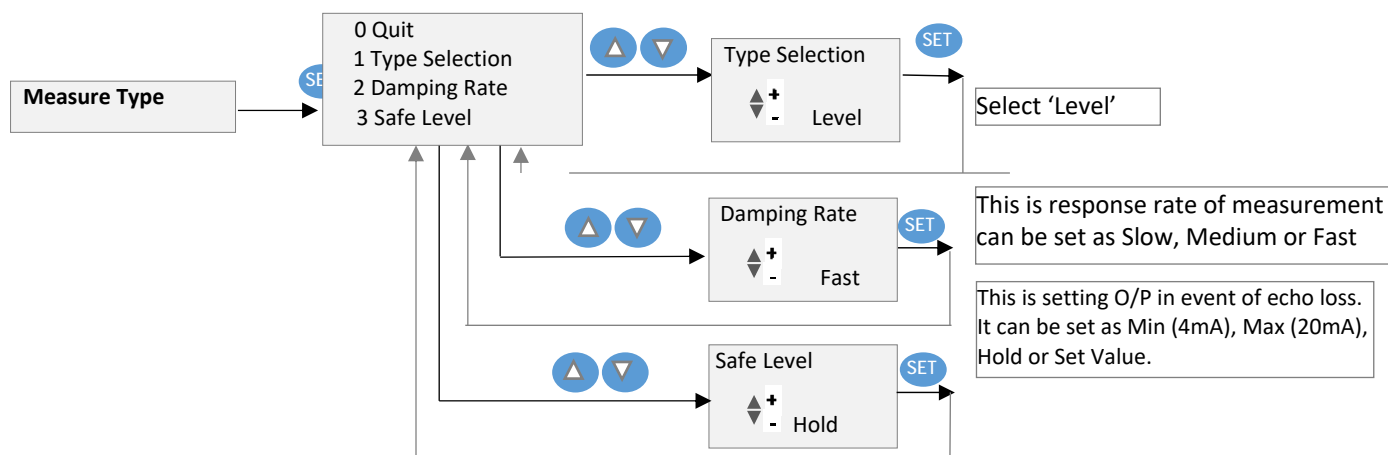
In this menu, program for 'Measure Type' option only. In which you can set for selection of measurement type i.e. Level or Distance, Damping rate and Safe Level



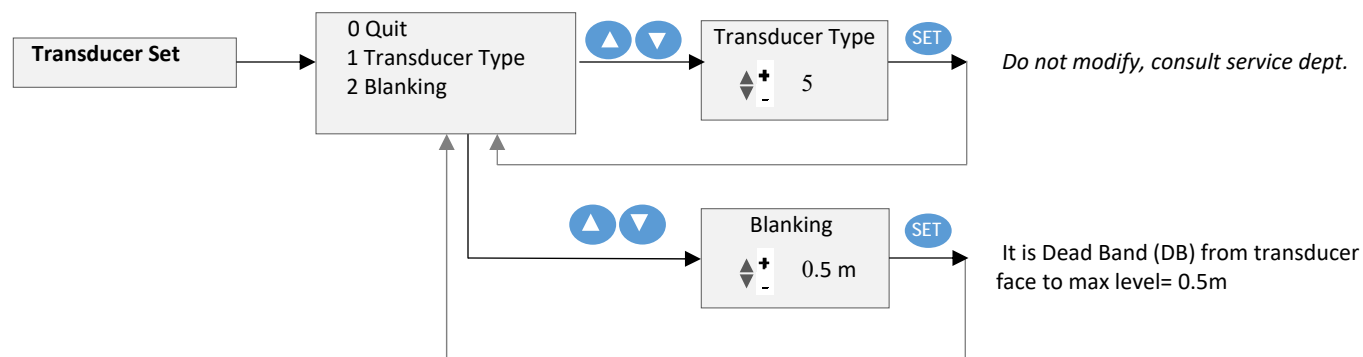
No need to change Input Bottom Distance, Range-L, Range-H here if it is already set in user set



Note - You can come out from programming by selecting 'Quit' option.



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Maintenance

- During maintenance switch off the power supply
- Check and tighten all loose electric connections.
- The equipment should be cleaned with a damp cloth, w/o use of solvents
- After maintenance, ensure transmitter enclosure is closed with its gasket and cover to ensure weather proofness.

Trouble shooting

SL	Problem	Cause	Solution
1.	No display	1. Wiring with incorrect polarity. 2. Loose connections	1. Wire with correct polarity (fig 5, 6, 7) 2. Tighten loose connections
2.	Incorrect output	1. Incorrect supply 2. Transmitter not perpendicular to liquid surface 3. Incorrect calibration	1. Ensure supply is within 24 VDC $\pm 10\%$ 2. Ensure perpendicularity as per installation guidelines. 3. Re-calibrate the transmitter
3.	No change in output	1. Wrong installation 2. Obstructions by tank internal.	1. Refer Installation guidelines for correct installation 2. Remove / Shift obstructions.

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