

ULTRASONIC LEVEL TRANSMITTER USER MANUAL

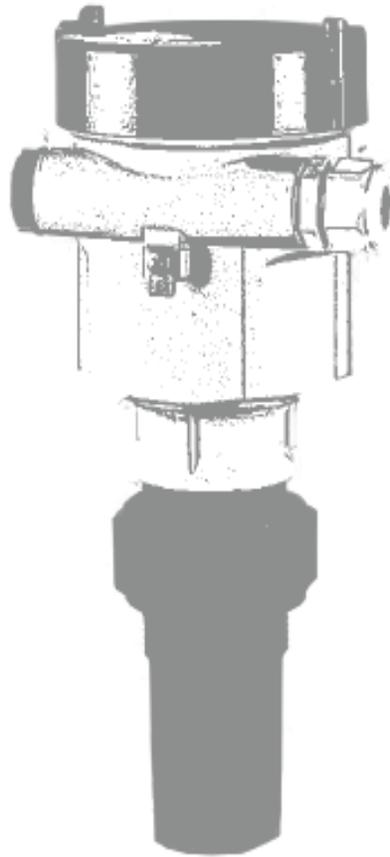


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1. SAFETY INSTRUCTIONS

1.1 Designated Use

The Ultrasonic Level Transmitter for measuring level

The manufacturer accepts no liability for damages resulting from incorrect use or use other than that designated

1.2 Installation, Commissioning and Operation

The device has been designed to operate safely in accordance with current technical, safety Standards. If installed incorrectly or used for applications for which it is not intended, however, it is possible that application- related dangers may arise E.g. product due to incorrect installation or calibration. For this reason, the instrument must be installed, connected, operated and maintained according to the instructions in this manual: personnel must be authorized and suitable qualified. The manual must have been read and understood, and the instructions followed. Modifications and repairs to the device are permissible only when they are expressly approved in the manual. Pay particular attention to the technical data on the nameplate

1.3 Operational Safety

1.3.1 Hazardous areas (Optional)

Devices for use in hazardous areas are fitted with an additional Nameplate. If the device is to be installed in an explosion hazardous area, then the specifications in the certificate as well as all national and local regulations must be observed, a separate Ex documentation is enclosed with the device and is an integral part of this documentation. The installation regulations, connection values and safety instructions listed in this document must be observed. The documentation number of the related safety instructions is also indicated on the additional Nameplate.

Ensure that all personnel are suitably qualified



1.4 Notes on Safety Conventions and icons

In order to highlight safety-relevant or alternative operating procedures in the manual, the following conventions have been used, each indicated by a corresponding icon in the margin

Warning

A warning highlights actions or procedures which, if not correctly, will lead to personal injury, a safety hazard or destruction of the instrument

Caution!

Caution highlights actions or procedures which, if not performed correctly, may lead to personal injury or incorrect functioning of the instrument

Note!

A note highlights actions or procedures which, if not performed correctly, may indirectly affect operation or may lead to an instrument response which is not planned.

Device certified for use in explosion hazardous area

If the device has this symbol embossed on its nameplate, it can be installed in an explosion hazardous area or a non-hazardous area, according to the approval.

Explosion Hazardous area

Symbol used in drawings to indicate explosion hazardous areas.

- Devices used in hazardous areas must possess an appropriate type of protection

Safe area (non-Explosion hazardous area)

Symbol used in drawings to indicate, if necessary, non-Explosion hazardous areas



- Devices used in hazardous areas must possess an appropriate type of protection. Lines used in hazardous areas must meet the necessary safety-related characteristic quantities

Direct Voltage

A terminal to which or from which a direct current or voltage may be applied or supplied

Alternating Voltage

A terminal to which or from which an alternating (sine-Wave) current or voltage may be applied or supplied

Grounded Terminal

A Grounded terminal, which as far as the operator is connected, is already grounded by means of earth grounding

Protective grounding (Earth) Terminal

A terminal which must be connected to earth ground prior to making any other connection to the equipment

Equipotential connection (Earth Bonding)

A connection made to the plant grounding system which may be of type e.g. neutral star or equipotential line according to national or company practice.



3. INSTALLATION

3.1 Incoming acceptance and storage

3.1.1 Incoming acceptance

- Check the Packaging and the contents for damage
- Check the shipment, make sure nothing is missing and that the scope of supply matches your order

3.1.2 Storage

The device must be stored in dry, clean area and protected against damage from impact

3.2 Installation Conditions

3.2.1 Dimensions

For dimensions, please refer to the Technical information, mechanical construction section and Overview documentation

3.3 Installation Instructions

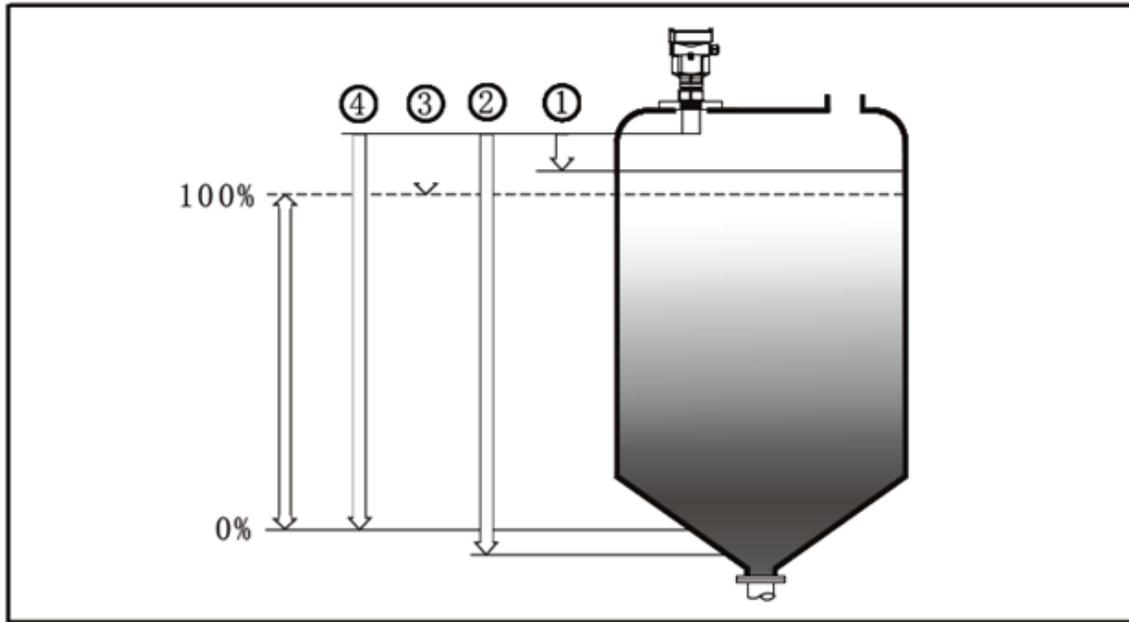
3. Mounting Requirements

Basic Requirements

There is a certain existing beam angle while transducer radiating ultrasonic pulses. There should be no barriers between the lower edge of antenna and surface of measured medium. Therefore it is highly recommended to avoid facilities inside vessels, such as ladders, limit switches, heating spirals, struts and etc, during the mounting process. “False echo storage” must be carried out during the installation in this case. Furthermore, ultrasonic waves must NOT intersect the filling streams.

Be cautions during the installation when : the highest level of target medium must NOT enter into blanking zone; the instrument must keep certain distance to vessel walls; every possible measure needs to be taken to position the instrument so that the direction of transducer emission is perpendicular to the surface of measured medium. The installation of instruments in Explosion proof area must abide by relevant local or federal safety regulations. Aluminum housing should be used for intrinsically safe explosion proof version, which is also applicable in explosion proof areas. The instrument must be connected with ground in this case.



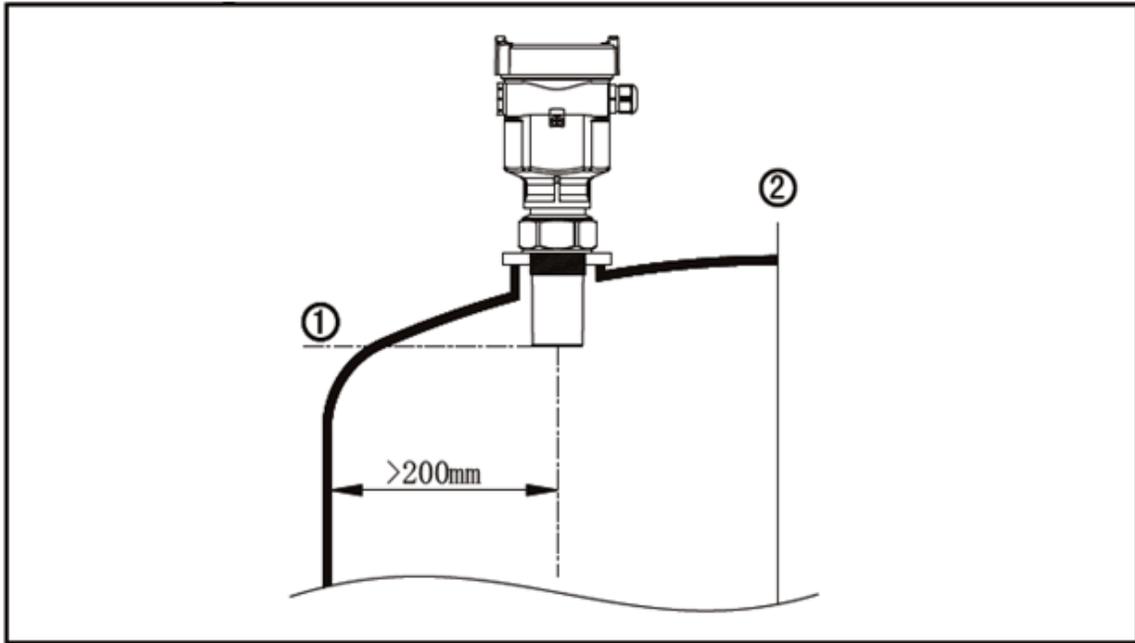


The lower edge of probe is the reference plane for measurement

1. Blanking Zone
2. Empty
3. Max. Adjustment
4. Min- Adjustment

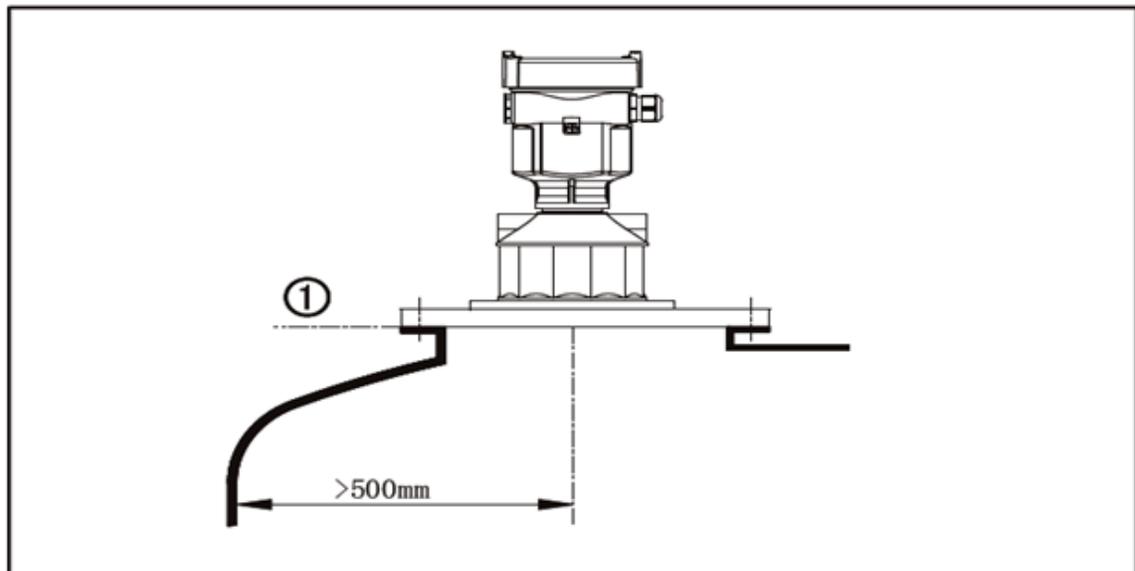
Note: The highest level of measured medium must not enter into blanking zone while ultrasonic level instrument is in operation

Mounting Position



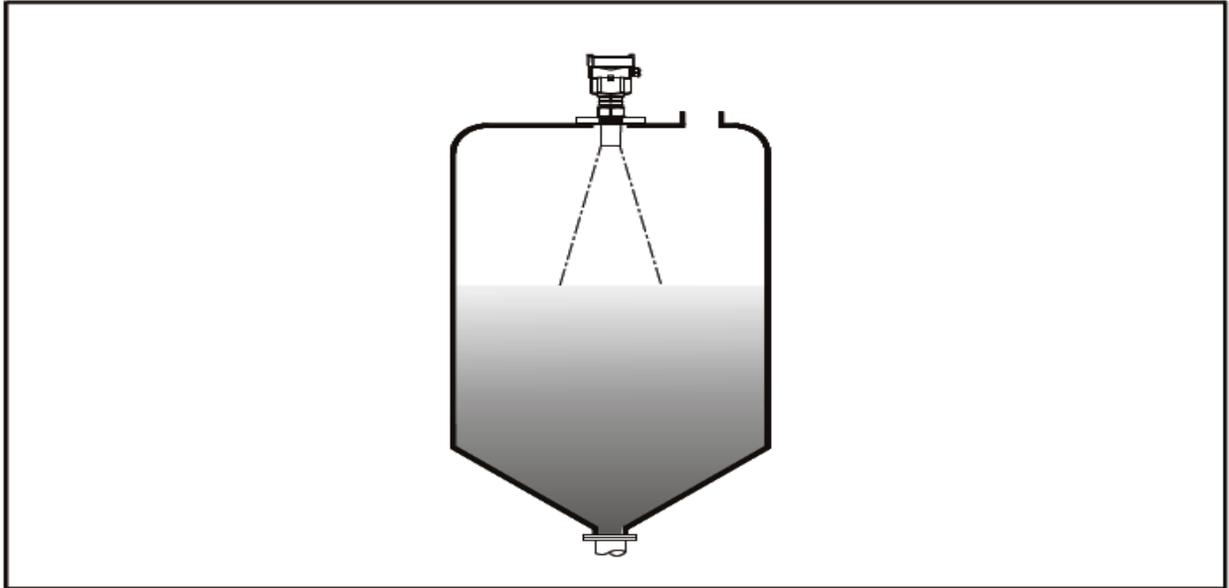
Minimum distance of 200mm between instrument and vessel wall must be assured while mounting LTU551 or LTU552

1. Reference Plane
2. Center of vessel or symmetrical axis



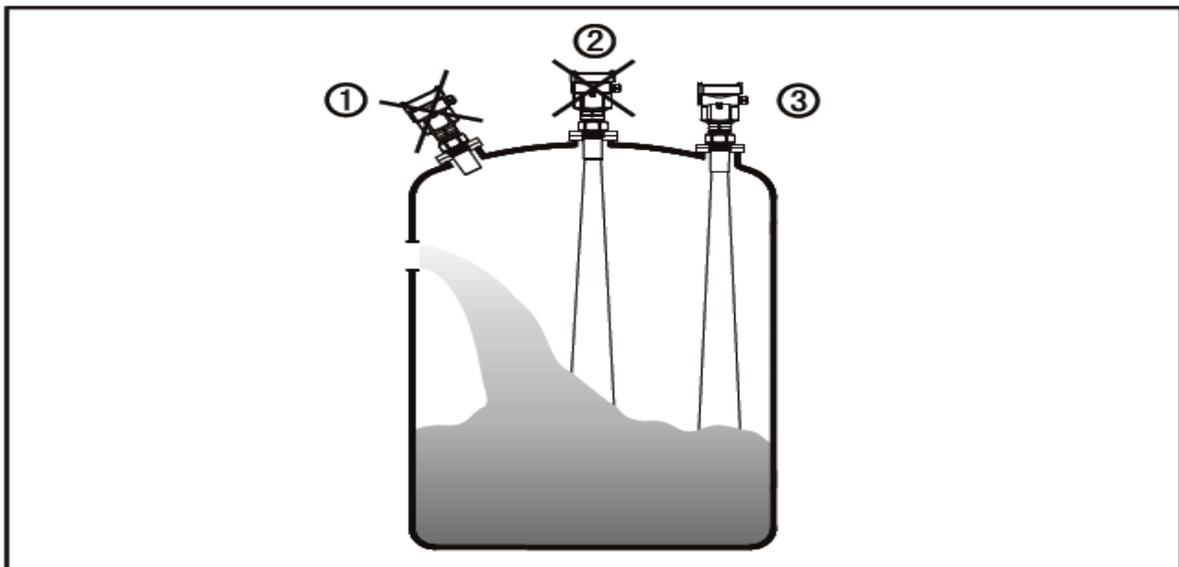
Minimum distance of 500mm between instrument and vessel wall must be assured while mounting LTU553

1. Reference Plane

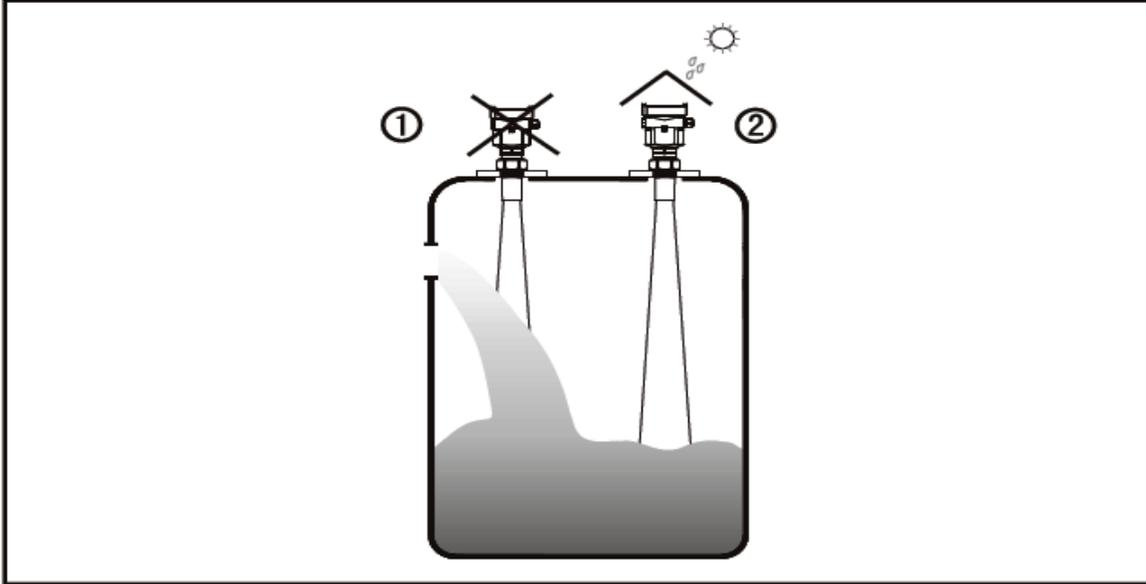


The best mounting position for a conical vessel with flat top is the center of its top. As the effective measurement can reach the bottom of vessel

Illustrative Diagram on installation



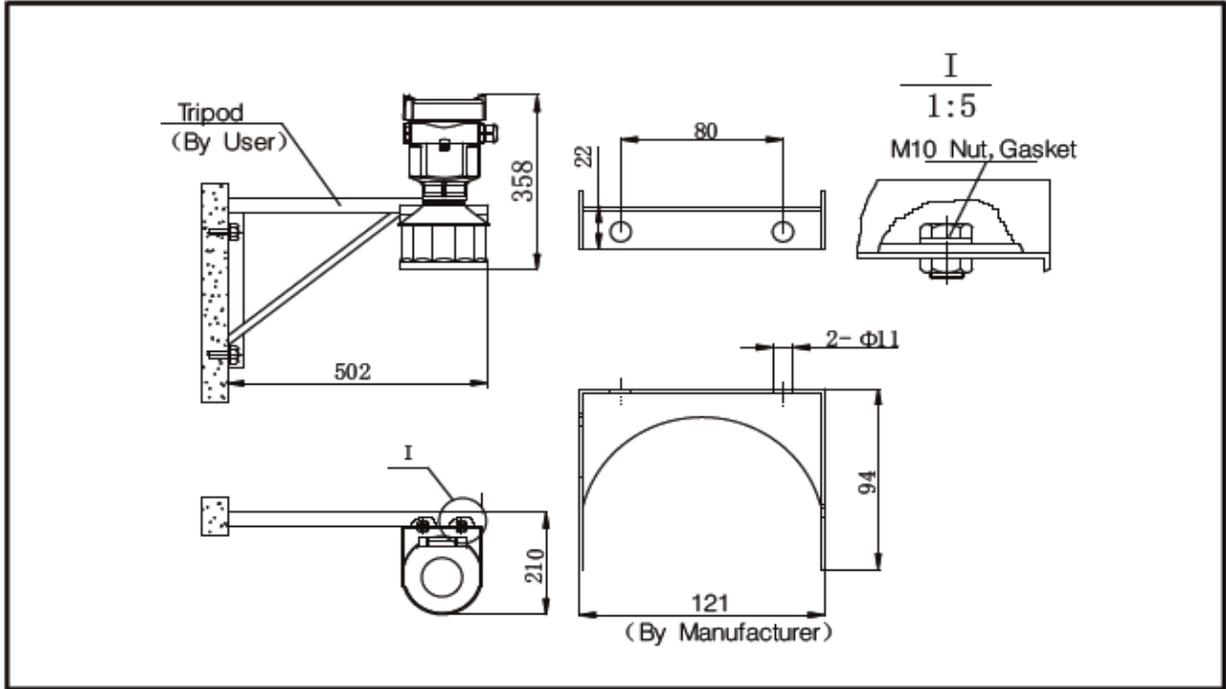
1. Wrong: Fail to turn the antenna perpendicular to the surface of target medium
2. Wrong: Instruments are mounted in the center of concave or arched vessel tops, which results in multiple echoes
3. correct



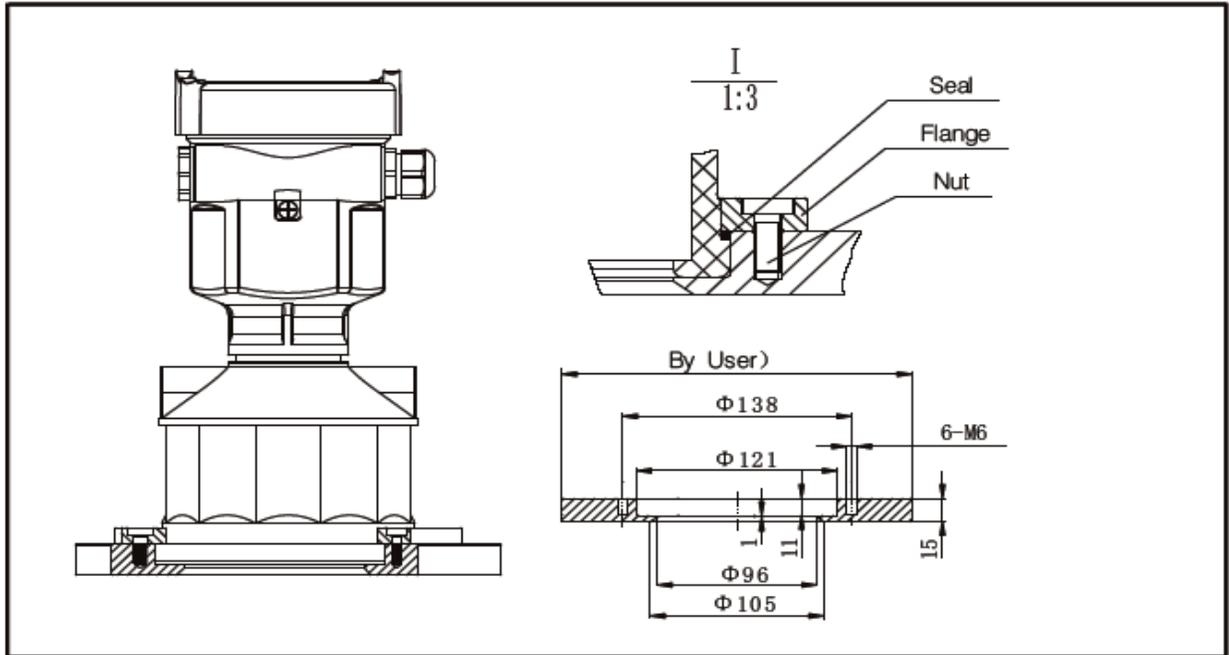
1. Wrong: Mount the instrument in/above filling stream, which results in the measurement of filling stream not the target medium
2. Correct

Note: sun shield or rain-proof is required for outdoor mounting

Installation Methods

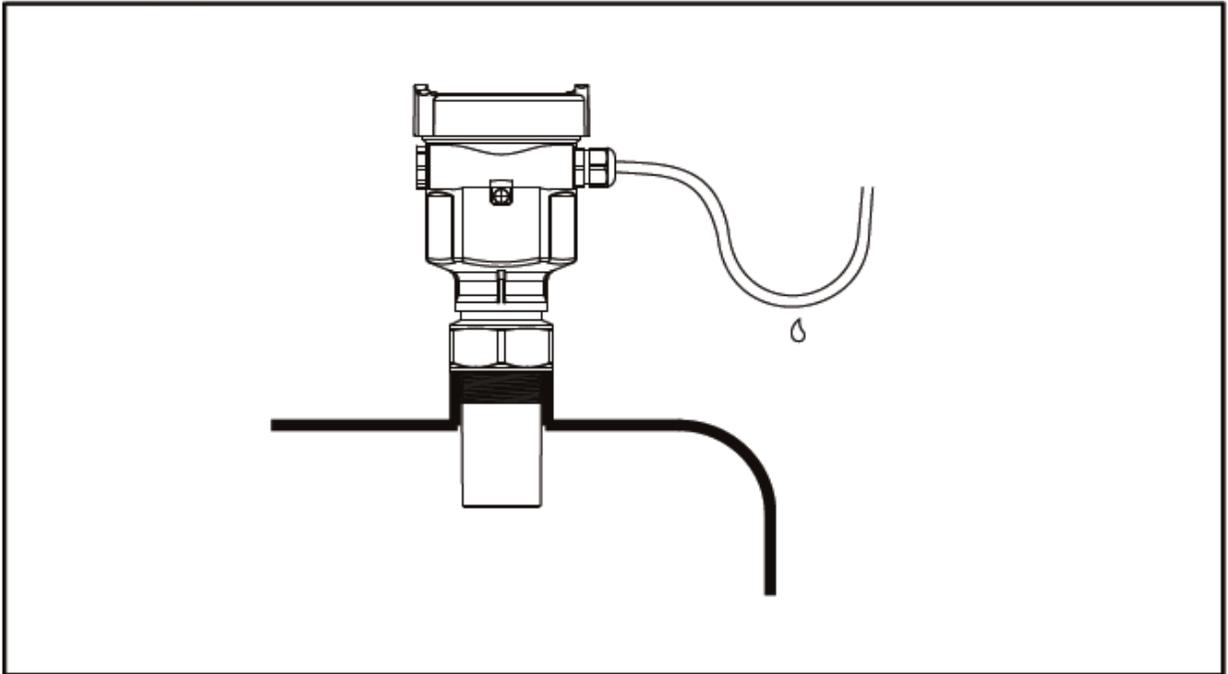


Installation with swiveling holder mount LTU553 with swiveling holder



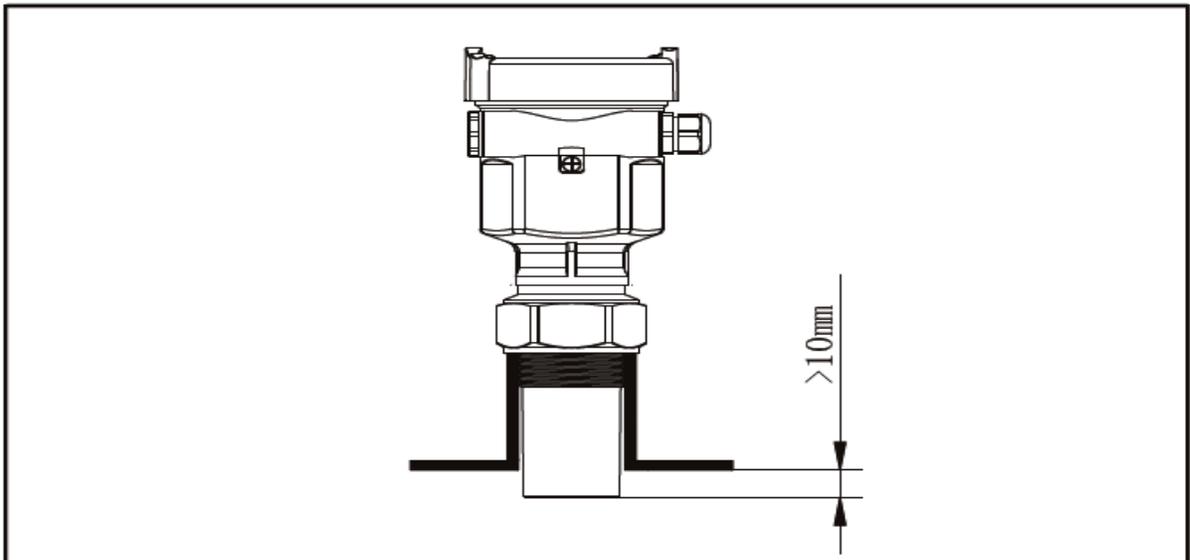
Use flange to mount LTU553

Damp-Proof

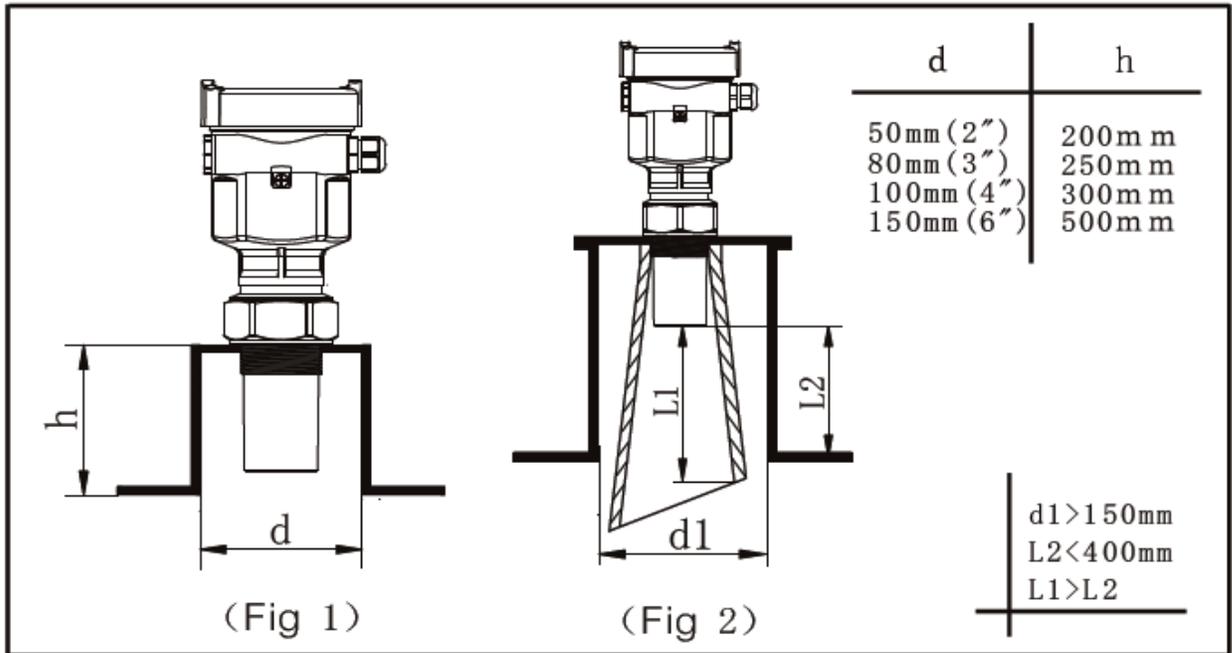


In order to avoid dampness under outdoor or humid indoor conditions or for those instruments mounted on cooling/ heating vessels, seal rings used on cables should be screwed tight, plus the cable must be bended downward outside cable entry, indicated on the diagram

Socket

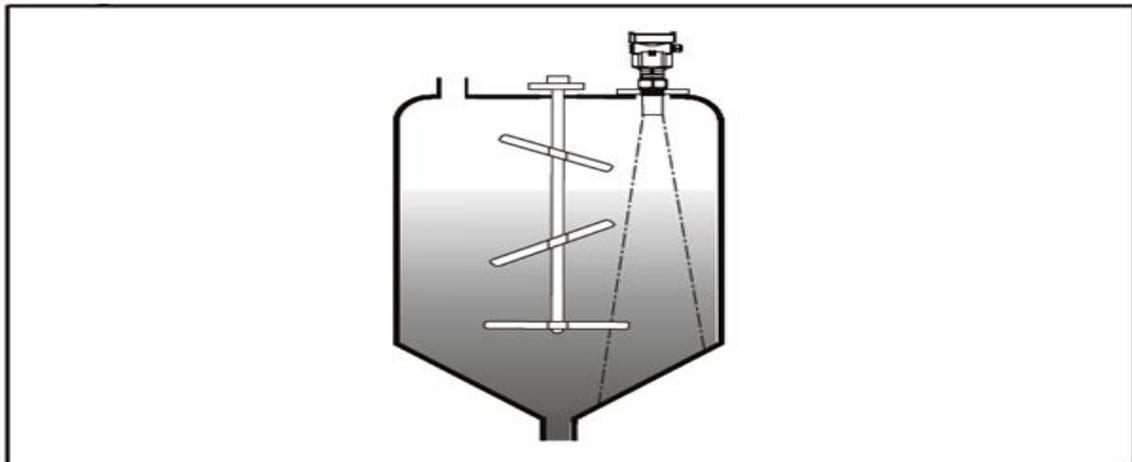


The transducer end must at least protrude 10mm out of socket



In case of strong reflective properties of target medium and big socket diameter, you can mount instruments on sockets higher than the antenna length. The recommended values for socket heights are shown in the illustration below. The socket end should be smooth and burr-free, if possible also rounded. Moreover, false echo storage must be carried out afterwards. On the contrary, if the reflective properties of medium are weak, you are advised to heighten the mounting position of instruments and also use a standpipe (optional) to reduce the influence caused by socket

Agitator



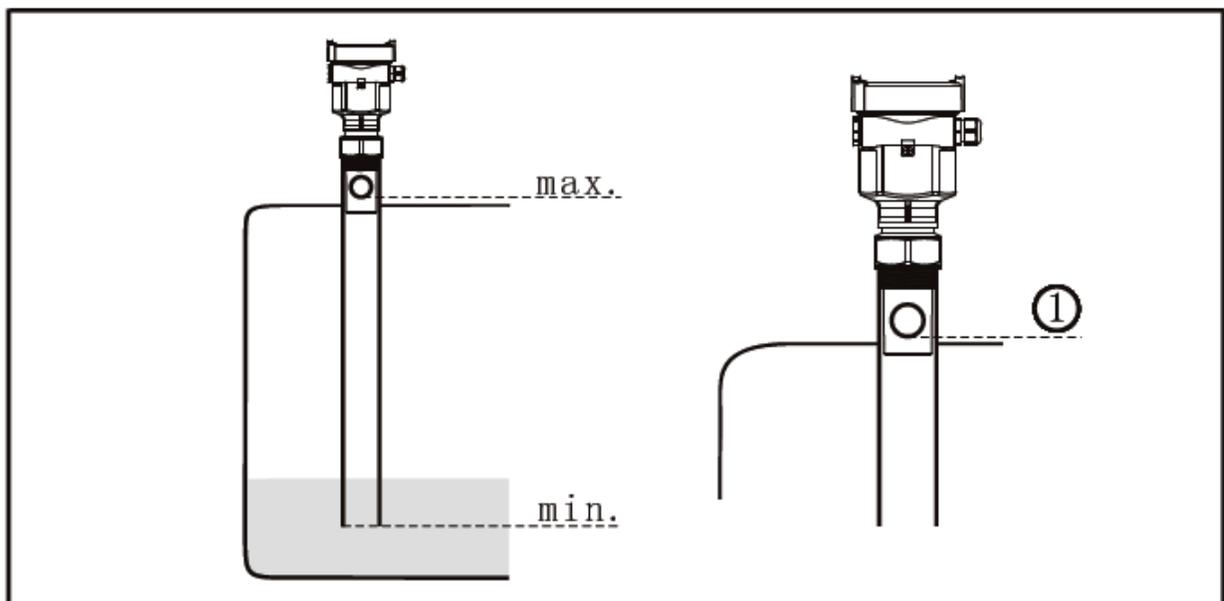
If there are agitators in vessels, instrument must be mounted as far away from agitators as possible, once installation completed, a false echo storage should be carried out while agitators in motion to eliminate negative influence caused by false echo of agitators. You are advised to opt for installation with standpipe if foam or wave is generated due to the action of agitators

Foam

Due to the action of filling, stirring or other processes inside vessels, dense foams are formed on the surface of some liquid medium, which could attenuate emitting signals considerably. You are advised to mount the instrument inside a standpipe or opt for a ultrasonic level transmitter if the generation of foam incurs measurement errors. Guided Wave radar level instrument is the best option for similar applications thanks to the fact that it is unaffected by foam generation

Airflow

You are advised to mount the instrument inside a standpipe or opt for a low frequency ultrasonic level transmitter with guided microwaves in the event of strong airflow presence in vessels. E.g., outdoor installation with gusty wind or presence of vortex inside vessels



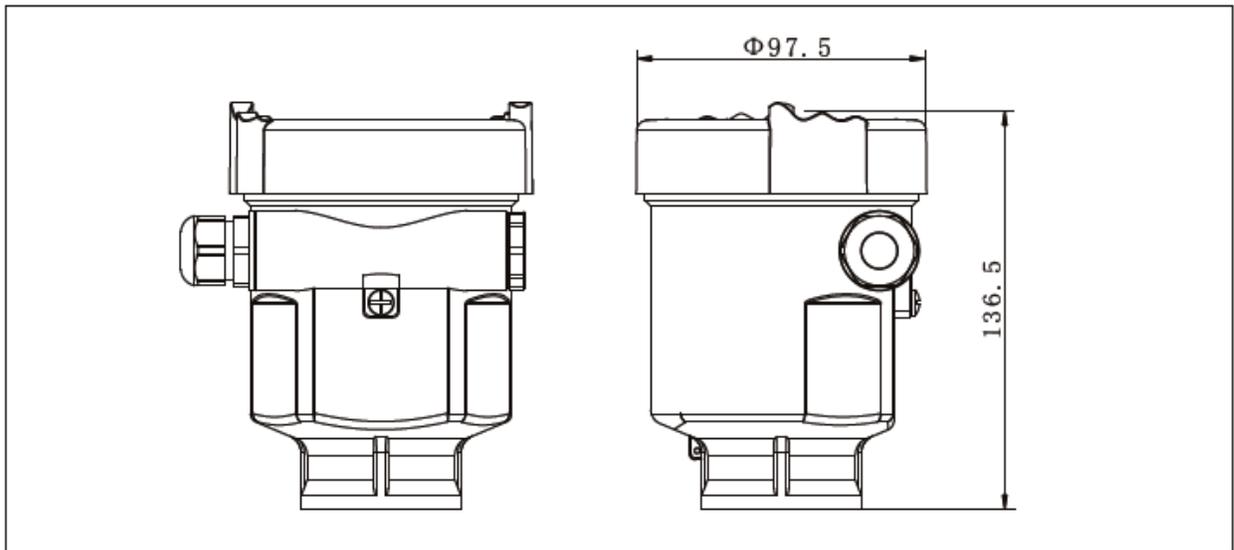
Vent hole of diameter (5~10) mm you are advised to opt for installation with standpipe (or bypass tube) to avoid the influence on measurement caused by barriers inside vessels,

foam generation or air vortex. If the measurement is undertaken by LTU55X inside the standpipe should be at least bigger than the outside diameter of transducer. Please see dimensional drawings for actual sizes. Avoid large cracks or welding seam when connecting standpipe. False echo storage must be carried out as well in this case

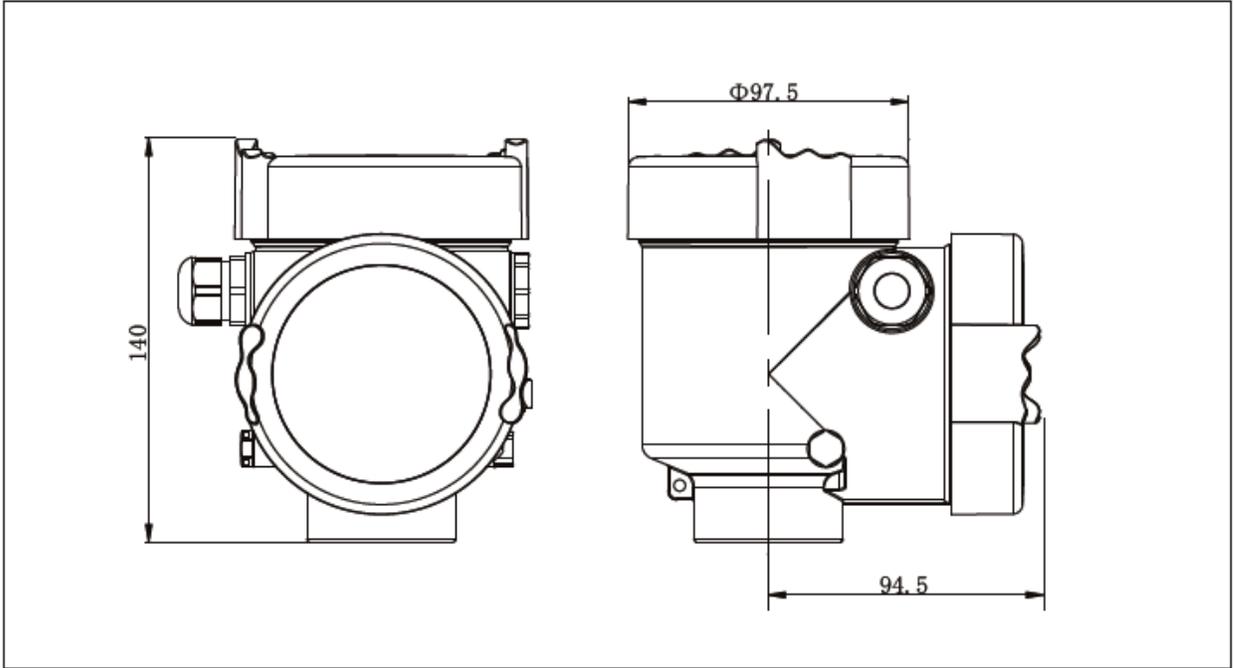
Dimensional Details

Dimension (Unit: mm)

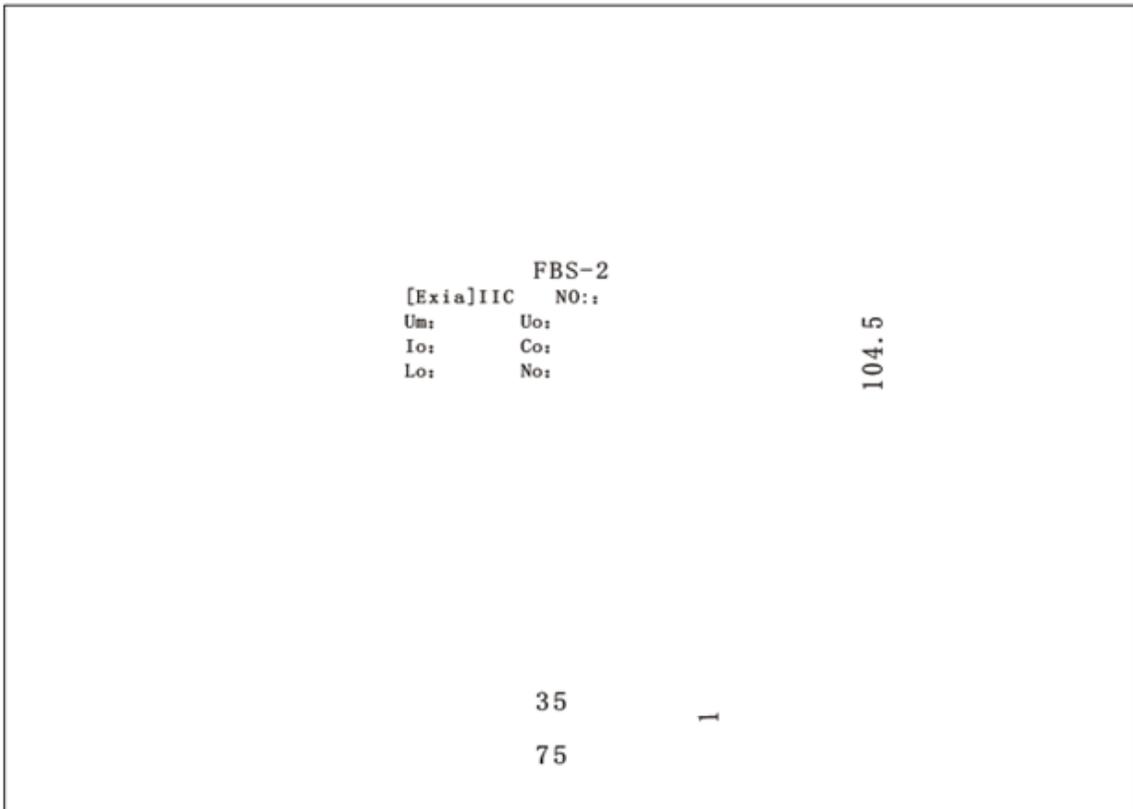
Housing Material: PBT/AL/316L



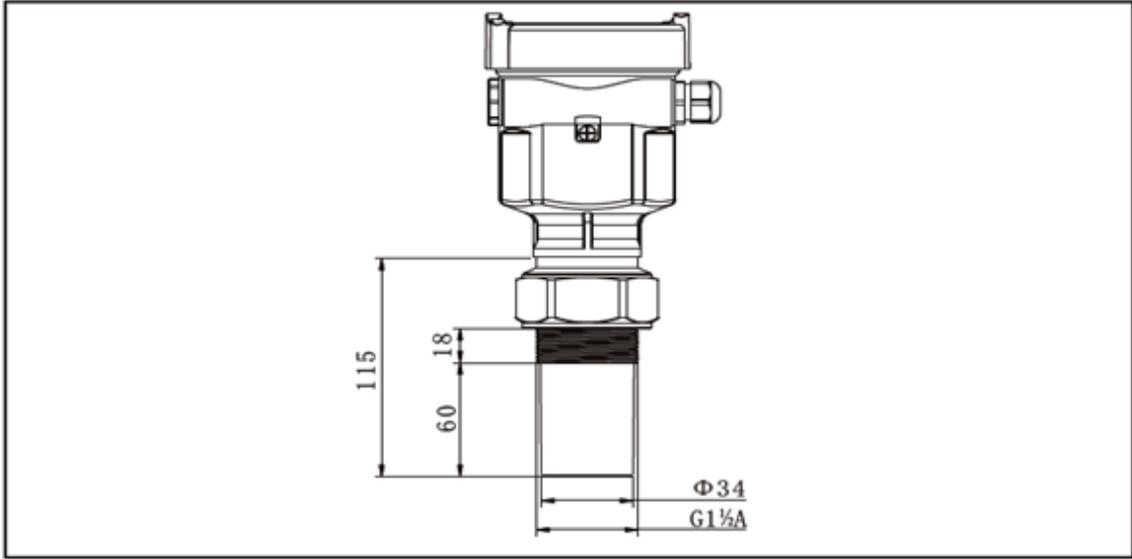
Material: Two- Chamber



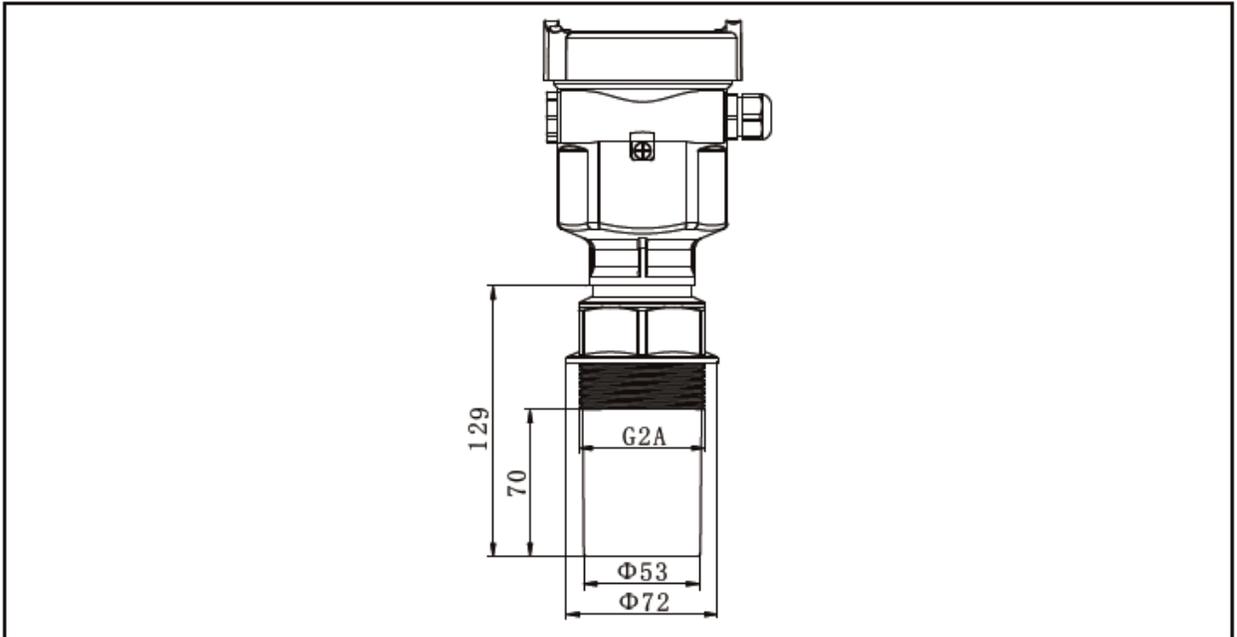
FBS Series



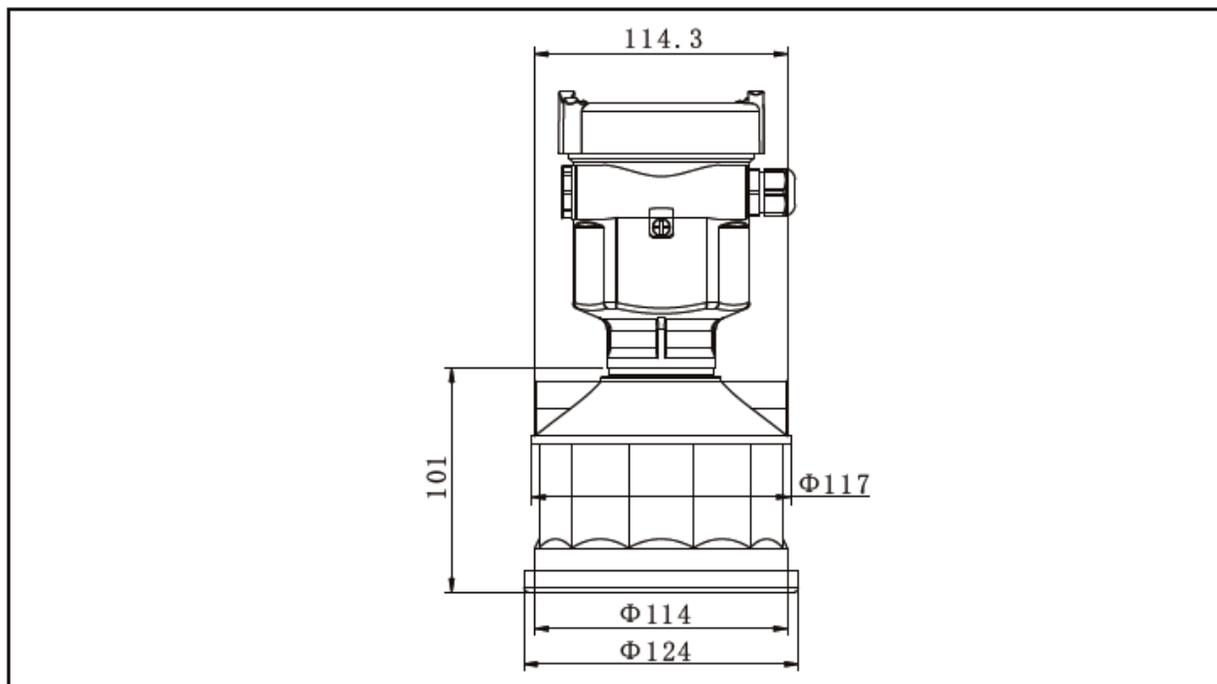
LTU551



LTU552



LTU553



WIRING

4 ELECTRICAL CONNECTIONS

Power Supply

20mA/HART (2-Wire)

Power supply and current signal are carried by the same two-wire connection cable. See the Technical Specifications of this guide for detailed requirement on power supply. A safety barrier should be placed between power supply and instrument for intrinsically safe version.

20mA/HART (4-wire)

Power supply and current signal are carried by two 2-wire connection cables respectively. See the Technical Specifications of this guide for detailed requirement on

power supply. Earth-connected current output can be used for standard version of level instruments, while the explosion proof version must be operated with a floating current output. Both instruments and earth terminals should be connected with ground firmly and securely. Normally you can either choose to connect with the earth terminal on vessel or adjacent ground in case of plastic vessels.

Cable Connection

General Introduction

4~20mA/HART

Standard 2-wire cable with outside diameter of 5...9mm, which assures the seal effect of cable entry, can be used as feeder cable. You are recommended to use screened cables in the event of electromagnetic Connection cable with special earth wire can be used as feeder cable.

Connection cable with special earth wire can be used as feeder cable.

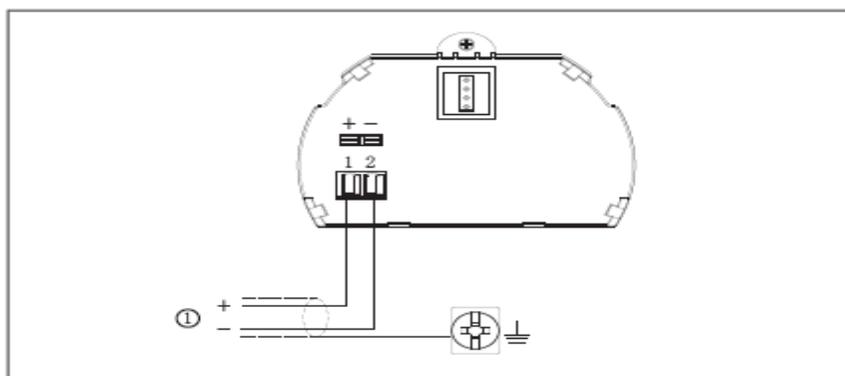
20mA/HART (4-wire)

Shielding & Grounding

The two ends of shielded cable must be connected with earth terminal. The shielded cable must be connected with inner earth terminal directly inside the transducer, while the outside earth terminal on housing must be connected with ground. In the event of Earth-connected current, the shielding side of shielded cable must be connected to ground potential via a ceramic capacitor (e.g. : 1 F 1500V) in order to dampen the low frequency grounding current and avoid the disturbance caused by high frequency signals

2-wire

Wiring Diagram

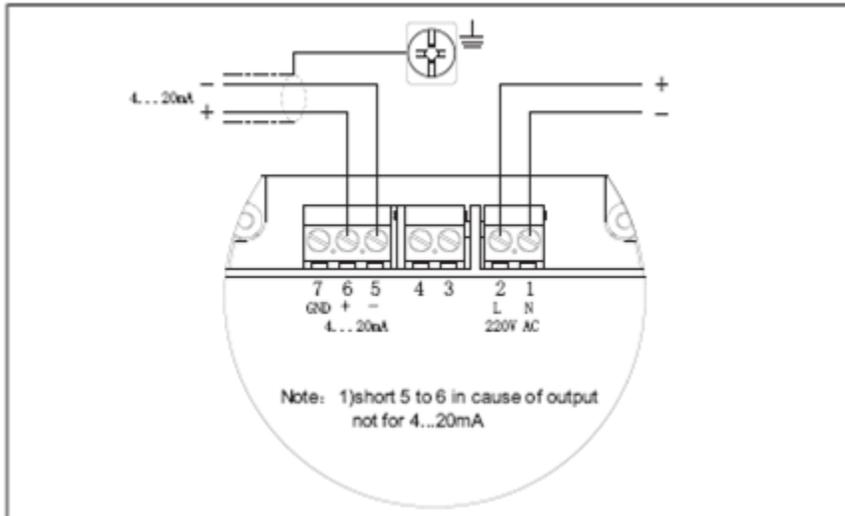


2-wire wiring used for HART (electronic unit B)

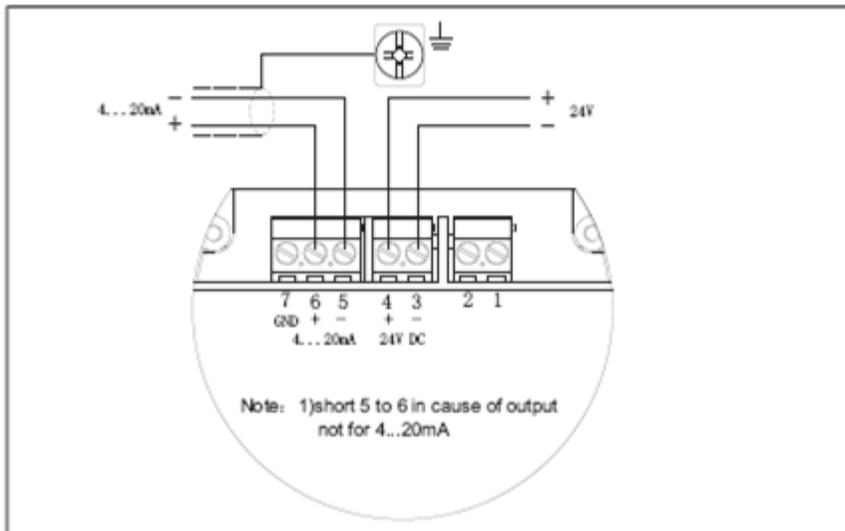
1 Power Supply and Signal Output

4-wire/2-chamber

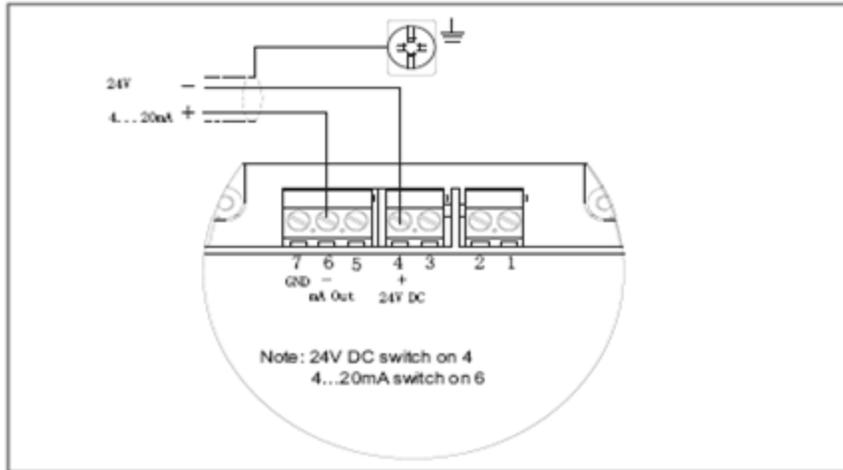
Wiring Diagram: 220V AC Power Supply, 4...20mA Signal Output (electronic unit D)



Wiring Diagram 4-wire 24V DC Power Supply, 4...20mA Signal Output (electronic unit C)



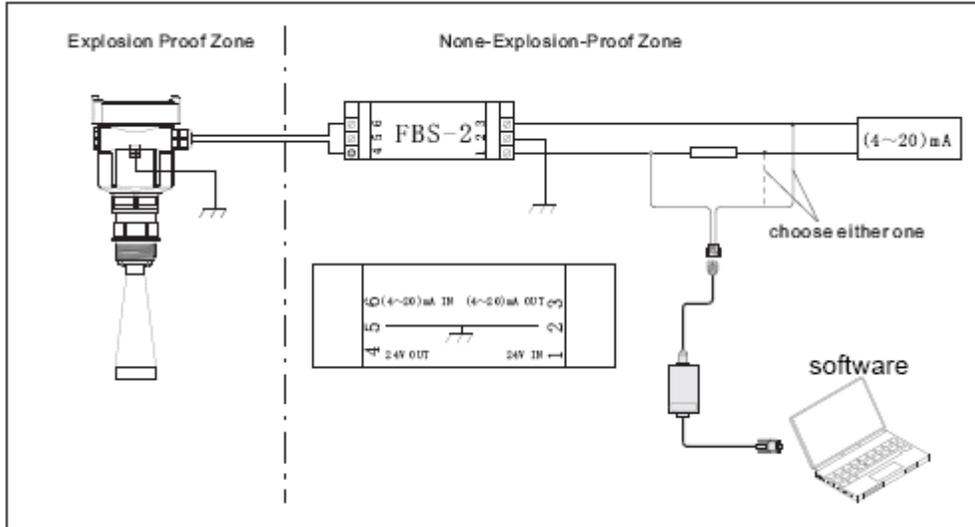
**Wiring Diagram: dual-wire 24V DC Power Supply, 4...20mA Signal Output
(electronic unit E)**



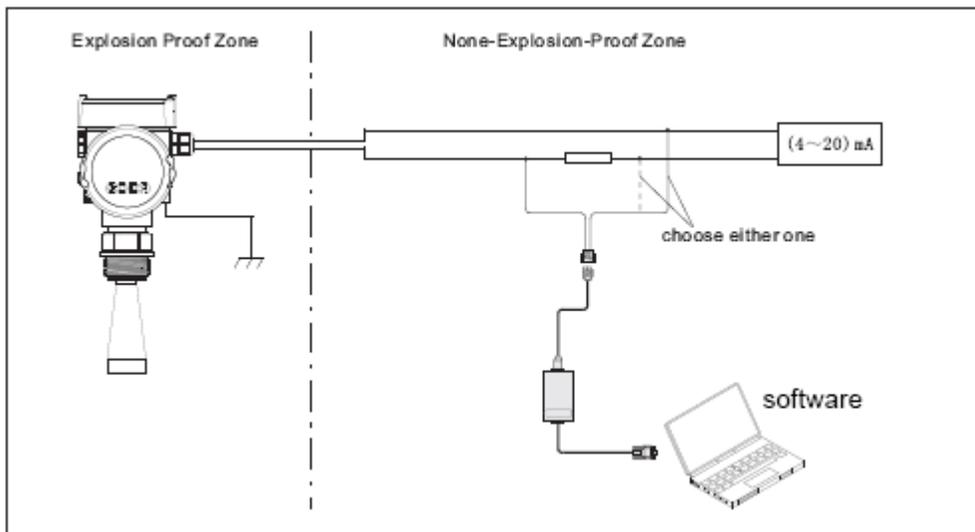
Explosion Proof Connection

This product is an intrinsic safety explosion proof version (Exia II C T6) with aluminum housing and plastic encapsulated internal structure aimed to prevent sparks resulted from transducer and circuit malfunction from leaking out. It is applicable for the non-contact continuous level measurement of flammable medium under the level of explosion proof inferior to Exia II c T6. You are required to use FBS-2 series (intrinsic safety explosion proof: [Exia] II C voltage of power supply: 24V DC 5% short-circuit current: 135mA operating current: 4...20mA) of safety barriers, which are supplementary to this product, for the power supply of this product.

All connection cables must be screened with max. Length of 500m. Stray capacitor 0.1 F/Km, stray inductance 1mH/Km. The level measurement instrument must be connected to ground potential and unapproved supplementary devices are not allowed to use.



Adjustment with SOFTWARE

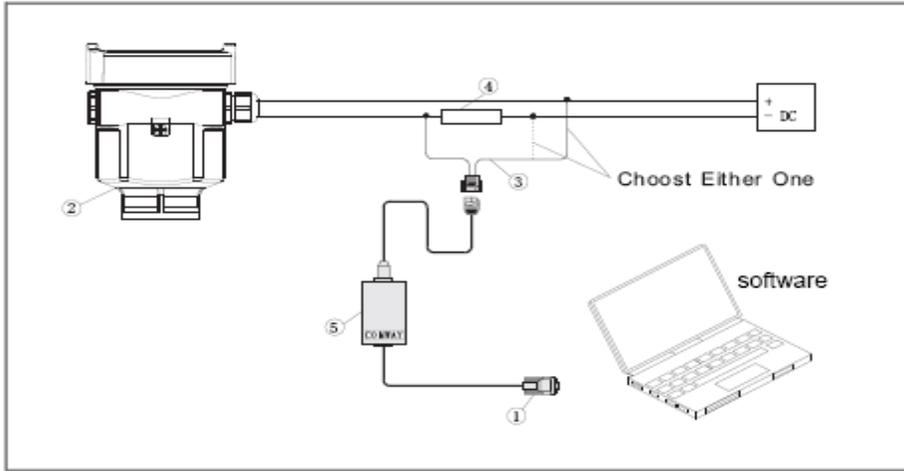


Adjust with Intrinsically Safe Flameproof Approval

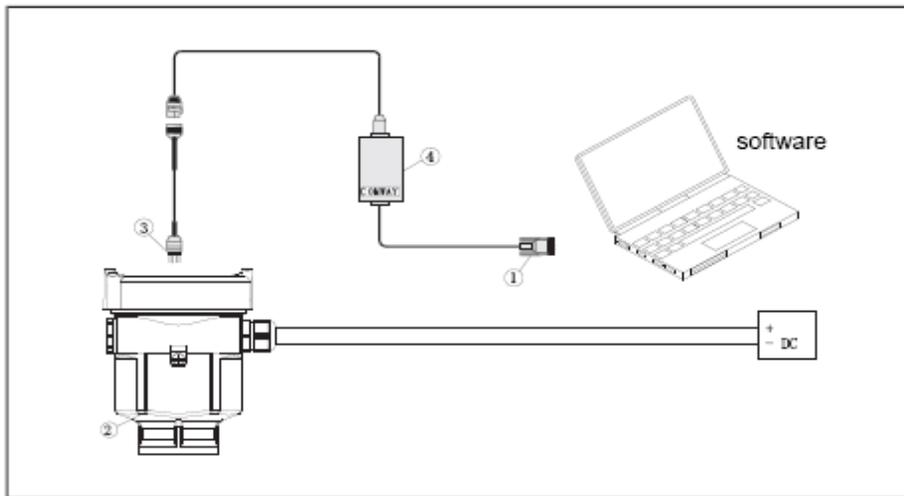


SOFTWARE

Connect with another unit through HART.



1. RS232 Connect Cable / USB port
2. LTR5X
3. HART port adapter used on COMWAY convertor
4. 250 ohm Resistance
5. COMWAY Convertor
6. Connect with another unit through I 2 C.



- 1 RS232 Connect Cable/ USB port
- 2 LTR5X
- 3 I 2C adapter port used on MOMWAY convertor

4 COMWAY Convertor

Operation

5 Adjustment Instructions

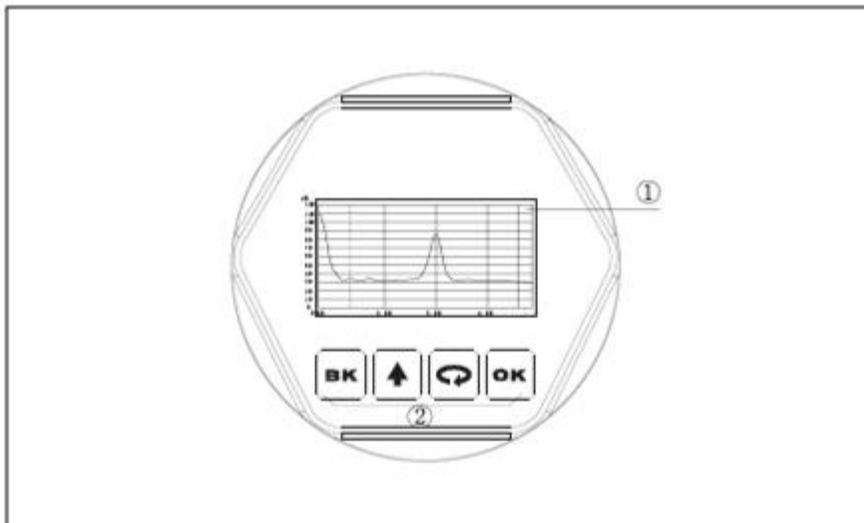
Adjustment Methods

Three adjustment methods available for LTR5X

1. Display / Adjustment Module
2. Adjustment software
3. HART handheld programmer

View Point is a pluggable display/adjustment module. The adjustment can be done through operating with four buttons on View Point. Optional menu operation languages are available for selection. View Point is only used for display after adjustment in that the measurement results can be seen clearly through the glass window.

Display/Adjustment Module



1 LCD

2 Adjustment Keypad

[] Keypad

-Confirm modifications to parameters.

-Enter programming mode;

-Confirm programming options;

O K [] Keypad



- Choose programming options;
- Choose the digit of parameters to edit;
- Display the contents of parameters

[B K]Keypad

Shortcut

[B K] Display Echo wave

- Modify parameter values.

[] Keypad

- Programming mode exit;

- Return to higher menu level.



Program Instruction Adjustment parameter settings and testing's can be done by the four keys View point

Program Menu Structure Menu structure is shown in the appendix. Turn to next menu item Pointed by right arrow with OK. Turn to next menu item pointed by down arrow with  Turn to left item with BK.

Program Submenu

Basic Settings Basic adjustment for the sensor is included in this menu. They are min. adjustment, max. Adjustment, medium, damping time, mapping curve, sealed units, scaling, near blanking and sensor tag.

Display In this menu you can setup the sensor display mode and adjust B/W contrast for LCD

Diagnostic In this menu you can store false echo curve and current output, Units of measurement, Language, rest HART operation mode, copy sensor data and PIN

Info the information of sensor including sensor type, serial no, date of manufacturer, software version.

Program Operation Enter program mode by press OK, Press OK after each parameter editings. Otherwise the modification will be abandoned. Press BK to quit program status.

Parameter Editing

Parameter Editing the first digit of the edited parameter will be displayed in black background on entering parameter editing. Modify the digit with  . Then you can edit next digit with  . After editing, press OK to confirm and store the modification

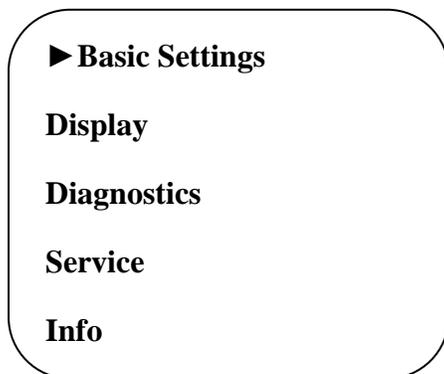
Optional item Program some settings can be done by selecting one os several optional items with  . And confirming with OK.

Program Menu instruction



Basic Settings

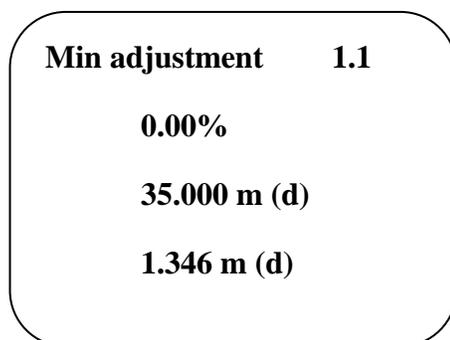
Basic settings are basic setup of the sensor, such as min/ Max adjustment, medium, damping and etc. to bring the sensor to program mode from run mode, press OK. Then the menu is displayed as below



Note: The menu item number is displayed on the top right corner

1.1 Min adjustment

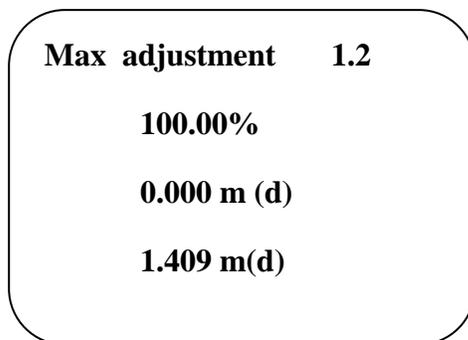
the item is one of the setting points that regulates the linear scaled current output. At main menu (the menu number is 1). Select basic settings with  and confirm with OK, now the min. adjustment is displayed on LCD. The menu item number is 1.1



Pressure OK, you can edit the percentage Value. Press OK again, you confirm the modification and further more you can edit the corresponding distance value. See parameter edition to learn how to edit parameters

1.2 Max. Adjustment

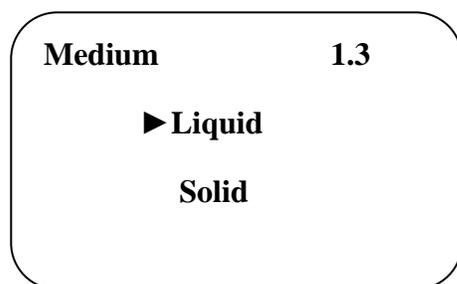
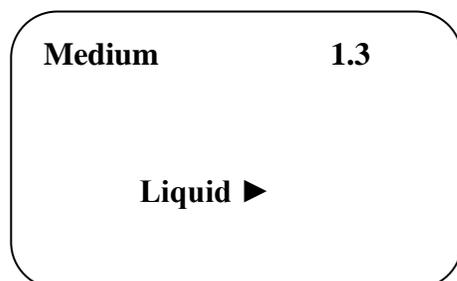
The item is one of the two setting points that regulates the linear scaled current output. Pushing  enter this menu when the menu item number is LCD displays



Pressure OK, you can edit the percentage value press OK again, you confirm the modification and further more you can edit the corresponding distance value. See parameter edition to learn how to edit parameters.

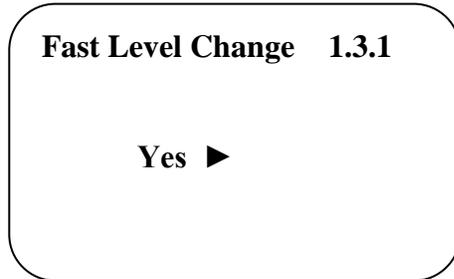
1.3 Medium

Pushing  enter this menu when the menu item number LCD displays as below each medium has different reflective properties. This menu is used to set the medium to be solid or liquid. Furthermore, make sure other relative factors



Move arrow with  Solid or liquid can be selected. Pushing OK will confirm the selection and enter fast level change sub menu

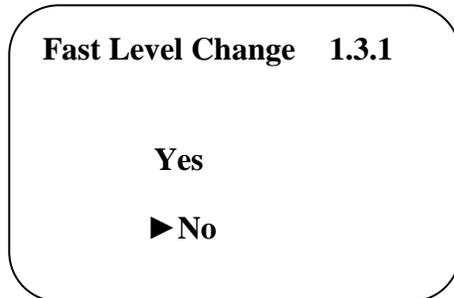




1.3.1 Fast Level Change

Pushing OK will enter this menu when it is liquid or solid selection menu and menu item number is LCD display as below 

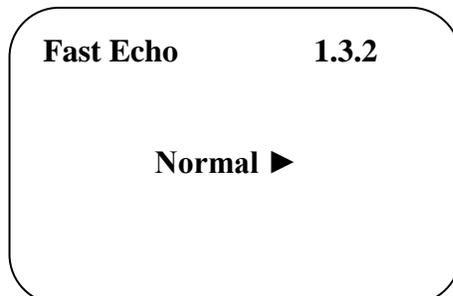
Push OK enters Fast Level change confirmation. LCD Displays as below



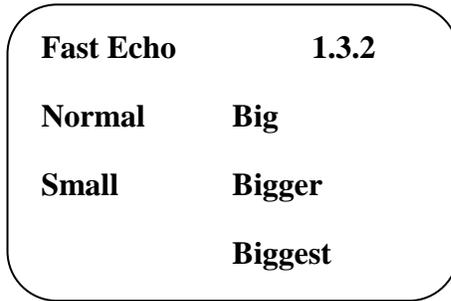
Move arrow with  to select yes or No for Fast Level changes. Then confirm the selection with OK

1.3.2 First Echo

When medium is chosen as liquid or solid, LCD menu is press to  choose next menu. LCD displays as below



Press OK to enter first echo menu LCD displays as below:



Press---to choose the way to set first echo. There are five ways:

Normal: No adjustments on first echo

Small: decrease first echo by 10dB

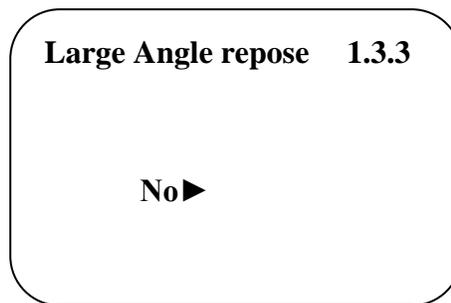
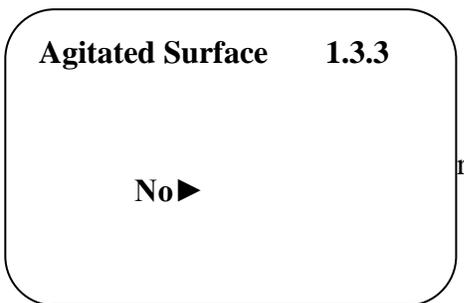
Big: Increase first echo by 10 dB

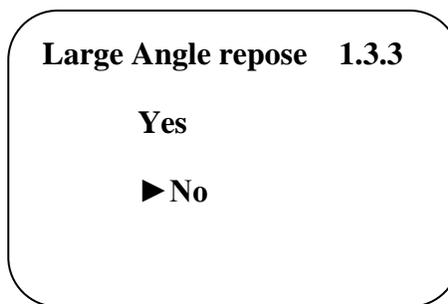
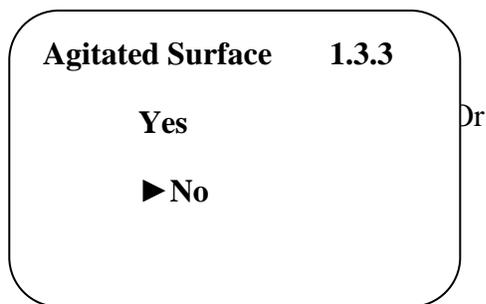
Bigger: Increase first echo by 20 dB

Biggest: Increase first echo by 40 dB

1.3.3 Liquid Agitated Surface

When measure medium is liquid, LCD menu. Press OK to choose next menu and enter agitated surface. LCD displays as below:

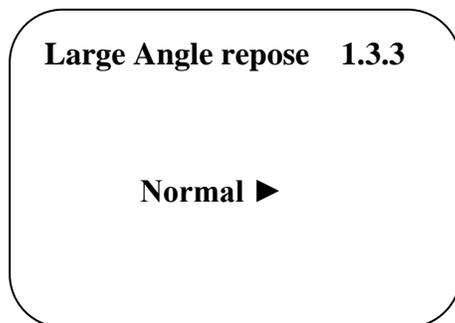




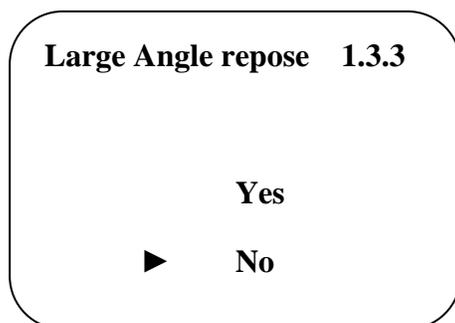
Press OK to enter Agitated surface menu

1.3.3 (Solid) Large angler repose

When measure medium is solid LCD menu. Press  to choose next menu and enter angler repose. LCD displays as below

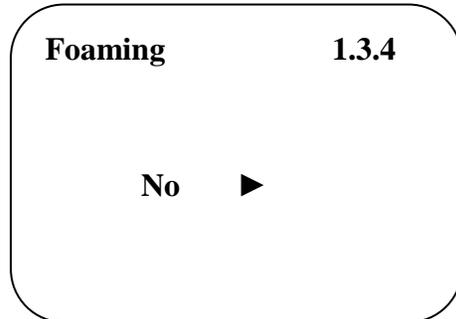


Press OK to enter large angler repose menu



1.3.4 (Liquid) Foaming

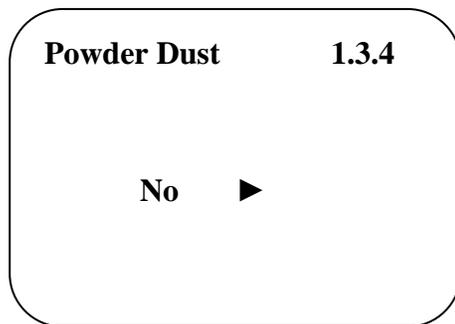
Pushing  will enter this menu when the menu item number is LCD displays as below



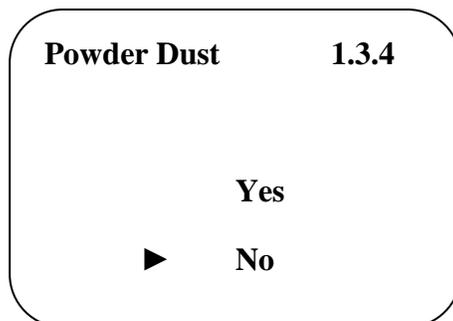
Push OK, enter the submenu of foaming/powder dust confirmation. LCD displays as below

1.3.4 (Solid) Powder Dust

Pushing  will enter this menu when the menu item number is LCD displays as below

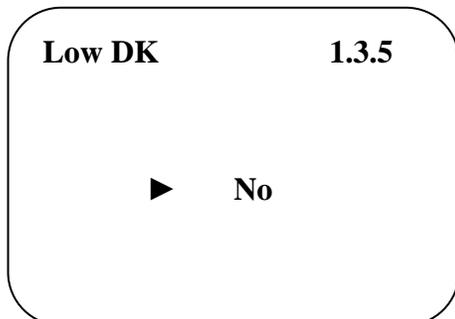


Push OK, enter the submenu of foaming/powder dust confirmation. LCD displays as below

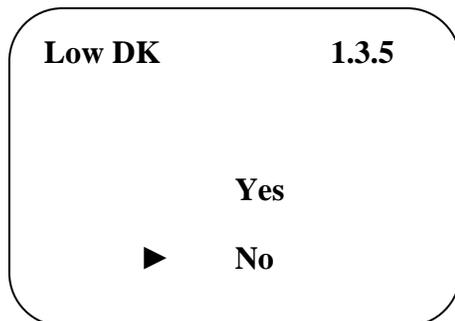


1.3.5 Low DK

Pushing  will enter this menu when the menu item number is LCD displays as below



Push OK, enter the submenu of foaming/powder dust confirmation. LCD displays as below

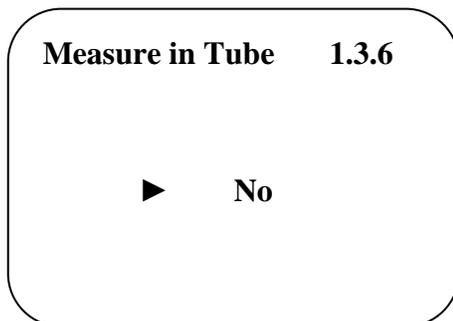


Move arrow with  to select yes or No for medium with Low DK. Then confirm with OK.

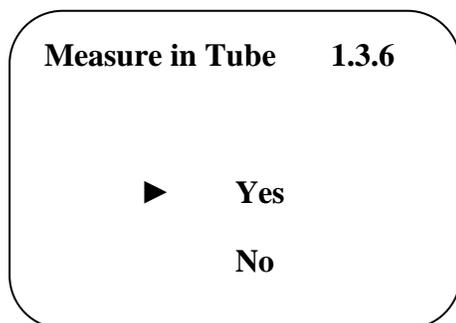
1.3.6. Measuring in Tube

When measurement is carried through a tube, that is limited for the liquid medium, the tube diameter must be set in menu measure in tube so as to rectify the measuring error

Pushing  will enter this menu when the menu item number. LCD displays as below



Push OK, enter the submenu of measure in tube confirmation. LCD displays as below

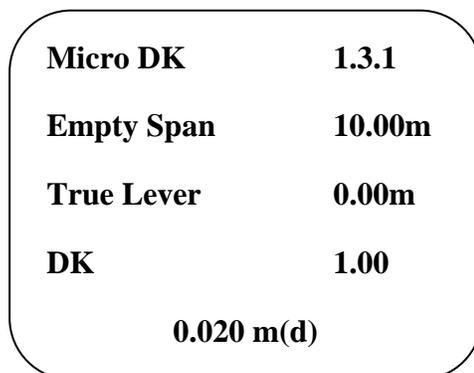


If the selection use is confirmed by OK, the diameter of the tube will be required. LCD displays as below

Press OK, the value can be edited

1.3.1 Micro DK

When choose micro OK as Medium property, press OK to enter micro DK setting



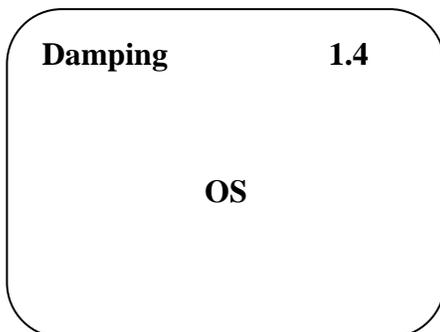
Normally when electronic constant is smaller than 1.4, the direct echo from the medium is low and hard to detect. However by measuring the echo reflected from the base of the vessel, the height of the medium can be measured. Two parameters are needed to be entered here.



1. Height of empty vessel
2. True medium height or medium electronic constant, these two parameters are related, entering either one is accepted. The precision of parameters will affect the precision of the measurement

1.4 Damping

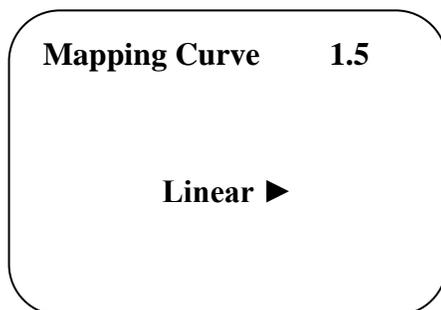
Pushing  will enter this menu when the menu item number 1.3. LCD displays as below



Press OK, enter editing menu. See parameter edition to learn how to edit the parameter. To confirm the modification with OK, give up with BK

1.5 Mapping Curve

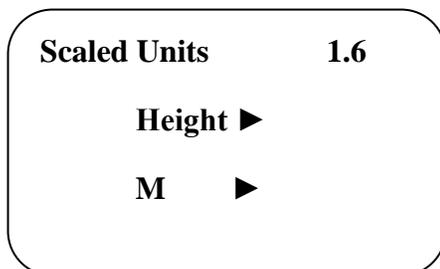
This menu define the correlation between the measured value and the current output. Linear or non-linear mapping can be selected in this menu. For the non-linear correlations, parameters setting must be done by a computer previously. Pushing  will select this menu when the menu item number is 1.4. LCD display as below



Press OK, enter editing menu. Move arrow with  to select linear or non-linear . Then confirm with OK.

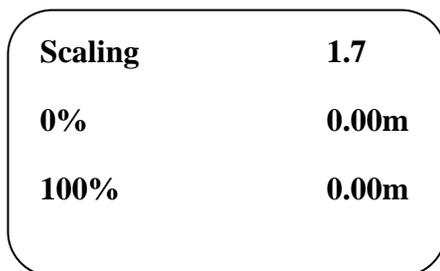
1 Scaled Units

The unit of the scaled output value can be set in this menu. Pushing  will enter this menu when item number is 1.5. LCD displays as below



1.7 Scaling

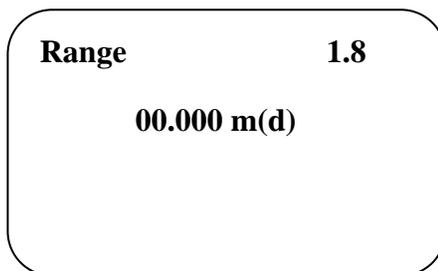
Pushing OK to enter the editing menu, see parameter editing for the value editing, press OK to confirm the modification



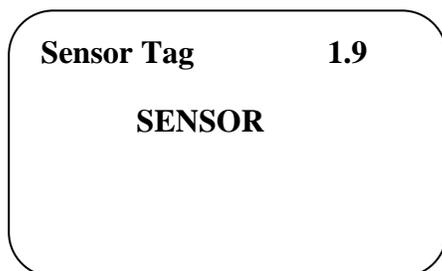
1.8 Range

Measure range should be set in order to get accurate result. When menu is 1.8, press  Key to enter Range. LCD displays as below

Press OK key to enter, Please see appendix as reference. When finishing editing parameter, Press OK key to confirm, or press BK to cancel



1.9 Sensor Tag

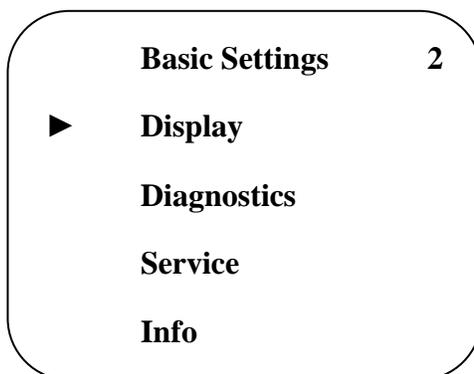


In the menu sensor TAG you edit a 11 digit measurement loop designation. The diameter set comprises: Letters from A-Z and Numbers from 0-9

See Optional item programming to edit the tag name

2 . Display

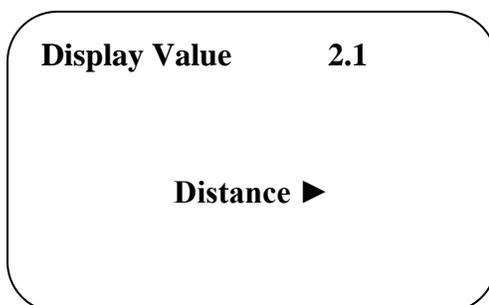
This menu is used to set display mode . Pushing  will select this menu when the main menu item number is 1. LCD displays as below



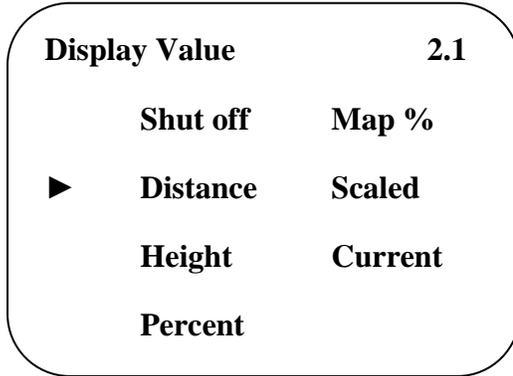
Push OK, you get

2.1 Display Value

Enter display mode set with OK. LCD displays as below



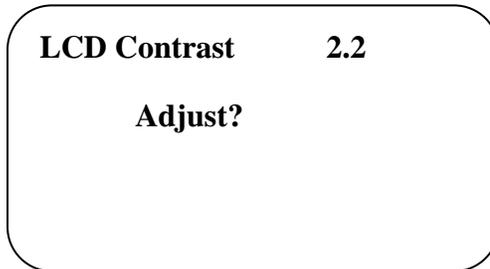
Push OK, you can select different display types of the measured value as shown below



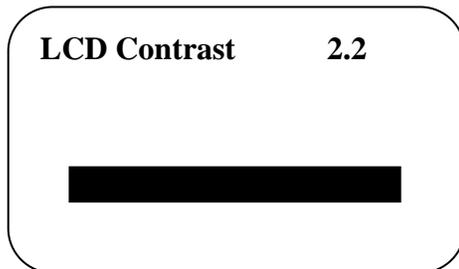
Move arrow to point to the type you want, confirm it with OK

2.2 LCD Contrast Adjustments

Pushing  will enter this menu when the menu item is 2.1. LCD displays as below



Adjust the B/W contrast by pressing OK, LCD displays as below

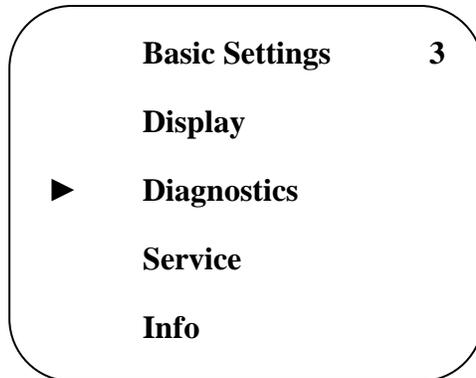


Increase contrast with  decrease contrast with  confirm with OK.

3. Diagnostics

The running status of the sensor can be provided by the menu diagnostics, and furthermore sensor testing can be done.

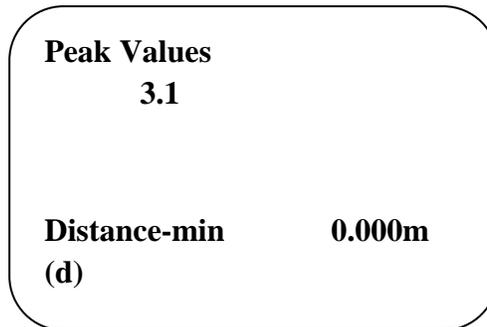
Pushing  to select this menu when the main menu item number is 2. LCD displays as below



Push OK, you get

3.1 Peak Values

Peak values record the maximum and minimum distance. The records can be cleared to zero at menu 4.4



3.2 Measurement status (measure)

Pushing  to display measuring status when the menu item is 3.1. LCD displays as below

Meas Status	3.2
Meas reliability:	10dB
Sensor Status:	OK

3.3 Choose Curve (Echo Curve)

At this menu, different curves can be selected to be displayed at menu 3, 4 when the menu item is 3.2 Press  . you get

Choose Curve	3.3
Echo curve	▶

Pushing OK to select the curve. There are three curves: Echo curve, false echo curve and output trend curve

Choose Curve	3.3
▶ Echo Curve	
False Echo Curve	
Output trend	

3.4 Curve

Pushing  will display the selected curve when the menu item is 3.3. LCD displays as below
Curve Zoom

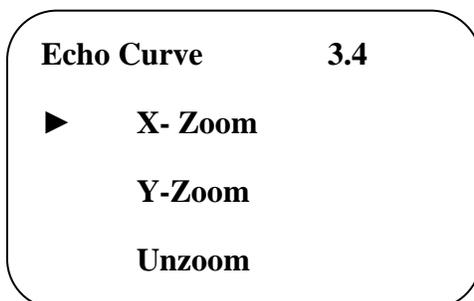
When the curve is displayed, pushing OK will enter curve Zoom function menu.

Move arrow with  , select menu item for X/Y axis Zoom. Then confirm with OK



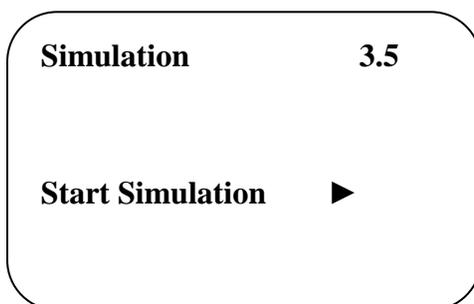
For X axis Zoom pushing  to mark the start position for zoom, then confirm with OK.

Pushing  again to mark the end position for zoom and confirm with OK. The selected area of the curve will be shown on the whole screen. Exit zoom with BK.

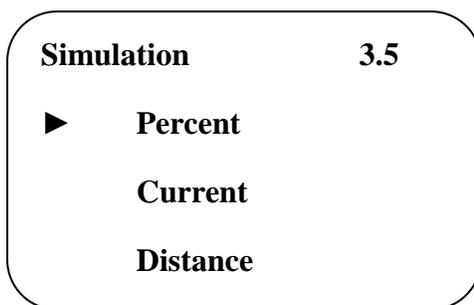


3.5 Simulation

Simulation is used to simulate the 4~20mA current output. By current output simulation the accuracy and linearity of the current output can be checked. And the system testing can be carried out. Push  to enter simulation menu when the menu item number is 3.4 LCD displays as below



Pushing OK enter simulation mode selection menu: LCD Displays as below



Pushing  select the simulation mode. Then confirm with OK. The corresponding value will be required and then simulation starts

Three types of simulations

Percent: the output current is decided by a percent Value: 100% relative to 20mA

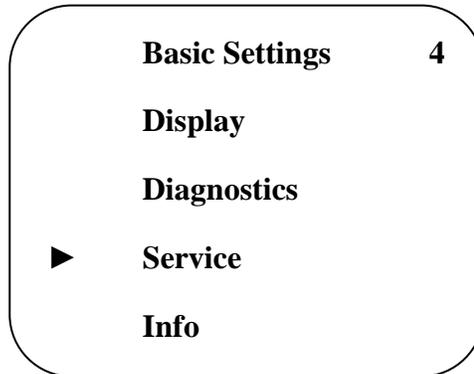
0% is relative to 4 mA

Current: the Output current is regulated by a current value

Distance: the output current is decided by a distance value. The current output depends on Min. adjustment (see 1.1), Max adjustment (see 1.2) and Mapping (see 1.5)

4.Service

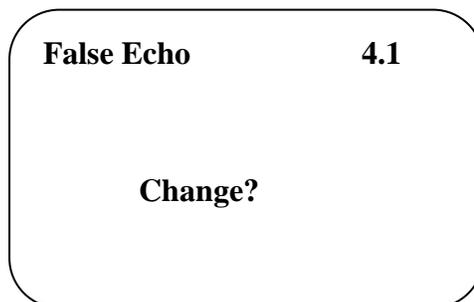
This menu with professional functions can only be used by trained technicians. They are false echo storage, reset, and sensor settings back up password setting and etc.



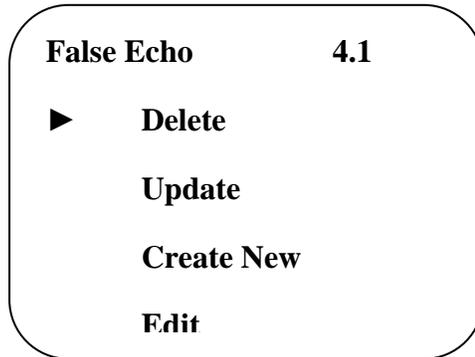
4.1 False Echo

High sockets or vessel installations. E.g. Struts or agitators as well as buildup and weld joints on the vessel walls cause interfering reflections which can impair the measurement. A false echo storage detects and marks these false echoes, so that they are no longer taken into account for the level measurement. A false echo memory should be created with empty vessel so that all potential interfering reflections will be detected

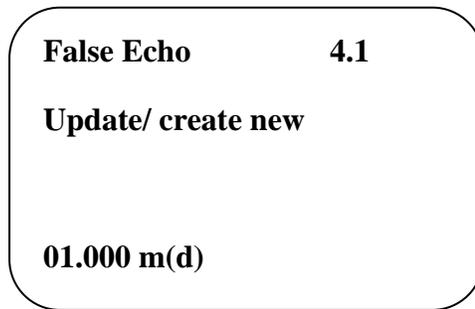
Pushing OK will enter this menu when the menu item is 4 =. LCD displays as below



Then Push OK, LCD displays as below



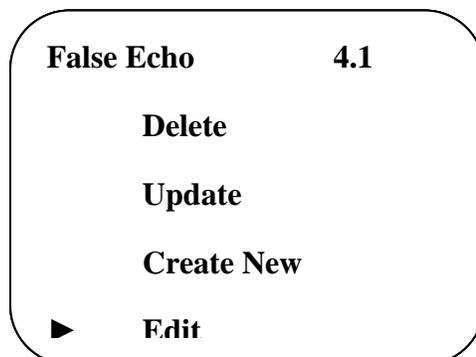
With  select Update/ Create new/ Delete a false echo, confirm with OK



When you select update create/new, you are asked to input a distance value for the real echo. Then push OK to confirm it and to start the operation. It will take some time to store the false echo.

Note: Check the distance to the product surface. Because if an incorrect (too large) value is entered, the existing level will be saved as false signal. The filling level would then no longer be detectable in this area

To edit a false echo curve, press the button, move the arrow to the desired section will be present, Press OK key to confirm. This feature has been built on false echo to edit or change to meet the special requirements of working conditions, access to virtual. False echoes editing interface is as follows: (Note: this menu requires professionals to operate)



False Echo Edit 4.1
Start 1.00 amplitude 1300
Stop 2.00 amplitude 1200
M(d)

Each curve edit points, start point and end point coordinates for the curve you want to edit, then the corresponding range of values. Is to modify the value (Note: When the distance coordinate input or modified, then the rate will automatically be the root corresponding according to the current saved data update rate changes used as a reference);

Two pairs of coordinates after editing press OK to confirm the amendment; instrument will automatically enter the two points into the line with new false echo generated curve, to replace the original curve; press OK to confirm , the interface will show the received by this false echo curve for reference, then edited by BK to return to the above interface to edit, when the editor has been confirmed false echo conditions required to be false then echo BK exit the Edit menu, then the interface displays the following:

False Echo Edit

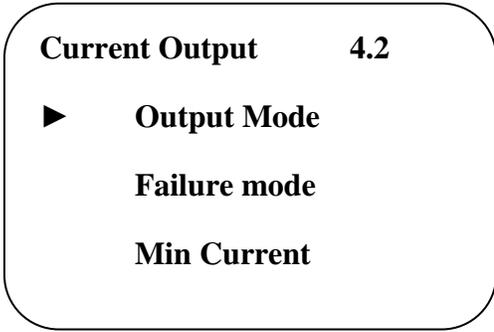
▶ **Save?**

Press OK button to save the above changes, according to BK key to abandon the current changes

4.2 Current Menu

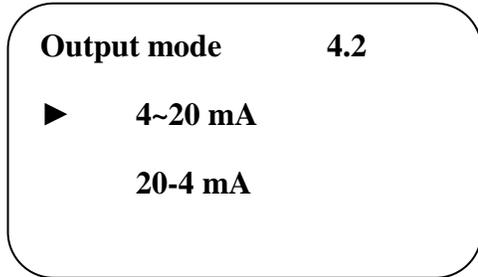
Current Output 4.2
Output Mode: 4~20 mA ▶
Failure mode: no change ▶
Min current: 4mA ▶





Output mode

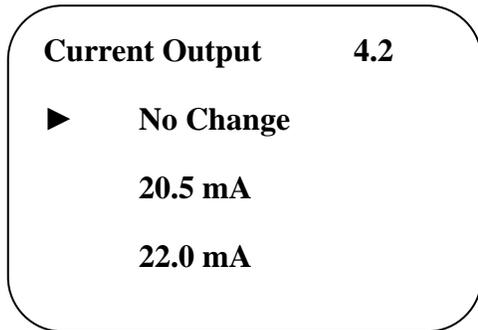
Select output as 4-20 mA or 20-4 mA means the min. levels is corresponding to 4mA and the Max. Level is corresponding to 20 mA. 20-4 mA mean the min. level is corresponding to 20 mA and the Max. Level is corresponding to 4mA. When the arrow points at output mode, push OK you get



Push  , you select the item you want and confirm with 

Failure Mode

Setup the output current on sensor error. Three status are available. When the arrow points at output mode, push  you get item failure mode and confirm with OK.

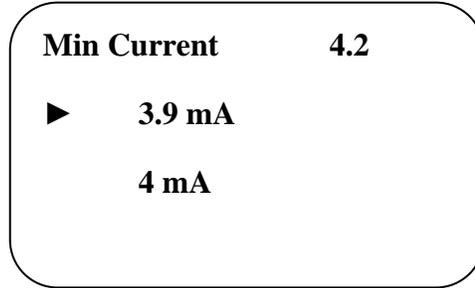


Min Current

Setup the minimal output current is 4mA or 3.8 mA. When the arrow points at fail mode, push 

You get min. current menu. Confirm with OK. You get





Select the item you want with  and confirm with OK.

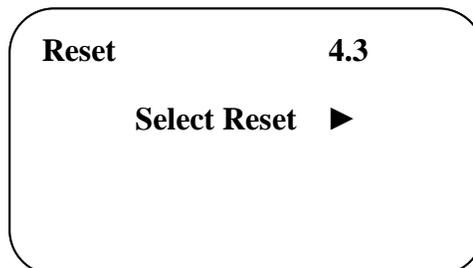
4.3 Reset

With the reset function, modified settings are reset. Three sub functions are available:

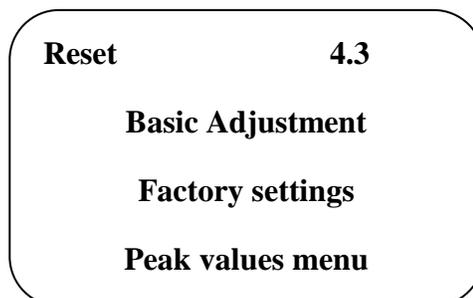
Basic Settings

- Reset settings modified with view point to the default values factory settings
- Reset special settings as well as basic settings to default values peak measured values
- Reset the min/ Max level records

When the menu item is 4.2, Push , you get



Push OK, LCD displays as below

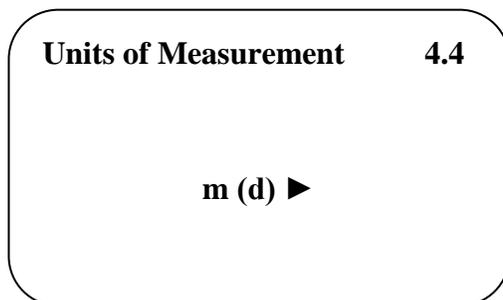


Select the item with , confirm with OK,



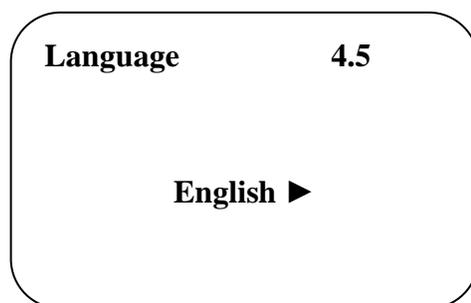
4.4 Units of Measure

Two sets of measure system units are available. The metric system and the British system



Push OK, to edit it

4.5 Language

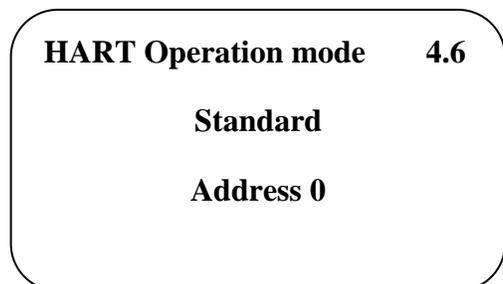


Push OK, to edit it

4.6 HART Operation Mode

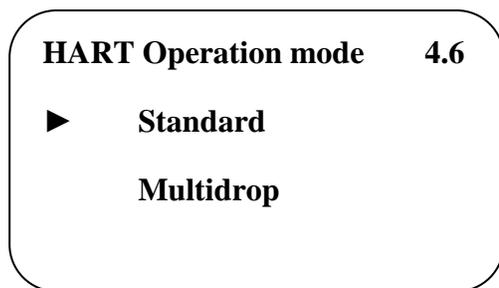
HART offers standard and multidrop mode. The standard mode with the fixed address 0 means output of the measured value as 4...20 mA signal. In multidrop mode, up to 15 sensors can be operated on one two-wire cable

In this menu you determine the HART mode and enter the address for multidrop



Push OK, you can select HART operation mode

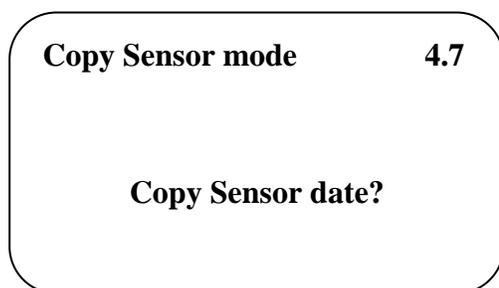




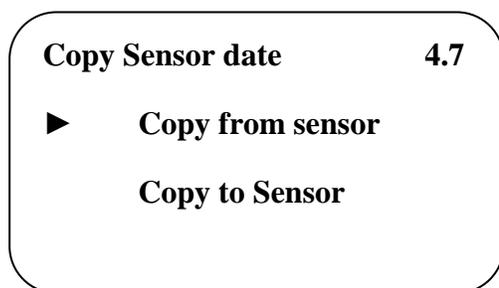
The default setting is standard mode with address 0.

4.7 Copy Sensor Data

In this menu you back up the sensor settings so as to restore them when necessary



Push OK, LCD displays below

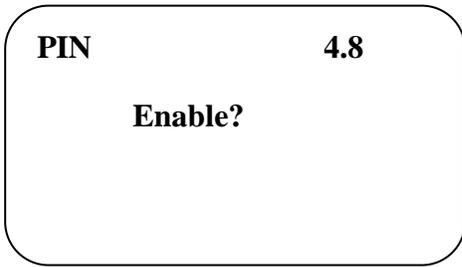


Copy from sensor means to save the sensor settings and copy to sensor means to restore the sensor settings

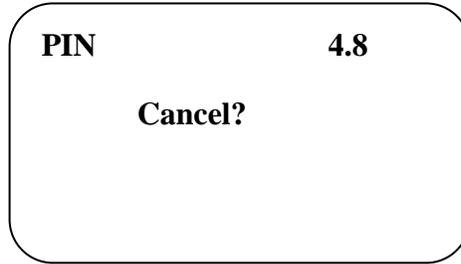
4.8 PIN

In this menu, the PIN is activated/ inactivated permanently. Entering a 4-digit PIN protects the sensor data against unauthorized access and unintentional modifications



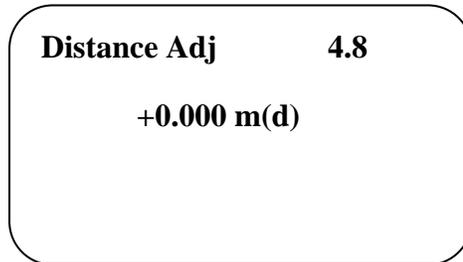


Or



4.9 Distance Adjustment

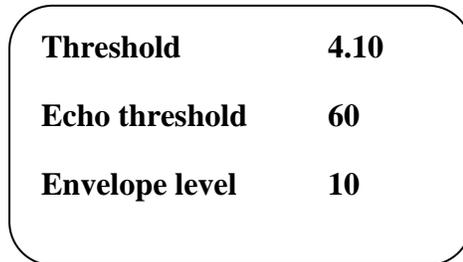
Distance Adj. is used to correct the difference between the measured value and actual distance. When menu is 4.8, press  to enter distance Adj. LCD displays as below: press OK to enter setting



4.10. Threshold Setting

(Note: This menu requires professionals to operate)

Threshold set used to set the effective size of the echo threshold, threshold set higher, ask to respond effectively to fluctuations in degree, that greater benefit exclude the small signal clutter; but definitely Note: if you modify the threshold value is greater than the effective Echo amplitude, the wave will cause the result of misunderstanding, the menu includes echo threshold and amplitude envelope, which the default rate of return threshold for the 60mV, amplitude envelope default value of 10mV



5. Info

In this menu the most important sensor information can be displayed,



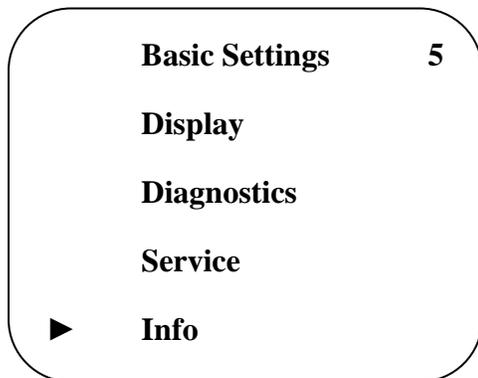
Sensor type: E.g. LTR

Serial No: E.g 123456

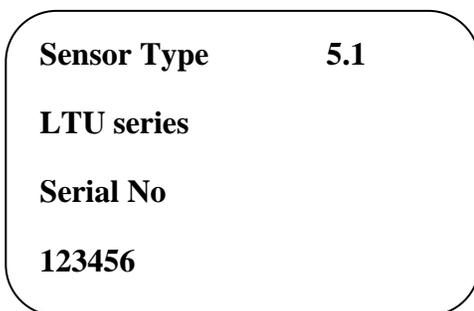
Date of manufacturer: E.g 2013-01-01

Software Version: E.g. 06.08.28

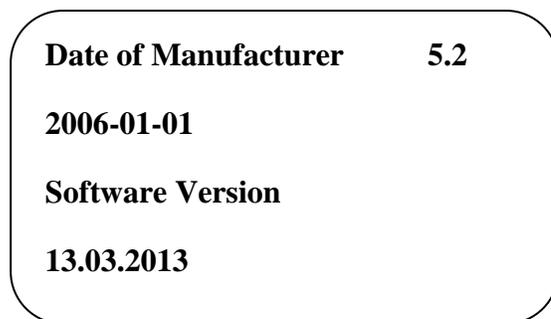
Pushing  will select this menu when the main menu item number is 4. LCD displays as below



Then Pushing OK enters the info display menu. LCD displays as below



Pushing  LCD Displays as below



Example: To Display echo curve do as follow:

1. Push OK to enter Program status. Main menu is displayed on LCD
2. Push  twice to select diagnostics submenu item
3. Push OK to enter the submenu number 3.1
4. Push  to enter next menu, the menu number is 3.2
5. Push  again, the menu number is 3.3
6. Push OK to enter the curve select menu (3.3)
7. Set arrow to point to echo curve with 
8. Push OK to confirm
9. Push  the echo curve will be shown. Menu number is 3.4
10. Push OK to enter curve zoom menu
11. Push  to select X-Zoom
12. Push OK to Confirm Push  to mark the start position
13. Push OK to confirm
14. Push  to mark the end position
15. Push OK to confirm. The area of the curve you select will be shown on the whole screen
16. Push BK several times to return to run state

Note: Shortcut Key BK can display echo curve on measurement mode, but it has no zoom functions.

Technical Specifications

General Parameters

Process Connection

- | | |
|-----------------------------|---|
| - Process Connection LTU551 | Silicone G1 ½ A |
| - Process Connection LTU552 | Silicone G2A |
| - Process Connection LTU553 | Silicone Steel 316L, Swiveling Holder/ Flange |

Material

- | | |
|---|---------------------------|
| - Transducer | PVDF/PTFE, PU/PC |
| - Transducer seal | Silicone |
| - Housing | Plastic PBT-FR; Aluminium |
| - Seal ring between housing and
Housing covers | Polycarbonate |



- View Point window on housing Polycarbonate
- Swiveling holder Stainless Steel

Weight

- LTU551/552 3 Kg (Depend on process connection and housing)
- LTU553 5 Kg (Depend on process connection and housing)

Power

2- Wire

- Standard Version (16~36) V DC
- Intrinsic Safe Version (21.6~26.4) V DC
- Power Consumption max 22.5 mA
- Ripple Allowance <100Hz $U_{ss} < 1$ V
- Ripple Allowance -(100~100K)Hz $U_{ss} < 10$ mV

4-Wire

- Intrinsic Safe Explosion- Proof (22.8~26.4) V DC, (198~242) V AC
- Power Consumption max. 1 VA, 1W

Parameters on Cable

- Cable Entry/ Plug One Cable entry of M20×1.5 (Cable diameter of 5~9mm) one binding of M20×1.5
- Spring Connection Terminal Applicable for cables with cross section of 2.5mm²

Output

- Output Signal 4-20 mA/ HART
- Resolution 1.6 μ A
- Fault Signal Constant current output: 20.5 mA; 22mA; 3.9mA
- 2-wire load resistance See diagram
- 4-wire load resistance Max. 500 Ω
- Integration Time 0-40 sec, adjustable



- Pressure Up to 3 Bar for LTU551, LTU552 and 2.5 Bar for LTU553
- Vibration Resistance Mechanical Vibration 10 m/s², (10`1500)Hz

Note: *mentioned as under standard temperature and pressure

- 1) Correct level measurement result needs longer time to be presented than usual in the event of drastic level changes

Maintenance

Exterior Cleaning

Please note the following points when cleaning the device

- The Cleaning agents used should not attach the surface and the seals
- Mechanical damage to the membrane, e.g. due to pointed objects, must be avoided
- Observe degree of protection. See therefore nameplate if necessary

Trouble Shooting

LCD Display Information	Causes	Solution
ROM verification Error	*ROM operation illegal/ Error	* contact the manufacturer
Logger reading error	*Stored parameters are wrong	*Power On again/ contact the manufacturer
System Logger error	*System stored data area has error	*Power On again/ contact the manufacturer
Measuring circuit hardware error	*Sub-CPU circuit errors	*Power On again/ contact the manufacturer
Date time error	*System timer has errors	*Power On again/ contact the manufacturer
No Display. Erratic or abnormal Operation	*Problem with wiring	*Check wiring connections. No influence of measuring normally
No Response to key pressing	*Keypad is locked *Bad Plug connection	* Input password to unlock keyboard or check wiring connections, no influence of measuring normally



LTR551

Explosion Proof Approval	
P- Standard (Without Approval) I- Intrinsically Safe (Ex ia IIB T6)	
Material/ Process Temperature/ Protection	
A- PU/PC/ (-40~70)°C/ IP66 B- PTFE/ PVDF (-40~80) °C/ IP67	
Electronic	
B- (4-20)mA/HART 2-wire C- (4-20)mA/(22.8~26.4) V DC/ HART 2-wire/ 4-wire D- (198-242)V AC/HART 4-wire	
Housing	
A-Aluminium/IP67 B-Plastic/ IP66 D-Aluminium (2-Chamber)/ IP67 G-Stainless Steel316L/ IP67 S-Special option (IP68 Protection)	
Cable Entry	
M- M20×1.5 N- ½ NPT	
Display / Programming	
A- Yes X- No	

Note: Version I product must be matched with housing A and electronic components A & C



LTU552

Explosion Proof Approval	
P- Standard (Without Approval)	
I- Intrinsically Safe (Ex ia IIB T6)	
Material/ Process Temperature/ Protection	
C- PU/PC/ (-40~70)°C/ IP66	
D- PTFE/ PVDF (-40~80) °C/ IP67	
Electronic	
B- (4-20)mA/HART 2-wire	
C- (4-20)mA/(22.8~26.4) V DC/ HART 2-wire/ 4-wire	
D- (198-242)V AC/HART 4-wire	
Housing	
A-Aluminium/IP67	
B-Plastic/ IP66	
D-Aluminium (2-Chamber)/ IP67	
G-Stainless Steel316L/ IP67	
S-Special option (IP68 Protection)	
Cable Entry	
M- M20×1.5	
N- ½ NPT	
Display / Programming	
B- Yes	
X- No	

Note: Version I Product must be matched with housing A and electronic components A & C



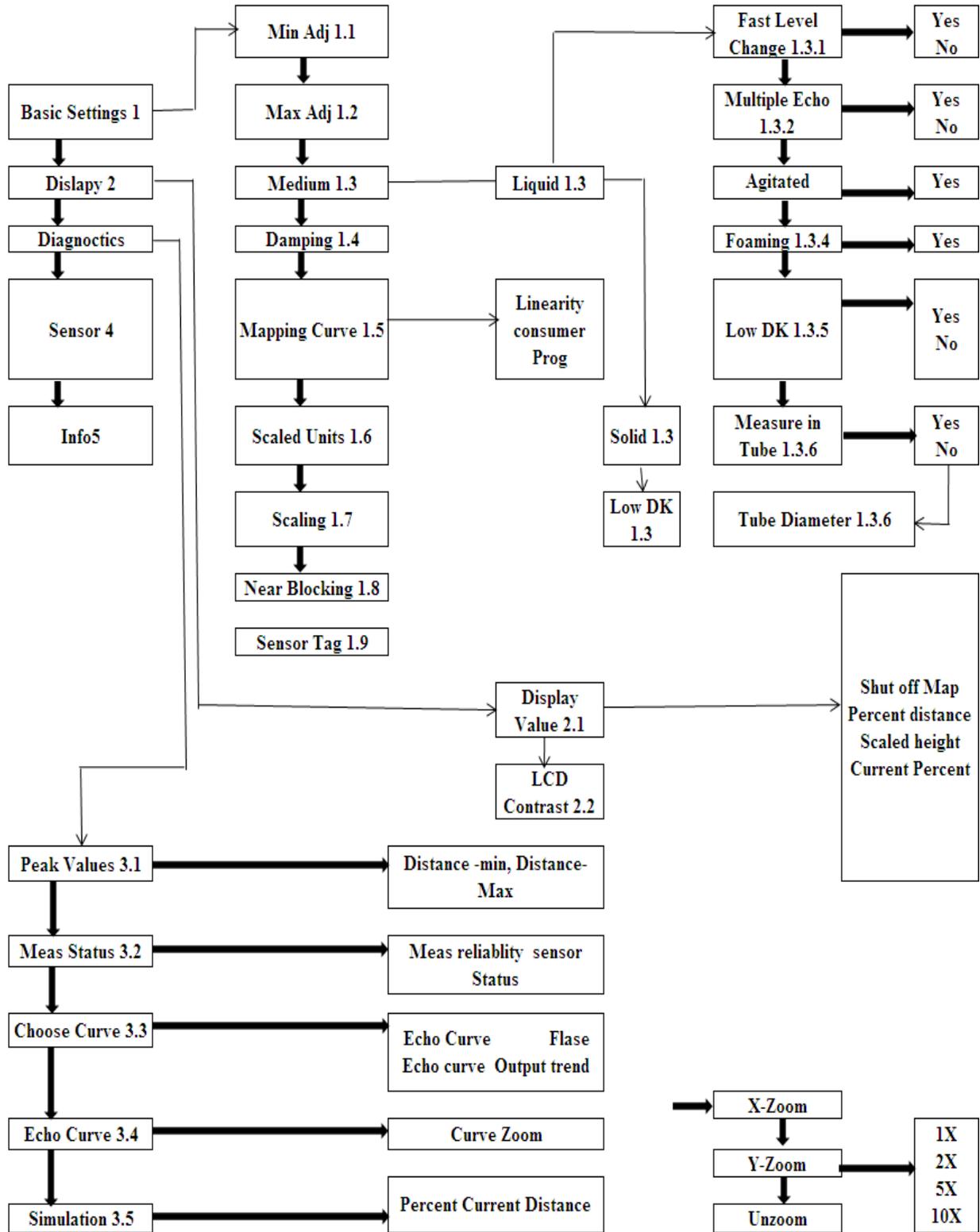
LTU553

Explosion Proof Approval	
P- Standard (Without Approval)	
I- Intrinsically Safe (Ex ia IIB T6)	
Material/ Process Temperature/ Protection	
E- PU/PC/ (-40~70)°C/ IP66	
F- PTFE/ PVDF (-40~80) °C/ IP67	
Electronic	
B- (4-20)mA/HART 2-wire	
C- (4-20)mA/(22.8~26.4) V DC/ HART 2-wire/ 4-wire	
D- (198-242)V AC/HART 4-wire	
Housing	
A-Aluminium/IP67	
B-Plastic/ IP66	
D-Aluminium (2-Chamber)/ IP67	
G-Stainless Steel316L/ IP67	
S-Special option (IP68 Protection)	
Cable Entry	
M- M20×1.5	
N- ½ NPT	
Display / Programming	
C- Yes	
X- No	

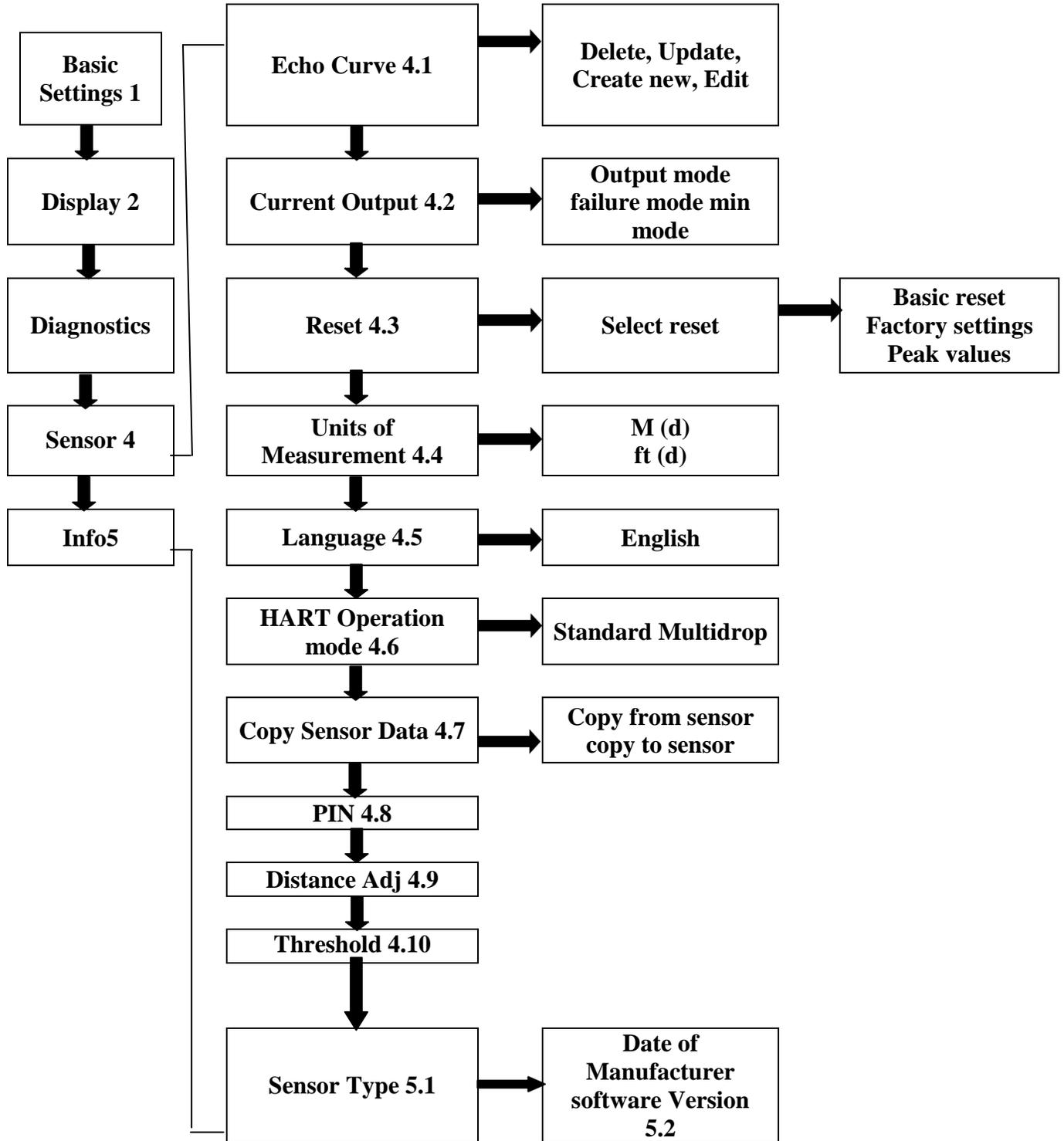
Note: Version I Product must be matched with housing A and electronic components A & C



Basic Settings:



Appendix:



Head Office



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