

Operating Instructions of User Set of Ultrasonic Level Meter Menu

The ultrasonic level meter, which is produced by our company, using full Chinese menus for simple set then it can satisfy different needs of customers. Normally, according to the installation requirements of manual, once the equipment is installed, one only needs to set following several parameters, and then it can be for normal use.

There are three keys on the panel, through them we can debug the instrument. Measured values are showed on the LCD screen after debugging.



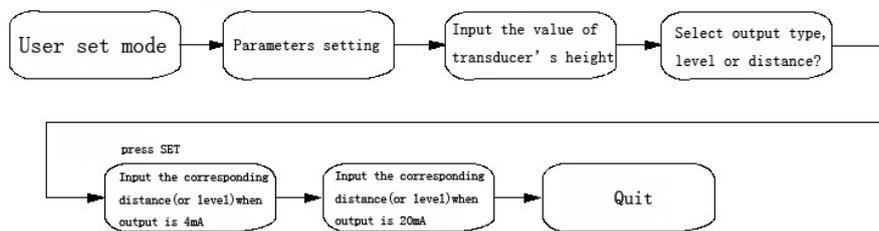
- ◇ Access to menu items ◇ Move the cursor
- ◇ Confirm menu item ◇ Select menu item
- ◇ Confirm parameter calibration ◇ Parameters calibration

(1)After instrument electrically excited, long press “Set” key for two seconds to enter the first level menu.

Menu mode: factory set and user set.
Menu lookup table of user set, see below table

Menu lookup table of user set mode

Note:Enter the menu for the first time,please press SET key for 2 seconds
press SET



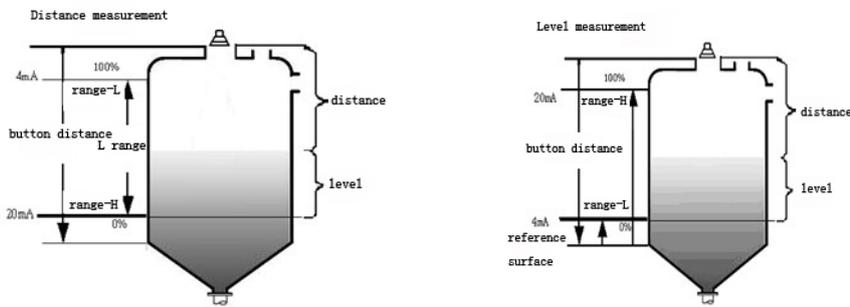
Menu lookup table of factory set, see “Appendix: Menu Lookup Table of Ultrasonic Level Meter Engineer”.

(2)Measure type selection:

Measure type divided into distance measurement and level measurement.
Factory set default as level measurement.

(3)Input the height value of transducer into “button distance”. (The distance from radiation face of transducer to irrigation bottom or pool bottom is transducer’s height)

- ①In distance measurement mode, setting of button distance has no significance, positions of **range-H**, **range-L** see attached graph1.1.
- ②In level measurement mode, positions of button distance, range-H, range-L see attached graph1.2.



Attached graph1.1: distance measurement Attached graph1.2: level measurement

Range-L: Distance from reference surface to range-L. The value is positive when range-L is higher than reference surface, and negative when it below reference surface. The output current is 4mA when level is on the position.

Range-H: Distance from reference surface to range-H. The value is positive when range-H is higher than reference surface, and negative when it below reference surface. The output current is 20mA when level is on the position.

(4)Work with relay: enter into the alarm settings, set three parameters:

- ①Alarm mode: high alarm, low alarm , close optional.
- ②Alarm value: high alarm: when level is higher than alarm value
Low alarm: when level is lower than alarm value

③difference: It is used to prevent the measurement error which can lead to the alarm switch repeatedly beating around the alarm point.

High alarm state: when level is lower than (alarm value - difference) removing alarm.

Low alarm state: when level is higher than (alarm value + difference) removing alarm.

(5)Setting of these three projects: transducer select, parameter calibration, algorithm select please follow the guidance of the professional technical person.

(6) After the completion of equipment installation, The equipment must be truly separate grounding,doesn't use the electrical box or meter box's common ground.

(7) Suggestion: When we connecting the ultrasonic level meter with some interference device such as frequency converter, PLC, **we'd better add an isolator between power supply unit and signal part, and do reliable ground handing.**

★Signal line doesn't allow sharing same slot with power line or power cord,but install through metal tube,or far away power line and power cord,under the indication of without throughing installation,the distance between power line,power cord should be more than 1 m.

Pictorial instructions:

★It's an important notice,please read it carefully,and do it accordance with the requirements strictly.

▲It's a general hints,please read it carefully,so as not to be troubled in using.

One, Product Introduction

Ultrasonic level (material place, liquid level) meter, is a non-contact, high reliability, cost-effective, easy to install and maintain level measurement instruments. It does not have to contact medium and it can meet most of the requirement of level measurement, the new generation ultrasonic level meter is developed through our company's many years' efforts and our company own the completely independent property rights of it.

Two, Debugging

Due to the different installation environment of instrument, so before ultrasonic level meter works we must know the basic situation of the required measure, such as measurement range, zero point, full scale and scene working condition. More specific please refer to the first page of this manual.

Other: Don't modify these three projects: transducer select, parameter calibration and algorithm select by yourself.

Three, Main Technical Specifications

function	Integral type	fission style
Measurement range	5m、10m、15m、20m、30m、40m、50m、60m	5m、10m、15m、20m、30m、40m、50m、60m、70m、
Measurement accuracy	0.25%-0.5%	0.25%-0.5%
resolution	3mm or 0.1% (take great)	3mm or 0.1% (take great)
display	Chinese LCD	Chinese LCD
Analog output	4wires4~20mA/750Ω load 2wires4~20mA/250Ω load	4~20mA/750Ω load
Relay output	2groups AC 250V/ 8A or DC 30V/ 5A state programmable (optional)	Single channel for two groups, double channels for four groups AC 250V/ 8A or DC 30V/ 5A state programmable (optional)
Power supply	Standard configuration 24VDC optional 220V AC±15% 50Hz	Standard configuration 220V AC±15% 50Hz optional 24VDC 120mA custom 12VDC or power supply
Environment temperature	Display instrument-20 ~ +60℃ , transducer-20~+80℃	Display instrument -20~+60℃ , transducer-20~+80℃
communication	Optional 485 , 232 communication (Manufacturer agreement)	Optional 485, 232 communication (Manufacturer agreement)
Protection grade	Display instrument IP65 , transducer IP68	Display instrument IP65 , transducer IP68
transducer cable	no	Up to 100 m, Standard configuration 10m
Transducer installation	According to the range and transducer select	According to the range and transducer select

Note: This series of ultrasonic transducer can also customize according to the

customer demands: special specifications of transducer such as high voltage, high temperature resistant, minor-caliber, small blind area and so no.

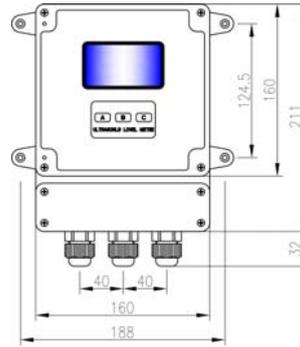
Four, Installation Guidance

4.1 Installation size of level meter

(1) Split type standard ultrasonic level meter:



Real figure



Structure diagram

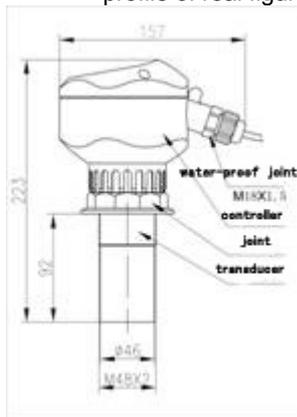
(2) Integral enhanced ultrasonic level meter



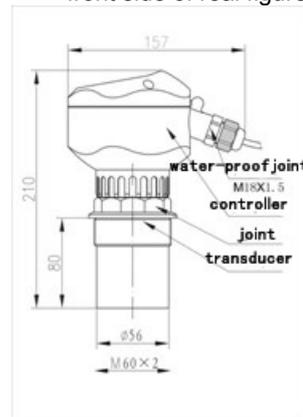
profile of real figure



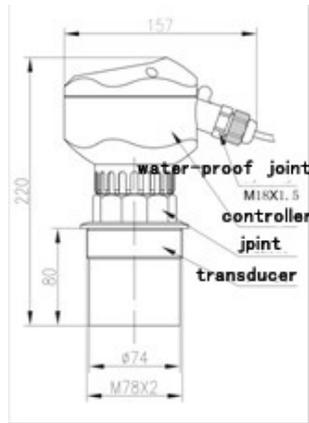
front side of real figure



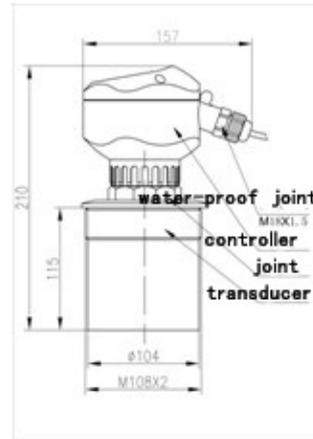
screw thread M48×2transducer



screw thread M60×2transducer



screw thread M78×2transducer

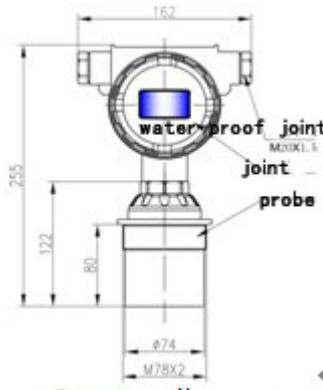


screw thread M108×2transducer

(3)integral explosion-proof ultrasonic level meter:



Real figure

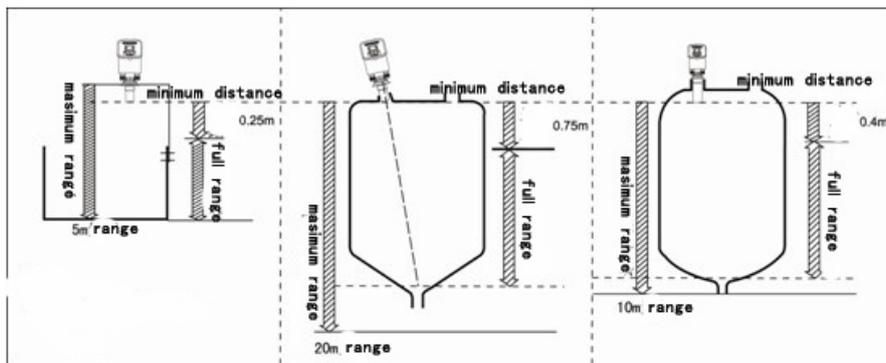


Structure diagram

4.2 installation guidelines

4.2.1 Understand the professional term

① measurement range: when choosing instrument selection, measurement range is important, please see following picture.



②angle of departure and False echo

Ultrasonic wave beam through probe focusing, the launching of pulsed beam as The beam of the flashlight, the farther from the probe, the greater the diffusion area.

Everything inside the angle of departure, such as: pipe, stents, weld, reinforcement, stirring propeller, hanging wall of the object, can cause strong false echo, especially within the angle of departure which is closer to the probe.

For example: the false echo of a pipe 6m away from the probe is 9 times that of the same pipe 18m away from the probe.

★As far as possible, the sensor axis is perpendicular to the surface of the medium, and avoid the launch angle with any other object, such as pipe and stent.

4.2.2 Measurement range selection

Measurement range depends on the chosen ultrasonic probe's range. Ultrasonic probe's range depends on the work environment, measurement object, centrifuge of scene. According to the following table, you can choose the range that you need.

Level surface	Times of attenuation	Percentage of attenuation	Increase times of range
smooth	0dB	0%	Don't need to increase
corrugated	5...10dB	50~67%	1time of range
Big move (such as with mixing blade)	10...20dB	90%	3times of range

Solid material surface	Times of attenuation	Percentage of attenuation	Increase times of range
Hard, rough (such as granulated rubber)	40dB	99%	10times of range
Soft (such as coal, cement, fly ash)	40...60dB	99~99.9%	Is not recommended

With dust	Times of attenuation	Percentage of attenuation	Increase times of range
none	0dB	0%	Don't need to increase
little	5dB	50%	1time of range
much	5...20dB	50~90%	3times of range

charging	Times of attenuation	Percentage of attenuation	Increase times of range
none	0dB	0%	Don't need to increase
little	5...10dB	50~67%	1time of range
much	10...40dB	67~99%	3time of range

With mist	Times of attenuation	Percentage of attenuation	Increase times of range
none	0dB	0%	Don't need to increase
little	5...10dB	50~67%	1time of range
much	10...20dB	67~90%	3time of range

With steam	Times of attenuation	Percentage of attenuation	Increase times of range
none	0dB	0%	Don't need to increase
little	5...10dB	50~67%	1time of range
much	10...20dB	67~90%	3time of range

Temperature difference between probe and medium surface.	Times of attenuation	Percentage of attenuation	Increase times of range
≤20℃	0dB	0%	Don't need to increase
≤40℃	5...10dB	50~67%	1time of range
≤80℃	10...20dB	67~90%	3time of range

The calculation of signal attenuation,if the scence is a variety of situation,we need to sum up serval condition to calculate the amount fo signal attenuation.

·with little charging 5...10dB
·with little steam 5...20dB
·temperature difference between probe and medium surface≤40℃ 5...10dB
In total The minimum 15dB, The maximum 40dB.

In this case, If the actual maximum measurement range is 5 meters, you need to choose 50 m range of ultrasonic liquid level meter.

4.2.3 installation of bottom threads

▲ it's recommended using plastic flange connect to sensor

① install a flange on the surface of measured object

② put a same inner diameter gasket on flange



③ align transducer to flange hole

④ put transducer inside flange hole



⑤ see from flange bottom flange

⑥ put a same inner diameter gasket below



⑦ screw nut and fix transducer well

⑧ the transducer installed



4.2.4 installation of top threads- Hoisting method of installation

- ①top screw thread of probe fixes with nut
- ②line into the probe should be protected with protective tube

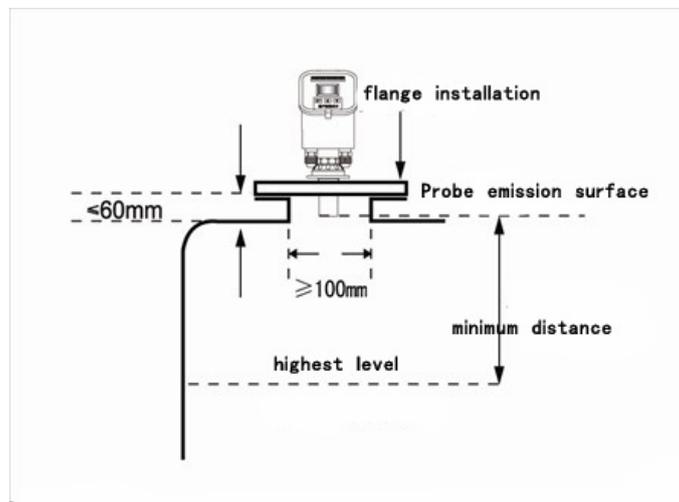


- ▲ method of fixes on can,tank,cover and bracket are the same with above.
- ★when probe was installed,launch surface of probe must out of cover or waveguide,can't contract in cover or waveguide.

4.2.5measure liquid

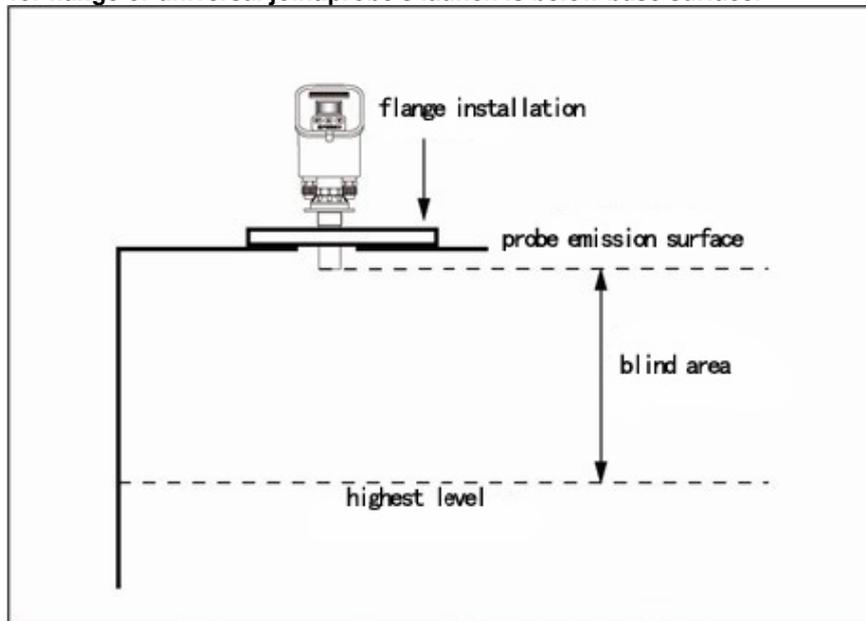
4.2.5.1ceiling tank

Ceiling tank always has a short connecting tube,the base level of connecting tube is flange's bottom surface,when connecting tube shorter than60mm,longer than100mm,connecting tube's inwall without burr,raised,with this prerequisite,the launch surface of installed probe below flange's bottom surface 3cm,it can measure.

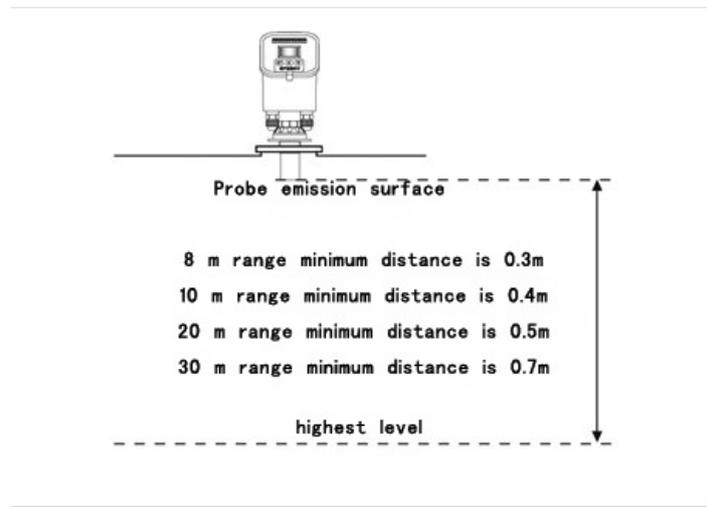


Flange type(locking flange)installed on the flat top of tank

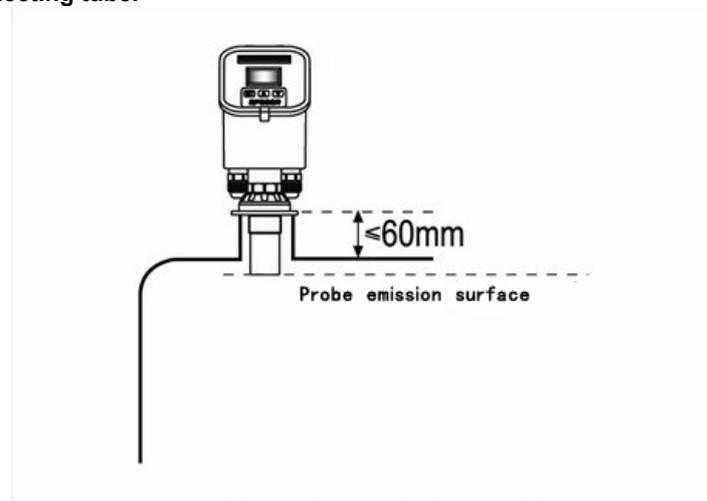
The ideal installation is directly make meter fix on ceiling container,doesn't use connect tube,circular opening of container is enough for flange or universal joint.probe's launch is below base surface.



Flange type (locking flange) installed on the flat top of tank

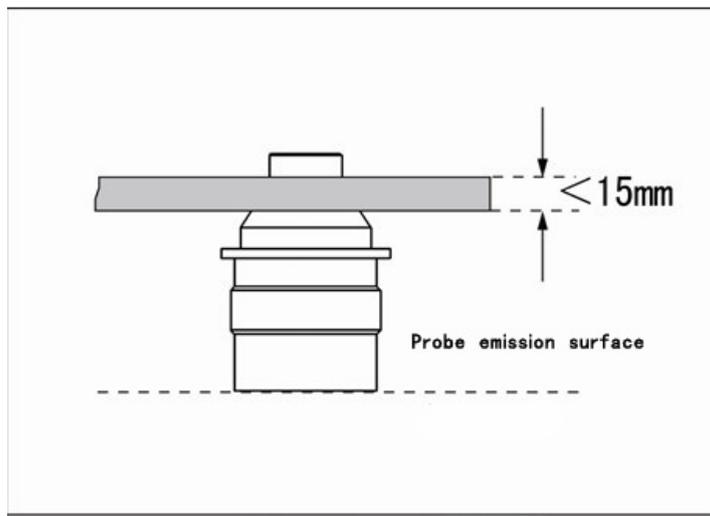


When meter is installed on the same screw thread tube of probe, connecting tube's inner diameter almost the same with outer screw thread, probe's launch surface must 2cm out of connecting tube, can't contract in connecting tube.



The probe is installed on the nipple

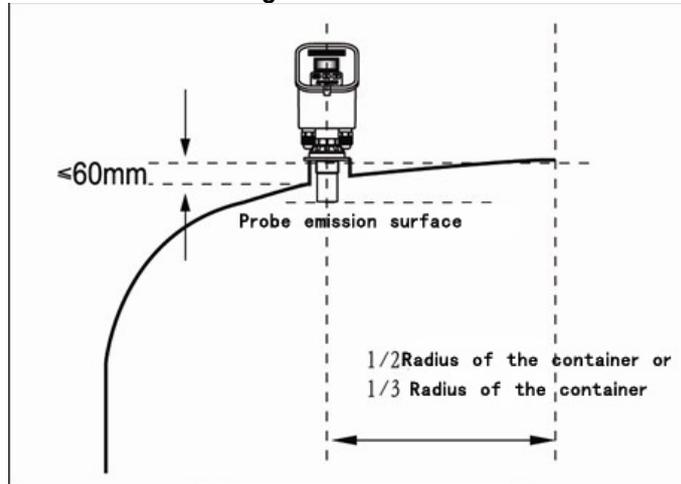
Similarly, split type of transducer can select top screw thread installation, fix on pipe thread which size is M30×1.5.



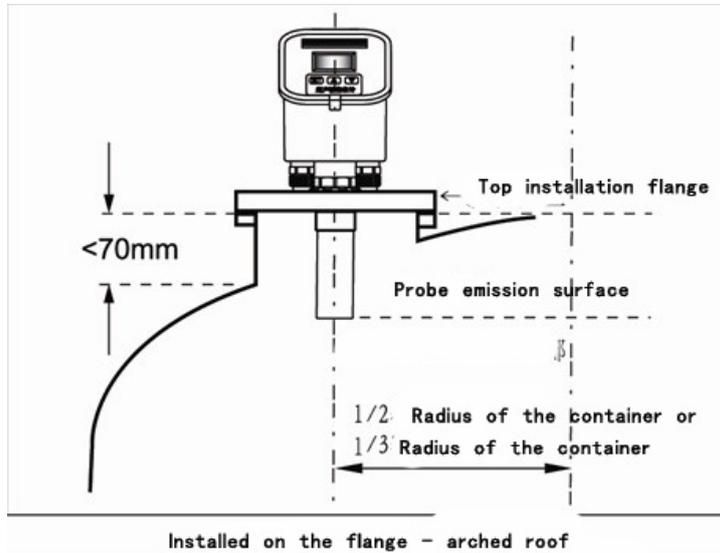
screw thread connection of fission probe

4.2.5.2 arched roof

For arched roof, it is better not to fix the meter on the middle of the tank roof, but $1/2$ or $1/3$ of the tank roof's diameter (under the premise of a distance from the tank inwall). To ultrasonic pulse, the arched roof acts as a convex lens. If the probe is fixed on the focus of the convex lens, it can receive all false echoes. So it should be tried to be installed at the base to avoid installing the transducer at the middle of the arched tank's roof.



Installed on the nipple - arched empowerments



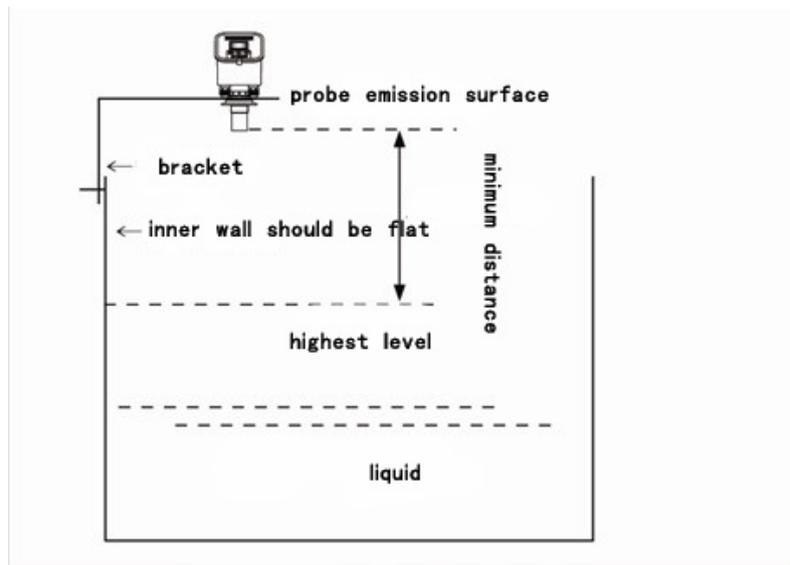
On most arched tank's roof, total length of connecting tube and flange's length is 150-180mm, but length of ultrasonic level's probe is not amount to it (customer can by longer probe from our company, that make probe's launch surface below connecting tube's bottom) in this case, we must make attention to the proportion between connecting tube's diameter and connecting tube's length.

list	Tube length	Tube diameter	notice
1	150mm	200mm	Inwall of tube without burr, bump, straight vertical, welding must be polished. joint of connecting tube and tank roof must be 45° bevel polished from inside to outside.
2	200mm	260mm	
3	250mm	325mm	
4	300mm	360mm	

4.2.5.3 opening container

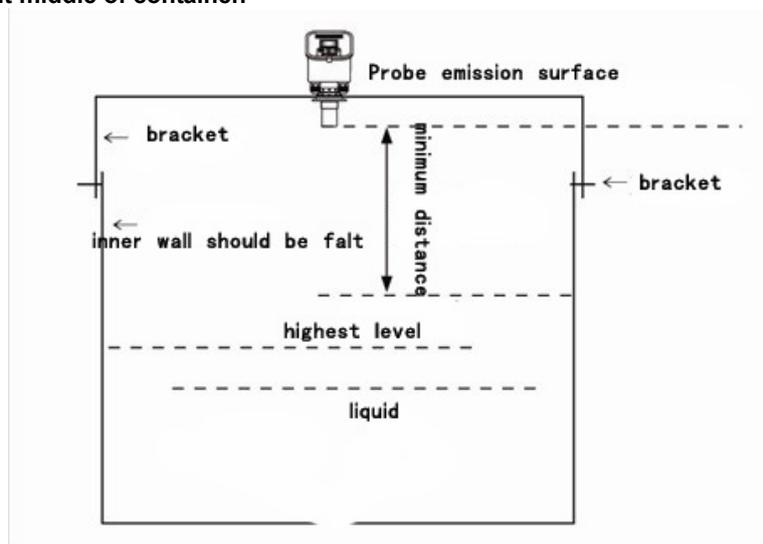
To opening container, can install with bracket, but pay attention to the bearing capacity of bracket, make distance between transducer and container wall. if the opening container's top and bottom inwall is falt, the distance between probe and container inwall see follow table:

Maximum range	Distance from wall	Maximum range	Distance from wall	Maximum range	Distance from wall
5m	0.5m	10m	1.0m	15m	1.5m
Maximum range	Distance from wall	Maximum range	Distance from wall	Maximum range	Distance from wall
20m	2m	30m	3m	40m	4m



open container-side top bracket installation

As opening container without focus effect,we can install transducer on right middle of container.

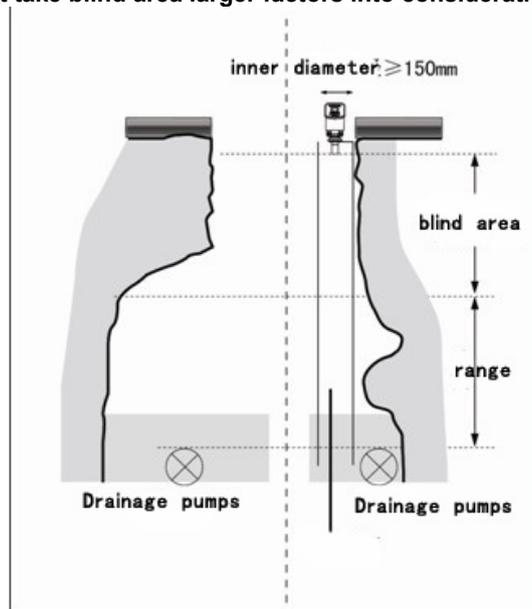


open container-middle top bracket installation

4.2.5.4 drain well and ordinary well

Drain well always has stricture shaft and wellhead,and well wall is uneven,it make measure very difficult.the problem can resolved by installing a connecting tube or installing full measure kit tube.please remind,when

transducer is put in connecting tube, blind area could increase by 50~100%, we must take blind area larger factors into consideration.



connecting tube and measuring casing is used for drain well

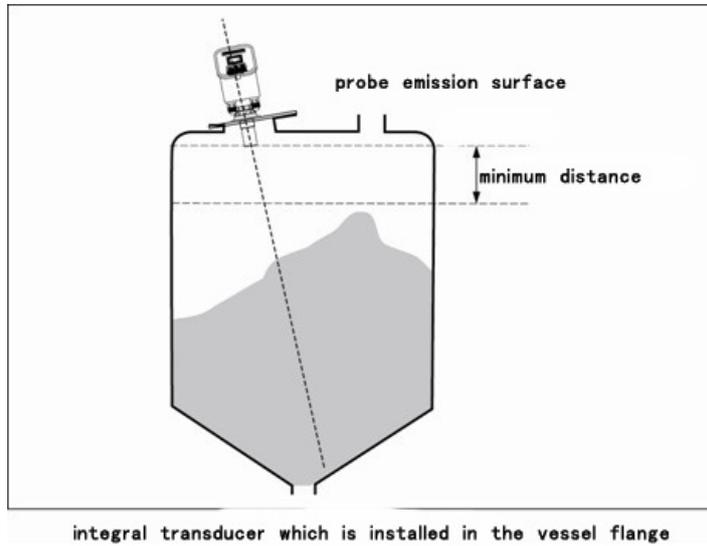
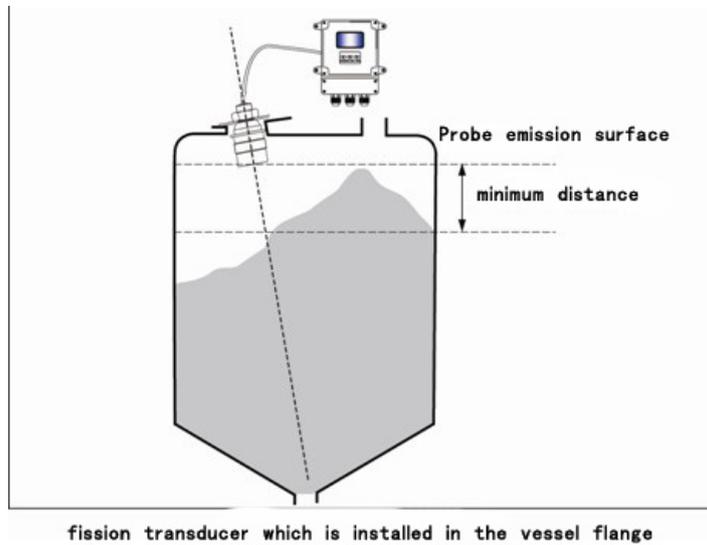
The diameter of ordinary well (including source well, deep well) is always short, we can install measurement kit to achieve the best measurement result, the inwall of measurement kit must be smooth (can use PVC, PE tube) the inner diameter $\geq 150\text{mm}$ (measurement range shorter than 10m) or diameter $\geq 200\text{mm}$ (measurement range shorter than 20m). as measurement tube keeps clean, without adhesion medium, then it can measurement.

Measurement kit never immerses in medium, or always immerses in the medium, so that we can ensure the accuracy of the measuring tube.

4.3.1 measurement solid

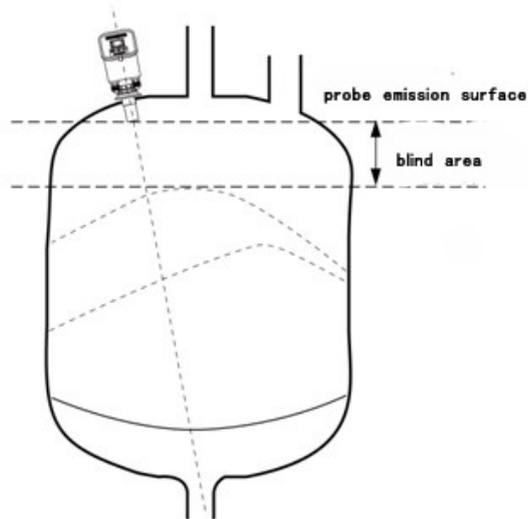
4.3.1.1 flange installation

The same with measuring liquid medium, Meter can be installed on the container to take over the counter flange, must take over axis alignment container export or perpendicular to the surface of the medium, the probe should be able to out from the takeover.



4.3.1.2 Nipple installed

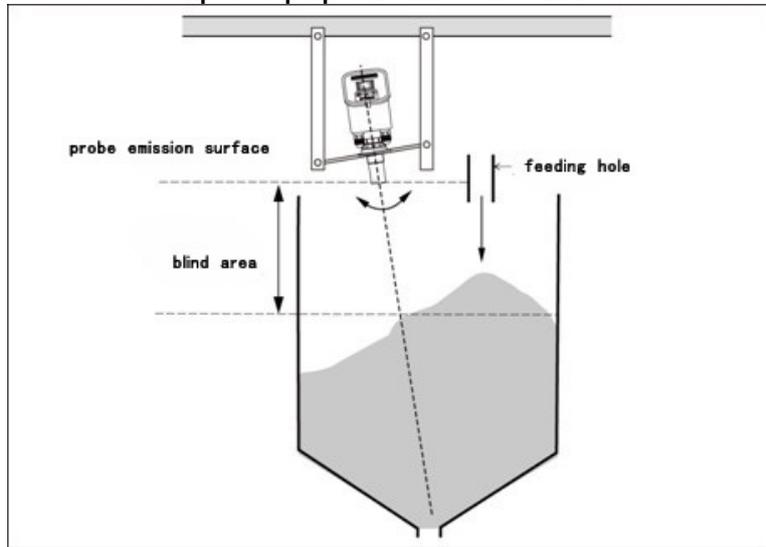
Use nipple installed, probe must be exposed over more than 2 cm at the bottom of connecting tube.



integral transducer-screw thread tube installation

4.3.1.3 bracket installation

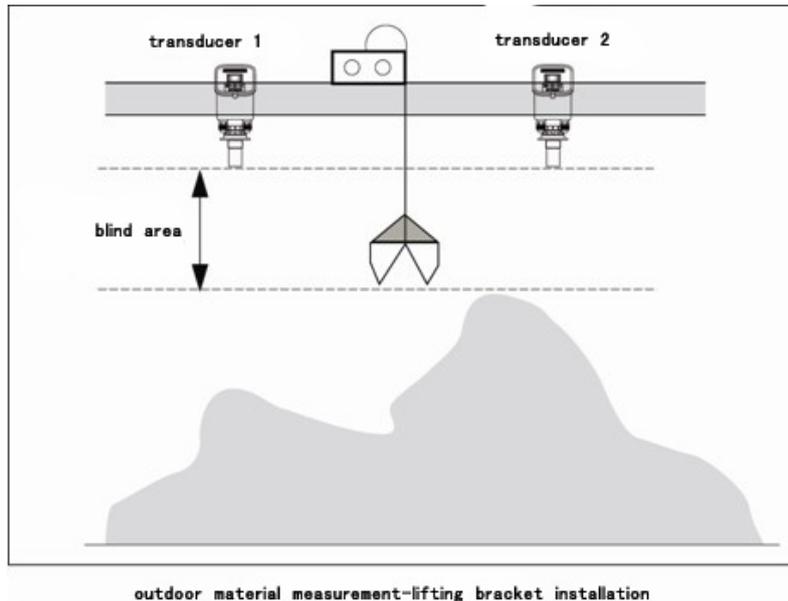
Bracket installation can be used in opening container, take over axis must be on the container export or perpendicular to the surface of the medium.



integral transducer-bracket installation

When installed in the outdoor window, big outdoor window needs several meters to measure, meter can fix on the lifting frame, the

transducer probe should aim at the medium surface.

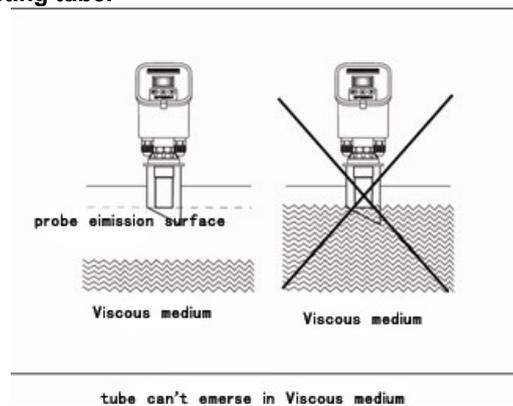


4.3.2 how to extend the length of measurement tube

Ultrasonic level meter's probe and the measured medium surface need to keep a minimum distance, which commonly refers to as blind area. But sometimes it does not guarantee the minimum distance, you will need to install an extension tube in the container.

4.3.2.1 how to extend the length of tube that measuring liquid

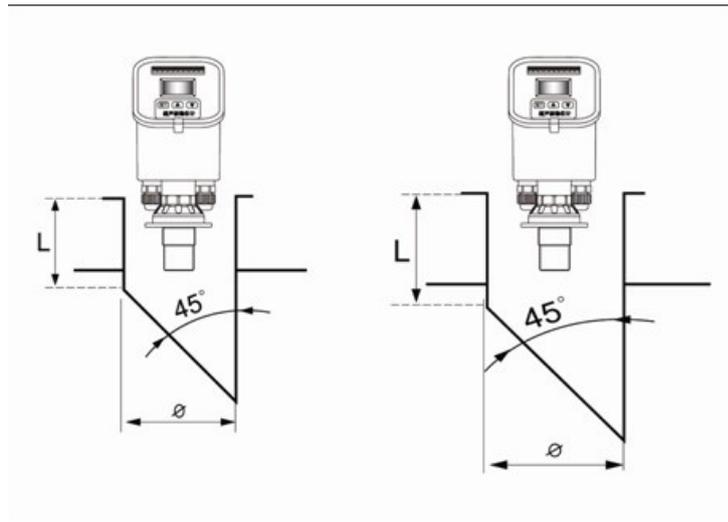
Try to keep tube in wall smooth, connecting tube can't immerse into the medium, to prevent the medium polluting connecting tube or adhesion on the connecting tube.



If the medium is not adhesive, the extensive tube can immerse in the medium long term (should be liquid corrosion, also can't have sundry adhesion), thus the measurement will be more accurate, because the measurement doesn't affected by other device inside the containe.

Connecting tube's inner diameter should be as great as possible, keeping iblique mout smooth. relationship of connecting tube's height and tube's inner diameter show in the following table.

list	Connecting tube's height	Tube's inner diameter	note
1	150mm	200mm	Connecting tube's inwall without burr, bump, strict perpendicular, weld to do polishing processing. joint of tube and tank roof needs to be done 45° bevel polishing from inner to outer.
2	200mm	260mm	
3	250mm	325mm	
4	300mm	360mm	
5	350mm	455mm	



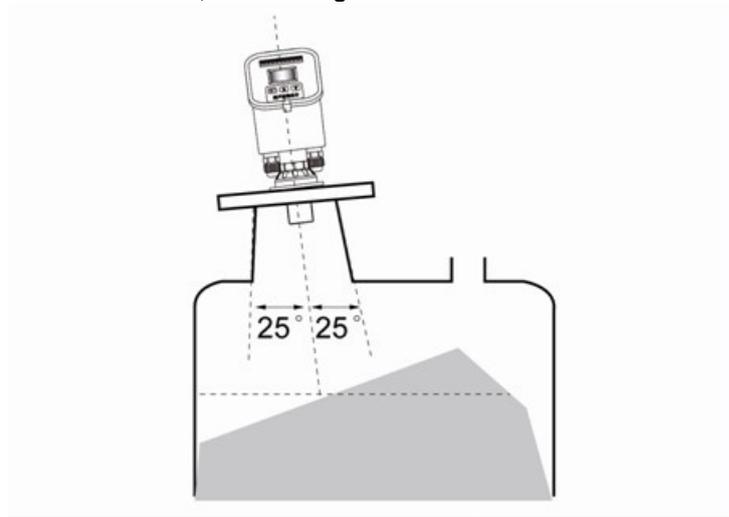
extend tube that doesn't emerse in medium

In the case of installation of extend tube from tank roof to tank bottom, relation between tube inner diameter and transducer measurement distance see following table.

Maximum range	Tube minimum inner diameter	Maximum range	Tube minimum inner diameter
5m	100mm	10m	150mm
Maximum range	Tube minimum inner diameter	Maximum range	Tube minimum inner diameter
15m	200mm	20m	200mm

4.3.3.2 how to extend the length of measurement of solid

If the medium is solid, measurement is different from liquid, we need to use conical extend tube, with the angle of 25° - 30° .



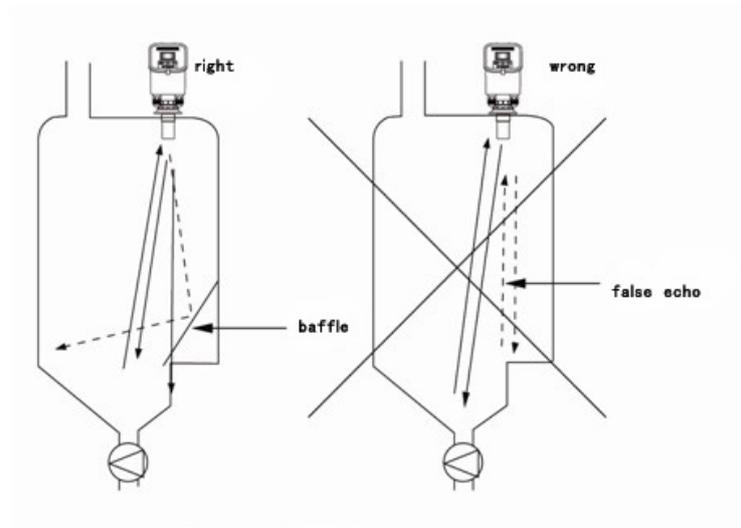
extend tube of measuring solid medium

4.3.3 installation needs to avoid false echo

4.3.3.1 setting and installation in container

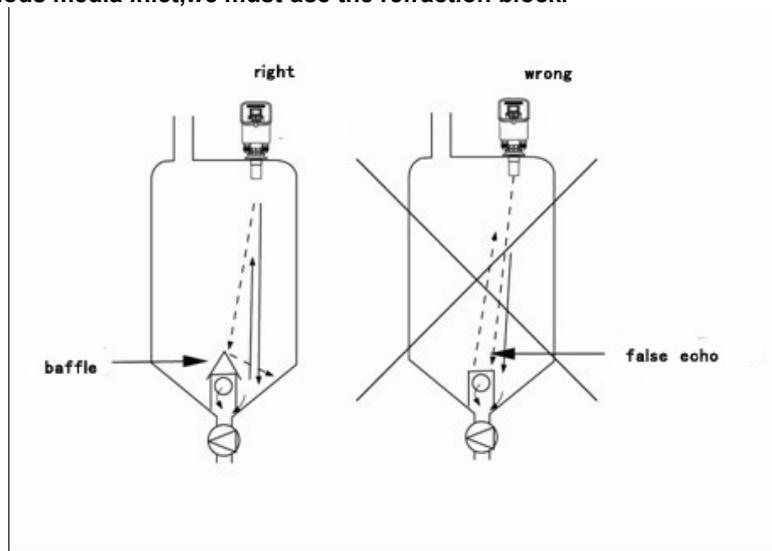
We must pay attention to other device or feed what could prevent ultrasonic beam when we installing transducer.

Bump in container inner plane will impact on measurement greatly, we can put a refraction board on the bulge so as to refract false echo, then make the accuracy of measurement.



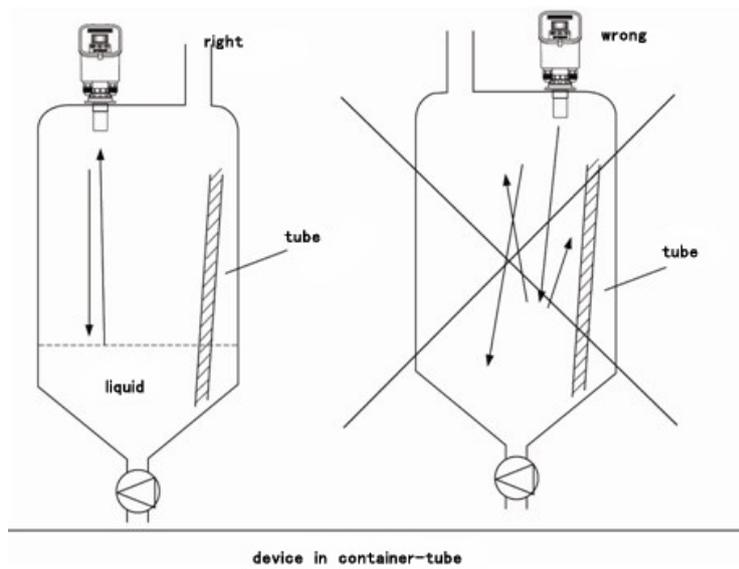
Bump in the container - puts helical baffle to refract the false echo

If there is object's top surface is flat in the container bottom,using for various media inlet,we must use the refraction block.

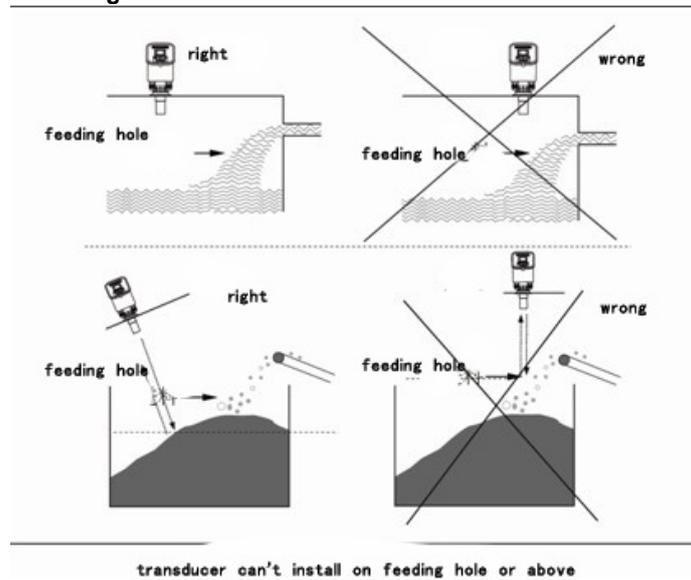


container bottom with flat bump-need adding refract board

Setting in container,such as:tube,bracket both can impact measurement.on the measurement point design,we must pay attention to the other setting in the range of ultrasonic signal's diffusion.

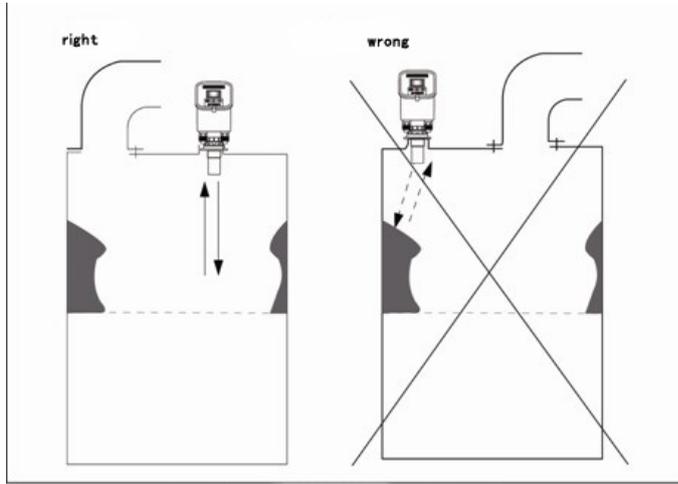


Do not install the sensor in the filling material flow or above, leaving the inlet a certain length.



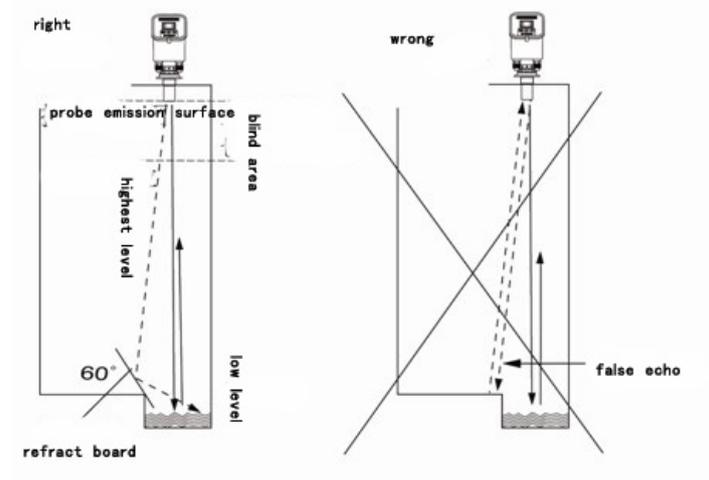
There is adhesion medium, such as crude oil storage tank, mud tank, asphalt tank, cement mixing tank. If the transducer is installed too close to the container wall, the container wall's adhesion medium can cause a very strong false echo, therefore the transducer should keep a certain distance away from the container

wall.



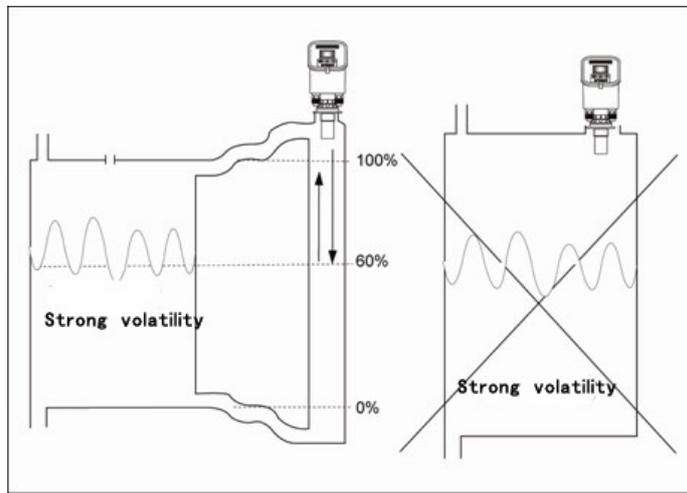
vessel wall has adhesive material-must leave the adhesive material a certain distance

Within the reservoir, it's generally according to the highest level to determine the installation height of the meter, we must pay attention on the distance between highest water level and transducer, there are gaps on tank bottom when low water, we can use a piece of refract to cover them.



there is obstacle on container bottom-using refract board for refraction

If the container has strong vortex, such as: the mixer, strong chemical reaction caused by eddy current, measurement will be very difficult. The ideal way is: the transducer can be installed in guide wave tube or measurement in the by-pass pipe.

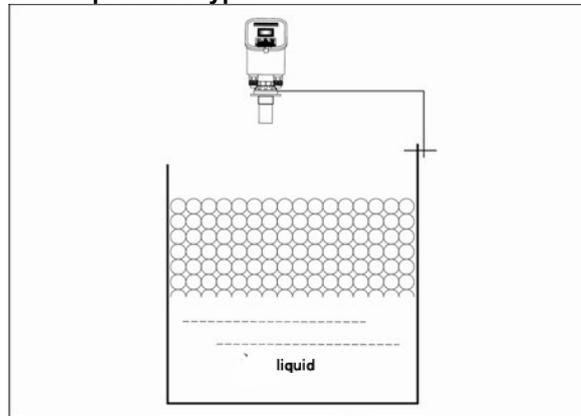


medium surface is volatility—using by-pass pipe or guided wave tube

4.3.3.2 Common installation errors

① bubble: bubble on medium surface is big and dielectric layer thickness, which cause measurement error, and even can't receive reflected ultrasonic. Please take measures to prevent the air bubbles, or install the transducer in the by-pass pipe for measuring.

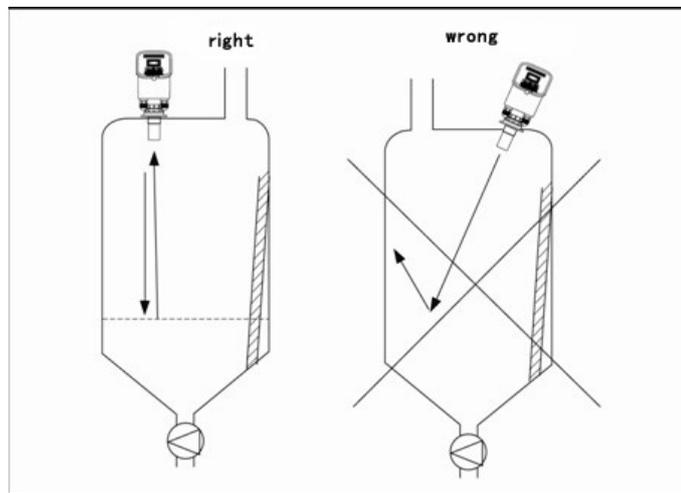
We also can use other measuring principle of instrument, such as: capacitive or static pressure type.



Produce bubbles

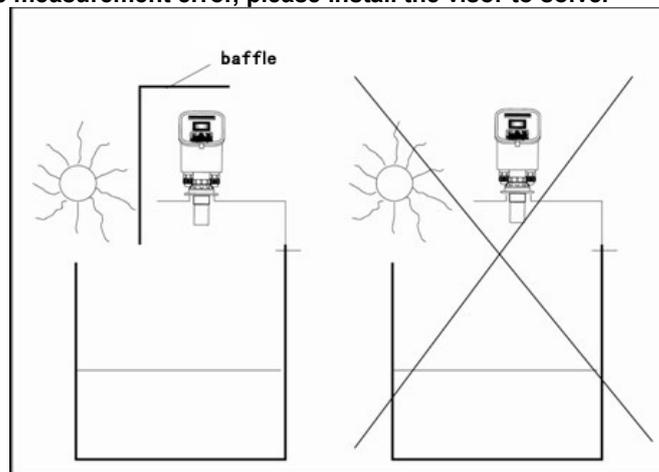
② wrong direction of transducer installation

Transducer doesn't install on the medium surface which will weaken the measuring signal, in order to ensure the best measurement results, please make the axis of the transducer perpendicular to medium surface.



transducer should be perpendicular to the surface of the medium

③installed at the location of temperature changing is great
 At the position of the temperature changing is great, such as: strong sun, can cause measurement error, please install the visor to solve.



Temperature change is big - plus visor or meter box

④the distance to medium shorter than blind area
 If distance between transducer and maximum level of medium shorter than meter's blind area,then measured value are all erro.

⑤transducer is too close to the container wall

If the transducer is too close to the container wall,which can produce strong false echo.uneven inner surface of container,adhesion of the medium,vivet in inner wall,screw,stiffener and the weld all can cause very strong alse echo,and loads on the effect echo.so please note that:keep a certain distance between transducer and container wall according to the

maximum distance that needs to be measure..

Maximum range	Distance from the wall	maximum range	Distance from the wall	Maximum range	Distance from the wall
5m	0.5m	10m	1.0m	15m	1.5m
Maximum range	Distance from the wall	Maximum range	Distance from the wall	v	Distance from the wall
20m	2m	30m	3m	40m	4m

In front of worse measuring condition,we should continue to enlarge the distance between transducer and container wall,until none false echo comes out.

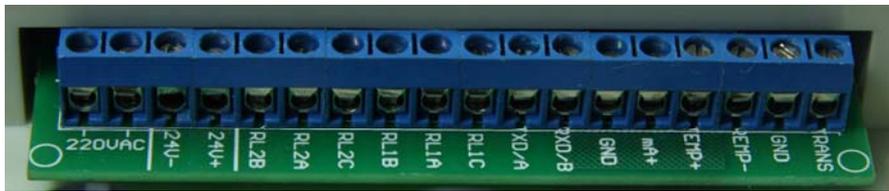
4.4 Electrical connection diagram

★note:please ensure the enough length of fission type ultrasonic level's probe and main machine's cable length,don't use other cable for connecting.connection again will affect the quality and strength of signal transmission.

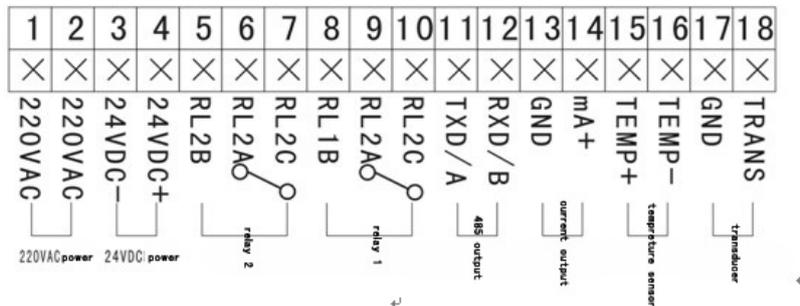
★don't connect AC to in addition to the AC terminals.or it will burn meter's circuits or components.

★485、232 and 4-20ma's output can't be short circuit,which can cause internal circuit burned.

(1)Electrical connection diagram of single channel fission type standard ultrasonic level meter:

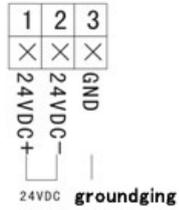


◆Terminals connection diagram of single channel fission type standard ultrasonic level meter:

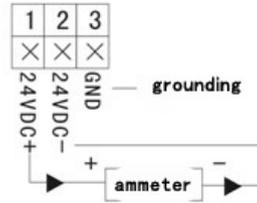




electrical connection diagram of integral enhanced two-wire

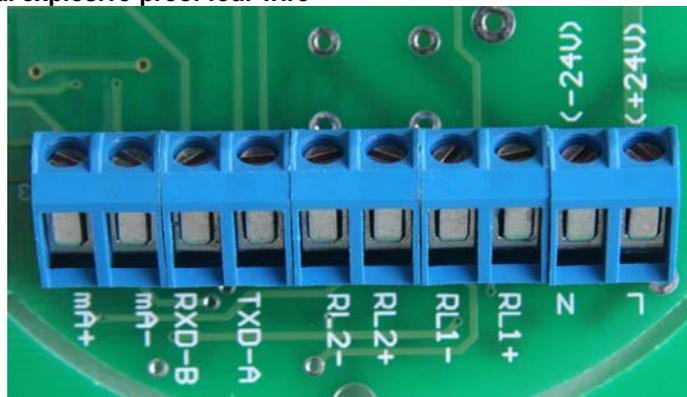


Two wire wiring diagram

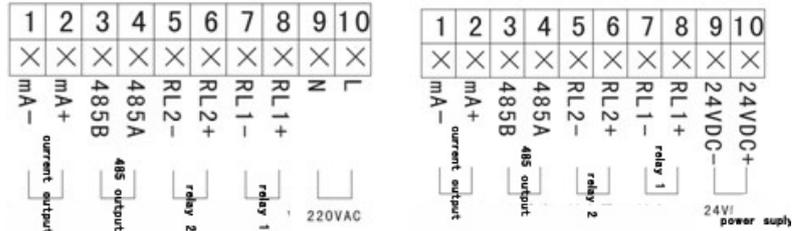


Two wire connects to current meter

◆integral explosive-proof four wire



electrical connection diagram of integral explosive-proof four wire



Wiring diagram of four wire 24VDC power supply
 Wiring diagram of four wire 220VAC power supply

◆integral explosive-proof two wire



electrical connection diagram of integral explosive-proof two wire 24VDC



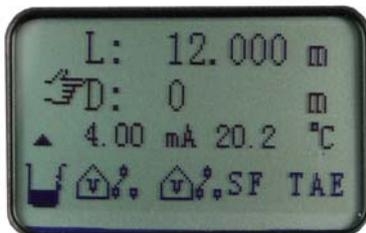
Wiring diagram of integral explosive-proof two wire
 Integral explosive-proof connects to current meter

Five, Setting

5.1 Interface profile of operation mode

This series of ultrasonic level meter have two kinds of work mode, after equipment electrically excited and finish initialization process, the ultrasonic level meter will be automatically enter into operation mode, and start measuring data. It's now on level measurement mode, and corresponding output 4~20mA. Output current is proportional to level height.

Interface of operation mode of ultrasonic level meter as follows:



Six, Menu interface and operating instructions:

Menu modes: factory set mode and user set mode.

Menu lookup table of user set mode, see first page.

Menu lookup table of factory set mode, see appendix.

Menu interface and operation instruction of factory set as follows:

① Press “Set” key In the mode of operation interface to enter the interface of first level menu:

② Instructions of first level menu:

◆ **“0 quit”**

When choosing this, press “Set” key will back to operation mode interface.

◆ **“1 Parameter Lock”**

Locking the menu, when you finish setting up all parameters, don't want others to change them at will, you can lock the menu, after that, one must input right password to unlock the menu for operation. The level meter's initial password is 25, user can modify it then setup your own (Special reminding: please remember the password what you have set, if you forget it you should contact the manufactory) .

instruction:

unlock: unlock, in this case all menu can be modify at will.

lock: when it is locking, you must input the password first then modify.

★ When the parameter is locked, press “Set” key into the unlock interface of parameter lock:

◆ **“2 Range Set”**

Set bottom distance, range-H, range-L, unit selection.

Bottom distance: set a bottom distance for level meter, in material place measurement it makes sense; factory set default as maximum range.

Range-L: Set the corresponding output measurement value of 4mA level meter; factory set default as 0.

Range-H: Set the corresponding output measurement value of 20mA level meter; factory set default as maximum range.

Unit selection: providing three kinds of unit for choices: m, cm, mm, factory set default as m.

◆ **“3 Measure Type”**

Type selection: Distance measurement and level measurement optional.

Distance measurement: Showed value is the distance from transducer to measured surface; Level measurement: Showed value is the distance from bottom distance to level (level height). Factory set default as distance measurement.

Damping rate: slow, middle, fast three items are provided for choices. Slow: low damping rate, high precision measurement, low interference; Middle: Between slow and fast; Fast: fast damping rate, low precision measurement, easy to be jammed. Factory set default as middle.

Safe level: There are four items provided for choices: hold, minimum, maximum, setting value. Hold: After system lost wave, display value is the last measured one, current is the corresponding value; Minimum: After system lost wave, display value is 4mA, current is 4mA; Maximum: After system lost wave, display value is 20mA, current is 20mA; Setting value: After system lost wave, display value is the last measured one, output current is the setting value of current. Factory set default as hold.

Current set: After system lost wave, it sets the output specified current, higher than 3.6mA, lower than 22mA, then choosing hold/maximum/minimum is invalid. Factory set default as 3.6mA.

◆**“4 Transducer Set”(Please don’t modify the parameter)**

Select transducer and set corresponding parameters.

Transducer selection: Range from 1 to 9, there are totally 9 items provided for choices. Making Choose according to the label on transducer, factory set default as 5.

Blanking: Setting transducer’s proximal blind area, factory set default as 0.30.

◆**“5 Algorithm Select”(Please don’t modify the parameter)**

Algorithm select: There are totally 7 items provided for choices: special environment 1, special environment 2, special environment 3, special environment 4, special environment 5, special environment 6, special environment 7. Factory set default as special environment 7.

◆**“6 Alarm Setting”**

Alarm relay setting.

Alarm 1 Mode: There are close, low alarm, high alarm three items provided for choices. Close: Relay 1 doesn’t work; Low alarm: Relay 1 in low alarm situation; High alarm: relay 1 in high alarm situation. Factory set default as close.

Alarm 1 Value: In meters, factory set default as 0.

Alarm1 Diff.: In meters, after triggering alarm, removing alarm needs to know the measured alarm value+/- alarm diff. then taking effect. Factory set default as 0.

Setting of Alarm 2 Mode, Alarm 3 Mode, Alarm 4 Mode are the same as above.

◆**“7 Parameters Calibration”(Please don’t modify the parameter)**

Operating with range adjust, sound adjust, current adjust, voltage adjust.

Range Adjust: Input the actual value, system proceeds to range adjust automatically. Factory set default as the measured value.

Sound Adjust: Input the actual value, system proceeds to sound adjust automatically, using occasion is not air. Such as: gasoline, acetone, alcohol etc. many volatile gases occasion, the speed of propagation of

sound in these gases is different, needs to be adjusted.
4mA adjust: Modify the value, until the actual output current is 4mA. Factory set default as 3100.
20mA adjust: Modify the value, until the actual output current is 20mA. Factory set default as 7200.
 Voltage: Input the voltage that was measured on the corresponding test point. Factory set default as 5.00.

◆“8 Communication”

Address: Choose the communication address, the default value is 1.
 Baud Rate: Choose the frequency of communication, 2400, 4800, 9600, 19200 optional, the default is 9600.
 Working Mode: Choose the way of communication, “automatic report mode” and “inquire mode” optional, the default is “automatic report mode”.

◆“9 Reset Selection”

Factory Reset: Yes: Return to the state of factory set. No: Quit. Factory set default as no.
 System Re: Yes: Return to system setting. No: Quit. Factory set default as no. (please don't change it)

Seven、 Error phenomenon and processing

Encounters an error,checking that all wiring is normal,and making ultrasonic level meter grounding,we can first hold down“▲”,then hold down“SET”,and then appearing echo menu,take picture of echo menu and send to us,we will be able to determine the possible electromagnetic interference,false echo,entered the blind area,didn't receive the echo signal etc. phenomenon.

phenomenon	reason	solution
Level meter doesn't work	Fail connection to power supply	Check the power line

<p>Level meter works, and the screen showed a small horn symbols without change, like this  "system now in the situation which called "lost wave"</p>	<ol style="list-style-type: none"> 1. Measured distance which beyond the range of level meter 2. The medium have strong disturbance, vibration or dust serious 3. Near the level meter there exists strong interference source like frequency converter, motor etc. 4. Transducer doesn't align to being measured surface 5. Being measured space exists redundant object such as support bar, feeding hole, and so on 6. Level enter the blind area 7. The medium is the loose powder, or liquid surface with foam. 	<ol style="list-style-type: none"> 1. Had better consider replacing it with a longer range 2. Waiting for the medium restore calm, the equipment will be back to normal use 3. Check the surrounding environment, deal well with electromagnetic shielding. Don't share the same power with frequency converter or motor, and the power supply should be reliable grounding. 4. Reinstall the transducer, make it perpendicular to liquid surface 5. To choose the suitable install position, try to avoid interference 6. Raise the transducer's installation position. 8. Exclude bubble, if it is powder please consulting producers
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Operating Instructions of User Set of Ultrasonic Level Difference Sensor

Menu

The ultrasonic level difference sensor which was produced by our company, using full Chinese menus for simple set then it can satisfy different needs of customers. Normally, according to the installation requirements of manual, when the equipment was installed, one only needs to set following several parameters, and then it can be for normal use.

Simple operation instructions:

Simple operations:

- 1、 Keys' function: There are three keys on the panel, through them we can debug the instrument. Measured values are showed on the LCD screen after debugging.

SET key

▼ key ▲ key

- ◇ Access to menu items
- ◇ Confirm menu item
- ◇ Confirm parameter calibration
- ◇ Move the cursor
- ◇ Select menu item
- ◇ Parameters calibration

2. After instrument electrically excited, long press set button for two seconds to enter the first level menu.

3. Input the height value of transducer 1 into “button distance 1”, the position of “button distance 1” in menu, see appendix table: Menu structure chart. (The distance from transducer radiation face to irrigation bottom or pool bottom as transducer’s height)

4. Input the height value of transducer 2 into “button distance 2”, the position of “button distance 2” in menu, see appendix table 1: Menu structure chart.

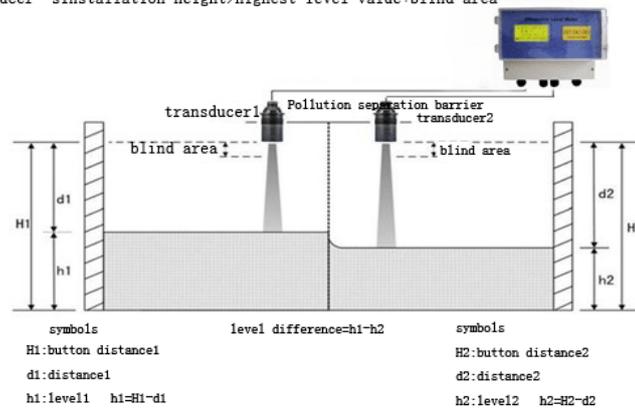
5. **setting “4mA corresponding difference” and “20mA corresponding difference”**

4mA corresponding difference: when difference is equal to the setting value, output 4mA.

20mA corresponding difference: when difference is equal to the setting value, output 20mA.

The position of “4mA corresponding difference” and “20mA corresponding difference” in menu, see appendix table: Menu structure chart.

transducer' sinstallation height>highest level value+blind area



One, Application

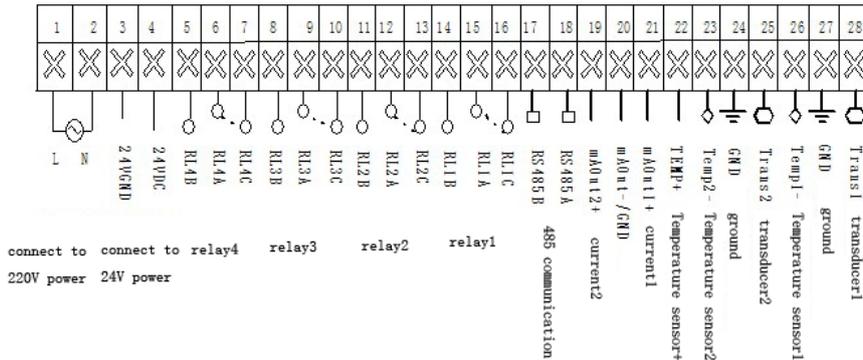
ultrasonic level difference sensor (material place, liquid level), is used to measure the two different container’s level or the discretion of the material’s level difference.

Two, Key technical specifications

function	Fission type
Conventional range	5m、10m、15m、20m
Special range	1m、30m、40m、50m、60m
Measurement accuracy	0.25%-0.5%
resolution	3mm or 0.1% (take great)
display	12864 Chinese dot-matrix LCD
Analog output	2 group 4~20mA/750Ωload
Relay output	2 group AC 250V/ 8A or DC 30V/ 5A state programmable (optional)
Power supply	220V AC±15% 50Hz or 24VDC 120mA optional
environment temperature	Display instrument (transmitter)-20~+60℃, transducer(sensor)-20~+80℃
communication	485 communication optional
Protection grade	Display instrument IP65, transducer IP68
Transducer cable	up to 200m, With standard 10 meters
Transducer install	According to the selection of range and probe

Three、Electrical connection diagram

◆Electrical connection diagram and terminals connection diagram of ultrasonic level difference sensor:



Connection method:

transducer: red wire: connect to Trans_n transducer n shielding wire (yellow): GND ground wire
 blue wire: Temp+ temperature sensor + black wire: Temp- temperature sensor n
 single transducer, n = 1, double transducers, n = 1,2
 current: current+ connect to mAOut n+ current- connect to mAOut-
 single transducer, n = 1, double transducers, n = 1,2
 relay: RLnA and RLnB normally open RLnA and RLnC normally close
 single transducer, n = 1,2, double transducers, n = 1,2,3,4
 power wire: AC, connect to L, N
 DC: 24V+ connect to 24VDC, GND connect to 24VGND

note:

- ① Relay1 is used for transducer1 alarm, relay2 is used for transducer2 alarm, relay3 and relay4 are used for difference alarm.
- ② ★ mAOut 1+ and mAOut- output the difference current. mAOut 2+ and mAOut- output transducer's current by default, output transducer1's current optional (select in "9 work mode"—"2 mAOut 2 output").
- ★ In double levels work mode, mAOut 1+ and mAOut- output transducer1's current, mAOut 2+ and mAOut- output transducer2's current.