LEFOO

Ultrasonic Level Meter

User Manual

5、Common installation instructions for ultrasonic level gauges

Ⅰ、The distance between the highest liquid level in the pool and the probe face of the meter is greater than the dead zone of the selected meter

It is recommended to use an L-shaped bracket   Installation method

Ⅱ、The distance between the highest liquid level in the pool and the probe surface of the meter is less than the blind area of the selected meter

It is recommended to use a Z-shaped bracket   Installation method

Ⅲ、The correct installation of the ultrasonic level gauge in the tank is shown in **Figure 1**, and the wrong installation is shown in **Figure 2**.
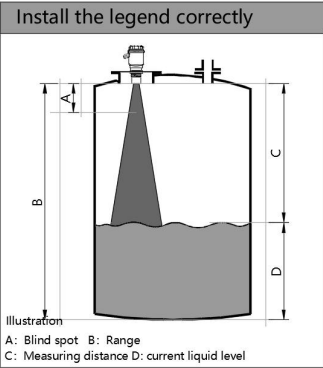

Install the legend correctly

Illustration
A: Blind spot   B: Range
C: Measuring distance D: current liquid level

Figure1

Common Mistakes Installation Legend

The meter is not perpendicular to the reflective surface or there is foam on theliquid surface

The size of the mounting hole does not meet the requirements

There are obstacles in the direction angle
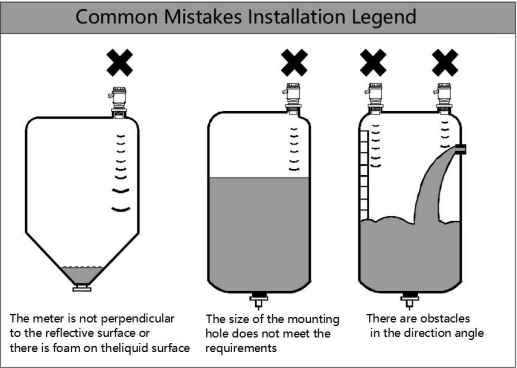
Figure 2

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1、 Overview

Sincerely thank you for purchasing our company's ultrasonic liquid level gauge!

This instrument contains a number of software patent technologies, which are safe, clean, high precision, long life, stable and reliable, easy to install Easy maintenance and other features, suitable for acid, alkali, salt, anti-corrosion, high temperature and other fields.The instrument can be connected to the display meter orIn various systems, it provides real-time liquid level data for industrial automation.The implementation standard of this instrument: GBT11828.4-2011, verification regulations: JJG971-2002. This instrument has the following characteristics:

●   The circuit design selects high-quality power modules from the power supply part, selects high-end brand components, and has high and stable performance reliable, able to resist various interference waves, and can completely replace the same type of imported instruments from abroad.

●   onic's intelligent technology software can perform intelligent echo analysis without any debugging and other special steps. It has the functions of dynamic thinking and dynamic analysis.

●   This instrument is a non-contact instrument, not in direct contact with liquid, so the failure rate is low.

The meter offers a variety of mounting In this way, the user can completely calibrate the instrument through this manual.

●   All input and output lines of the instrument have protection functions against lightning and short circuit。

2、 Technical specifications:

Measuring range: (0 ~ 30) m (selected according to the actual measurement range)

Blind zone: 0.3m-0.8m

Distance measurement accuracy: ±0.5% (full scale under standard conditions)

Ranging resolution: 1mm

Pressure: normal pressure

Instrument Display: Built-in LCD display liquid level (the distance between the bottom of the pool or the bottom of the tank and the surface of water and other media)

And the empty height value (the distance between the probe surface of the instrument and the surface of water and other media)

Analog output: (4～20)mA/510Ω

Digital output: ModBus-RTU protocol or custom protocol

Relay output: 250AC/5A or 30VDC/2A

Power supply voltage: DC24V

Ambient temperature: -20°C ~ +60°C

Protection class: IP65

Meter Power: <3W

Menu 2 communication settings (operation menu for on-site installation and commissioning personnel) as shown in the figure below (Figure 1）

1. Rs485: The communication address defaults to 01, the communication rate defaults to 9600, and the parity check defaults to no check. It is convenient to receive logs   Used by on-site engineers during debugging.

2. Current output setting: (4-20) mA and (0-20) mA two modes, users can choose according to their needs. (4-20)mA is the common mode, 0mA or 4mA generally corresponds to 0m, and 20mA corresponds to the highest level of liquid (material).
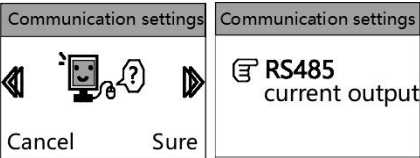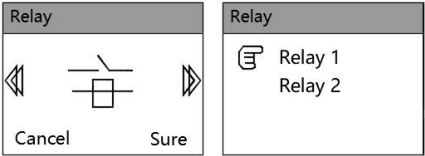

Figure 1   Figure 2

Menu three Relay settings: the default is off! (On-site installation and commissioning personnel operation menu) as shown below (Figure 2）

The function of relay 1 and relay 2 is that when the water level (liquid level) in the on-site pool rises or falls to a certain level, the instrument can control the water pump in the pool to start or stop by pulling in or disconnecting the relay.

Ⅰ. If the depth of the pool is 6 meters, drain water when the water level reaches 4 meters, and stop when the water level reaches 1 meter! The settings are as follows: Upper limit (represents high liquid level)

Set it to 4 meters, set the lower limit (representing low liquid level) to 1 meter, action logic: open → close, control mode: double limit alarm;

Ⅱ. Water enters when the water level reaches 1 meter, and stops when the water level reaches 4 meters! The settings are as follows: Upper limit (represents high liquid level)

Set it to 4 meters,   set the lower limit (representing low liquid level) to 1 meter, action logic: close→open, control mode: double limit alarm;

Menu 4 record query function is to record the power-on time of the meter

Menu 5 system settings

1. Set the brightness and contrast of the screen; 2. Set the backlight time of the screen; 3. Choose Chinese or English; 4 and 5. Restart the instrument and restore factory settings 6. You can set the login password to enter the menu by yourself (modification is risky! If you must modify it, please remember the password!)
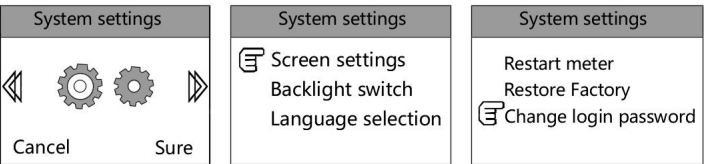
Menu 6 advanced functions (dedicated menu for engineer debugging, do not enter!)

4、Instrument debugging

4.1 keyboard description

Quit | Qlus key | Shift Minus key | Menu Save
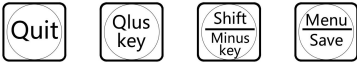
Menu\Save key: When the instrument needs to be set, press this key to enter the menu, after changing

the instrument parameters, press the save key.

Plus key: scroll up the menu key or the plus key to change the size of the number.

Shift\minus key: When changing the data of different digits, press this key to shift, or scroll down to

use the menu key.Escape key: After completing the required menu settings, press the Escape key to

return to the main interface of the instrument.

4.2 Menu Settings

Ⅰ、**Enter the menu steps:**

After pressing the menu key, **** will

appear on the left , The first * is flashing,

press the plus key to change to 1***,

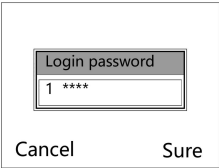Press the menu key again to enter the menu .**(Figure 1）**

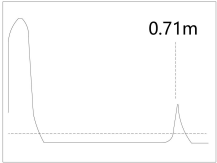Login password

1 ****
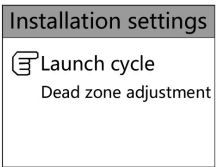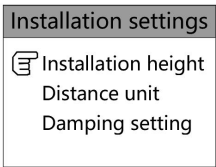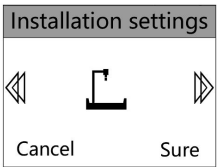
Cancel   Sure

Figure 1

0.71m

Figure 2

Ⅱ．Echo mode：

When the meter is in the mode of displaying liquid level and empty height, press the shift key, and

the current measurement status will appear

The following echo curve is shown in Figure 2. Press the plus key to return to the liquid level and
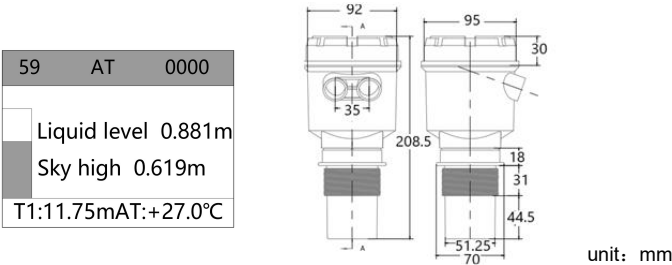
empty height mode. **(Figure 2）**

Menu 1: Installation settings (operation menu for on-site installation and commissioning personnel)

(Figure 3）

1. Installation height: the position when the on-site water level and other media are zero (generally refers

to the bottom of the pool or the bottom of the tank, etc.) to the probe surface of the instrumentthe

vertical distance between;

2. Distance unit: m (meter), cm (centimeter), mm (millimeter) and in (inch), which can be set by users

according to their needs;

3. Damping setting: automatic filtering and damping time (generally automatic filtering is enough,

it is not recommended to turn off automatic filtering);

4. Transmission period: 100ms-999ms, the default is 500ms, the shorter the time, the faster the

transmission speed;

5. Blind zone adjustment: the default is 10cm. If you need to modify it, it is recommended to operate it under

the guidance of an engineer.

Installation settings	Installation settings	Installation settings
◁ ⌐ ▷	☰ Installation height Distance unit Damping setting	☰ Launch cycle Dead zone adjustment
Cancel Sure		

3、Instrument installation

3.1LCD display and dimensions of the meter

59	AT	0000

Liquid level 0.881m

Sky high 0.619m

T1:11.75mAT:+27.0℃

92   95   30

35   208.5   18   31   44.5

51.25   70

unit：mm

Liquid level: the distance from the bottom of the pool or tank to the water surface

Empty height: the distance between the probe surface of the meter and the water surface

Installation method: In an open environment, the bracket installation method is generally used (the bracket should

be installed horizontally), and a round hole with a diameter of 60mm is opened on the bracket, and the instrument

probe is put in, and then the instrument comes with a nut, from bottom to top Tighten; the tank body at normal

temperature and pressure is generally installed with a flange, and a round hole with a diameter of 60mm or a G2

thread is opened in the middle of the blind plate (keep the horizontal state when installing the blind plate) to fix the

ultrasonic liquid level gauge.

3.2 The instrument terminal is as shown in the figure below

DC(12-24V)   4-20mA

+   −   T   +   −   A   B   0   1   COM
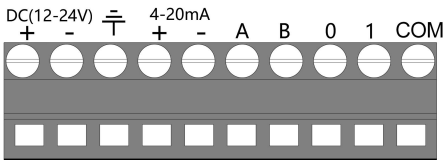
The description of the binding post is as follows:

Ⅰ. The terminal of DC (12-24) V is connected to the external DC power supply DC24V, the power is 3W, pay attention to

the positive and negative poles when wiring;

Ⅱ. Output: (4-20) mA: Pay attention to the positive and negative poles when wiring;

Ⅲ. The common terminal and 0 correspond to relay 1 in the instrument menu, and the common terminal and 1

correspond to relay 2 in the instrument menu;

Ⅵ, Rs485 (A, B): A is the positive pole, B is the negative pole;

Ⅴ. The ground sign port on the terminal of the instrument is to connect the site ground wire.

3.3 Meaning of installation parameters
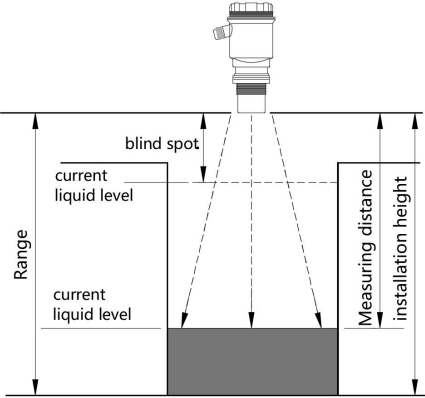
As shown in the figure, the measurement method of the instrument: start timing from the sending sound wave

pulse of the instrument to the time reflected from the surface of the receiving medium

Until the pulse, multiply half of this time by the speed of sound, which is the measurement distance,

(installation height – measurement distance = current liquid level);

Ⅰ. The installation height should be less than the measuring range;

Ⅱ. The blind area of the instrument refers to the area where the instrument cannot measure near the probe.

The distance between the highest liquid level on site and the probe should be greater than the blind area;

Ⅲ. The wave sent by the probe is in the shape of a trumpet, that is, there is a direction angle. When

installing, try to choose an open space. The lower part of the instrument

There should be no other obstacles, and the place below the meter should avoid places where the liquid

level fluctuates violently, such as the inlet and outlet.

3.4 Precautions for instrument installation

（1）The distance from the probe emitting surface to the highest liquid level should be greater than the

blind area of the purchased instrument.
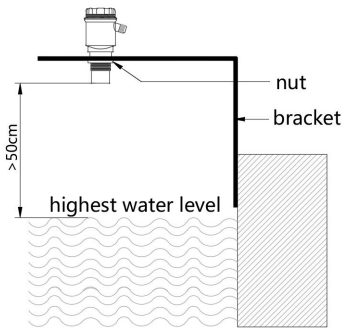
（2）If the liquid level in the pool or tank fluctuates violently and it is inconvenient to install a seeding tube,

please purchase a range that is the pool height orAn ultrasonic liquid level gauge that is 2.5 times the

height of the filling.

3）If the distance from the probe emitting surface to the highest liquid level is less than the blind area of the

purchased instrument, an extension tube is required, and the diameter of the extension tube is ≧150mm, length

0.2m-0.5m, vertical installation, smooth inner wall, the hole on the tank body should be larger than the inner
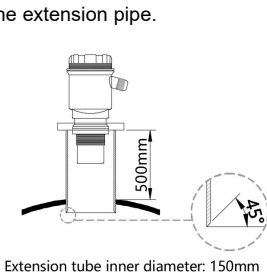
diameter of the extension pipe.

(Figure 1）

Extension tube inner diameter: 150mm

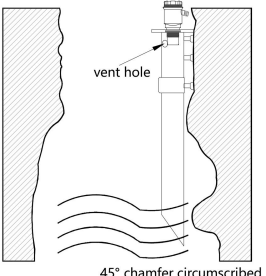**Figure 1**

vent hole

45° chamfer circumscribed

Figure 2

4）If the wall of the pool or tank is uneven, there are other obstacles, the water surface fluctuates violently, and

there are foams or other impurities on the water surface, the meter needs to follow the guide pipe, or connect

the pipe to the bottom of the pool or tank. Leave a gap to make the liquid level in the extension pipe equal to

the liquid level in the pool or tank. On the extension pipe, install a few small holes near the probe so that the air

in the pipe can communicate with the outside of the pipe! **(Figure 2）**

5）For flange installation on tanks at normal temperature and pressure, the probe surface of the instrument is

best exposed in the tank, as shown in **Figure 3**; if it is not possible in the field environment, the diameter of the

pipe fixing the flange is shown in **Figure 4** and **Figure 5**, and the length h is between 100mm-300mm The

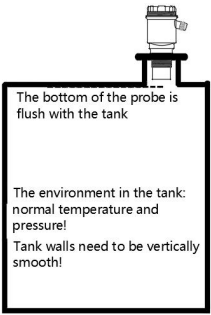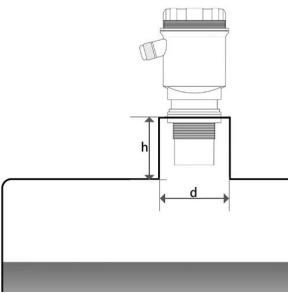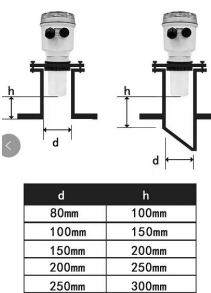larger the h value, the larger the corresponding d value.

The bottom of the probe is flush with the tank

The environment in the tank: normal temperature and pressure!

Tank walls need to be vertically smooth!

d	h
80mm	100mm
100mm	150mm
150mm	200mm
200mm	250mm
250mm	300mm

Figure 3   **Figure 4**   **Figure 5**

6）When the instrument is used in a particularly hot or cold place, that is, when the ambient temperature may

exceed the working requirements of the instrument, it is recommended to

Add anti-high and low temperature devices around the liquid level gauge.