

Ultrasonic Level Meter

Instruction Manual



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I. General information

Ultrasonic level measuring instrument, taking the advantages of various many level measuring instruments, is a universal one characterized by total digitalized and humanized design. It has perfect level monitoring, data transmission and man-machine communication.

It is featured by strong anti-interference performance; free setting of upper and lower limits and online output regulation, on-site indication, optional analog, switching value, and RS485 output and easy connection with main unit. The cover, made of waterproof engineering plastics, is small and firm with ABS probe. Therefore, it is applicable for various fields concerning level measuring and monitoring. According to the practical situation, it also can add other modules, such as RS 485, current output; it can be match with PLC better.

II. Characteristics

- DC12-24V wide work voltage
- Backup and recovery parameter set
- Free adjustment of the range of analog output
- Set a filter value to remove
- Custom serial port data format
- Optional increment/difference distance measurement to measure air space or liquid level
- 1-15 transmitted pulse intensity depending on working conditions

More choices depend on your requirement, as bellowing:

- 3 NPN output
- 2 relay output
- Voltage output
- RS485output connect with PC
- Explosion-proof

III. Specifications

Range : 8m

Blind zone : < 0.3m

Measure error : 0.3%F.S

Display : LED or LCD

Display resolution : 1mm

Frequency: : 20 ~ 350KHz

Power: 12-24VDC

Power consumption : <1.5W

Output (optional) :

4 ~ 20mA RL>600Ω (standard)

1 ~ 5V1 ~ 10V

RS485

3 NPN

2 relays (AC: 5A 250V DC: 10A 24V)

Material : ABS

Installation : G1 1/2 (M47mm)

Electrical interface : PG7

Admission cable : 1.5m

Operating surroundings : normal temperature, normal pressure

Protection degree : IP65(others optional)

IV. Menu operation and parameters setting

4.1 Keys function

(A) (1.1) **normal work / menu** : enter password.

(1.2) **menu interface** : page down or back, Long press back to normal work.

(1.3) **input/ confirm** :

Confirm input data and exit this menu.

(B) (2.1) **menu interface** : Enter or input.

(2.2) **input/shift** : Shift cursor to right.

(C) (3.1) **menu interface**: page up.

(3.2) **input interface/add** : from 0~9 ,minus, decimal.

4.2 Setting

Enter password interface or data input mode, press B to shift right, press C to choose number or symbol then press A to confirm.

Under measuring interface, presses A to display password, default: 0000.press A to confirm, enter menu interface.

4.3 Menu instruction

Menu, code and its meaning

BD.11 : **Ins. Ht** , measures liquid level, it's the distance from sensor to tank bottom. Measures air space level, the value is 0.

ST.15 : **Filter** , filter times in fix time , 0-100.the bigger, the more stable; the smaller, the quicker response.

PL.25 : **PUL** , transmitted intensity.

PA.36 : **Password** , password for menu:0000.

F0.44 : **F0** , start point of output::4mA.

FS.45 : **FS** , end point of output:20mA.

DR.49 : **Add.** , serial port address: 0-255.

BP.50 : **Bdr.** , serial port baud rate: 600-38400.

1L.54 : **No.1 D** , No.1 switch output D.

1H.55 : **No.1 H** , No.1 switch output H.

2L.56 : **No. 2 D** , No.2 switch output D.

2H.57 : **No.2 H** , No.2 switch output H.

3L.58 : **No.3 D** , No.3 switch output D.

3H.59 : **No.3 H** , No.3 switch output H.

4.4 Adjusting

The method of adjusting the proportion of light column of the complete instrument:

First long press SET key for 3 seconds, when displaying AH, then press the up key, it will display PS55, and then press once SET, 0 will flash, and then press the up key to change 0 into 5, and then press right shift key in the lower part of the instrument, and move to in the front of 5 and then set another 5, and then press the shift key, and input 5, a total three "5", and then press once SET, displaying SN, and then press up key 3 times, displaying PUH. If you use 5-meter probe, the PUH was change into 500.0, and once you have finished, long press SET for 3 seconds to save it.

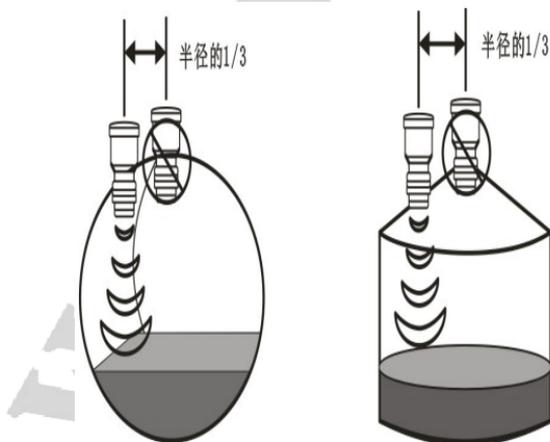
Method for connecting instrument to sensor: connect 13 to positive pole of the sensor, and connect 7 negative pole of the sensor, and connect instrument 23 and 24 to 220V.

V Installation and precaution

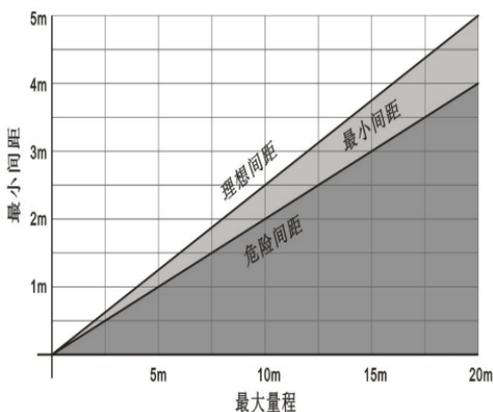
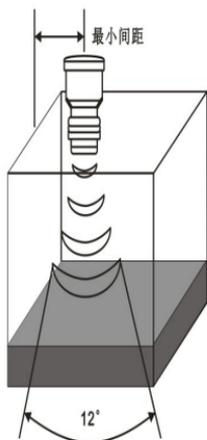
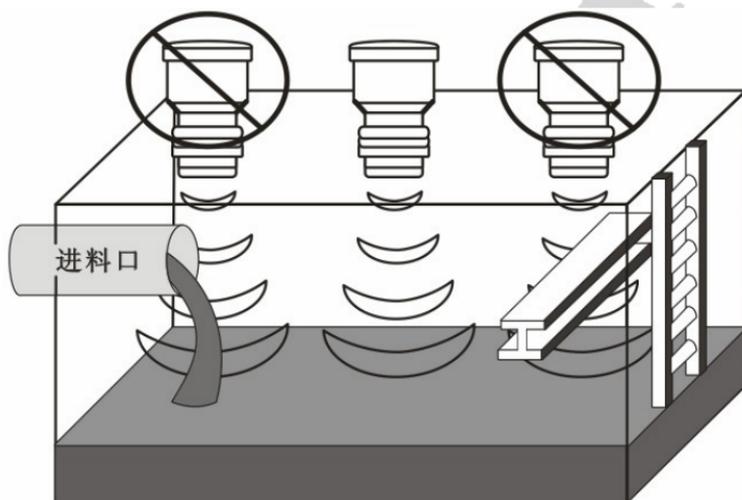
5.1 sensor installation

5.1.1 Sensor should be placed where there is no obstacle between emission surfaces and measured liquid, it also should be far way from feeding throats, chart I.

5.1.2 Tank shape should be considered. Some type of container will bring second echo, especially conical and spherical tank. A good installation place will solve the problem, chart II.



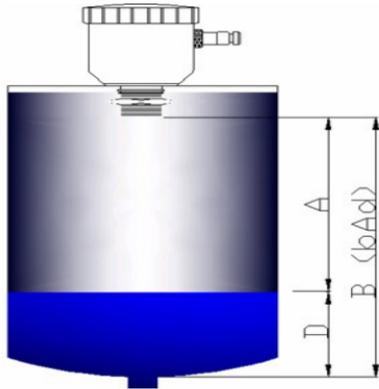
5.1.3 Lever meter can be installed by flange or $\varnothing 61$ hole, whatever installation way, make sure the sensor bottom through the installation hole or flange



5.1.4 If the liquid to be measured has sewage, afloat impurities or fluctuation, use a waveguide and the diameter of the waveguide should over 120mm

5.2 Work mode

This instrument has two mode, the difference as following



5.2.1 Measure liquid level

B (Installation Height) is the distance from bottom of container to sensor surface , A is the distance between sensor surface and liquid surface , D is the height of liquid , $D = B$ (Installation Height) - A , display value is bottom of container to liquid surface (D) .

5.2.2 Measure air distance

Set $BD = 0$, display value is distance from sensor surface to liquid surface (A) .

5.3

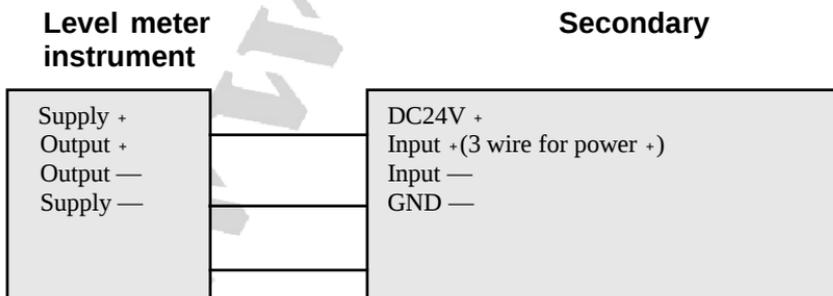
DC24V power is better. When it's from switch power, the DC negative must contact ground. Refer to the tags attached on the instrument for wiring. In order to keep it working reliable and display precise , please electrify > 15 minutes before work. When operated outdoors, it should be placed under a sun screen to avoid direct under sunshine and rain. Lightning proof measures should also be taken outdoor.

VI Wiring diagrams

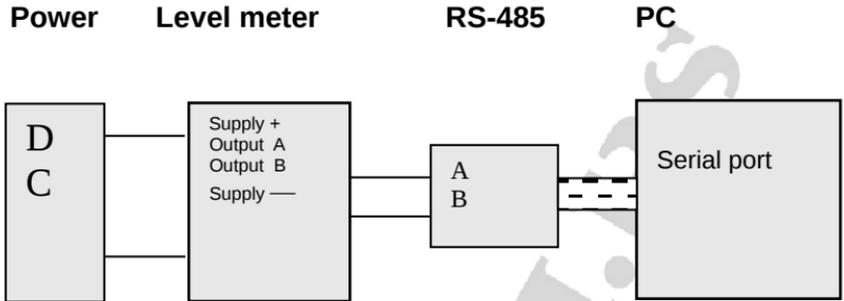
6.1 Definition of lead

Definition of lead	pin / color	applied
Supply +	2/red	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No
Supply -	1/black	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No
Current output	yellow	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No
Voltage output		<input type="checkbox"/> Yes / <input type="checkbox"/> No
Serial output		<input type="checkbox"/> Yes / <input type="checkbox"/> No
Output controll (NPN)	Green	<input type="checkbox"/> Yes / <input type="checkbox"/> No
Output control II (NPN)	Blue	<input type="checkbox"/> Yes / <input type="checkbox"/> No

6.2 Wiring diagram of current (voltage) output connecting with secondary instrument



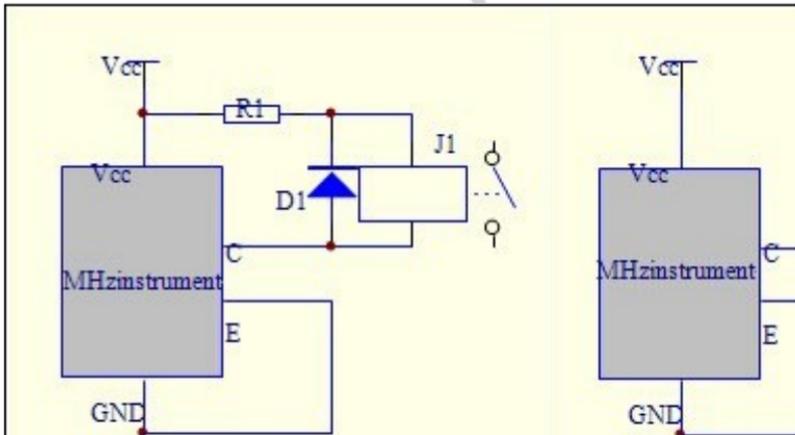
6.3 serial output connecting with PC



6.4 NPN output wiring diagram

Conventional relay

TTL output



VII. Trouble shooting

1、 Not working , no display, no sound
Probable reason: 1 Power is not connected or “+”“-”polarities are connected reversely 2 Too low voltage resulting no working or too high resulting damage
Remedy: ① Check to ensure correct wiring as instructed. ② Use 12-24V DC supply, or contact with distributor
2、 No display, sensor has sound
Probable reason: 1 Turning off 2 Connected to high voltage, damaging display chip
Remedy: ① Press “B” to turn on display; ②contact with distributor.
3、 With sound and display, but the values not change with distance
1 Too low input voltage 2 Sensor or power driver damaged
Remedy ①12-24V DC supply ②Contact with distributor
4、 With display ,but value is irregular fluctuation
Probable reason 1 Deflective installation 2 improper setting of pulse intensity, leading to great residual vibration or diffraction 3 more than 2 instruments work together, interfering each other 4 too much electromagnetic disturbance in working area

5	There are bubbles or debris on liquid
Remedy	
1	Adjust the axis of sensor vertical to surface to be measured
2	in general, range of 1-3m, transmit intensity is 2-5
3	try to eliminate interference
4	find out disturbance source and shield
5	eliminate bubbles or debris
5、 Big error	
Probable reason	
①Non vertical installation, leading to multiple reflection ②installed too close to wall, sonic wave reflected midway③ check “ BD ”④ check temperature display	
Remedy	
①Adjust installation positions several times.② correctly set “ BD ”	
③adjust temperature (“ TE ”) to proper value.	
6、 Abnormal current output	
Probable reason	
①Too large load resistance ② FS, AL or AH changed. ③ undesired supply rectification and filtering ④ electrify time is not enough	
Remedy	
①Lower load resistance ②readjust parameter③ replace with DC regulated supply with larger capacity ④electrify > 15 minutes before work	
7、 Abnormal RS485 output	
Probable reason	
①Reverse connecting of A and B ②incorrect parameter of serial ports, its not match with main unit	
Remedy	
① Change wiring, ②reset parameter, same with main unit	

8、 Abnormal control output

Probable reason

- ①Wrong parameter. Setting ②external current-limiting resistor too large
③external current-limiting resistor too small, damaging the level meter

Remedy

- 1 Reset parameter
②decrease current-limiting resistor ③ contact with distributor

Manufacturer Certificate

Product : Ultrasonic level meter

Mode : MH-A

Main specification

Sense range : FS= __m

Unusable area : 300mm 400mm ; 500mm ; other____

Accuracy : ±0.3%×max range ; ±2mm ; other____

Display resolution : 1mm

Output : 0-20mA ; 4-20mA ; 0-5V ; 1-5V ;

0-10V ; 1-10V ; RS485 ; other

upper and lower limit switch ;

Working temperature : normal ; -10-60°C ; other

Working pressure : normal ; other

Working humidity : ≤80%RH

Storage temperature : -40—85°C

Storage humidity : ≤70%RH

Working voltage : 12-24V DC

Normal power consumption : < 1.5W

Inspected by :

Delivery date: 09. 16th, 15

Guarantee log

Purchaser		Telephone	
Address		Post code	
Product		Type	
Item No.		Delivery date	
Repair record			
Notes	<ol style="list-style-type: none">1. According to THREE GUARANTEES, When there are problems with the product under correct operation, it can be refunded, changed and repaired free of charge within one week, three months and one year respectively from the day it was bought.2. For the problems caused by improper use, only the cost of material will be charged.3. The product can not be dismantled or unsealed without manufacturer's agreement; otherwise the repair service is not available.4. The freight out and home in relation to repair will be paid by customer.		