User Manual For Ultrasonic Level Sensor

UL101

CONTENTS

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 bellow:

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

III. Specifications

Range:2, 5, 8, 10, 12, 15m
Blind zone:＜0.35-0.5m（different for range）
Measure error:0.3%F.S
Display:OLED
Display resolution:1mm
Frequency:20~350KHz
Power:12-24VDC
Power consumption:<1.5W
Output (optional):
4～20mA RL>600Ω（standard）
1～5V\1～10V
RS485
3 NPN
2 relays (AC: 5A 250V DC: 10A 24V)
Material:ABS, PP
Dimension:Φ92mm×198mm×M60
Electrical interface:M20X1.5
Installation:M60X2 or ¢61MM
Operating surroundings:normal temperature, normal pressure
Protection degree:IP65(others optional)

IV. Menu operation and parameters setting

The instrument is OLED display, with key operation instruction. Press A appears instruction interface. According to the instruction,operation can be work.

1:Users' manual Power on press A then press C twice enter the manual.(no password)

Menu and Function			
One level	**Two stage menu**	**Three level**	**Four level**

Mounting	Work Mode	Range Mode	
		Water Level Mode	Input Mounting Height
			Input Level Value
Output	Analog	F0	
		FS	
	Serial	Address	
		Baud Rate	9600(default)
		Check	NONE(default)
	Switch	No.1 D	
		No.1 H	
		No.2 D	
		No.2 H	
		No.3 D	
		No.3 H	
Display	Display Unit		m(default)
	Reserved Decimal Number		3(default)
	Contrast		
	Display Delay	means:close display	15minute(default)
Probe	Filtering		Fast(default)

2:Administrator manual. Power on, press A,press B then press C input password then enter manual.(password: 1000)

Menu and Function			
One level	Two stage menu	Three level	Four level
Mounting	Work Mode	Range Mode	
		Water Level Mode	Input Mounting Height
			Input Level Value
	Environment		Open (default)

Output	Analog	F0	
		FS	
		L. Regul.	
		H. Regul.	
		Virtual	
		Analog Config	
	Serial	Address	
		Baud Rate	9600(default)
		Check	NONE(default)
		Delay	
		Serial Read And Write	
		Custom Receive	
		Custom Send	
	Switch	No.1 D	
		No.1 H	
		No.2 D	
		No.2 H	
		No.3 D	
		No.3 H	
		Switch Config	
Display	Display Unit		m(default)
	Reserved Decimal Number		3(default)
	Display Conversion		
	Contrast		
	Display Delay	means:close display	15minute(default)
Probe	Medium	Medium Selection	Air (default)
			Water
			Custom
		Custom Speed	Zero speed
			Temperature

			Correction
	Characteristic	**Cycle**	
		Blind	
		Intensity	
		Gain	
		Threshold	
	Filtering	**Fast/General/Stable /No/Rapidly**	**Fast(default)**
	Amendment	**Temperature Correction**	
		Display Correction	
		Linear Correction	
		Effective Rod	
System	**Set User**	**User**	
		Admin	
	Power Consumption	**Wake Up Cycle**	
		Work Time	
		Voltage Protection	
	Language		
	Restore		

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, **chartI.**

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.**

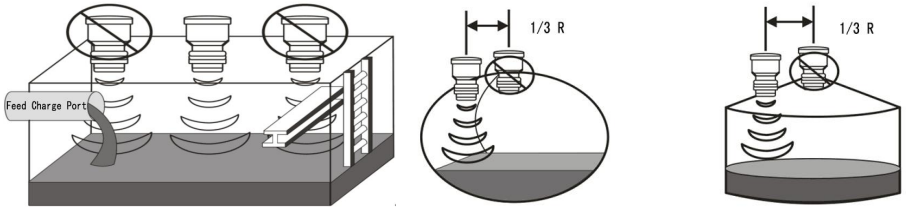


chart Ⅰ **chart Ⅱ**

5.1.3 Lever meter can be installed by flange or ⌀61 hole, whatever installation way, make sure the sensor bottom through the installation hole or flange, **chart III.**

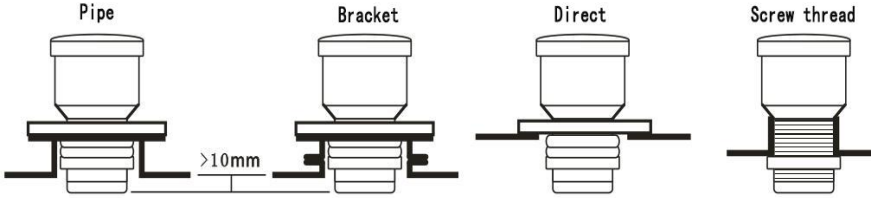
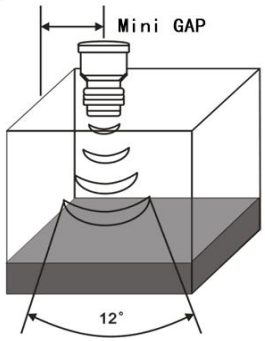


chart Ⅲ

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, **chart IV.**



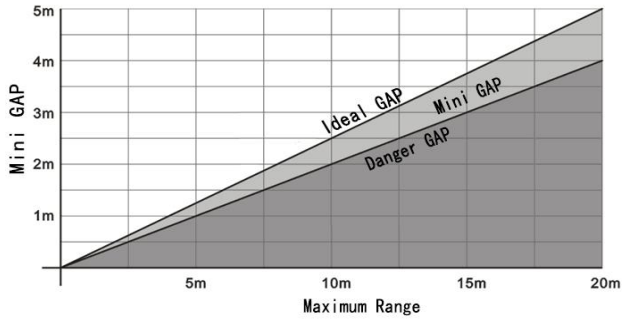
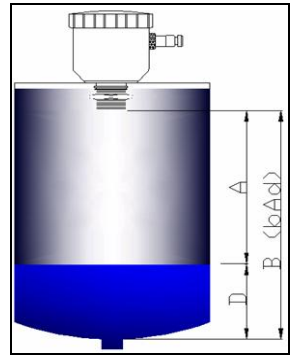


Chart IV

5.2 Work mode

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）.



chartⅧ

5.2.2 Measure air distance

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

5.3 Environment and Filtering

This instrument default dynamic filtering, to avoid the filter interference of mixing, tank walls, and other fixed bars. But for totally enclosed small space or other easily formed secondary echo environment, it's not reliable. When the display value is about twice the actual value regularly, change "**Environment**" to "**Closed**".

5.4 DC12V 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 out door.

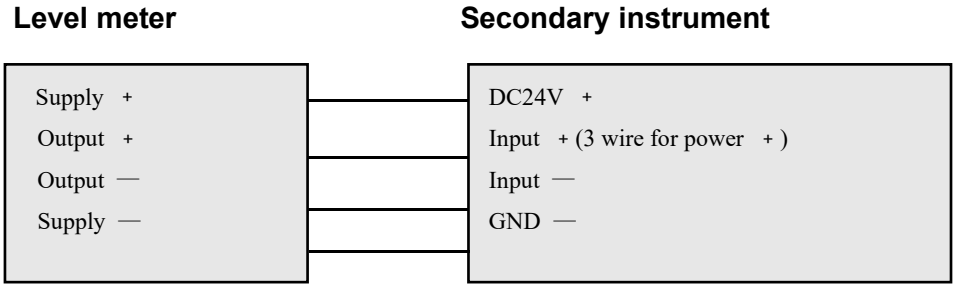
VI. Wiring diagrams

6.1 Refer to the tags attached on the instrument for wiring.

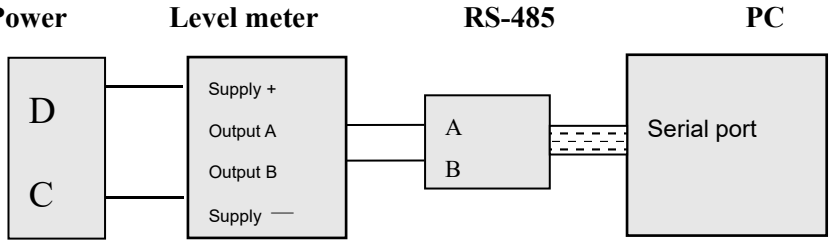
Wiring definitions

Definition of lead	pin / color	applied
Supply +	⑤DC12~24V+	■Yes / □No
Supply -	⑥DC12~24V-	■Yes / □No
Current output	⑨4~20mA	■Yes / □No
Voltage output		□Yes / □No
Serial output	③RS485(A)	□Yes / □No
	④RS485(B)	
Output controlI	①J1_COM	■Yes / □No
	②J1_NO	
Output controlII	⑩J2_COM	□Yes / □No
	⑪J2_NO	

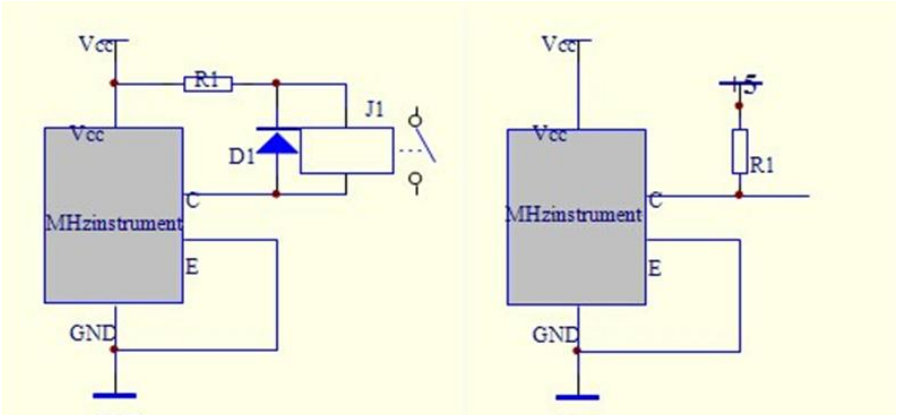
6.2 Wiring diagram of current (voltage) output connecting with secondary instrument



6.3 serial output connecting with PC



6.4 NPN output wiring diagram



Relay output setting:

This instrument has 2 relays or 3 NPN output. When uses relay control, it must be set control point: D and H. D for relay start point, H for relay end point. X for display value. It works as follows:

When D < H

X < D close	D	D<X<H retain	H	X > H Disconnect

when D > H

X > D close	D	D>X>H retain	H	X < H Disconnect

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
Solution: 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
Solution: 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
Solution

① 12-24V DC supply ② Contact 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
Solution 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 midway ③ check **“BD”** ④ check temperature display
Solution 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
Solution 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
Solution 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
Solution ① Reset parameter ②decrease current-limiting resistor ③ contact with distributor

Manufacturer Certificate

Main specification

Sense range:FS= __8__m
Unusable area:≤□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; ■1 Relay
Working temperature: ■normal; □-10-60℃; □other
Working pressure: ■normal; □other
Working humidity:≤80%RH
Storage temperature: -40—85℃
Storage humidity:≤70%RH
Working voltage:12-24V DC
Normal power consumption:＜1.5W

Warranty

Purchaser		Telephone	
Address		Post code	
Product		Type	
Item No.		Delivery date	
Repair record			
Notes	1. According to warranty, 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 in relation to the repair will be paid by customer.		