MEOKON®

User Manual

MD-UL Ultrasonic level meter

CONTENS

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：5、8、10、12、15、20、25、30m
Blind zone：＜0.4-1.5m（different for range）
Measure error： ±1mm(1m)、±1.5mm(2m)、±0.25%FS(3-40m)
Display： OLED
Display resolution：1mm
Frequency:：20～350KHz
Power: 12-32VDC、18-32VDC（2-wire）
Power consumption：<1.5W
Output (optional)：
4～20mA RL>600Ω（standard）
Hart（2 wire）
1～5V\1～10V
RS485
2 NPN
2 relays (AC: 5A 250V DC: 10A 24V)
Material：ABS
Dimension： Φ92mm×198mm×M60（3-15m ）
109mm×226mm ×G1 1/2（3m ）
109mm×226mm×G2 （3-15m ）
109mm×257mm×G3 1/2（15-40m ）
Φ71mm×116mm×M30（1-2m ）
Φ71mm×207mm×M60（3-15m）
Φ71×225mm ×G1 1/2（3m ）
Φ71×225mm×G2 （3-15m ）
Φ71×255mm×G3 1/2（15-40m ）
Electrical interface：M20X1.5、M16*1.5
Installation：M60X2 、G11/2、G2、G31/2、M30*1.5
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	**Input Mounting Height**		
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)**
Menu and Function			
One level	**Two stage menu**	**Three level**	**Four level**

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	**Input Mounting Height**		
	Environment	**Open**	**Open (default)**
		Closed	
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	
	Delay		
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	
		Gain Max	
		Threshold	
		Rate	
	Filtering	**Fast/General/Stable/No/Rapidly**	**Fast(default)**
	Amendment	**Temperature**	
		Display	

		Linear	
System	**Set User**	**User**	
		Admin	
	Language		
	Restore		
	Backup		

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.**

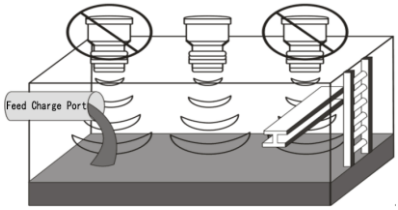
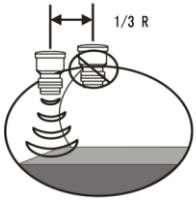


chart Ⅰ



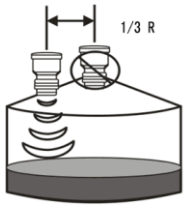


chart Ⅱ

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.**

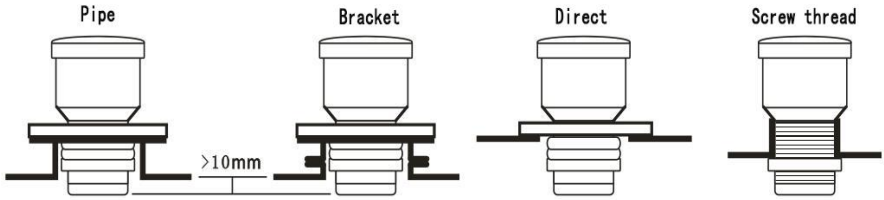
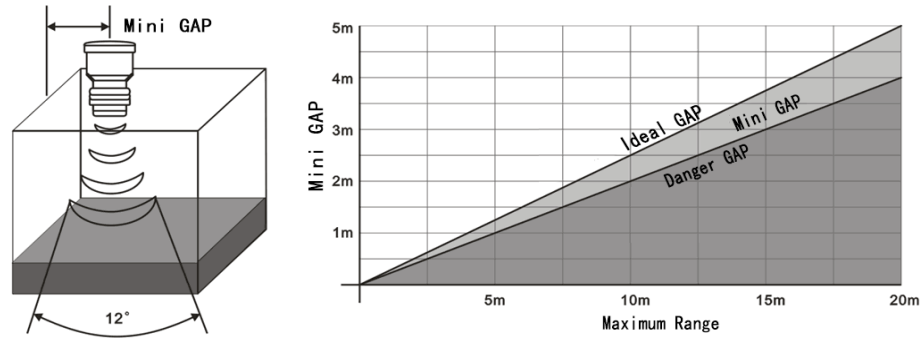


chart Ⅲ

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, **chartⅣ**

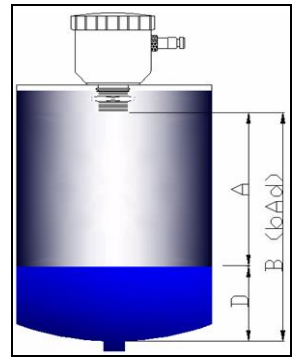


chartⅣ

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**".

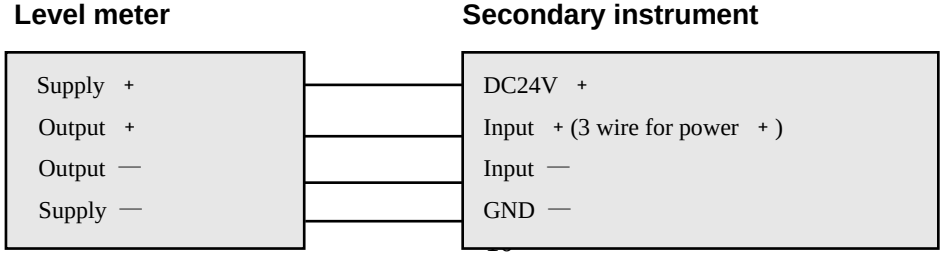
5.4 DC12V power is better. When it's from switch power, the DC negative must contact ground. Refer to the tags attached on the instrument for wiring. In order to keep it working reliable and display precise , please electrify ＞15 minutes before work. When operated outdoors, it should be placed under a sun screen to avoid direct under sunshine and rain. Lightning proof measures should also be taken out door.

Ⅵ、Wiring diagrams

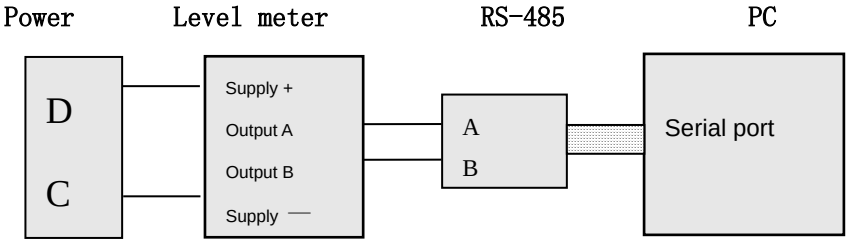
6.1 Wiring definitions

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 control Ⅰ	J1_COM ①	□Yes / □No
	J1_NO ②	

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

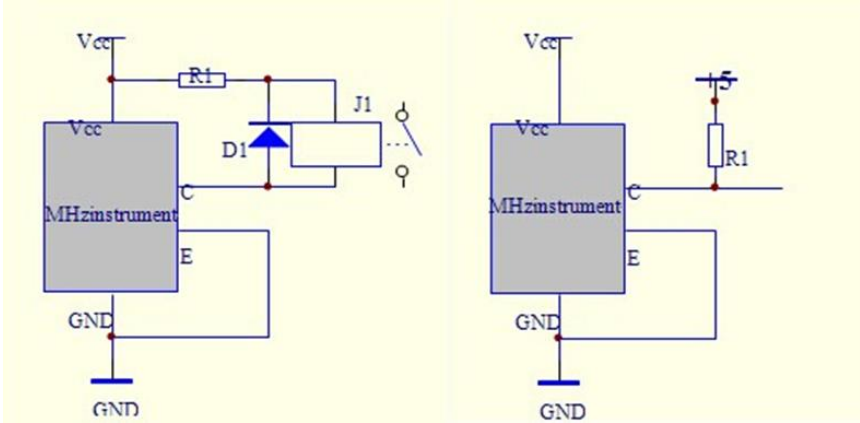


6.3 serial output connecting with PC



6.4 NPN output wiring diagram

Conventional relay **TTL output**



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
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

Main specification

Sense range：FS= ___ 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；□other

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

Guarantee log

Purchaser		Telephone	
Address		Post code	
Product		Type	
Item No.		Delivery date	
Repair record			
Notes	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.		