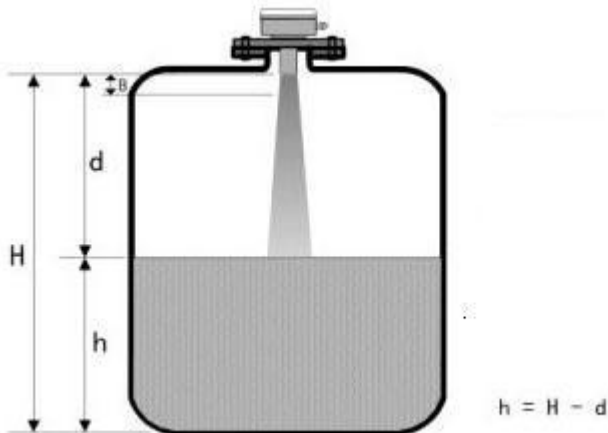


ML-8 Ultrasonic Level Meter

ML-8 ultrasonic level meter is instrument of measured material level, which is non-contact, high reliability, cost-effective, easy to install and maintain. It meets the requirements of material level without the contact. ML-8 ultrasonic level meter offers compact size, high performance, and outstanding operation capabilities. Sophisticated design and rugged construction guarantees no maintenance. The meter consists of ultrasonic sensor and electronic transmitter unit. Ultrasonic pulses are emitted by the sensor to the surface of measured medium. Part of reflected ultrasonic pulses are received by the transducer and converted into output electronic signal. The relationship among distance S , sound speed C and transmission time T is: $S=C \times T/2$.

Principle



Notes: B=Blind area; d=Distance; h=Level; H=Installation height; L=Measuring rang

Features:

- Non-contact survey, high performance, low cost, long life;
- Micro-processor based instrument;
- Digit LCD Display;
- Menu display provided to ease setting up;
- Two-wire or four-wire output optional;
- Dual relay alarm output;
- Anti-corrosion plastic enclosure (IP67), adapt to harsh environment;
- Bracket, flange, thread mounting optional;

Specifications:

Measuring range: **0 ~ 40m** for arbitrary choice

Blind area: 0.3~0.5m

Accuracy: 0.5% FS

Output: two-wire or four-wire current signal 4-20A

Display resolution: 1mm

Output Resolution: 0.03% FS

Display: LCD

Output load: 0~500Ω

Relay output: Upper & lower limit alarm control

Relay Specifications: 5A 250VAC/30VDC

Temperature: **-20~55℃**

Pressure: ±0.1MPa, less than 4MPa

Power: AC220V、DC24V (Optional)

Sound beam angle: 8o (3db)

Measuring cycle: 1 second

Ordering Codes

ML-8	Ultrasonic Level Meter (Transmitter)	
-	Style	I: Integrated S: Split
-	Length of connecting cable	LC(XX mm): If select split style, please specify the length of connecting cable
-	Housing type	J: Economical small housing S: Standard housing Ex: Ex-proof aluminum housing
-	Level range	e.g. 0-5000 mm etc.
-T	Probe material	1: ABS 2: PTFE 3: PVDF 4: Specified
-O	Signal Output	1: 4-20 mA 2-wires 2: 4-20 mA 4-wires 3: Relay 4: RS485 0: Specified
-P	Power	1: 24VDC 2: 220VAC
-E	Ex-proof	1: Nope 2: Ex-proof
-A	Installment type	1: thread 2: flange 4: customer specified

Technical data:

Function	Integrated type	Split type
Range	5m、10m、15m、20m、30m、40m、50m、60m	5m、10m、15m、20m、30m、40m、50m、60m、70m、
Accuracy	0.25%-0.5%	0.25%-0.5%
Resolution	3mm or 0.1% (bigger)	3mm or 0.1% (bigger)
Display	Chinese and English LED	Chinese and English LED
Analog Output	Four-wire 4~20mA/510Ωload Two-wire 4~20mA/250Ω load	4~20mA/510Ωload
Relay Output	Two groups: AC 250V/ 8A or DC 30V/ 5A Status can be programmed	Two groups for single channel Four groups for double channels AC 250V/ 8A or DC 30V/ 5A Status can be programmed
Power supply	Standard:24VDC Optional: 220V AC+15% 50Hz	Standard:220V AC+15% 50Hz Optional:24VDC or 120mA Customize:12VDC or battery
Environment Temperature	LED : -20~+60℃ , Probe : 20~+80℃	LED : -20~+60℃ , Probe : 20~+80℃
Communication	Option:485,232 Communication (manufactures agreement)	Option:485,232 Communication (manufactures agreement)
Protection Grade	LED: IP65, Probe: IP68	LED: IP65, Probe: IP68
Cable Probe	No	standars:10m longest:100m
Probe installation	According to the range and the probe type	According to the range and the probe type

Power Consumption	<p>Split type</p> <p>Power supply:24V, No relay: 100mA Channel 1 of Relay: 120mA; Channel 2 of Relay: 145mA; Channel 3 of Relay: 170mA; Channel 4 of Relay: 190mA; The specific power is as follows: No relay: $24 \times 100\text{mA} = 2.4\text{W}$; Channel 1 of Relay: $24 \times 120\text{mA} = 2.9\text{W}$; Channel 2 of Relay: $24 \times 145\text{mA} = 3.5\text{W}$; Channel 3 of Relay: $24 \times 170\text{mA} = 4.1\text{W}$; Channel 4 of Relay: $24 \times 190\text{mA} = 4.6\text{W}$;</p>
Power Consumption	<p>Integrated type(four-wire system)</p> <p>Power supply:24V, No relay: 80mA Channel 1 of Relay: 105mA; Channel 2 of Relay: 130mA; The specific power is as follows: No relay: $24 \times 80\text{mA} = 1.9\text{W}$; ; Channel 1 of Relay: $24 \times 105\text{mA} = 2.5\text{W}$; Channel 2 of Relay: $24 \times 130\text{mA} = 3.1\text{W}$;</p>
Power Consumption	<p>Integrated type(two-wire system)</p> <p>Power supply:24V, No relay: 30mA The specific power is as follows: No relay: $24 \times 30\text{mA} = 0.72\text{W}$</p>

Note:

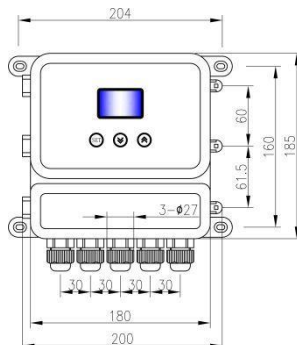
Ultrasonic probes can also be customized according to customer need in this series: high pressure and high temperature resistant, light, small diameter, small blind area and other special regulatory probes.

Installation Dimension Of Level Meter

(1) Split type



Outline of product



Structure of product

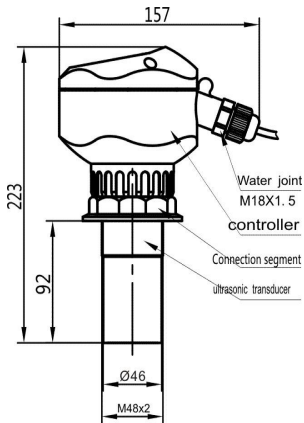


Probe and cable

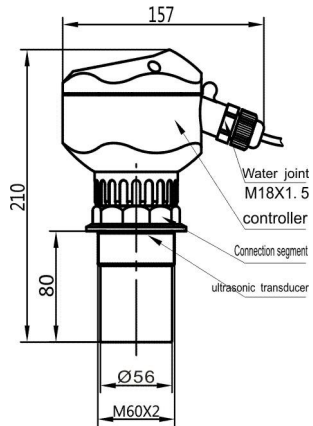
(2) Integrated Type (Enhanced Mode)



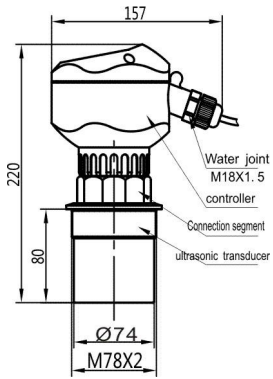
Side view



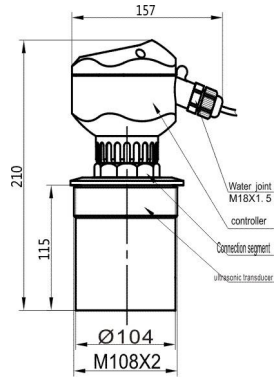
Thread of sensor (M48×2)



Thread of sensor (M60×2)



Thread of sensor (M78×2)

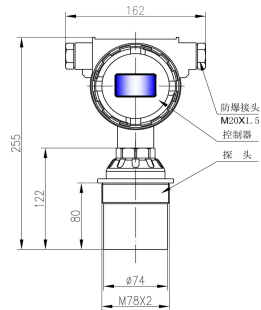


Thread of Sensor (M108×2)

(3) Integrated Type (Explosion-proof Mode):



Outline of product



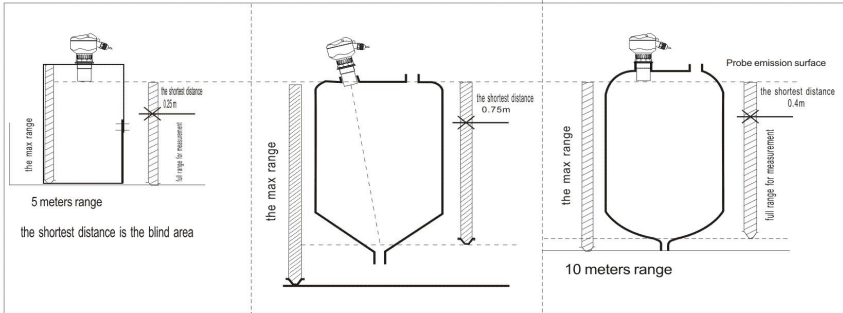
Structure of product

(4) Economical Type



Installation Guide

Range is so important when you choose our products, please check the following photos.



Launch angle and false echo

When the ultrasonic wave speed is focused by probe, the launch of impulse wave speed is the same as the speed light of flashlight. The place is farther away from probe, their proliferation area will be greater.

All the objects in the launch angle, such as pipes, brackets, seam, reinforced, mixing propellers and wall objects, will cause strong false echoes, especially the objects of near distance between launch angle and the probe.

For example: The false echoes which is away from probe 6m is more powerful than away from probe 18m by nine times.

Make axis of the sensor is perpendicular on the media surface as much as possible, and move any other objects in the launch angle (such as: pipes and brackets).

4.2.2 Selection measure range

Measure range depends on the range of ultrasonic probe. The ultrasonic probe depends on the work environment, measured object, the temperature at the scene. According to the following table, you can select the measure range you need.

Liquid Level	Multiple attenuation	Percentage of decay	Plus multiple range
smooth	0dB	0%	No
corrugated	5...10dB	50~67%	1 time of range
Large fluctuations (such as mixing blades)	10...20dB	90%	3 times of range

Material surface	Multiple attenuation	Percentage of decay	Plus multiple range
Hard, rough (such as the granulated rubber)	40dB	99%	10 times of range
Soft(such as coal, cement, fly ash)	40...60dB	99~99.9%	Not recommended

Dust	Multiple attenuation	Percentage of decay	Plus multiple range
No	0dB	0%	No
little	5dB	50%	1 time of range
A lot of	5...20dB	50~90%	3 times of range

Material	Multiple attenuation	Percentage of decay	Plus multiple range
No	0dB	0%	No
little	5...10dB	50~67%	1 time of range
A lot of	10...40dB	67~99%	3 times of range

Fog	Multiple attenuation	Percentage of decay	Plus multiple range
No	0dB	0%	No
little	5...10dB	50~67%	1 time of range
A lot of	10...20dB	67~90%	3 times of range

Steam	Multiple attenuation	Percentage of decay	Plus multiple range
No	0dB	0%	No
Little	5...10dB	50~67%	1 time of range
A lot of	10...20dB	67~90%	3 times of range

Temperature difference of probe and media surface	Multiple attenuation	Percentage of decay	Plus multiple range
≤20℃	0dB	0%	No
≤40℃	5...10dB	50~67%	1 time of range
≤80℃	10...20dB	67~90%	3 times of range

If there are many situations, so the calculation method of signal attenuation is put them together.

·Little material 5...10dB

·Little steam 5...20dB

Temperature difference of probe and media surface ≤40℃ 5...10dB

Total Min is 15dB, Max is 40dB.

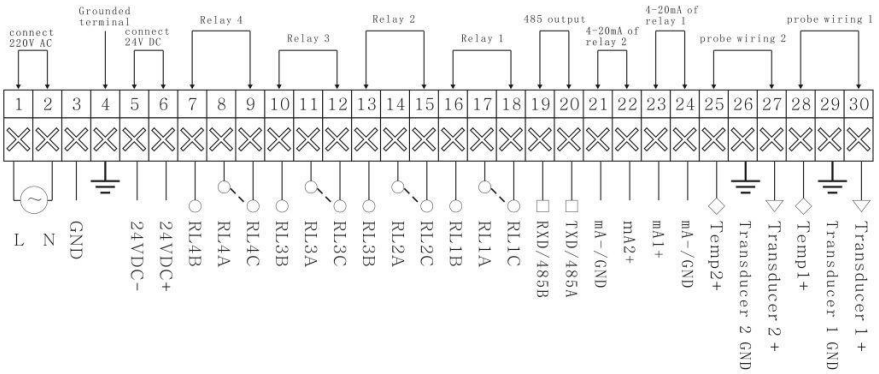
Based on it, if the actual range is 5m, you need to choose the range of 50m.

Wiring

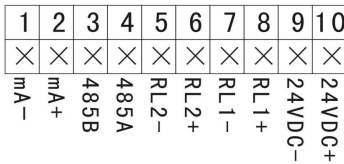
Tip: As the split type, the cable length of connection probe and mainframe is should be confirmed in advance. Do not use other cables to connect on the scene. It will affect the quality and strength of transmission signal.

When connected power, do not put AC connect any other terminals expect the AC terminal. Otherwise it will burn circuits or components. The output terminals of 485, 232, 4-20mA can't be short-circuited, because short circuit will burn the internal circuit.

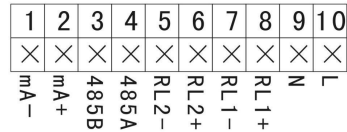
Wiring of Split type (single channel) :



◆ Integrated anti-explosive type (four-wire system)



Wiring of 24VDC (four-wire system)



Wiring of 220VAC (four-wire system)

◆ Integrated anti-explosive type (two-wire system)



Wiring of 24VDC (two-wire system)

Operating instructions of Ultrasonic Level Difference Meter

The ultrasonic level difference meter has simple setup menu, which can meet different requirements from customer. Normally, after followed installation instruction, then set several parameters, it will start to work.

Simple operation:

1、Key: Our products can be debugged through three keys on the panel. Then, the measured value is showed by LED.



◇ Enter to menu

◇ Confirm menu

◇ Confirm parameter calibration



◇ Move the cursor

◇ Select the menu

◇ parameter calibration



key

2、After switched on of our product, press the SET key for two second and enter the firs level menu.

3、The height value of probe(No.1) inputs to the “reference zero 1”, the “reference zero 1”position can be found structure table in the menu. (the height of probe is the distance from the launch surface of probe to the bottom).

4、The height value of probe(No.2) inputs to the “reference zero 2”. the “reference zero 2”position can be found structure photo of the menu.

5、Set “4mA ”corresponds difference value and “20mA corresponds difference value.

4mA corresponds difference value: Output is 4mA, when the difference value equal to setting value.

20mA corresponds difference value : Output is 20mA, when the difference value equal to setting value.

As the corresponds difference value and “20mA corresponds difference value, please check the structure photo of menu.

Application

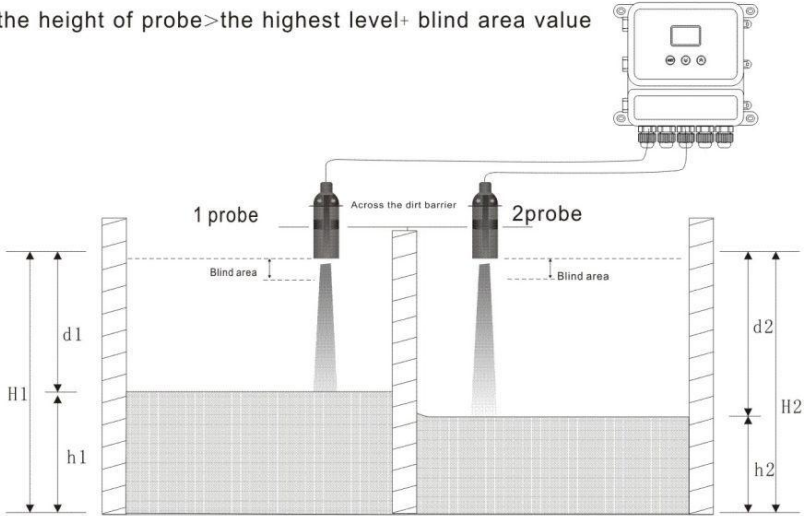
Ultrasonic level difference meter (material, liquid), is used to measure height differences of level or material level in the two different of containers.

Technical data

Function	Spilt Type
Standard Range	5m、10m、15m、20m
Special range	1m、30m、40m、50m、60m
Accuracy	0.25%-0.5%
Resolution	3mm or 0.1% (bigger)
Display	12,864 dot matrix LCD
Analog output	2 types 4~20mA/510Ωload
Relay output	2 groups AC 250V/ 8A or DC 30V/ 5A Programmable

Power	220V AC \pm 15% 50Hz or 24VDC 120mA (optional)
Ambient temperature	LED(transmitter):-20 \sim +60 $^{\circ}$ C , probe(sensor):-20 \sim +80 $^{\circ}$ C
Communication	485
Protection Class	LED: IP65, probe: IP68
Probe cable	Standard: 10m, longest: 200m.
Probe installation	According to range and probe type

the height of probe > the highest level + blind area value



Map symbols: level difference = $h1 - h2$
 H1: reference zero point value 1
 d1: distance value 1
 h1: level value $h1 = H1 - d1$

Map symbols: $H2$: reference zero point value 2
 d2: distance value 2
 h2: level value