TEKSENS

UNICERT ISO 9001

TUS Split Ultrasonic Level Meter
Operation Manual

TUS Split Ultrasonic Level Meter

1. Overview

TUS ultrasonic level meter is a kind of Intelligent non-contact level meter. This product offers automatic power control, gain control, temperature compensation. Using advanced detecting and computing technology to suppress jamming signal, so as to improve measuring accuracy. This product can be widely used in measuring all kinds of liquid level and solid material level.

2. Parameters

Output Signal	4-20mA (standard),Pulse or RS232 ‖ RS485
Power Supply	AC220V(standard) or DC-24V
Control	Four-way relay (two for upper control, two for down control)
Measurement Range	5m,10m,15m,20m,30m,40m,50m
Beam Angle	7º
Accuracy	0.25%(range<20m), 0.5%(range>20m)
Resolution	1mm（range<20m）,1cm(range>20m)
Blind Area	0.3—1.5m
Display Type	LCD 16x2, backlight
Display Mode	Liquid level, distance
Process Temperature	-20℃~80℃
Protection Class	Transmitter:IP65, Sensor:IP67

3. Operating Instructions

3.1 LCD display information

■ The main display interface:

After power on, level meter enters into the main display interface through starting procedure, there are four kinds of display modes for the main display interface as below:

Distance (Ullage) Mode:

```
Dist =05.000M
1on 2on 3off4off
```

```
Dist=05.000M
067 159 220 220
```

Liquid Level Mode:

```
Level=05.000M
1on 2on 3off4off
```

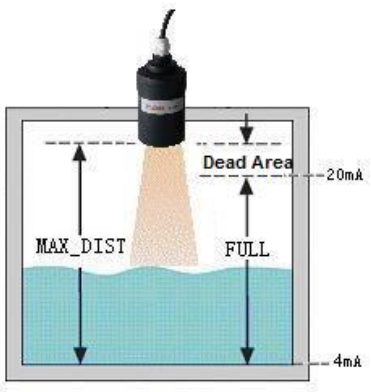
```
Level=05.000M
068 158 220 220
```

The first line “Dist” stands for distance (Ullage), “Level” stands for liquid level. The distance between the bottom surface of display probe and liquid level is called ullage. The value of ullage (Dist) will decrease as the liquid level increases.

1、2、3、4 in the second line respectively stands for HH relay, H relay, L relay, LL relay, on and off respectively stands for pull-in and release. If there are four data in the second line, which means the strength of the echo signal, normally, the last digit can reach more than 200.

Note: The main display interface is associated with the setting value in

```
DIST(0) LEVEL(1)
01 LEVEL+RELAY
```



■ Password Interface: used for entering password

■ User Parameter Interface: ullage and full scale、blind area、data change、485 number of filter(n)、the main display mode、HH relay、H relay、L relay、LL relay in the user parameter interface, as shown below:

(1) MAX_DIST&FULL
05.00M 03.00M ullage and full scale, MAX_DIST stands for ullage, FULL stands for full-scale, the following data stands for detailed value. Ullage is the distance from the bottom surface of probe to 4mA setting point (normally the bottom of tank is set as 4mA). Full-scale is the distance from the tank bottom （ 4mA setting point） to 20mA setting point (normally the highest level is set as 20mA)

(2) BLANKING DIST
Blind area (dead area), blind area is the minimum distance from the bottom surface of probe to liquid surface, where level meter can not work, normally the value is 30cm.

(3) RATE & COM & n
20mm 01 03 RATE is used for measuring data change, this value displays the variation of maximum allowable measured value. Normally, the value is set as 10-30mm when measuring liquid level. Level meter converts to material level model when setting 00m. COM: RS485 address setting. The parameter n is filter times, this parameter is valid only when RATE is set as 00mm. The larger the parameter, the stronger the signal filter capacity, but the response speed of level meter will be reduced. So normally, the value is set between 3 and 5.

(4) DIST(0) LEVEL(1)
01 LEVEL+RELAY the content of the main interface: the figure in the second line stands for specified value, the main interface corresponding to setting value as below（normally the value is set as 01）

Setting value	Main interface	Setting value	Main interface
00	Dist=05.000M 1on 2on 3off4off	01	Level=05.000M 1on 2on 3off4off
04	Dist=05.000M 067 159 220 220	05	Level=05.000M 068 158 220 220

The main interface 04 and 05 is for factory debug model which is not advised for field use

(5) HH:UP_ON>DW_OFF
04.50M 04.00M HH controlling relay work point, data1 close controlling point, data 2 release controlling point, Close controlling point should be more than releasing controlling point. When measured value is more than close controlling point (data1), H controlling relay close; when measured value is less than releasing controlling point (data2), H controlling relay release.

(6) H:UP_ON>DW_OFF
04.50M 04.00M H controlling relay work point, data1 close controlling point, data2 release controlling point. Close controlling point should be not less than releasing controlling point. When measured value is more than close controlling point (data1), H controlling relay close, when measured value is less than releasing controlling point (data2), H controlling relay release.

(7) L:DW_ON<UP_OFF
03.00M 03.50M L controlling relay work point, data1 close controlling point, data2 release controlling point. Close controlling point should be not more than releasing controlling point. When measured value is less than close controlling point (data1), H controlling relay close, when measured value is more than releasing controlling point (data2), H controlling relay release.

（8）LL:DW_ON<UP_OFF
03.00M 03.50M LL the lower limit controlling relay working point, data1 pull-in controlling point, data 2 releases controlling point. Pull-in controlling point should be less than releasing controlling point. When the measured value is less than pull-in controlling point (data 1), upper limit controlling relay pull-in; When the measured value is more than releasing controlling point (data 2), upper limit controlling relay releases.

3.2 Buttons Define

SCR Change the content of display: when you are in the main display interface, press this button to enter the password interface; when you are in user parameter interface, press this button to enter the next parameter interface.

SET When inputting password or changing parameters are required, press this button to enter setting status, at this moment, there will be a flashing cursor, then press this button, flashing button digital will add "1".

▶ Cursor turns right to the next digital, press SET and ▶ to modify parameter or input password.

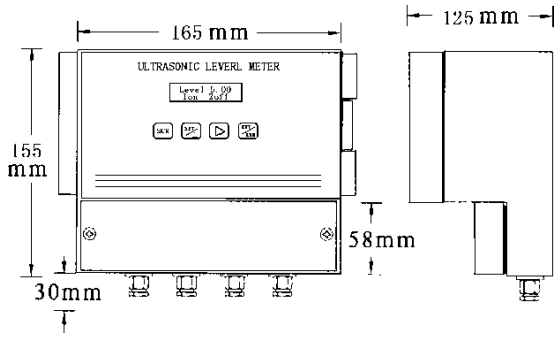
ENT RUN Press this button to confirm after modifying parameters (No cursor will be flashing after confirmation), press this button again then return to the main display interface.

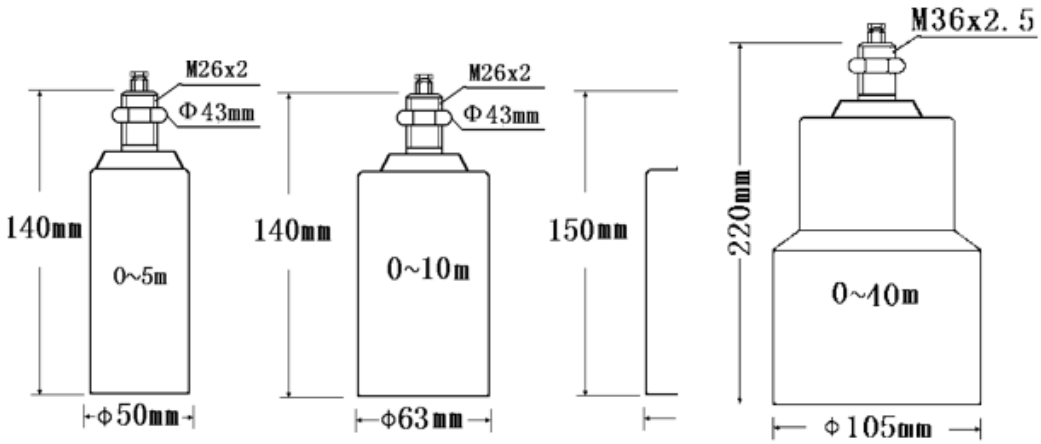
3.3 User parameters setting (password:3456)

Under the main display interface, press SCR to enter PASS WORD **** , at this moment, press SET and ▶ to input password 3456, then press ENT RUN to enter the first parameter interface MAX_DIST&FULL 05.00M 03.00M . Press SET and ▶ to modify parameters, press ENT RUN to confirm, if you want to modify parameters in the next parameter interface, press SCR to the next parameter interface. If you finish modifying all of the parameters, then press ENT RUN again to return to the main display interface, the meter will enter into measurement status.

Normally, users only need to set ullage (MAX_DIS) and full-scale value, then the meter will work.

4. Transmitter Dimension.



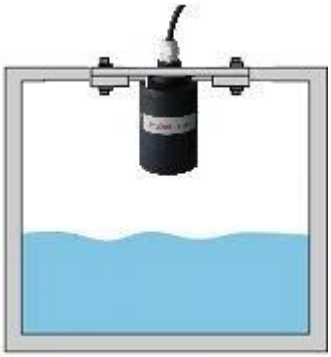


5. Installation and Wiring

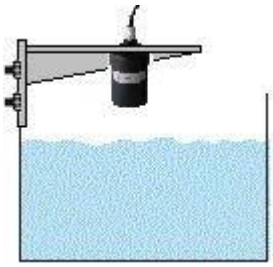
5.1 Installation

Installation method: Flange, Bracket etc.

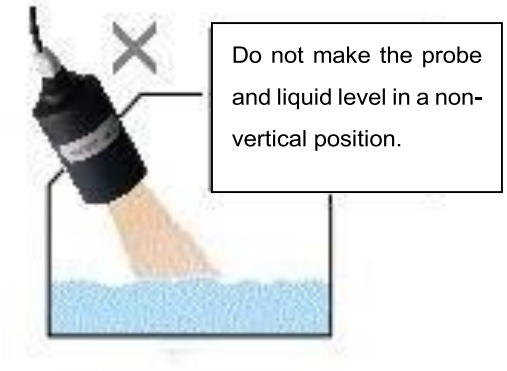
Flange Installation

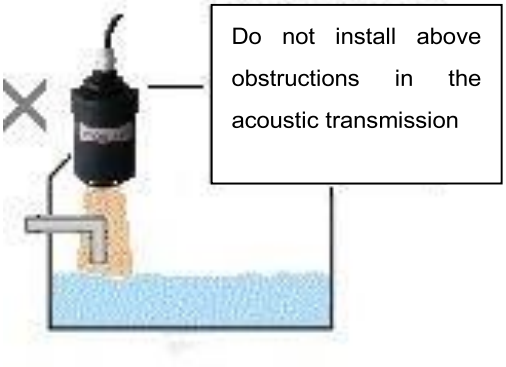


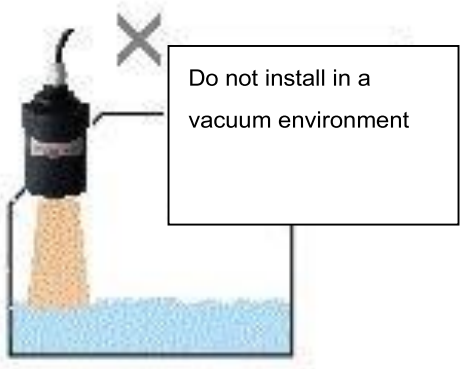
Bracket Installation



5.2 Attention

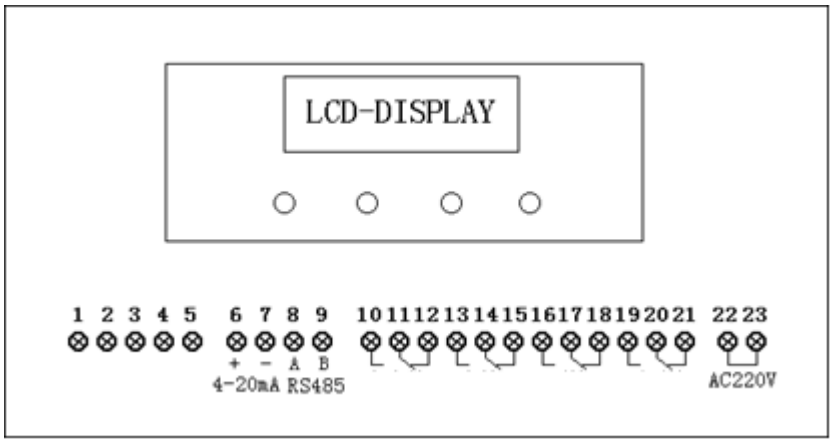






5.3 Wiring

Open the meter cover, panel diagram below:



1-5 connects with 5 core wire on the sensor(1-brown, 2-red, 3-yellow, 4-blue/shielded line, 5-black);
6 & 7 output 4-20mA current;
8 & 9 output RS485 (please inform factory if you need this function)
10-21 relay output
22 and 23 input AC220 power supply.

6. RS485 Communication descriptions

6.1 Data format

Start bit: 1
Data bits: 8, lower bit in the first
Stop bit: 1
Baud Rate: 9600

6.2 Command and Response

Command

Offset	Field Name	Field Value	Note
0	Address	0x01	
1	Cmd word	0x03	Read the command from the sensor
2~3	Parameter Address	0x00 0x00	Parameters in the sensor location, high byte first.
4~5	The number of parameters	0x00 0x01	Read one parameter
6~7	CRC Check code	0x84 0x0A	Code is 0x0A84，Low byte first

Response

Offset	Field Name	Field Value	Note
0	Address	0x01	
1	Cmd word	0x03	Read the command from sensor
2	The number of parameter bytes	0x02	
3~4	Parameter	0x09 0x07	16 digits of parameters (unit：mm)， Value: 0x0907(2311mm)
5~6	CRC Check code	0xFF 0xD6	Code: 0xD6FF，Low byte first

TEKSENS
YEDPA D 212 AS ISTANBUL/TURKEY
P +90 216 660 12 77 F+90 216 660 12 79
www.teksens.com.tr / info@teksens.com.tr