

UL103
Ultrasonic Level Sensor
User Manual

1. Overview

Ultrasonic level (distance) sensor UL103 is a highly reliable, maintenance-free transmission instrument that uses a non-contact measuring method that is not easily affected by environmental electromagnetic fields. It does not come into contact with industrial media and can meet the transmission requirements in most closed or open containers.

Its communication protocol used is Modbus-RTU, and the serial port supports 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 baud rates (after changing the baud rate, you need to power off and reconnect).

UL103 has high accuracy (0.25%~0.5%F.S for 4-20mA, 0-5V, RS485), minimum blind area ($\leq 200\text{mm}$), DC power supply (DC10-30V, 7-30V by customized), polarity reverse protection, surge lightning protection, anti-obstacle interference, quick response, stable reading value, power-off self-recovery function and many other advantages.

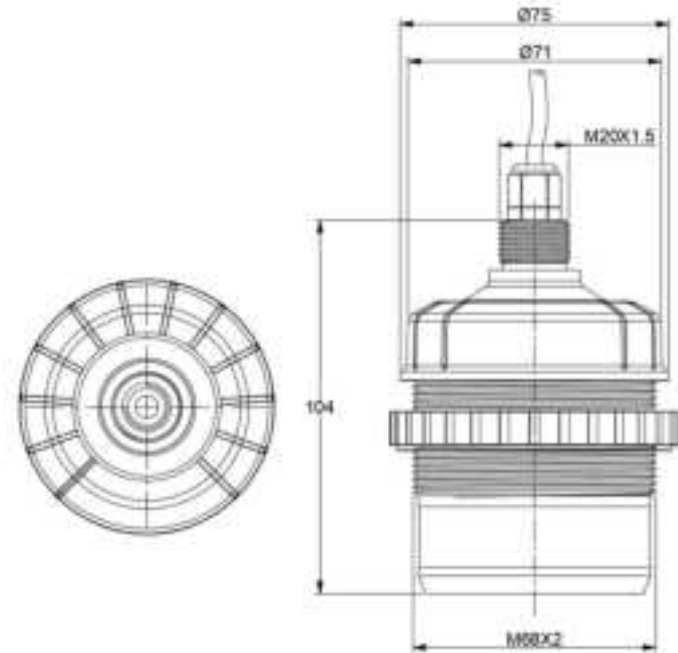
We provide installation instructions and videos, as well as OEM service.

2. Technical Parameters

Measuring range	2.5m, 5m, 10m, 15m,others on request
Blind area	4-20mA/0-5v(2.5m/5m):≤200mm 4-20mA/0-5V(10m):≤300mm 4-20mA/0-5V(15m):≤500mm
Accuracy	0.25%F.S, 0.5%F.S optional
Beam angle	12°
Measuring mode	Distance mode(default)/level mode optional
Output signal	4-20mA(3 wires)&RS485 Modbus RTU; 0-5V(3 wires)&RS485 Modbus RTU Optional
Power supply	DC 24V(default); DC 12V(by customized)
Working current	≤300mA
Working temp.	-10~50℃ (-40~80℃ by customized)
Installation mode	Nut clamping fixed installation, screw-in installation, M68×2
Response time	0.5s (2.5m/5m default); 1s (10m default); 2s (15m default); 0.5~10s adjustable via software or Modbus commands. Faster settings reduces the lifespan
Product material	Polypropylene + glass fiber
IP rating	IP67(IP68 by customized)

3. Dimensions

(Customized products may vary in overall size depending on the sensor selected. Please refer to the actual product for details.)

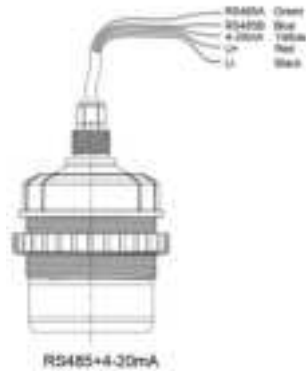


4. Wiring Definition

RS485+ 4-20mA(5-wire)

◆ Wiring Definition

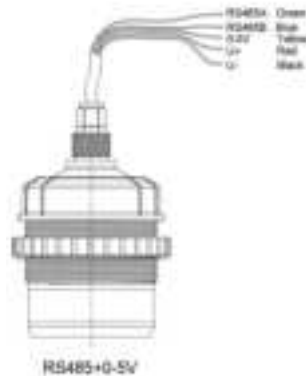
- ◇ U+: Red
- ◇ RS485A: Green
- ◇ RS485B: Blue
- ◇ 4-20mA: Yellow
- ◇ U-: Black



RS485+0-5V(5-wire)

◆ Wiring Definition

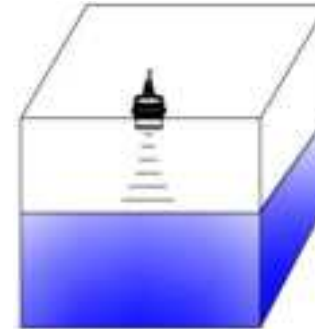
- ◇ U+: Red
- ◇ RS485A: Green
- ◇ RS485B: Blue
- ◇ 0-5V: Yellow
- ◇ U-: Black



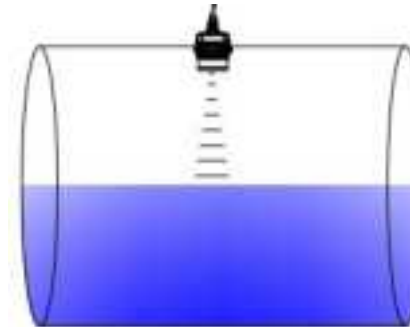
5. Installation and Precaution

5.1 Installation diagrams for different shapes of tanks

◆ Measurement in rectangular tanks



◆ Measurement in horizontal cylinder tanks



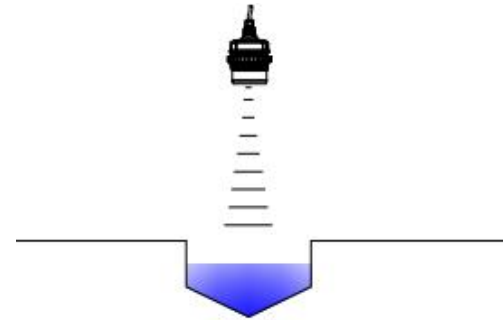
◆ Measurement in cylinder tanks



◆ Measurement in cube tanks

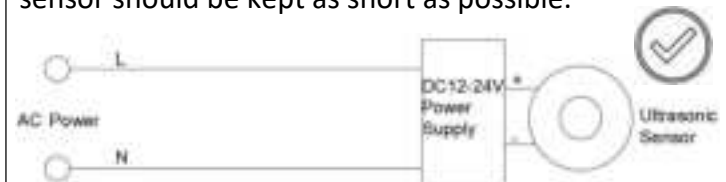


◆ Measurement in flumes

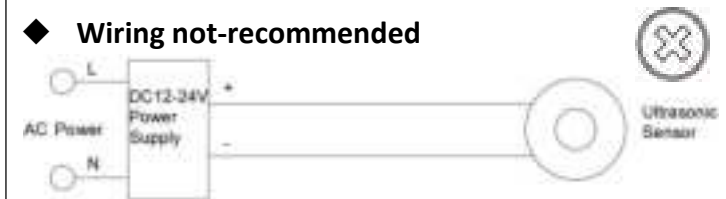


◆ Recommended wiring

The length between the DC power supply and the sensor should be kept as short as possible.



◆ Wiring not-recommended



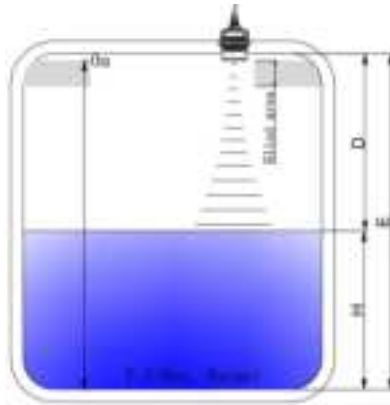
5.2 Installation Diagram

E=Total height from the tank to the probe's end surface

D=Distance from the end surface of the probe to the liquid level surface

H=Actual liquid height

Example: if sensor range is 5m, the actual tank height is 3m, using liquid level measurement mode, the end of the range is set to the actual tank height, the zero point of the range is set to (sensor range - actual tank height)



5.3 Precautions

1. All ultrasonic level sensors have blind areas, and the values detected within the blind areas are random values.

2. Ultrasonic level sensor emits ultrasonic waves at a certain emission angle, so there should be no objects within the range between the instrument and the measured target object that can easily reflect ultrasonic waves.

3. If the ultrasonic level sensor is in the distance measurement mode, the actual measured data is value D; if the sensor is in the liquid level measurement mode, the actual measured data is Value H. It must be ensured during installation that the height from the end face of the sensor to the bottom of the container is Value E (generally $E = F \cdot S$, i.e the maximum range), if it is installed too high or too low, the measurement output will be inaccurate.

4. Since the sensor has high sensitivity, they should not be subjected to strong noise or electromagnetic interference during use. Large air flows, temperatures and humidity outside the specified range, temperature changes that are too fast, and condensation on the surface can all affect the stability of the instrument and even shorten its service life.