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 (≤200mm), DC power supply, polarity reverse protection, surge lightning protection, anti-obstacle interference, quick response, stable reading value, power-off self-recovery function and many other advantages.

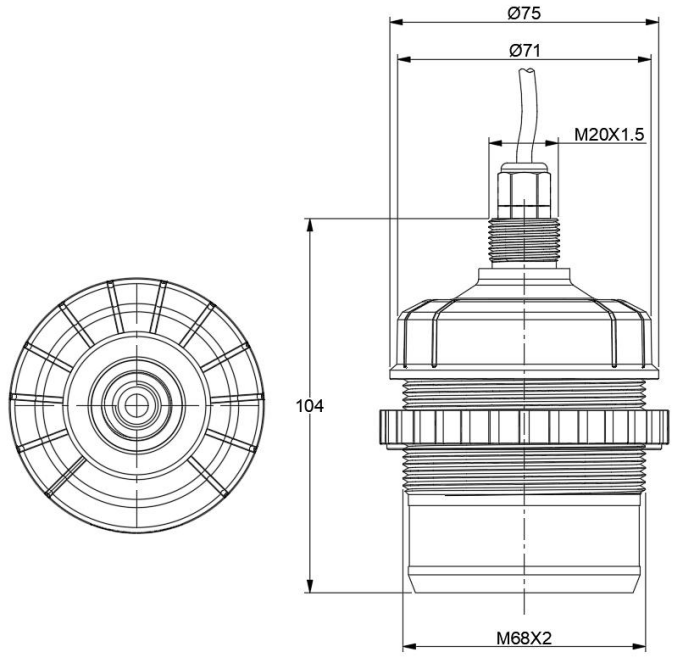
We provide installation instructions and videos, as well as OEM service.

2. Technical Parameters

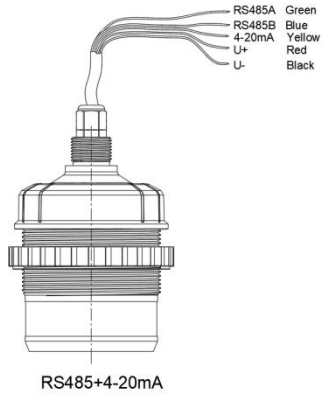
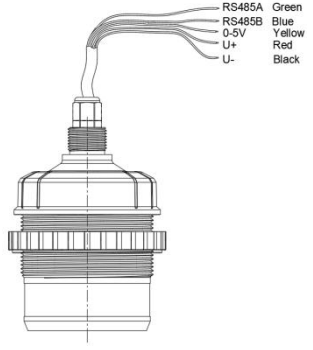
Measuring range	2.5m, 5m, 10m, 15m, others on request
Blind area	4-20mA/0-5V(2.5m/5m):≤200mm 4-20mA/0-5V(10m):≤300mm 4-20mA/0-5V(15m):≤500mm
Accuracy	0.5%F.S; 0.25%F.S(by customized)
Beam angle	12°
Measuring mode	Distance mode(default), level mode optional
Output signal	4-20mA(3 wires)&RS485 Modbus RTU; 0-5V(3 wires)&RS485 Modbus RTU Optional
Power supply	DC 24V(default); DC 12V(by customized)
Working current	≤300mA
Working temp.	-10℃ to +50℃
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.)



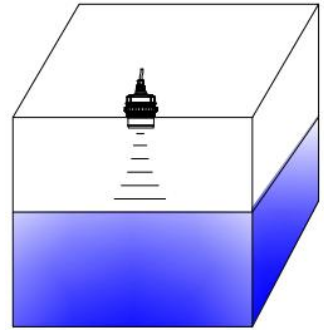
4. Wiring Definition

RS485+ 4-20mA(5-wire) ♦ Wiring Definition ◊ U+: Red ◊ RS485A: Green ◊ RS485B: Blue ◊ 4-20mA: Yellow ◊ U-: Black	 RS485+4-20mA
RS485+0-5V(5-wire) ♦ Wiring Definition ◊ U+: Red ◊ RS485A: Green ◊ RS485B: Blue ◊ 0-5V: Yellow ◊ U-: Black	 RS485+0-5V

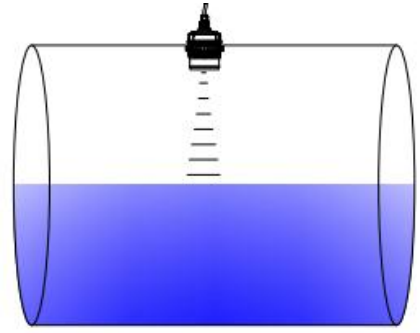
5. Installation and Precaution

5.1 Installation diagrams for different shapes of tanks

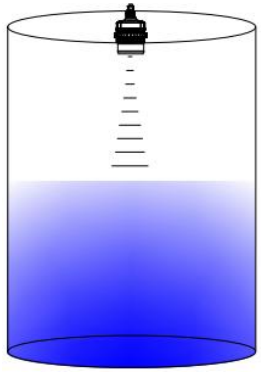
♦ Measurement in rectangular tanks



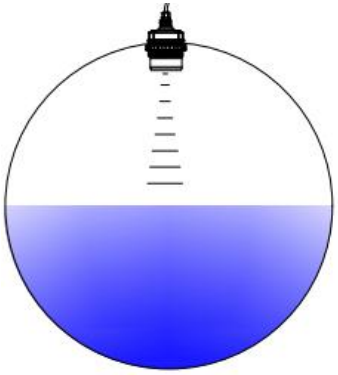
♦ Measurement in horizontal cylinder tanks



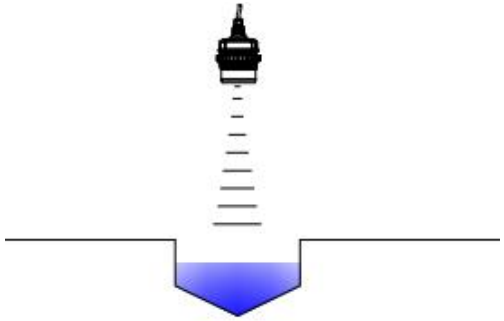
♦ Measurement in cylinder tanks



♦Measurement in cube tanks

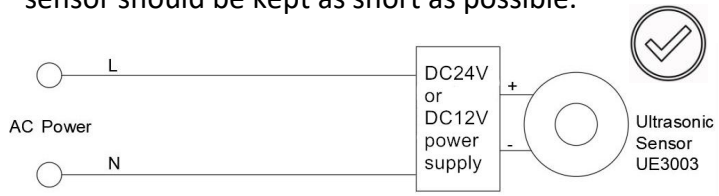


♦ Measurement in flumes

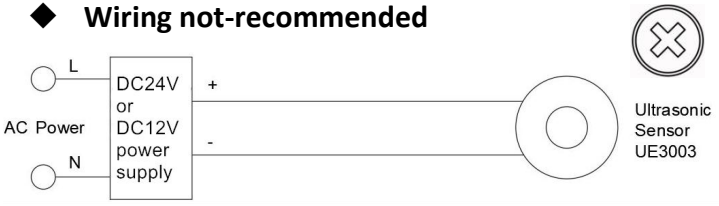


◆ **Recommended wiring**

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

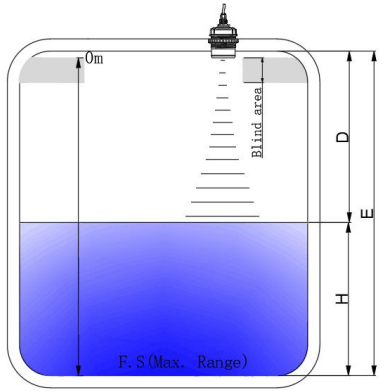


◆ **Wiring not-recommended**



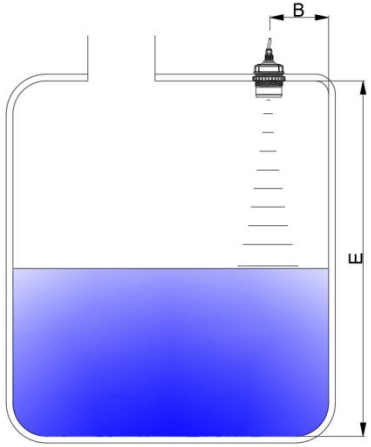
5.2 Installation Diagram

E is the total height from the container bottom to the sensor face.
D is distance from sensor face to liquid surface.
H is the actual liquid height.
Example:
Sensor range: 5m
Actual tank height: 3m



In level mode, set the range end point to the actual tank height 3m, set the range zero point to 2m(sensor range - actual tank height).

B is the distance from the sensor to the tank wall.



E	B
1m	≥50cm
2m	≥50cm
3m	≥50cm
4m	≥55cm
5m	≥75cm
8m	≥115cm
10m	≥145cm
12m	≥175cm
15m	≥215cm

5.3 Precautions

1. Every ultrasonic level sensor has a blind zone where detected values are random and unreliable.

2. Ultrasonic waves are emitted at a fixed angle, so ensure no reflective objects are present between the sensor and the target.

3. In distance mode, the measured value is D. In level mode, the measured value is H. The height from the sensor face to the container bottom must be E (typically E = F·S, the maximum range). Incorrect installation height will cause inaccurate readings.

4. These highly sensitive devices are affected by strong noise, electromagnetic interference, large airflow, out-of-range temperature or humidity, rapid temperature changes, and surface condensation, all of which can reduce stability and shorten the device's lifespan.