Thank you for purchasing our product! Please read this manual before operation in order to ensure the safety and most effectiveness of our product.

Portable Ultrasonic Liquid Level Indicator Manual

Standard： Q/XHS 003-2015

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Xi'an Huashun Measuring Equipment Co., Ltd.

Content

1. General Description

The portable ultrasonic liquid level indicator is designed to measure the presence or absence of liquid at a certain height position in a container or in pipelines. Measurable liquid containers can be made of various kinds of materials like metal, glass or unfoamed plastics. Under ordinary conditions, the maximum wall thickness of measurable containers is 30mm. It is noted that medium density, permittivity, conductivity, reflection coefficient, pressure, temperature, precipitation or other factors have negligible influence on the measurement result. The product is applicable to the detection of various types of liquids (without crystallization or other particulate matter). With non-contact detection technologies the liquid level indicator is an ideal choice for the level measurement of dangerous toxic or corrosive liquids .

Features：

- No contact with medium
- Suitable for toxic, corrosive, or invasive medium
- No need for drilling or welding on the container wall
- Advanced ultrasonic sensor technology
- Reliable measurement results
- Easy and convenient to operate and maintain
- Ultrasonic adaptive detection algorithm.
- High-contrast OLED color display, suitable for outdoor use under strong light
- The added ultrasonic-waveform-display function facilitates parameter testing, waveform comparing and application of other functions to ensure measurement accuracy in complicated situations
- Good user interface design
- Comprehensive software displays measurements in a simple manner
- Bilingual operation modes (Chinese/English)

2. Main Specifications

measurement accuracy	<5mm
measurable range of wall	3～30mm
measurable tank material	steel, stainless steel, glass, unformed plastics
measurable medium	pure liquid, milky liquid, suspension liquid
ambient temperature	-20℃～60℃ (-4℉~+140℉)
ambient	15%～85%RH
power supply	two 18650 lithium batteries (supplied by customers)
current	100mA (on average)

3. Operating Environment

3.1 Applicable Tank:

Vertical tank, horizontal tank, spherical tank(diameter > 3m) and CO_2 tanks with any of the following diameter ranges:

215mm - 225mm, 270mm- 280mm, 345mm - 355mm and 395mm-405mm.

Precautions:

Cone-shape, very small tanks or tanks with irregular layer inside cannot be measured.

3.2 Selecting Measuring Point

When selecting measuring points, make sure that the horizontal distances from all the points to their opposite (reflecting) tank wall are the same.

Tips：

- Measure from one smooth side of horizontal tanks.
- Measuring points should be more than 20cm away from welding lines to avoid interference in the

measurement results.

4. Appearance

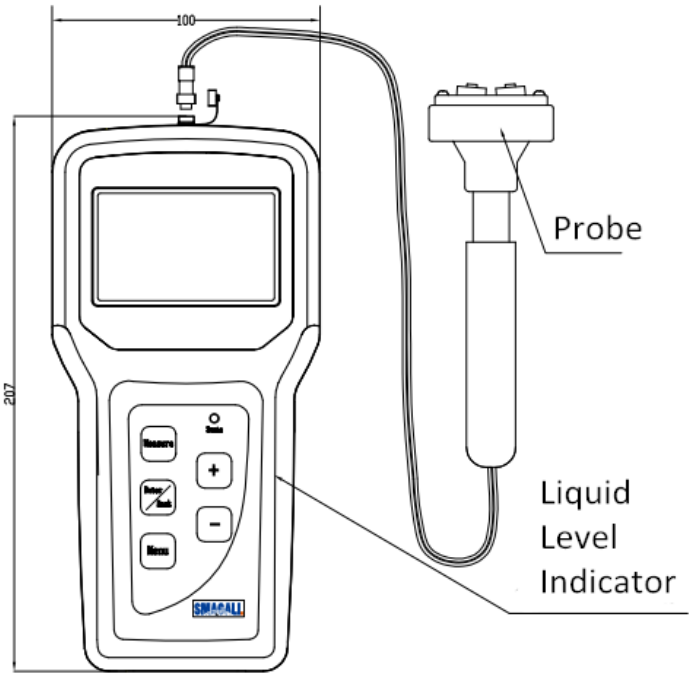

Fig. 4-1 Overall Appearance

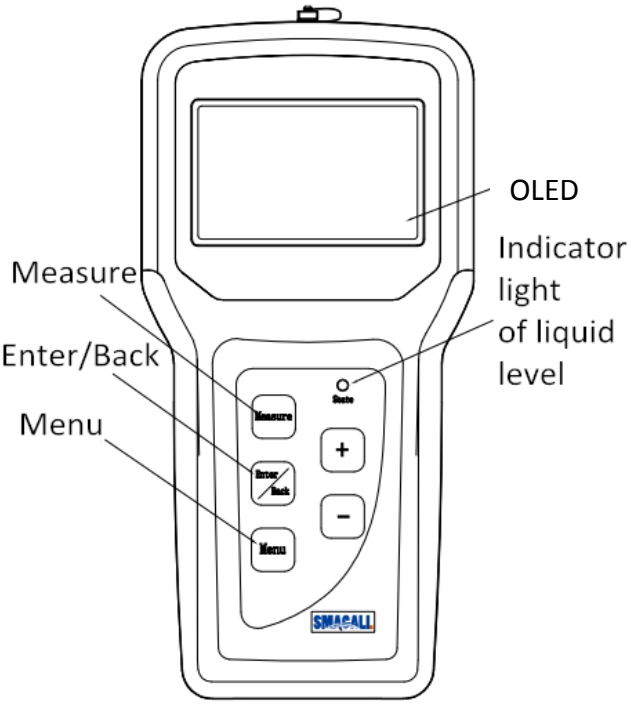
OLED
Indicator light of liquid level
Measure
Enter/Back
Menu
Measure
Enter/Back
Menu
+
-
SMAGALL

Fig. 4-2 Panel

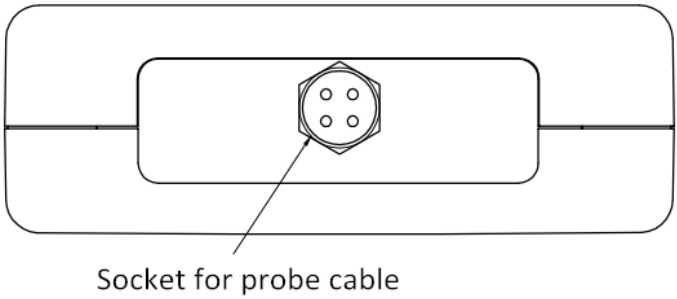

Fig. 4-3 Top of the indicator

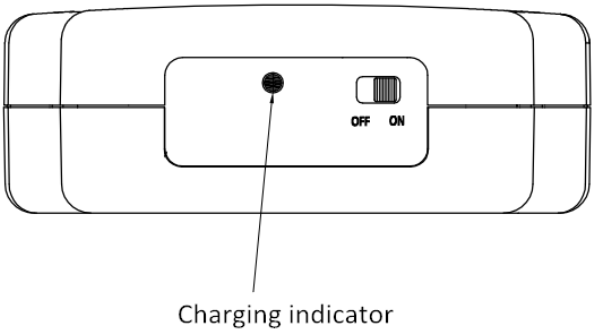

Fig. 4-4 Bottom of the Indicator

5. Measuring Methods

5.1 Buttons

Menu	Press to shift between *Menu* and *Measurement* interfaces
Enter/Back	Short press for enter; long press for back. This button functions under menu or parameter setting modes.
< + >	Towards upside, right or adding
<—>	Towards downside, left or subtracting
Measure	Button for sending ultrasonic waves or measuring. When this button is pressed, the ultrasonic probe should touch the body of tank vertically and very closely.
State	When the indicator light is green, it indicates the probe is in liquid area; red, no liquid.

5.2 Interface

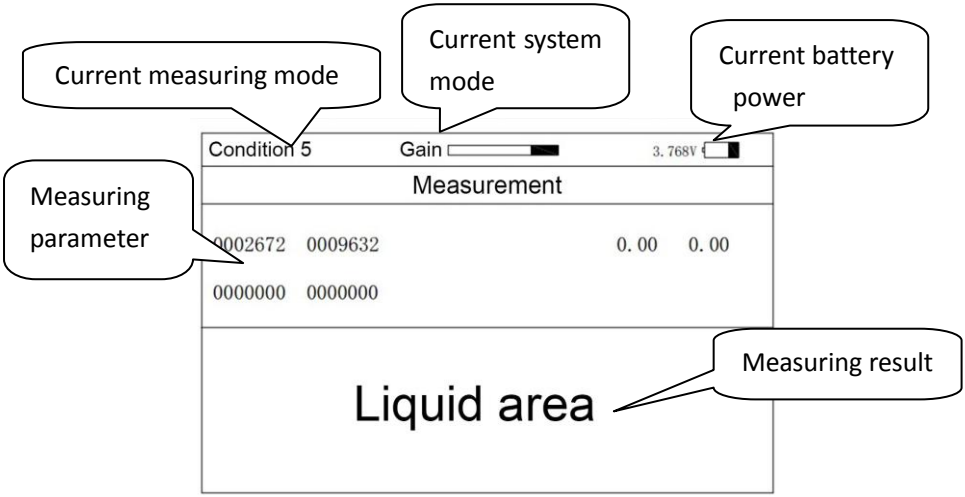

Fig. 5-1 Measuring Interface of Common Tank

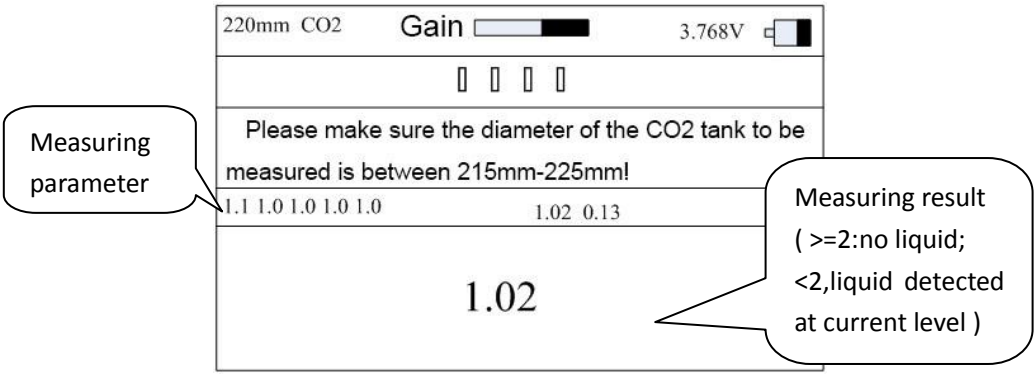

Fig. 5-2 Measuring Interface of CO_2

5.3 Two Tank Categories

CO_2 Tank:

The tank with the following diameter range are considered as CO_2 tank used in fire fighting, food and some other industries:

215mm-225mm, 270mm-280mm

345mm-355mm, 395mm-405mm

The indicator has no requirement for medium and tank height.

Common Tank:

All tanks outside the above tank diameter ranges can be considered as common type.

The indicator has no requirement towards medium, height and pressure.

5.4 Operating Process （See the Appendix）

5.5 Measurement

5.5.1 Measurement of Common Tank

1) There are five types of operating condition in common tanks. Each type of operating condition should be subject to the tank to be measured. In menu interface, 5 types of operating condition can be selected to facilitate operation in various types of operating condition.
2) Calibration is the prerequisite to the measurement in a unsaved type of operating condition. Calibration must be done in the liquid area.
3) After calibration place probe on the body of the tank closely, tightly and vertically; then press *Measure* to start measurement.
4) The measurement result is displayed in the way of showing *liquid area* or *no liquid* on the screen. The liquid level indicator light is another way to present the result. Red light means *no liquid*; green light,

liquid area.

5) Multiple measurements should be made on the same horizontal level to avoid faulty results. The final result should be the statistically favorable one.
6) The final liquid level can be identified through several tentative measurements.

Note:

During measurement of tank of irregular shape, the measuring point and the calibrating point must be in one vertical line.

If the system fails to calibrate several times (in this case after calibration the system cannot return to measuring interface automatically) it indicates the indicator cannot be used in current operating condition. Contact manufacturer to debug professionally to solve the problem.

5.5.2 Measurement of CO_2 Tank

1) In menu interface, select *CO_2 tank* and then choose the corresponding tank diameter to go to measuring

interface.

2) Place probe on the body of tank tightly and vertically; then press *Measure* to start measuring.

3) The liquid level indicator light is a way to present the result. Red light means *no liquid*; green light, *liquid area*.

   Normally, measure from the bottom of tank. If measurement parameter is >= 2, it indicates that there is no liquid on the current level; on the contrary if measurement parameter is <2, there is liquid. If the parameter is around 2, it indicates that there is a short distance (generally about 5cm) between the current level and liquid level.

4) In general, multiple measurements are recommended for precise results (especially when measurement parameter is close to 2). When different results are obtained at the same horizontal level, the statistically favorable one should be considered as the final results.

5) The final liquid level can be identified through several tentative measurements.

6. Other functions and settings

6.1 Language Settings

Enter *Menu-Language*. Select *English* or *Chinese.*

6.2 Power Indication

The remaining power is displayed on the up-right corner of the screen. When the power indicating light turns red, the batteries should be charged.

6.3 Battery

18650lithium rechargeable battery

Image 1.

Image 2.

Please note that the length of standard 18650 lithium battery is 65±2.0mm.

If you see the above two dimensions of 18650 batteries, please select the one with longer terminal.

7.Operation, Maintenance and Precautions

1) Keep the indicator clean, away from water, moist, sudden shock and violent contact.
2) If the indicator is to be kept idle for an extensive period, it is better to turn off the indicator, and store it properly.
3) The indicator should be kept in an ambient temperature between 0℃～+40℃ (32°F~104°F). The surrounding air should not contain substances that may corrode the indicator.
4) The ultrasonic probe must avoid being crashed, damped and corroded by chemical substances.

8. Packing List

Item	No.
Portable Ultrasonic Liquid Level Indicator	1
Ultrasonic Probe	1
Manual	1
Certificate of Approval	1
Warranty	1

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