

# Manual for Ultrasonic level sensor

## QDY70B

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# Intelligent Ultrasonic Level Sensor

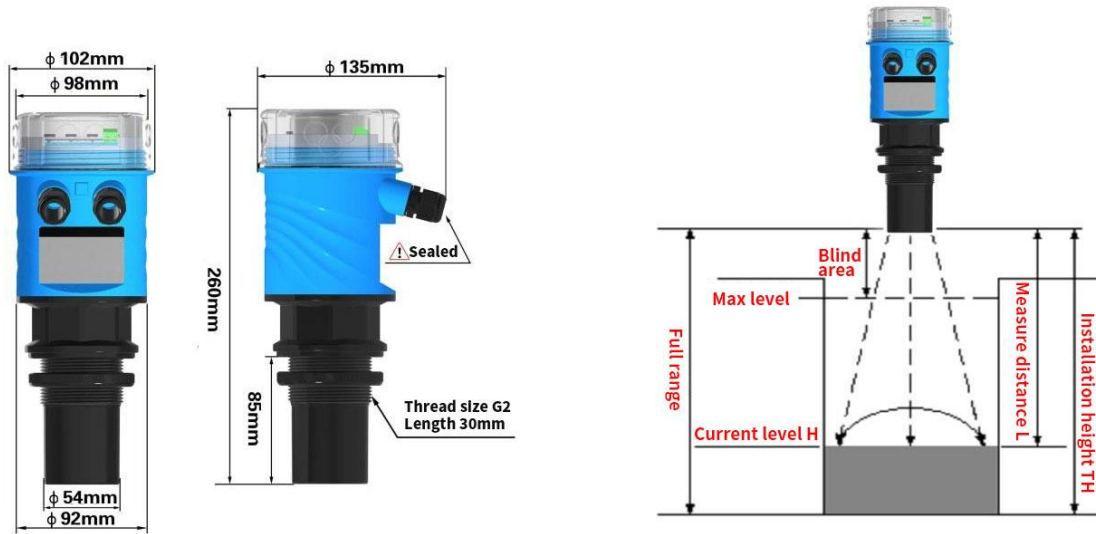


## Specifications

- ◆ Measuring range: 0~25m (customized)
- ◆ Blind area: 0.25~0.5m
- ◆ Accuracy: 0.25~0.5%
- ◆ Resolution: 1mm
- ◆ Pressure: Below 4 atmospheres
- ◆ Display: LCD display, show level height and spatial distance
- ◆ Analog output: 4~20mA, 0~10V, 0~5V etc
- ◆ Digital output: RS485 Modbus
- ◆ Power supply: DC24V, AC220V (built-in lightning protection)
- ◆ Ambient temperature: -20°C ~ +60°C (high temperature customized)
- ◆ Protection grade: IP68

## Dimensions

### ① Product external dimensions



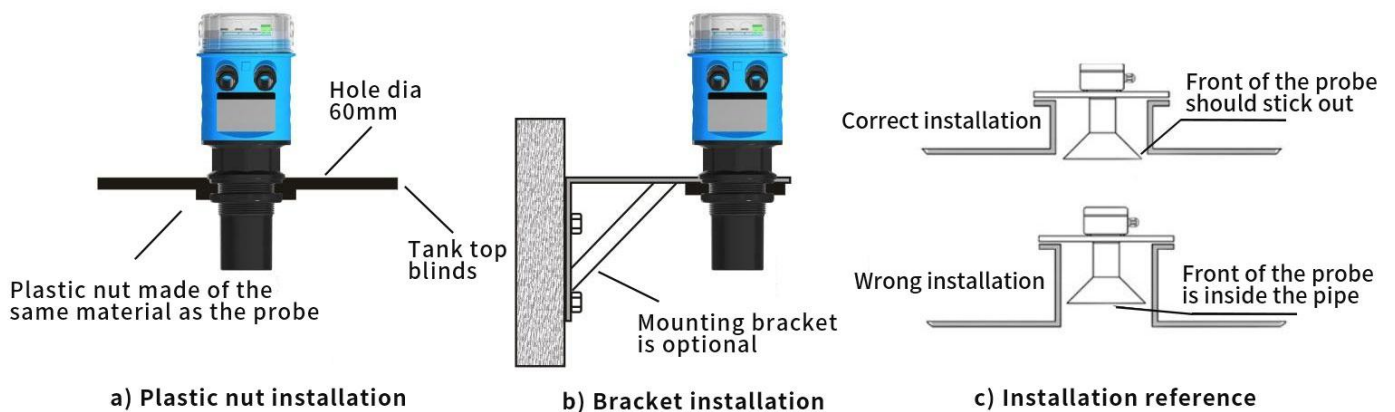
(Thread material, size and length can be customized)

(Installation principle schematic)

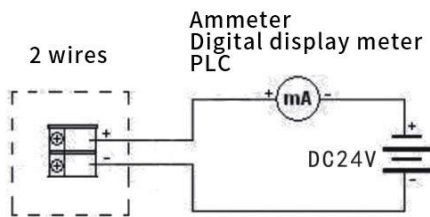
## Installation

### ① Product installation methods

In open environment generally adopts the bracket mounting method, fixed with the instrument's own flange or nut. Pool or tank in the installation position to cut a slightly larger than the diameter of the probe (60mm) hole, the instrument will be placed, and then the flange or nut screwed from bottom to top. The installation must ensure that the probe surface of the instrument is level with the measured liquid surface. The following 3 installation methods are commonly available.

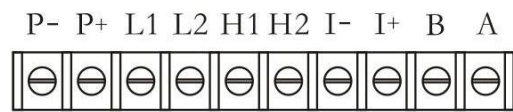


## Wiring diagram



**2 wires wiring**

Note: Do not use the same DC24V power supply as the inverter.



**4 wires wiring**

Note: P is power, DC24V or AC220V optional available. L1 L2 are low limits, H1 H2 are high limits. I- I+ are output 4-20mA, B A are for RS485.

## Calibration

### ① Key description



【SET】 : Menu key. Press [SET] to appear the password interface, enter the password to enter the menu, after setting, press [SET] to exit the menu.

【▲】 : Flip-up key and numeric key. In the menu, this key is used as the up key of the menu; when changing the data, this key is used as the numeric key.

【▶】 : Shift key. This key is used as a shift key when changing data.

【OK】 : Confirmation. Selects a menu or confirms options and data.

### ② Password

Press [SET] key, the password interface appears: "0000", press [▲] key to change the first bit to 2, that is, "2000", press [OK] key to enter the parameter setting menu interface.

### ③ Parameters setting

#### I Liquid level calibration (P01) (Note: now this function is realized by the P04 menu)

After the instrument is installed and powered on, the liquid level value will be displayed on the LCD, which often does not match the actual liquid level, so level calibration is required. As long as the P04 menu is set up, it will automatically calibrate the liquid level calibration (liquid level value H) and the air distance calibration (air distance value L).

Liquid level calibration automatic calibration steps are as follows: Press SET key, enter the password; and then press OK key to enter the parameter setting menu, turn to the P04 menu, OK key for P04 probe mounting height calibration; with the key (shift) and ▲ key (numerical change) will be changed to the actual height of the value of the number (such as 2.100), press OK key to confirm; in the case of the number does not blinking press SET key to exit the menu, at this time the first line H" is displayed for the current liquid level value, indicating that the instrument probe installation height calibration is complete, while the liquid level calibration (liquid level value H) and measure distance calibration (measure distance value L) is also automatically calibrated.

#### II Full scale 20mA value setting (P02)

When the instrument is working normally, press SET key to enter the parameter setting menu, press ▲ key to select P02 menu, the second line of numbers is 20mA corresponding to the liquid level, press OK key to set.

#### III Display mode setting (P03)

P03 menu can change the display mode, there are 3 display modes to choose from:

00 shows the level value (H) and temperature value (F);

01 shows the measure distance value (L) and temperature value (F);

02 shows the level value (H) and measure distance value (L).

Press ▲ to select the desired mode and then press OK to confirm.



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#### **IV Probe mounting height setting and automatic level calibration (P04)**

The P04 menu is for the probe mounting height setting, which must be a true and valid value. Once the valid mounting height value is set, the H and L values (i.e.: level value and space distance) are automatically calibrated.

#### **V Reaction speed setting (P05)**

The P05 menu changes the speed of the meter response. The faster the level changes, the faster the meter is required to respond. The meter has 4 modes to choose from: 00 fastest response speed; 01 faster response speed; 02 medium response speed; 03 slow response speed.

Press ▲ to select the desired mode and then press OK to confirm.

Note: The faster the reaction speed of the meter, the bigger the data display jumps; on the contrary, the slower the reaction speed of the meter, the more stable the data display is. If the liquid level does not change particularly fast, it is generally not necessary to modify the factory settings.

#### **VI Blind area setting (P06)**

The instrument's blind zones can be changed to accommodate some of the more complex conditions in the field. For example, it is possible to avoid the influence of nearby protruding objects on the instrument. In general, there is no need to modify the factory settings.

#### **VII ID number setting (P07) (Note: Only 4 wires instrument has this function!)**

Used for communication, especially for multi-computer communication, default is 01.

#### **VIII Relay output setting (Note: Only 4 wires instrument has this function!)**

The meter comes with two relays, H (upper limit), L (lower limit). Press SET key, the password interface appears: "0000" Press [▲] key to change the first digit to 3, press [OK] key to enter the relay parameter setting menu interface.

Each group of relays has two parameters corresponding to it, which are the control value and the return value. h (upper limit) relay is controlled by the menu parameters H (control value) and dH (return value); L (lower limit) relay is controlled by the menu parameters L (control value) and dL (return value).

For the high point relay (H), the relay closes when the measured value changes from small to large and is greater than the control value (H); the relay breaks when the measured value is less than the control value minus the return difference value (H-dH).

For the low point relay (L), the relay closes when the measured value becomes larger and smaller than the control value (L); the relay breaks when the measured value is larger than the control value plus the return difference (L+dL).

#### **IX Relay (Alarm type)**

Press the SET key password interface "0000", press the [▲] key to change the first digit to 4, that is: "4000", press the [OK] key that you can enter the relay settings, PH: 01 for the high alarm, PL: 02 for the low alarm, set the type of alarm according to demand (for example, need two high alarm settings for PH: 01, PL: 01; low alarm settings for PH: 02, PL: 02 can be realized). Set the alarm type according to the demand (e.g. need two high alarm set to PH:01, PL: 01; low alarm set to PH:02, PL:02 can realize this function).

#### **X Examples**

(1) 8 meters of liquid level, need close the relay to open the pump to inject water when it is lower than 2 meters, and disconnect the relay to stop the pump when it is higher than 7 meters.

This can be achieved by using a lower limit alarm relay, setting the return difference  $dL=7-2=5$  meters and setting  $L=2$  meters. So that when the liquid level is less than 2 meters, the relay closes and the pump is opened to inject water. When the liquid level is greater than 7 meters, the relay is disconnected and the pump is stopped.

(2) 5 meters of liquid level, higher than 4 meters close the relay to open the pump drainage, lower than 1 meter when the relay is disconnected to stop the pump.

This can be achieved using the upper limit relay. Set the return differential  $dH=4-1=3$  meters and  $H=4$  meters. This can be realized when the liquid level is greater than 4 meters relay closure open pump drainage, less than 1 meter when the pump stops.

The above two examples are in the case of only one pump, the use of differential control of the two liquid level points of the example. For the use of multiple pumps, you can simply set the control value can be.