

KWD110 Split Ultrasonic Depth Sounder Operation Instructions

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1.Introduction

Ultrasonic depth sounder is a contact-type, highly reliable, cost-effective, easy-to-install and maintain mud level measuring instrument. It detects underwater distance through liquid propagation. It is a new generation of ultrasonic depth sounding equipment developed by our company after years of hard work.

2.Debugging

Due to the different installation environments of the instrument, the ultrasonic depth sounder must know the basic conditions of the required measurement before working, such as: measurement range, zero point, full range and on-site working conditions, etc. Therefore, the instrument must be set before measurement.

Others: **Please do not modify the three items of probe selection, parameter calibration and algorithm selection by yourself.**

3.Technical Parameters

Function	Split type
Range	The conventional measuring range is 5 meters, 10 meters, 15 meters, 20 meters, and can be customized to 30 meters, 40 meters, 50 meters, 60 meters, 70 meters and further special measuring ranges
Measurement Accuracy	1%~3%
Resolution	5mm or 0.5% (the larger one)
Display	Chinese LCD display
Analog Output	4~20mA/750Ω load
Relay Output	Single channel is 2 groups of AC 250V/8A or DC 30V/5A, state programmable
Power Supply	Standard 220V AC+15% 50Hz Optional 24VDC 120mA Customized 12VDC or battery power supply
Ambient Temperature	Display instrument -20~+60℃, probe -20~+80℃
Communication	Optional 485, 232 communication (manufacturer protocol)
Protection Level	Display instrument IP65, probe IP68
Probe Cable	Up to 100 meters, standard 10 meters
Probe Installation	Depending on the selection of measuring range and probe

4. Installation Guide

4.1 Installation Precautions

When selecting the sensor installation location, the following standards need to be followed:

- (1) The sensor should be kept perpendicular to the mud surface and the bottom of the pool.
- (2) The sensor probe should be completely immersed in the water and at least 50 cm away from the pool wall.

If the pool wall is uneven, or there are objects such as brackets and pipes, the distance from the pool wall needs to be increased to avoid interference with the measurement caused by these objects.

- (3) There should be no obstacles in the transmitting surface directly below the probe to avoid the ultrasonic signal being blocked and reflected by obstacles.

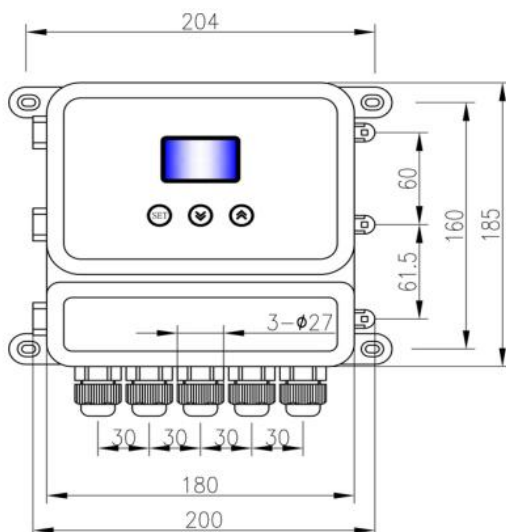
- (4) The probe should be installed away from gas bubbles and active floating solids caused by sudden changes in flow rate to ensure accurate and stable measurement.

4.2 Installation Dimensions

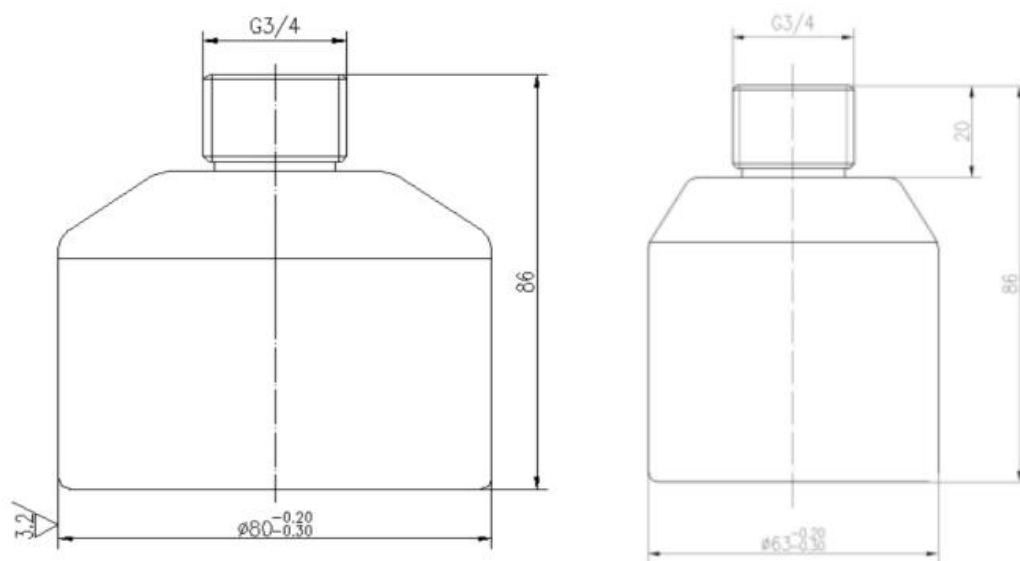
- (1) Appearance



- (2) Display instrument Dimension

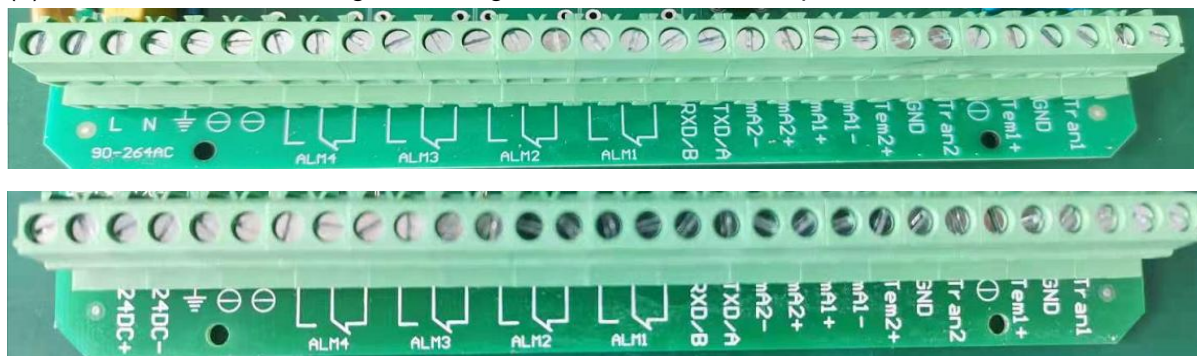


(3)Probe Dimensions

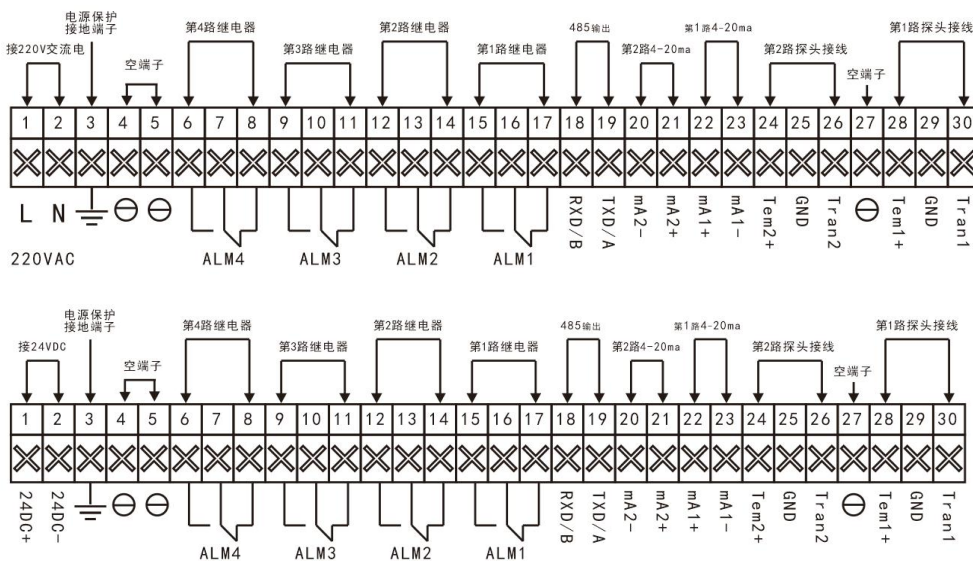


4.3 Electrical wiring diagram

(1) Electrical connection diagram of single-channel ultrasonic depth sounder:



(2)Schematic diagram of underwater rangefinder wiring terminal



Wiring method:

Grounding: First, the ground terminal of the instrument must be truly connected to the ground. Do not share the ground terminal with other equipment. Connect to terminal 3.

Transducer: Red wire (or brown wire): Connect to Tran 1;

Blue wire: Tem1 +;

Black wire: GND;

Current: Current + Connect to mA 1+ ,Current - Connect to mA 1-

Relay: ALM n ("n" represents 1, 2, 3, 4)

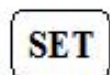
Terminal diagram: The closed symbol is normally closed, and the middle is the common terminal.

Power line: AC, connect to L, N

DC: 24V + Connect to 24VDC+, GND Connect to 24VDC-.

5.Operating Instructions

There are three buttons on the panel of KWD110 split ultrasonic depth sounder, through which the instrument can be debugged. After debugging, the measured value will be displayed on the LCD screen.



◇ Enter menu item

◇ Confirm menu item

◇ Confirm parameter modification



◇ Move cursor

◇ Select menu item

◇ Modify parameters

(1) After the meter is powered on, **press and hold the SET button for two seconds to enter the first-level menu.**

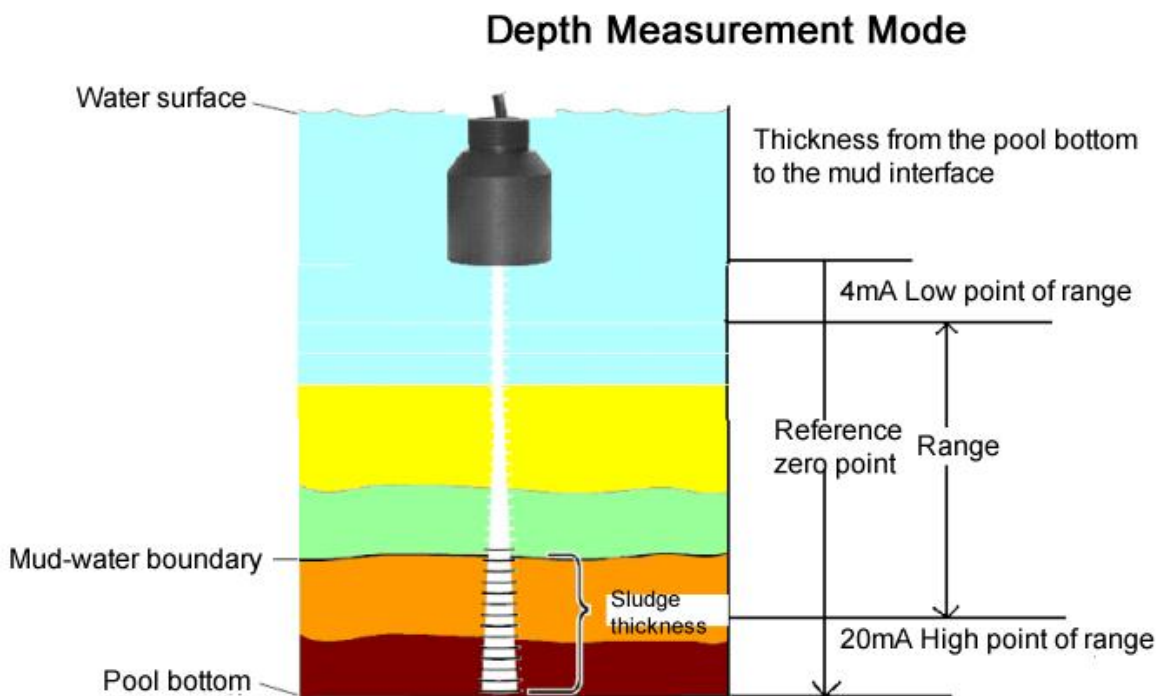
For the specific menu, please see the "Menu Query Diagram" on the last page.

(2) Select the measurement mode:

The measurement mode is divided into water depth measurement and mud level measurement. The factory default is mud level measurement.

(3) Enter the height value of the probe into the "**reference zero point**". (The probe height is the distance from the probe emission surface to the pool bottom)

In the water depth measurement mode, the reference zero point setting is meaningless. The positions of the **high point** and the **low point** of the range are shown in the figure below.



Low point of range: The distance value from the reference plane to this position. When the low point of the range is higher than the reference plane, the value is positive, and when it is lower than the reference plane, the value is negative. The measured mud level outputs 4mA current at this setting value.

High point of range: The distance value from the reference plane to this position. When the high point of the range is higher than the reference plane, the value is positive, and when it is lower than the reference plane, the value is negative. The measured mud level outputs 20mA current at this setting value.

(4) For devices operating with a relay: Enter the alarm settings option and set three parameters:

① Alarm mode: Select from high - level alarm, low - level alarm, or off.

② Alarm value:

High - level alarm: An alarm will be activated when the water depth is higher than the alarm value.

Low - level alarm: An alarm will be activated when the water depth is lower than the alarm value.

③ Hysteresis value: The hysteresis value is designed to prevent the alarm switch from repeatedly switching near the alarm point due to measurement errors.

High alarm state: Alarm is released when the water depth is lower than (alarm value - hysteresis value)

Low alarm state: Alarm is released when the water depth is higher than (alarm value + hysteresis value)

(5) The settings for probe selection, parameter calibration, and algorithm selection should be performed under the guidance of professional technicians.

(6) Suggestion: When connecting the ultrasonic depth sounder to devices that may cause interference, such as motors, frequency converters, and PLCs, it is best to install an isolator in - between. Even if there is no direct connection, maintain a sufficient distance to reduce the electromagnetic interference from these devices.

6.Settings

6.1 Introduction to the operating mode interface

This series of ultrasonic depth sounders has two working modes: operation and setting. After the device is powered on and the initialization process is completed, the underwater rangefinder will automatically enter the operating mode and start measuring data. At this time, the measurement is the water depth measurement mode. And the relative output value is 4~20mA. The output current is proportional to the water depth.

6.2 Menu interface and operation instructions

① Press the Set key in the operation mode interface to enter the first-level menu interface:

② Description of each item in the first-level menu:

◆“0 End setting”

When this item is selected, press the Set key to return to the operation mode interface.

◆“1 Parameter lock”

The menu is locked. When your parameters are set and you do not want others to change them at will, lock the menu. In this way, you must enter the password to unlock and operate the menu. The initial password of the mud level meter is 25. The user can modify the initial password and set his own password at will (special reminder: please remember the password you set, if you forget, you should contact the manufacturer).

Description:

Unlock: If not locked, all menus can be modified at will.

Global lock: After global lock, you must enter a password to modify.

★When the parameters are locked, press the Set key to enter the unlocking interface of the parameter lock.

◆“2 Range Setting”

Set reference zero point, range high point, range low point, and display unit.

Reference zero point: Set the reference zero point of the underwater rangefinder, which is mainly meaningful when measuring the level; the factory setting defaults to the maximum range.

Low point of range: Set the measurement value corresponding to the 4mA output of the underwater rangefinder; the factory setting defaults to 0. High point of range: Set the measurement setting corresponding to the 20mA output of the underwater rangefinder; the factory setting defaults to the maximum range. the factory setting defaults to the maximum range.

Display unit: There are three units to choose from: m, cm, and mm. m: displayed in meters, cm: displayed in centimeters, and mm: displayed in millimeters. The factory setting defaults to cm.

◆“3 Measurement mode”

Mode selection: There are two options: water depth measurement and mud level measurement. Water depth measurement: The display value is the distance from the probe to the boundary point between the mud and water; mud level measurement: The display value is the distance from the reference zero point to the mud-water interface, that is, the mud level height. The factory setting defaults to mud level measurement.

Response speed: There are three options: slow, medium and fast. Slow: slow response rate, high measurement accuracy, not easily disturbed; medium: between slow and fast; fast: fast response rate, low measurement accuracy, easily disturbed. The factory default is medium.

Safe water depth: There are four options: hold, minimum, maximum and set value. Hold: The display value after the system loses the wave is the last measured value, and the current is the corresponding value; minimum: The display value after the system loses the wave is 4mA, and the current is 4mA; maximum: The display value after the system loses the wave is 20mA, and the current is 20mA; set value: The display value after the system loses the wave is the last measured value, and the current output is the set value of the set current. The factory default is hold.

Set current: Set the output specified current after the wave is lost. It is greater than 3.6mA and less than 22mA. It is invalid when you select hold/maximum/minimum. The factory default is 3.6mA.

◆“4 Probe Settings” (Please do not modify this parameter)

Select the probe and set related parameters.

Probe Selection: There are nine options from 1 to 9. Select according to the label on the probe. The factory default setting is 5.

Blind Zone Setting: Set the near-end blind zone of the probe. The factory default setting is 0.30.

◆“5 Algorithm Selection” (Please do not modify this parameter)

Algorithm Selection: There are seven options for selection: Special Environment 1, Special Environment 2, Special Environment 3, Special Environment 4, Special Environment 5, Special Environment 6, and Special Environment 7. The factory default setting is Special Environment 7.

◆“6 Alarm Settings”

Set the alarm relay.

Alarm 1 mode: There are three options: Off, Low Alarm, and High Alarm. Off: Relay 1 does not work; Low Alarm: Relay 1 low alarm; High Alarm: Relay 1 high alarm. The factory default is Off.

Alarm 1 value: In meters, the factory default is 0.

Alarm 1 hysteresis: In meters, after the alarm is triggered, the alarm needs to be released when the measured value reaches the alarm value +/- alarm hysteresis. The factory default is 0.

Alarm 2 mode, alarm 3 mode, and alarm 4 mode settings are the same as above

◆“7 Parameter Calibration” (Please do not modify this parameter)

Perform range calibration, sound velocity calibration, current output calibration, and reference level calibration operations.

Range calibration: Enter the actual value, and the system automatically performs range calibration. The factory default is the measured value.

Sound velocity calibration: Enter the actual value, and the system automatically performs sound velocity calibration, which is used in situations where the liquid is not water. For example: In the case of gasoline, acetone, alcohol and other liquids, the propagation speed of sound in these liquids is different and needs to be corrected.

4mA correction: Modify the value until the actual output current is 4mA. The factory default is 3100.

20mA correction: Modify the value until the actual output current is 20mA. The factory default is 7200.

Reference level: Enter the voltage value measured at the corresponding test point. The factory default is 5.00.

◆ "8 Communication Settings"

Communication address: Select the communication address, the default value is 1.

Baud rate: Select the communication frequency, 2400, 4800, 9600, 19200 are available, and the default value is 9600.

◆ "9 Reset Selection"

Factory reset: Yes: Restore to the state just set by the factory. No: Exit. The factory default is No. System

reset: Yes: Restore system settings. No: Exit. The factory default is No.