Pressure Level Sensor Series
YW07 User's Manual

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Table of Catalogue

1 Product Features

- Imported ceramic core.
- PP bushings have good chemical, heat and electrical insulation. 3. Teflon cable, long service life, more durable.
- Ptfe thread corrosion resistance, good sealing.
- Strong anti-interference ability.
- Wiring reverse and over voltage protection (current output only).
- Accuracy: 0.5%FS (other accuracy can be customized).
- Measuring medium: liquid between PH3-12.
- Measuring range: 0~100 m.

2 Product Description

The integrated anti-corrosion liquid level transmitter adopts high-performance imported ceramic core as the measuring element, and converts the gauge pressure of the measured medium into standard voltage or current signal through high-reliability amplification processing circuit and precision temperature compensation. The product is small in size, easy to use and install, and can be directly put into the water to measure the liquid level height from the end of the transmitter to the liquid surface. Mainly measure hydrochloric acid, sulfuric acid, nitric acid, hydrofluoric acid, sodium hydrofluoride, hydrogen peroxide and other highly corrosive liquids or chemical electroplating wastewater.

2.1 Product Application

Widely used in environmental protection, water conservancy, variable frequency water supply, industrial process control, chemical and other fields of liquid level measurement control.

2.2 Working principle

The pressure received by the sensor at the liquid surface is as follows: P=ρgh+Po

P:Pressure strength of the sensor against the liquid surface (for convenience of understanding, hereinafter referred to as pressure)

ρ: Density of the measured liquid

g: Acceleration of gravity (9.8015 when debugging)

Po: atmospheric pressure at the liquid surface

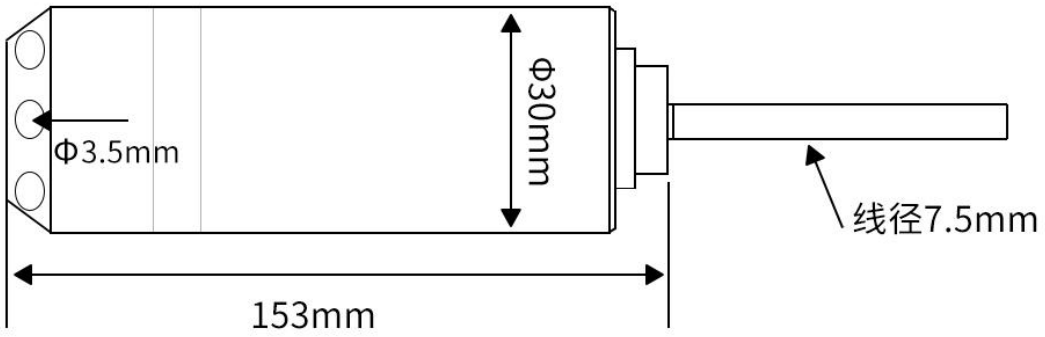
h: The depth of the sensor into the liquid

When the sensor is put into the measured liquid at a certain depth, the pressure of the measured medium is introduced into the positive pressure chamber of the sensor, and the atmospheric pressure Po on the liquid surface is connected to the negative pressure chamber of the sensor through the cable airway to offset the Po on the front of the sensor, so that the measured pressure of the sensor is: ρgh, obviously, by measuring the pressure P, the liquid level depth can be obtained.

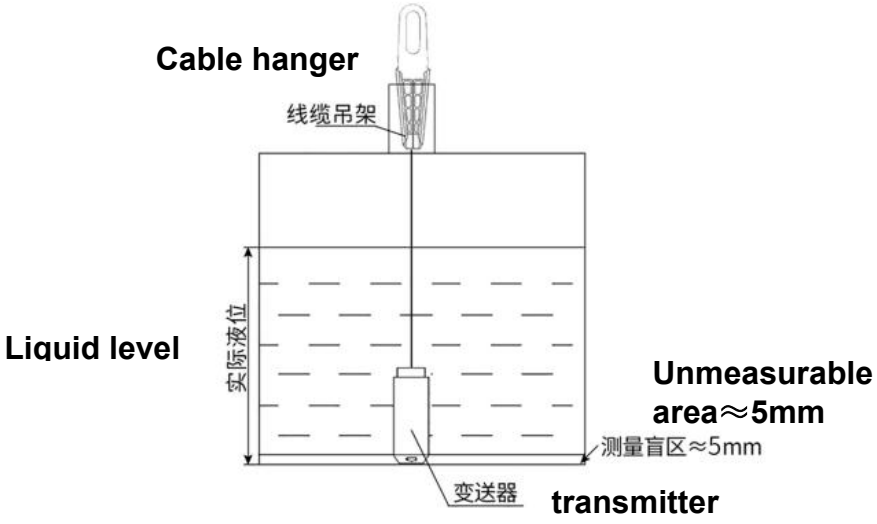
3 Specifications

Material	PP probe, Teflon cable
Measuring medium	liquid within PH3-12
Measuring range	0 ~ 200 m
Comprehensive precision	0.5 level (tacit recognition) 0.2 level (customized)
Overload capacity	200% full scale
Response time	8ms (up to 90% FS)
Medium temperature	-40 ~70℃
Ambient temperature	-40 ~125℃
Power supply voltage	DC10V~32V
Output signal	4-20mA, 0-5V, 1-5V, 0-10V
Stability	± 0.2% F.S/ year
Seal class	Probe IP68
Process connection	Put in (put into the liquid under test)
Storage temperature	-40 ~125℃
Zero temperature drift	± 0.2% F.S
Sensitivity temp. drift	± 0.2% F.S
Mechanical vibration	20g(20~5000Hz)
Impact	100g(11ms)
Insulation	100mΩ/DC 250V
Medium compatible	PH3-12 medium liquid

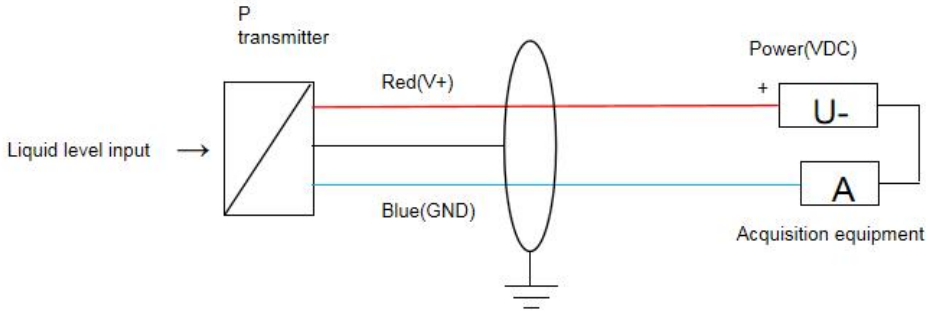
4 Outside Drawing



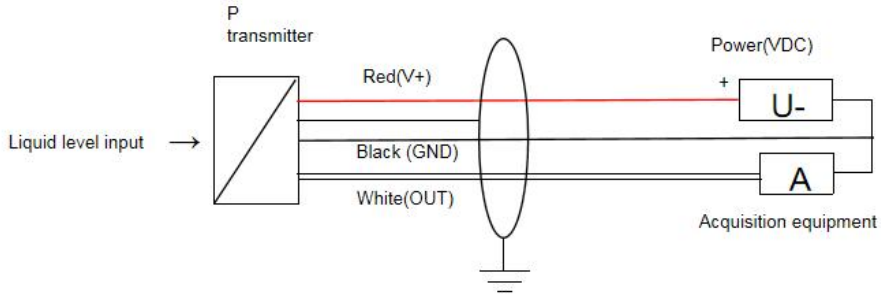
5 Wiring installation



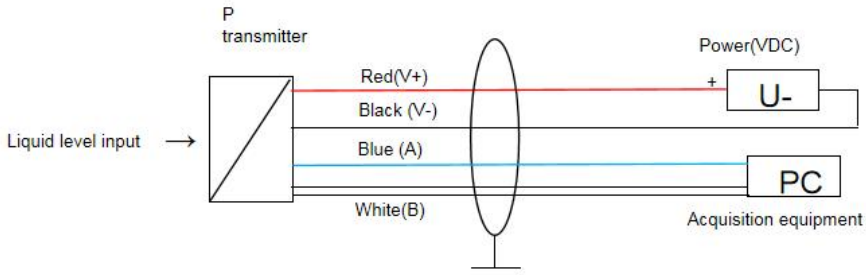
6 Connection diagram



Current output wiring diagram（2-Wire）



Voltage output wiring diagram（3-Wire）



RS485 digital signal output wiring diagram

If you need to install an extension cable, ensure that the wiring part is dry.

Only the current output has reverse protection (no damage but not working), current and voltage limiting protection. Other output signals are reversed resulting in transmitter damage

7 Model Code Selection Table

Part	Number
Type	YW07
Range	The actual length required, for example 3m, Max 200m
Medium	Chemical code for the medium being measured, such as H_2O
Power	V1：24V V2：12V V3：32V
Output	B1：4~20mA B2：RS485 B3：0~5V B4：0~10V
Structure	G1：Waterproof wire G2：PP tube
Additional features	K1：Straight lead K2：2088 housing K3：French P1:0.2% M1：0-100% linear indicator M2： digital display Y：By customized

8 Installation precautions

Warning!

8.1. Install the device without pressure or power supply.

8.2. Do not measure the media that is incompatible with the transmitter contact material.

8.3. When you receive the product, please check whether the package is intact, and check whether the transmitter model and specifications are consistent with the products you purchase.

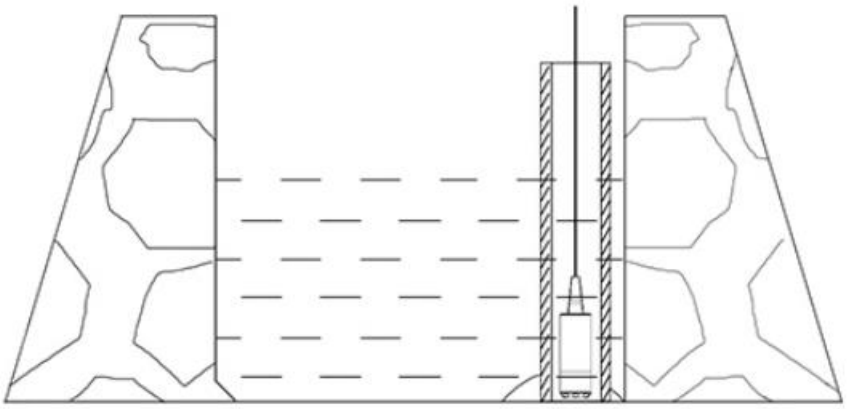
8.4. No modifications or changes can be made on the device.

8.5. To be handled lightly and not thrown at will, please do not use brute force when installing the transmitter.

8.6. If the transmitter is installed in the harsh site will encounter dangerous damage such as lightning strike or overvoltage, we recommend the user to carry out lightning protection and overvoltage protection between the distribution box or power supply and the transmitter.

8.8. The transmitter can be installed vertically, tilted or horizontally in the tank or tank, and it should be ensured that impurities such as sediment are not buried or blocked in the probe part of the transmitter.

8.8. When the medium fluctuation is large, measures should be taken to fix the transmitter probe part, such as adding counterweight to the transmitter or fixing the sleeve. When measuring the water level in flowing water, you can insert or install a steel pipe or PVC pipe larger than the diameter of the probe in the water, and open a number of small holes about 5mm in the opposite height of the pipe in the direction of the water flow, so that water enters the pipe. As shown in the figure.



8.9. In addition to serving as a power supply and signal transmission, the gas guide cable also plays a key role in atmospheric compensation. During installation, avoid locking the cable too tightly or bending at too acute an Angle to prevent the gas guide from being blocked or broken.

8.10. If an extension cable is required for on-site installation, please ensure that the wiring part is kept dry and ventilated, and it is strictly prohibited to soak and avoid moisture and dirt blocking the atmospheric connection pipe in the cable, otherwise it will cause damage to the transmitter or inaccurate measurement.

8.11. Avoid the cable of the liquid level transmitter from being scratched by knives or other sharp metal bodies, which may cause water damage to the transmitter.

8.12. This product belongs to the weak current equipment, wiring must be separated from the strong cable, should comply with the relevant wiring standards for wiring.

8.13. Ensure that the power supply voltage meets the transmitter power supply requirements.

8.14. Please do not disassemble the diaphragm when using, and do not touch the diaphragm to avoid damage.

9 Agreed statement

Transmitter basic technical parameters

This protocol complies with Modbus communication protocol and adopts the sub-centralized RTU mode in Modbu protocol. RS485 half double working square type)

9.1. Output signal: RS485 (distance up to 1000 meters)

9.2. Standard Modbus-RTU protocol (03 function read data, 06 function write setting data)

9.3. Data format: 9600, N,8, 1(9600bps, no check,8 data bits, 1 stop bit)

9.4. Test range: 0-X(m · · ·)

9.5. Resolution: 0.05%

9.6. Output data: 0 · ·2000(other range customization)

9.7. Response frequency: ≤5Hz

9.9. Response speed: ≥10ms

(1). Read data by Modbus-RTU 03 Command description

A. Send reading command pattern:

Address	Function	Data start (H)	Data start (L)	Data start (H)	Data start (L)	CRC16(L)	CRC16(H)
0X01	0X01	0X00	0X00	0X00	0X01	0X84	0X0A

A. Read back to fetch data cell: For example:

Address	Function	Data Length	Data (H)	Data (L)	CRC16(L)	CRC16(H)
0X01	0X03	0X02	0X00	0X00	0X79	0X84

Communication example (reading PV value):

The address of the sensor communication device 0-5m is 1, that is, (address range 1-255) when CRC check =C5 CB. Then send and return data as follows:

Send: 010300040001 C5 CB Return: 01030209 C4 BF 87

09C4 is hexadecimal, converted to decimal 2500(retain a decimal), so the current liquid level is 250.0cm (in centimeters)

(2).Read data by Modbus-RTU 06 Command description

Address	Function	Data start (H)	Data start (L)	Data start (H)	Data start (L)	CRC16(L)	CRC16(H)
0X01	0X06	0X00	0X00	0X00	0X02	0X08	0X0B

B. Return read data format: example

Address	Function	Data start (H)	Data start (L)	Data (H)	Data (L)	CRC16(L)	CRC16(H)
0X01	0X06	0X00	0X00	0X00	0X02	0X08	0X0B

Modification example

For example, address 01 is changed to address 02

Send 010600000002080B and return 010600000002080B

The original address 01 is successfully changed to 02. The new address can be changed offline or online. After the change, you can directly work without powering on the device again.

(3).Exception reply return

Address	Function	Exception code	(L)	(H)
0X01	0X80+Function code	0X01(invalid instruction),0X02(invalid address		

10 Precautions for use

10.1. A single RS485 bus must take the "hand in hand" bus structure, absolutely do not use the star link and fork link address code from near to far, that is, the management computer to the No. 1 controller, No. 2 to No. 1, No. 3 to No. 2, and so on... ,

10.2. The AC power supply of the device and the chassis must be properly grounded. There are a lot of places that have triangular sockets on the surface that are not grounded at all, so be careful. When the device is properly grounded, it can release energy based on the lightning protection design to protect the RS485 bus device and related chips from damage when lightning surges accumulate static electricity. If the ground is not connected or not connected, do not use the RS485 bus to avoid equipment burning and casualties.

10.3. The wire must use multiple strands of shielded twisted-pair cable with a wire diameter of 0.3 square millimeters or more (multiple strands are for backup) to apply PVC pipe separately to avoid walking together with strong electricity to avoid interference with strong electricity.

10.4.485A and 485B must be twisted-pair, twisted-pair because 485 communication uses the principle of differential mode communication, twisted-pair has the best anti-interference. It is extremely wrong not to use twisted pair, and other types of cables must be avoided.

10.5. Connect the reference ground GND of the RS485 converter and all the access controllers in series (power negative), and use one or all of the remaining twix-pair network cables for the series GND: The reference ground is not connected properly, which also affects the communication failure, mainly from the distributed capacitor and the high-frequency radiation of electrical induction.

10.6. The shielding layer of the network communication line is connected to the ground, and it must be connected to the ground, otherwise the bus has potential unknown dangers.

10.7. If multiple slave machines or the connection line is too long and the communication is not smooth, it is necessary to add 120 ohm matching resistance between 485A and 485B of the first section of the 485 bus and the last slave machine to improve the communication quality. (Must be twisted pair)

10.8. Reasonable arrangement of transmission rate, number of load nodes and transmission distance, so as to achieve the principle of remote low speed and less nodes, and short-range multi-node

10.9. Data communication must be validated to protect the correctness of transmission. Generally, Modbus-RTU uses crc-16 verification mode to verify, and the error rate is less than 1/*1 billion.

Warning!

When ordering the transmitter, the user should pay attention to select the appropriate specifications according to the medium, temperature, protection level and environmental conditions.