

Instructions for use of the contact liquid level sensor

The XKC-Y20 model number

catalogue

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1. Product Overview:

The XKC-Y20 intelligent contact liquid level sensor uses the induction capacitance of water to detect the presence of liquid. In the absence of a liquid proximity sensor, on the sensor due to the presence of the distributed capacitance, so the sensor has a certain static capacitance. As the liquid level slowly rises and approaches the sensor, the parasitic capacitance of the liquid will be coupled to the sensor static capacitance, increasing the capacitance value of the sensor. The changing capacitance signal is then input to the control IC for signal conversion, changing the analog amount of converting the changing capacitance into the circuit signal. The MCU will then calculate and determine the degree of this change. When this change exceeds a certain threshold, the liquid level is considered to reach the induction point. The sensor adopts advanced signal processing technology and high-speed signal processing chip, including glass, plastic, ceramic, tile, brick, ceramic tile, cement, wood board, and metal containers of copper, iron, stainless steel and aluminum alloy. Due to the contact detection, the influence of the container wall thickness is broken through. This series of liquid level sensors has two signal output control modes, namely high and low level output interface and NPN output interface.

2. Product features:

1. XKC-Y20 contact liquid level sensor, glass, plastic, ceramic, tile, brick, ceramic tile, cement, wood board and other non-metal containers and metal containers such as copper, iron, stainless steel and aluminum alloy are evenly detected.
2. Can support high and low level output, NPN signal output (when selected with the manufacturer can explain).
3. The detection liquid level is accurate and stable, and the cold, hot and boiling liquid can be detected.
4. Pure electronic circuit structure, non-mechanical working mode, stable performance, long continuous service life.
5. High stability, high sensitivity, strong anti-interference ability, not by external electromagnetic interference, for power frequency interference and common mode interference has done special treatment, to Compatible with all 5-12V power adapters on the market.

3. Product technical parameters:

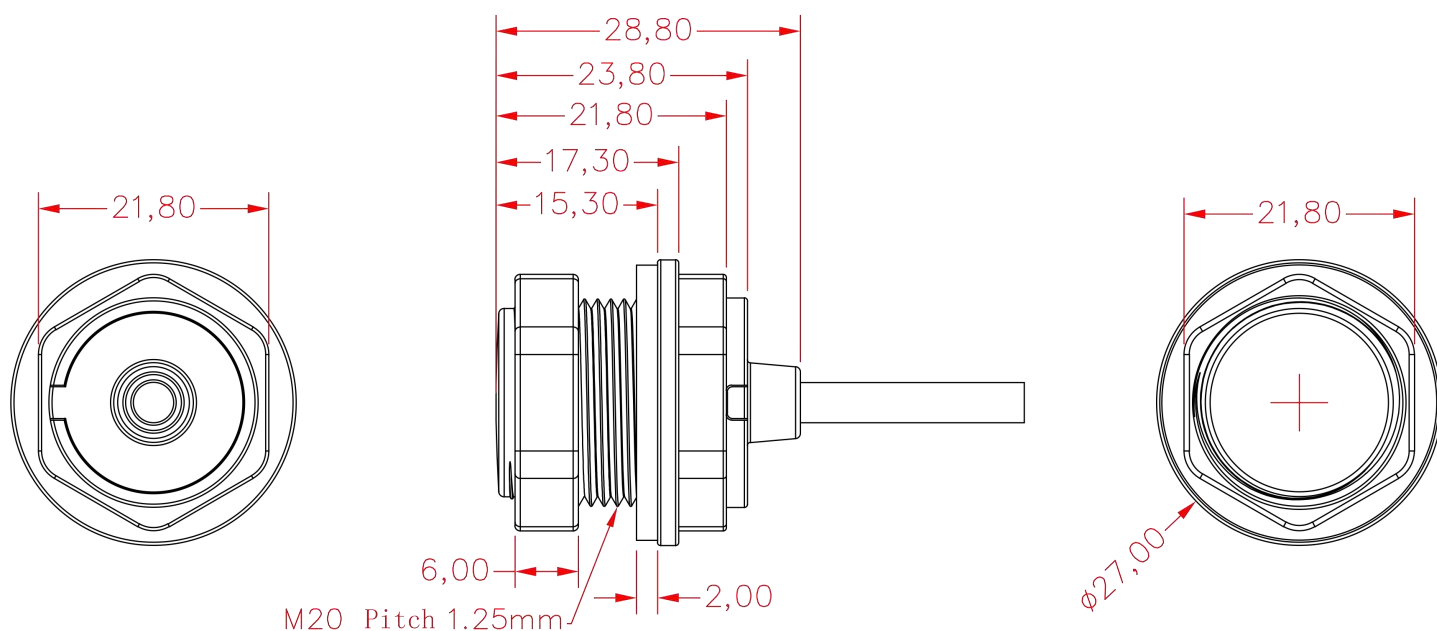
project name	parameter
Input voltage (Vin)	DC5V-12V
Output method	High and low level / NPN
Power ripple requirements	≤ 200 mV
Power consumption	≤ 10 mA
Initialization time	≤ 500 ms
response time	≤ 500 mS

operating ambient temperature	-20~80°C
humidity	5%~100%
Liquid level accuracy	±10mm
wire length	300MM (± 10MM) (batch customizable)
Line end definition	Brown (VCC), yellow (OUT), blue (GND), Black (MARK)
material quality	PC + ABS V1 fireproof material
suffer from stress	≤0.3Mpa
Waterproof performance	IP67
Safety regulations refer to standards	GB/T2423,GB/4208-2017,GB/T17626.1-2006
Environmental protection reference standard	ROHS-2.0

4. Product types choosing:

order number	model	signal interface
1	XKC-Y20-V	High-and low-level output interface
2	XKC-Y20-NPN	NPN

5. Product size



6. Installation method:

1. Drilling 20mm diameter through holes on the vessel wall with tools;
2. After the sensor covers the waterproof ring, insert the first drilled hole from the outside to the inside (the rear waterproof ring is installed on the outside of the container);
3. Tighten the supporting plastic nut (the main body of the sensor does not move, the plastic nut rotates);
4. After ensuring no water leakage, turn the power on.

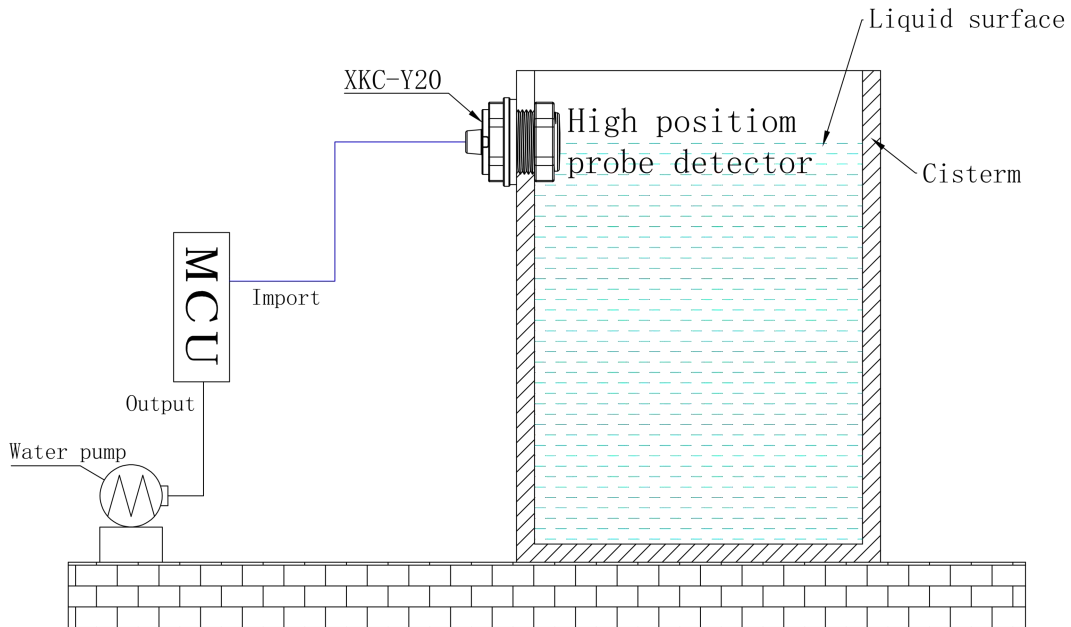


Figure 1 (diagram of one probe installation mode)

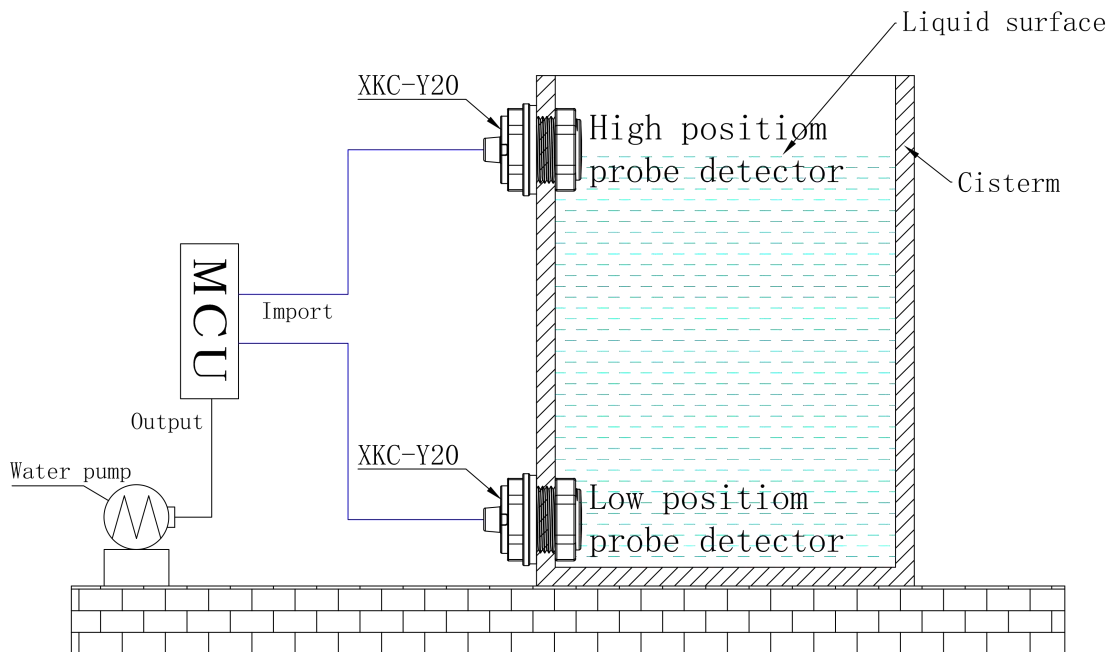
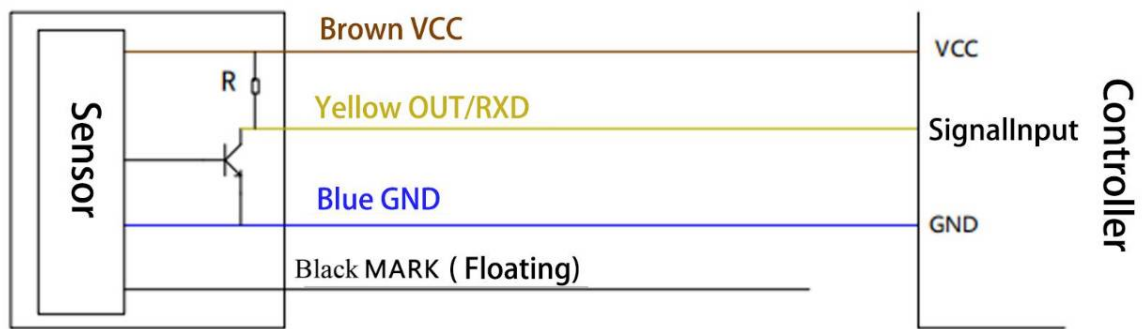
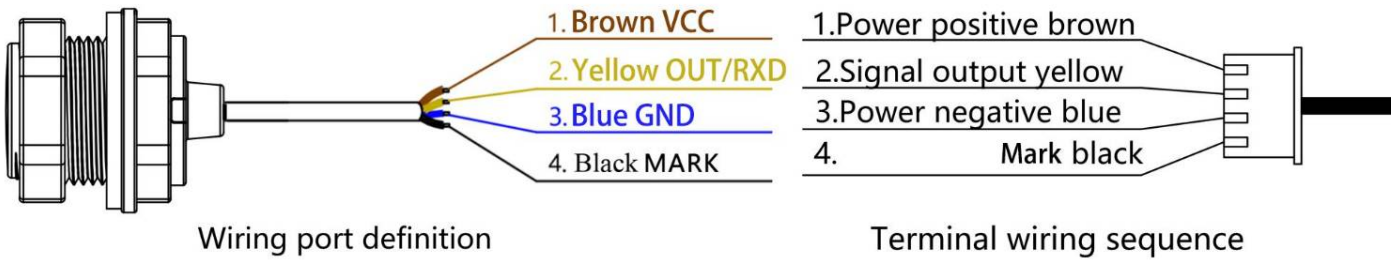


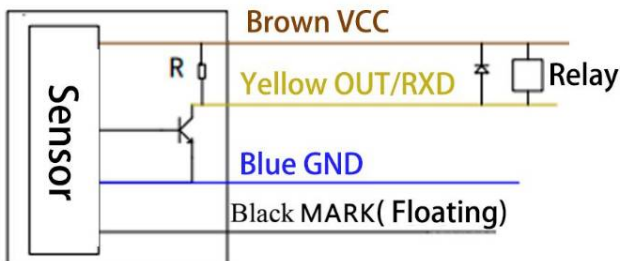
Figure 2 (installation diagram of 2 probes)

7. Output principle and recommended wiring method

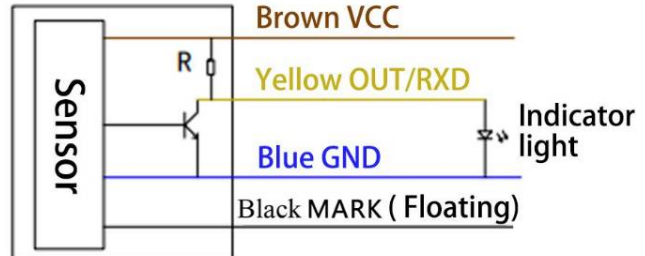
1. XKC-Y20-V Wiring metho



High and low signal output: wiring method to connect to controller or MCU



High and low signal output:
Wiring method of connecting relay

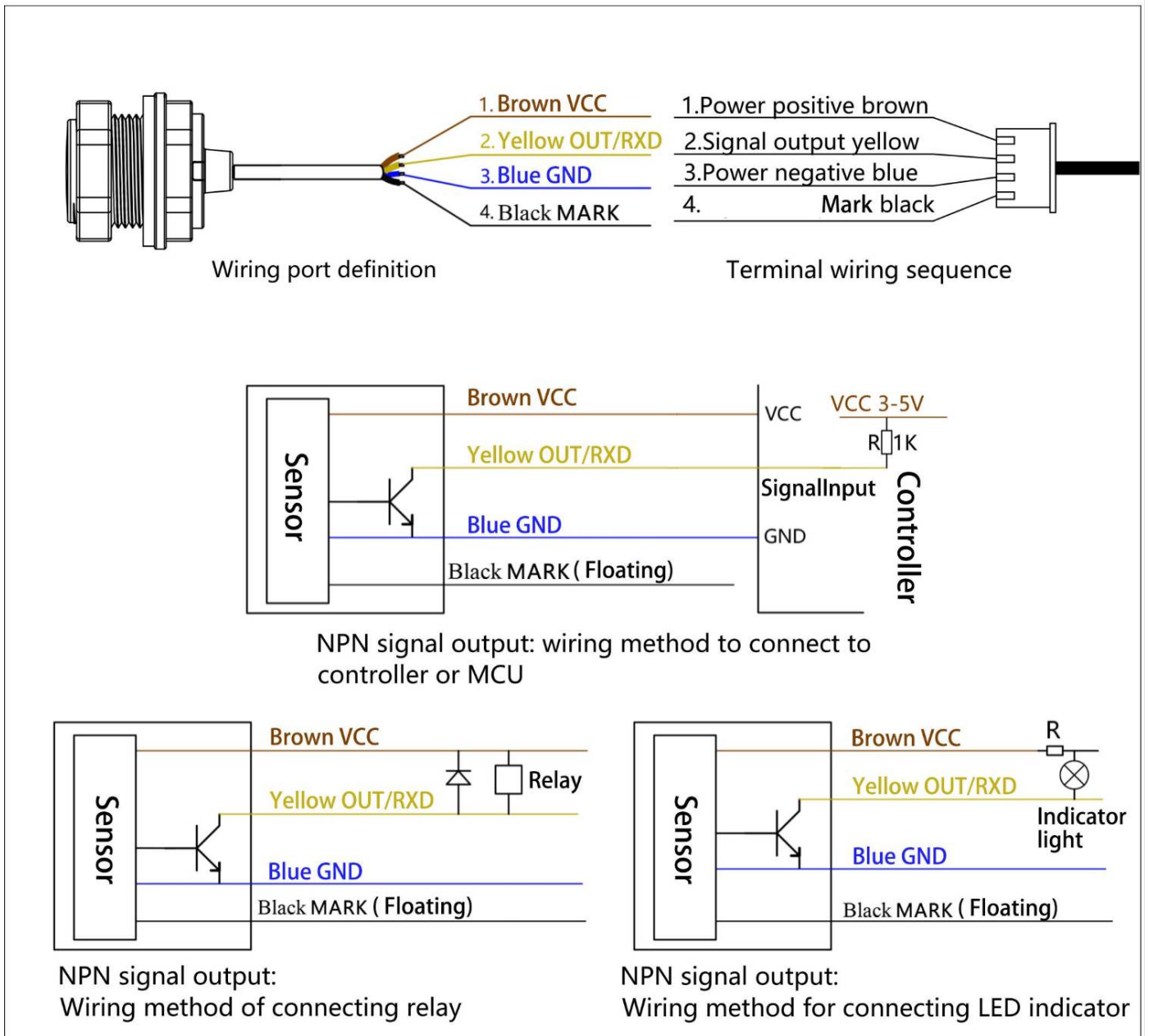


High and low signal output:
Wiring method for connecting LED indicator

High and low level output drive small relay (coil current 100 mA) Operating principle:

When the liquid is induced, the transistor cut off output high level, the relay power does not suction; when the liquid is not induced, the transistor conduction output low level, the relay power suction.

2. XKC-Y20-NPN wiring method



PN output drive small relay (coil current 100 mA) Operating principle:

When the liquid is induced, the transistor is on and closed, and the relay is electrified and closed; when the transistor is closed.

8. Sensitivity Settings

Before leaving the factory, the product sensitivity is determined strictly according to the standard, and the factory calibration is suitable for tap water. In the actual use process, due to the different conductivity and viscosity of the measured liquid, the sensor sensitivity can be set according to the actual use of the site to achieve a better experience effect. The method of setting the sensitivity is as follows:

8.1 Full fluid calibration

1. Fixed the position according to the installation method of FIG. 1, and then immerse the detection liquid in the sensor part.

2. Referring to FIG. 3, connect the MARK line to the GND line to keep 1~2S release, the sensor output signal line output frequency 100 HZ signal, the calibration is completed, the sensor is normal induction output state after calibration (the sensor switch point will be set below the actual detection value).

2. Referring to FIG. 3, connect the MARK line to the GND line to keep 1~2S release, the sensor output signal line output frequency 100 HZ signal, the calibration is completed, the sensor is normal induction output state after calibration (the sensor switch point will be set below the actual detection value).

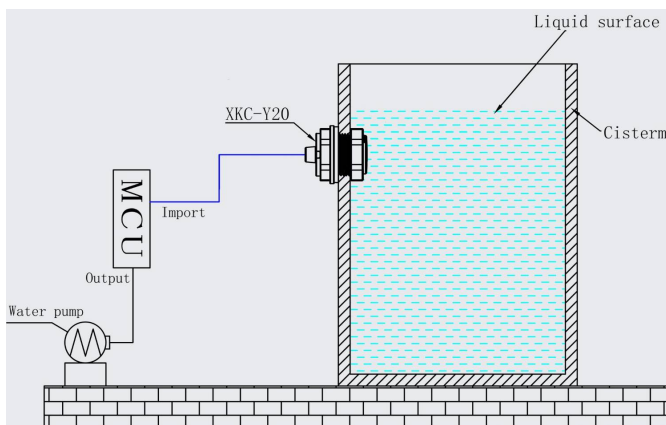
8.2 Empty liquid calibration

1. Fixed the installation position according to Figure 2, and then keep the sensor position without liquid cover.

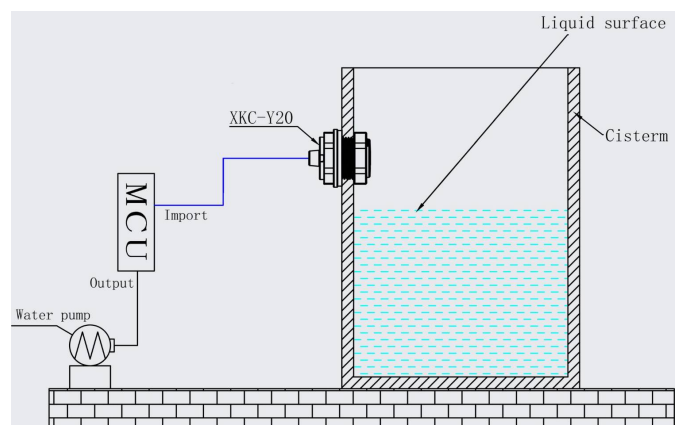
2. Referring to Figure 3, connect the MARK line to the GND line for 5~8S. The output signal line of the sensor is 100 HZ. After the signal output, the calibration is completed, and the sensor is in normal non-induction output state after calibration.

8.3 Notes:

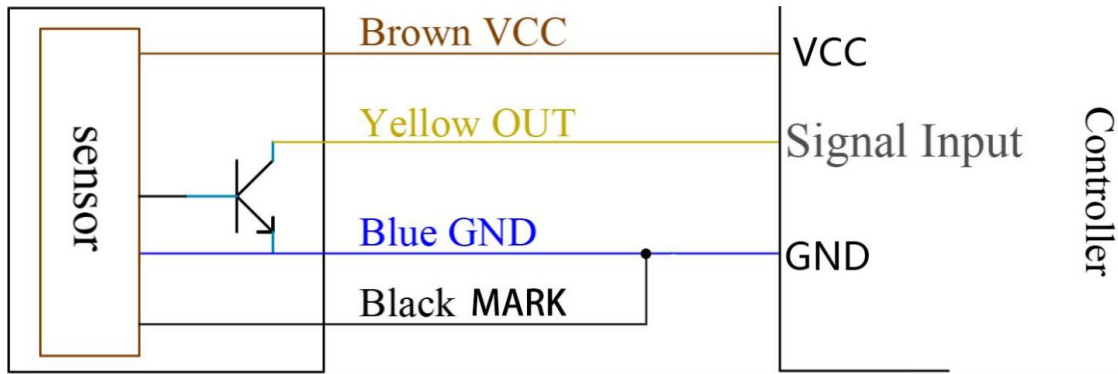
In most applications, full fluid calibration meets most of the detection requirements, especially in the key applications with large medium type and temperature change; the advantage of empty fluid calibration is a large amount of residual film, moisture and foam accumulation on the container, which can be calibrated in the case of accumulation.



graph 1



graph 2



Schematic diagram of the calibration wiring
graph 3

9. Other matters needing attention

1. The viscosity of the measured liquid medium

Normal measurement with dynamic viscosity <10 mPaS. It may affect detection when 10 mPaS $<$ dynamic viscosity <30 mPaS. The dynamic viscosity >30 mPaS is attached to the wall of the vessel and cannot be measured.

2. Note: As the temperature increases, the viscosity decreases, most of the liquid with high viscosity is more obviously affected by the temperature, so pay attention to the influence of the liquid temperature when measuring the viscosity liquid.

3. Pay attention to keep the surface of the sensor clean, and try to clean the surface dirt regularly (it is recommended once a month), to prevent strong corrosive liquid contact and avoid violent collision by other objects.

4. During outdoor installation, direct sunlight should be avoided directly to the main body of the sensor and far away from the high heat source. If the ambient temperature exceeds the rated temperature, corresponding cooling protection measures should be taken.

5. When the ambient temperature is too lower than the normal operating temperature range of the sensor, the instrument protection box or other protective devices can be used for anti-freezing protection.

10. Product warranty terms and description

(1) Warranty service

1. Warranty maintenance: from the date of purchase, the product host is free of charge. The Company has the right to decide to repair or replace the faulty parts. If the replacement parts are replaced, the replacement parts may be new equipment or repair goods with the same category, function and quality. The replaced faulty parts shall be owned by the Company; the resale and maintenance of the products shall not affect the warranty period, and the products repaired or replaced shall continue to enjoy the original remaining warranty period; if less than three months after the end of the warranty period, the repaired or replaced products shall be repaired by customers.

2. Loss upon arrival (DOA) replacement: from the date of purchase, you can enjoy within 7 days of free replacement service of the equipment. Products with the following problems are defined as DOA equipment after the first unpacking; part or all of the components after the first opening (surface scratches or other defects that do not

affect the function of the equipment are not included); other hardware faults identified by remote or local inspection by the engineers of the Company.

(2) Limitations of application of warranty

The Company does not assume any warranty liability for:

1. The product exceeds the warranty period; the product surface is easily broken and damaged; the product appearance is seriously damaged, installation / use under abnormal environment, unauthorized disassembly, repair / modification, external power supply injury and other abnormal damage;
2. Damage caused by the wrong installation and use of the product if the user fails to follow the requirements of the manual;
3. Damage caused by natural disasters and man-made negligence (fire, lightning strike, water flooding, impact, etc.).

(3) The accessories and consumables are not covered by the warranty.

(4) Non-free warranty service

Within two years of the purchase of the product, for the products (including parts) not under warranty, you can choose the paid maintenance service (free of labor cost), and we will charge the transportation cost of the parts and accessories of the repair product according to the actual situation.

(5) Access to warranty services

Recommend you to contact the dealer to buy this product for warranty service, warranty please show valid warranty card (dealer stamp effect) or purchase invoice / receipt: if not show, the product free warranty period to product 12 months from the date of delivery, the latest DOA application period, to 7 days from the date of delivery.

(6) Statement

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5. Not all models are available in all countries

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accidents caused by it.

(7) Environmental protection

The product meets the design requirements for environmental protection, and the storage, use and disposal of the product shall be conducted in accordance with the relevant national laws and regulations.

11. Manual version

version number	date of issue
V10	2025-03-18