Instructions for use of the non-contact pipe liquid level sensor

XKC-Y29D-PUB

catalogue

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1. Summary

Intelligent non-contact pipeline liquid level sensor = using advanced signal processing technology and high-speed signal processing chip, specifically for infusion tubes, industrial tues and other liquid level detection needs. Intelligent non-contact pipeline liquid level sensor can output high and low level signal at the same time, which can meet the needs of various occasions.

Intelligent non-contact pipe liquid level sensor uses the induction capacitor 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 approaches the sensor, The parasitic capacitance of the liquid will be coupled to this static capacitor, Increase the capacitance value of the sensor, The changing capacitance signal is then input to the control IC for signal conversion, Convert the changing capacitance into some variation of the electrical signal, By a certain algorithm to detect and determine the extent of this change, When this change exceeds a certain threshold, the liquid level is considered to reach the induction point.

2. Applied range

Specialized for a variety of pipeline size level detection application industries, such as: medical equipment, medical infusion, biological drug liquid detection, scientific research and teaching equipment, intelligent coffee machine, intelligent water dispenser, intelligent electrical appliances, industrial tubing level detection, home decoration intelligent water supply, etc.

3. Technical parameter

project name	parameter	
Product specifications and models	XKC-Y29D-V	XKC-Y29D-NPN
Output method	High and low level	Switch quantity (low effective)
DC input voltage	DC12V-24V	
Power ripple requirements	≤10%V	
Power consumption	≤10mA	
Power delay	≤500mS	
response time	≤100mS	
operating ambient temperature	-25~85℃ (material withstand temperature)	
humidity	0%~90% (no condensation)	
Catheter specification (nominal outer diameter)	D3,D4,D6,D8,D10,D12,D13,D15,D16,D18,D20,D25	
The temperature drift	≤20% (-25℃~+60℃)	
Test for the electrical conductivity of the liquid	≤25000uS/cm	
repeatability precision	＜3mm	
wire length	500MM (± 10MM) (batch customizable)	

Line end definition	Brown VCC, yellow OUT signal output, blue GND, and black MARK sensitivity calibration line
material quality	fire prevention PC+ABS
Waterproof performance	IP67
Safety standards certification	CE
Environmental certification	ROHS-2.0

4. Product types choosing

order number	product model	output signal	Can clip pipe outer diameter
1	XKC-Y29D-D3-V	Output the high and low level signal	The outer diameter of the water pipe is 3mm and the inner diameter is 2mm
2	XKC-Y29D-D3-NPN	Output of the NPN signal	
3	XKC-Y29D-D4-V	Output the high and low level signal	With an outer diameter of 4mm and an inner diameter of 2mm
4	XKC-Y29D-D4-NPN	Output of the NPN signal	
5	XKC-Y29D-D6-V	Output the high and low level signal	The outer diameter is 6mm and the inner diameter is 2mm
6	XKC-Y29D-D6-NPN	Output of the NPN signal	
7	XKC-Y29D-D8-V	Output the high and low level signal	The outer diameter of the water pipe is 8mm and the inner diameter is 4mm
8	XKC-Y29D-D8-NPN	Output of the NPN signal	
9	XKC-Y29D-D10-V	Output the high and low level signal	The outer diameter of the water pipe is 10mm and the inner diameter is 6mm
10	XKC-Y29D-D10-NPN	Output of the NPN signal	
11	XKC-Y29D-D12-V	Output the high and low level signal	The outer diameter of the water pipe is 12mm and the inner diameter is 6mm
12	XKC-Y29D-D12-NPN	Output of the NPN signal	
12	XKC-Y29D-D13-V	Output the high and low level signal	The outer diameter of the water pipe is 13mm and the inner diameter is 7mm
14	XKC-Y29D-D13-NPN	Output of the NPN signal	
15	XKC-Y29D-D15-V	Output the high and low level signal	The outer diameter of the water pipe is 15mm and the inner diameter is 9mm
16	XKC-Y29D-D15-NPN	Output of the NPN signal	
17	XKC-Y29D-D16-V	Output the high and low level signal	Outer diameter of 16mm and inner diameter of 10mm
18	XKC-Y29D-D16-NPN	Output of the NPN signal	
19	XKC-Y29D-D18-V	Output the high and low level signal	Outer diameter of 18mm and inner diameter of 12mm
20	XKC-Y29D-D18-NPN	Output of the NPN signal	
21	XKC-Y29D-D20-V	Output the high and low level signal	The outer diameter of the water pipe is 20mm and the inner diameter is 16mm
22	XKC-Y29D-D20-NPN	Output of the NPN signal	
23	XKC-Y29D-D25-V	Output the high and low level signal	The outer diameter is 25mm and the inner diameter is 19mm
24	XKC-Y29D-D25-NPN	Output of the NPN signal	

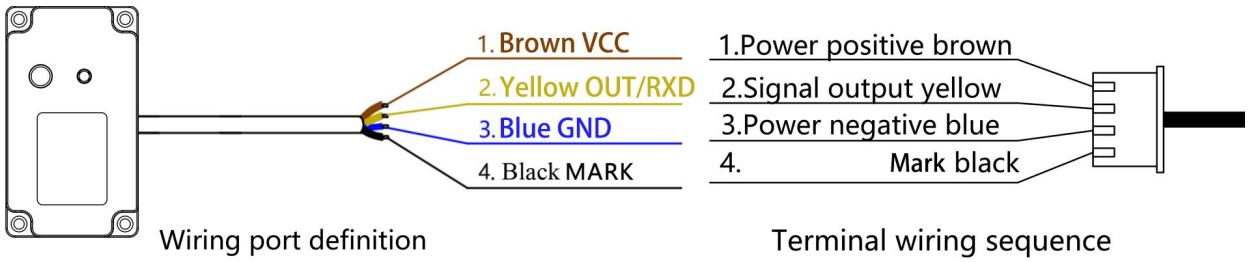
matters need attention:

1. The sensor can only be used on non-metal pipes; plastic pipes (PP, PVC, ABS, PTFE, DPE), glass pipes, silicone rubber pipes can be applicable; however, some customized pipes can be mixed with special materials to affect the detection of the sensor. If the pipe is not applicable, the calibrated indicator light of the sensor cannot be illuminated normally.

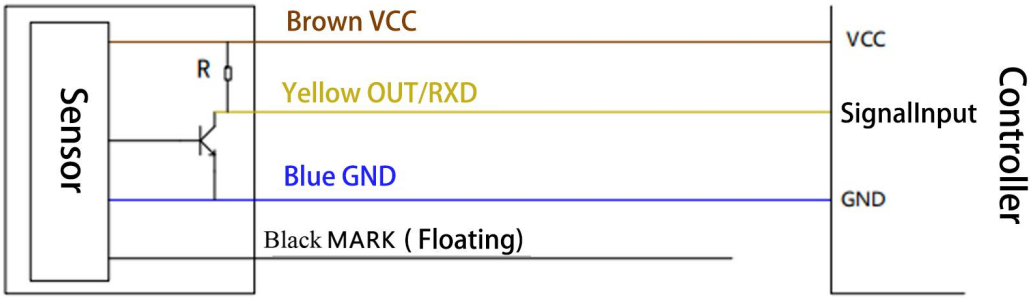
2. In terms of pipe size, due to the different production standards of different manufacturers, the pipe under the same standard will have the outer diameter and the inner diameter. In some cases, the sensor cannot be tightened with the pipe, so it is necessary to paste the gasket on the pipe clip of the pipe and the sensor to fill the gap.

5. Output principle and the recommended wiring method

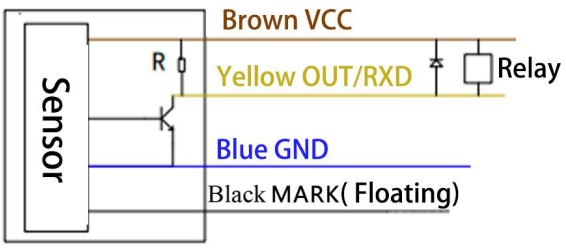
5.1 Output principle and recommended wiring method of XKC-Y29D-V

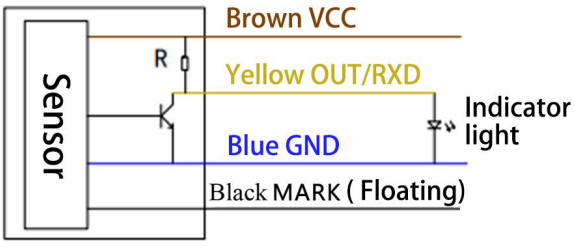


Wiring port definition　　Terminal wiring sequence



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



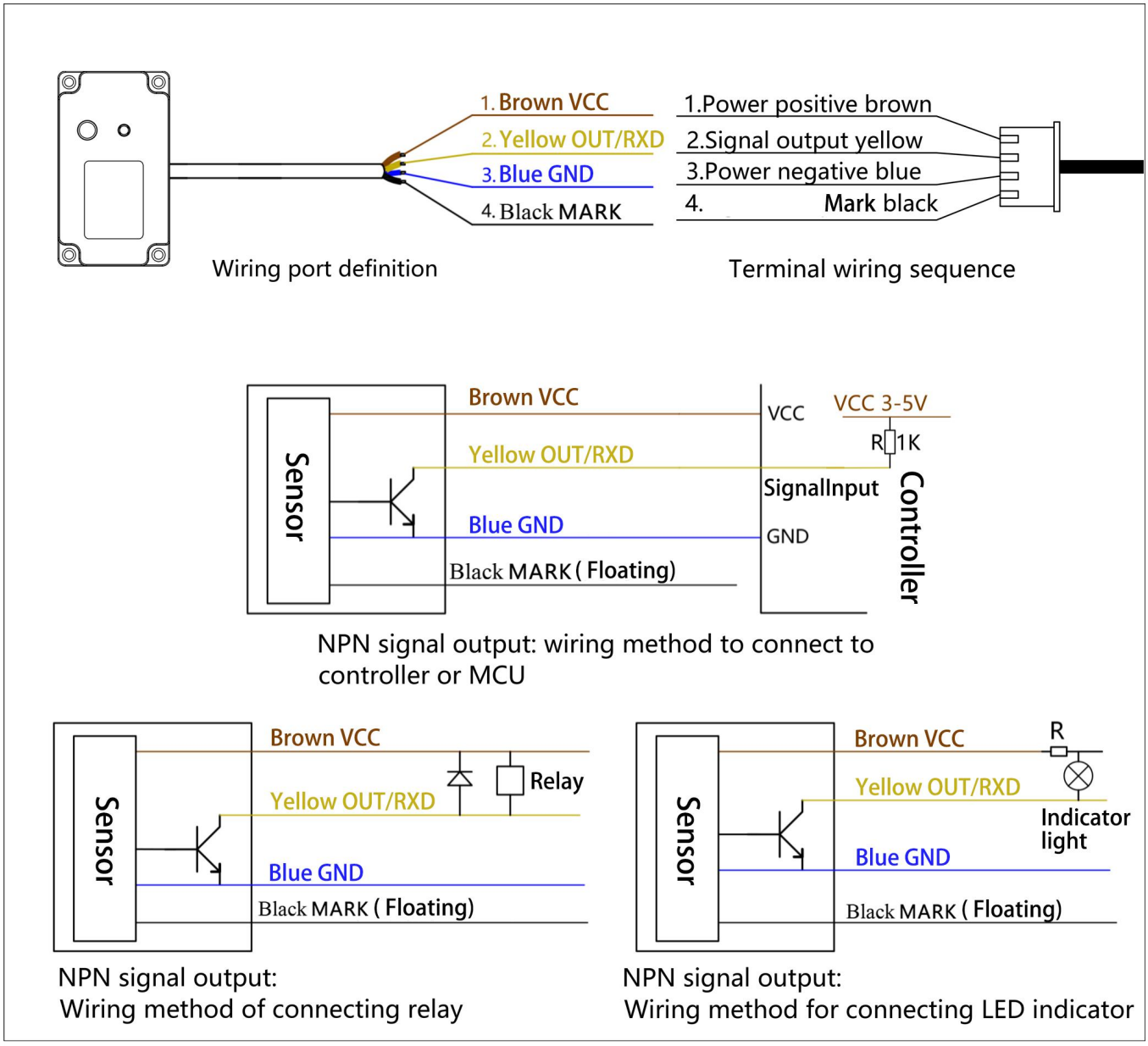


High and low level output drive small relay (coil current 100 mA) Operating principle:

When the liquid is induced, the transistor cut off output high level, the relay power off does not absorb;

When the liquid is not induced, the transistor output a low level, and the relay is electrified and engaged.

5.2 Output principle and recommended wiring method of XKC-Y29D-NPN



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

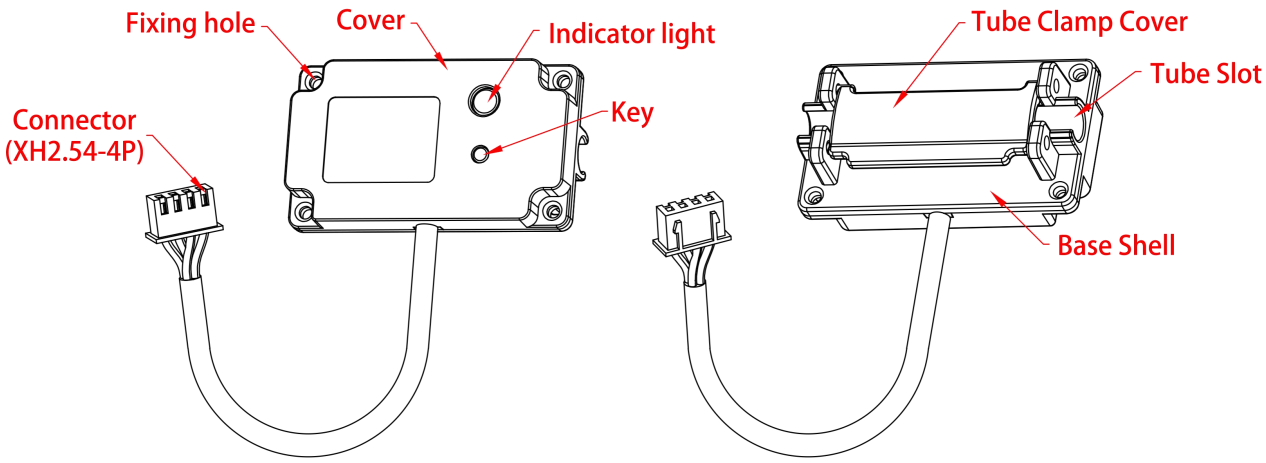
When the liquid is induced, the transistor is closed, and the relay is electrified and absorbed;

When the transistor is disconnected when the liquid is not detected, the relay is not closed.

matters need attention:

When wiring, it cannot be charged, the sensor black MARK sensitivity calibration line can only be suspended or connected to the key switch, can not be directly connected to the positive or negative electrode of the power supply; the detailed use of the black line.

6. Structure declaration

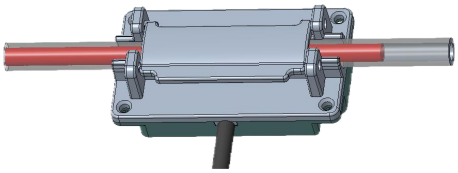


7. Methods of use

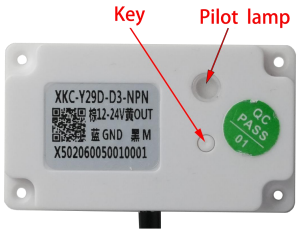
Place the loading liquid tube into the clamp slot when the sensor is working normally. The indicator light is on and the output high level indicates the current position of the liquid passing through the tube. The indicator light is off and the output low level indicates the current position of no liquid passing through the tube.

8. The sensitivity setting steps

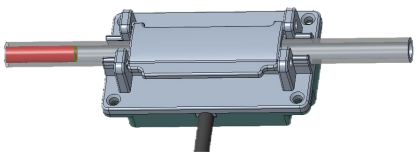
Before leaving the factory, the sensitivity is strictly determined according to the standard; However, the sensor sensitivity through operation calibration process is required to achieve better experience effect. The calibration mode is divided into full fluid calibration and empty fluid calibration; the calibration operation can be performed by pressing the keys or controlling the MARK line.



graph 1



graph 2



graph 3

Full liquid calibration

1. Referring to Figure 1, the catheter fluid level (red indicates liquid) is more than 5mm outside the sensor housing.

2. Referring to Figure 2, press the button or connect the MARK line to the release of GND line to keep 1S, the indicator light of the sensor flashes quickly (frequency 100 HZ), the flashing end means the calibration is completed and the indicator light is on (the sensor switch point will be set below the actual detection value).

Empty liquid calibration

1. Referring to Figure 3, the catheter fluid level (red indicates liquid) is over 3mm away from the sensor housing

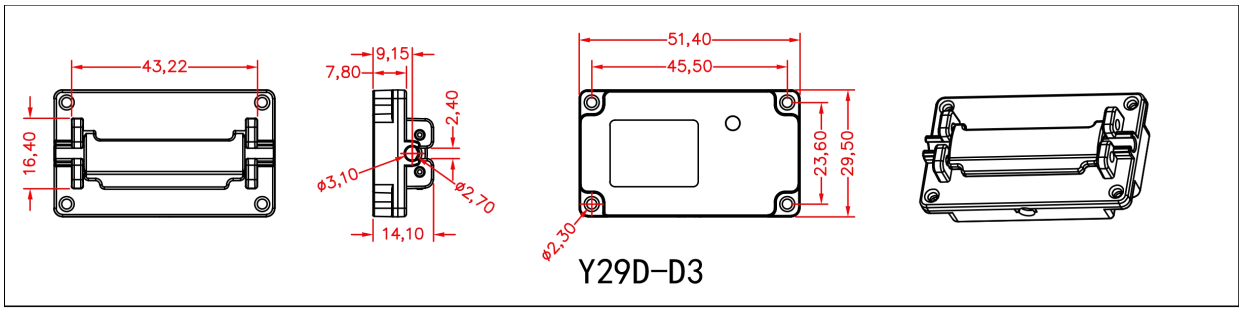
2. Referring to Figure 2, press the key or connect the MARK line to the GND line for 5~6S, loosen the sensor indicator light slowly flash (frequency 50 HZ), the flashing end means the calibration is completed, the indicator light is

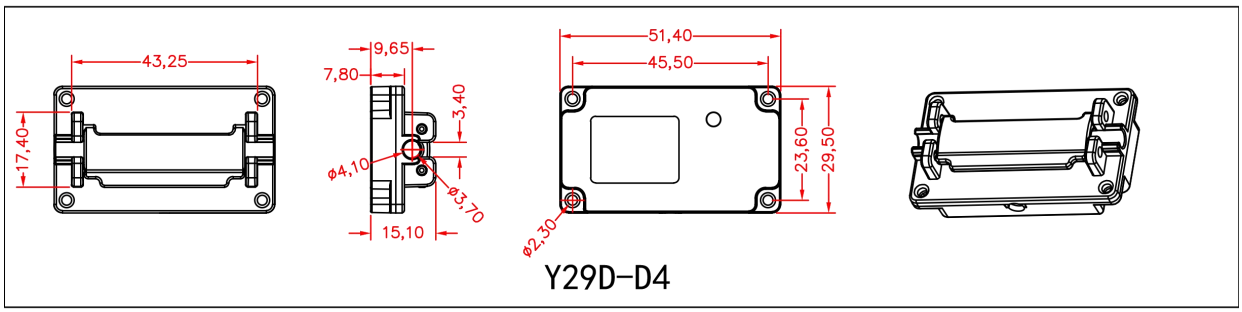
off (the sensor switch point will be set above the actual detection value).

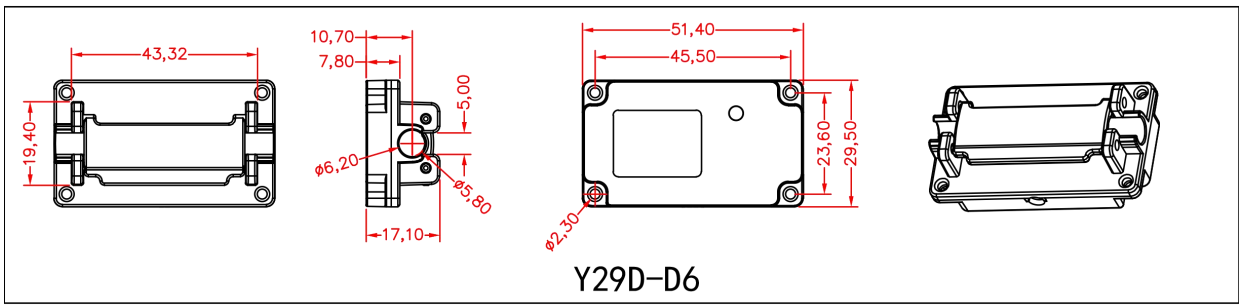
matters need attention:

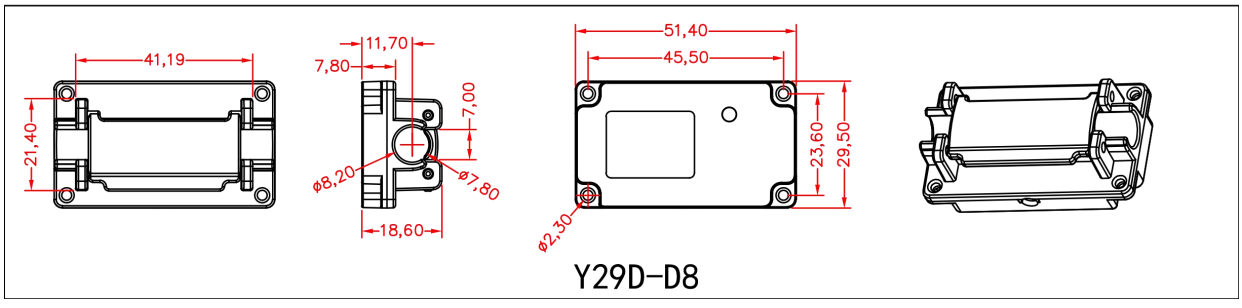
In most applications, full fluid calibration meets most of the detection requirements, especially in the key applications with large medium type and temperature change; the advantage of empty fluid calibration is a large amount of residual film, moisture and foam accumulation on the container, which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

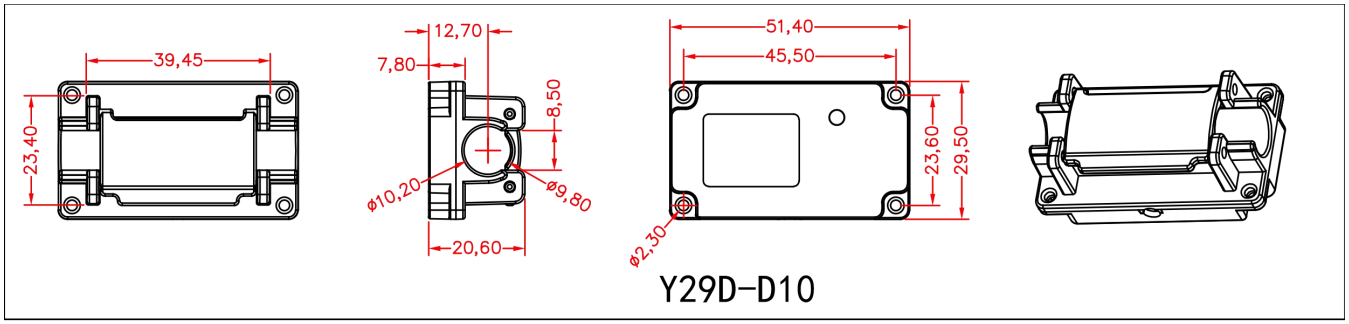
9. Appearance and dimensions of each model



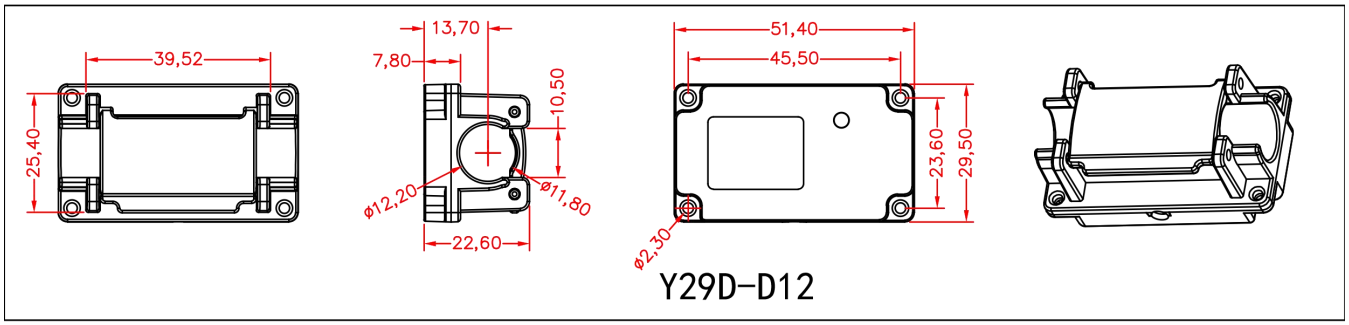




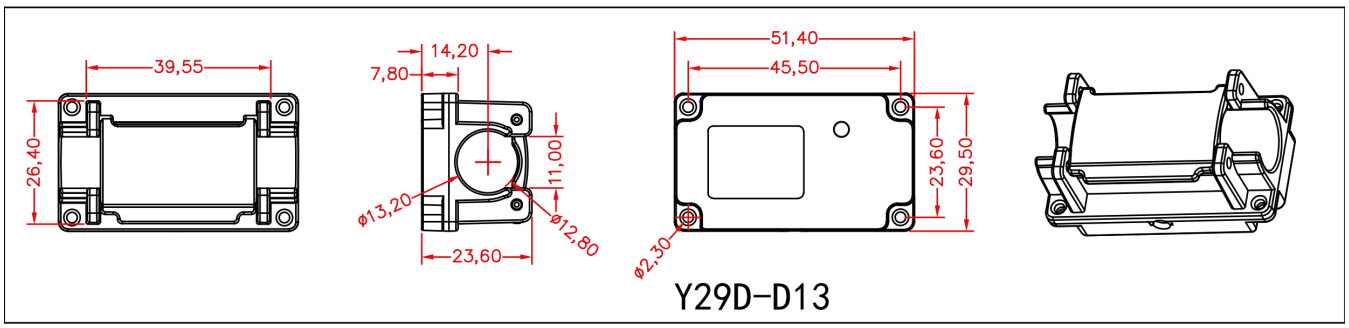




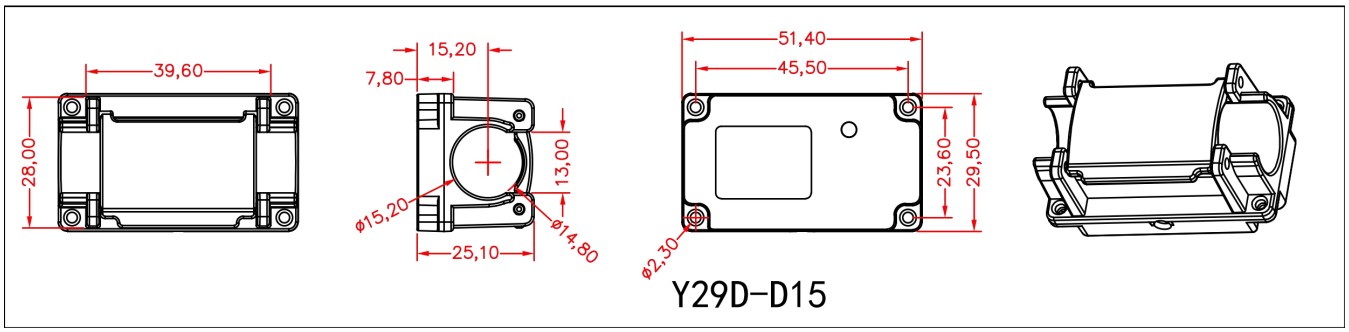
Y29D-D10



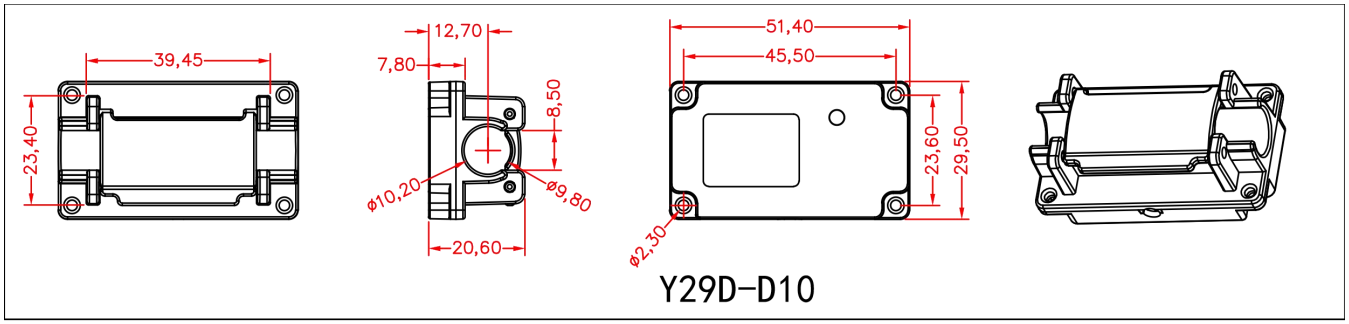
Y29D-D12

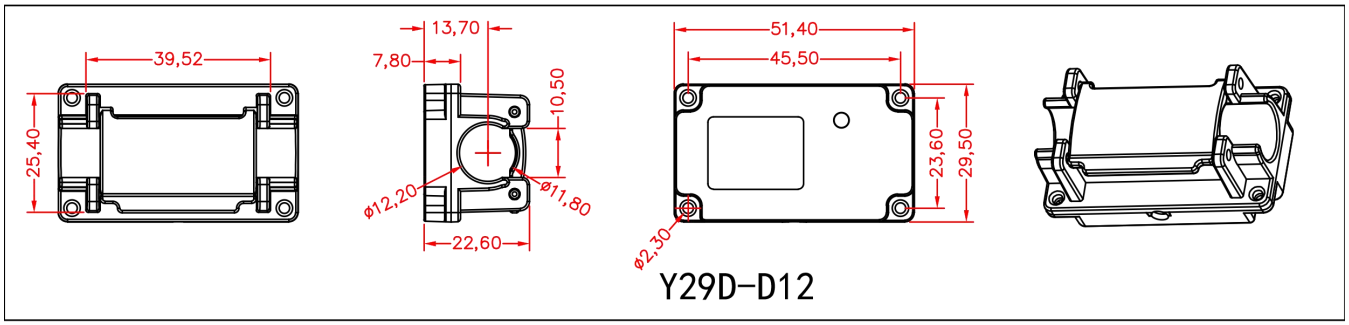


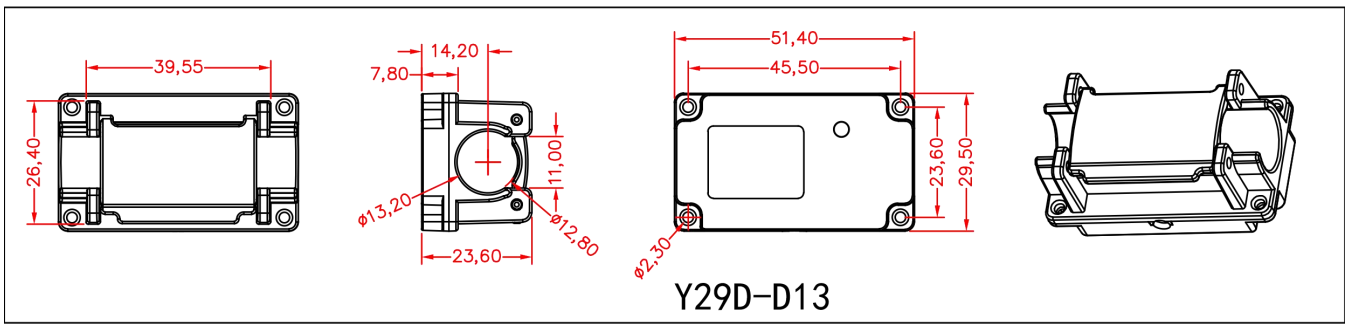
Y29D-D13

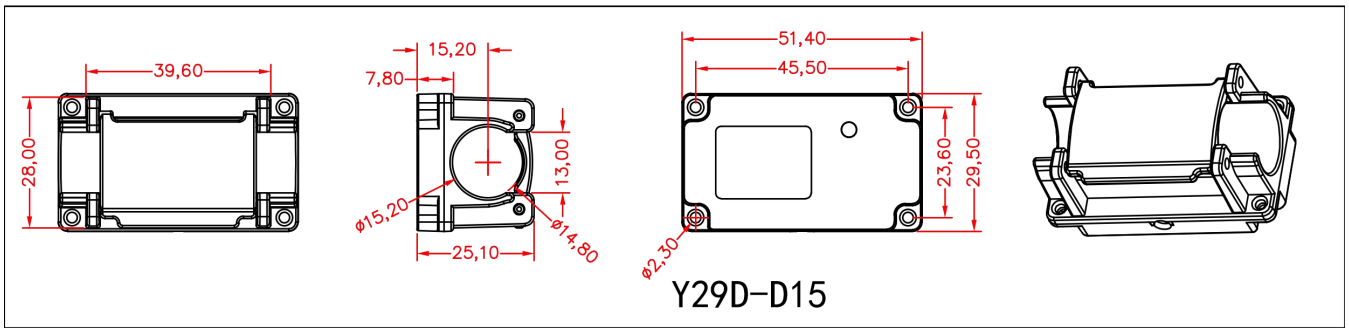


Y29D-D15









10. Other product precautions:

1. The viscosity of the measured liquid medium will affect the detection. A dynamic viscosity> 20 mPaS poses a risk of significant fluid attached to the catheter wall.(Note: As the viscosity decreases, most of the liquid with high viscosity is more obviously affected by temperature, so pay attention to the influence of liquid temperature when measuring the viscosity liquid.)

2. When the catheter is installed in the clamp slot, a certain thickness of foam can be affixed on the cap cover, so that the catheter can be stably fixed in the clamp slot.

3. Pay attention to keep the liquid level meter clean, try to prevent corrosion and avoid violent collision by other objects.

4. During outdoor installation, avoid the main body of the direct sunlight level meter, stay away from the heat source and pay attention to ventilation. If the ambient temperature exceeds the rated temperature, corresponding cooling protection measures should be taken.

5. When the ambient temperature is too low, the instrument protection box or other protective devices can be used for antifreeze protection, and pay attention to keep the liquid level gauge dry.

6. The sensors shall be maintained and checked regularly.(The detection time interval shall be determined by the user unit according to the specific situation).

11. Troubleshooting

Fault condition	analysis of causes	countermeasure
There is no reaction after the liquid level sensor is energized (the water level reaches the induction point indicator light is not on, and the sensitivity adjustment is not responsive)	① power supply is not connected	Check and connect to the power supply
	② Positive and negative terminals of the power line	Correct wiring
	③ The power supply module is damaged	Replace the circuit board of the power module
	④ sensitivity is too low	Adjust the sensitivity to the appropriate gear
The indicator lights are always on	① The sensitivity gear is too high	Adjust the sensitivity to the appropriate gear
	② The initialization parameter is abnormally modified	Return to the factory for reinitialize
	③ The sensor has debris or other metal parts close to it	Clean up the debris and keep a certain distance from the metal parts

12. 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 replaced, the replacement parts may be new equipment or repair products with the same categories, functions and quality, the replaced faulty parts shall belong to the Company; the warranty period and the remaining warranty period is less than three months after the repair, the repaired or replacement parts shall be guaranteed for three months from the delivery of the product.

2. Loss upon arrival (DOA) replacement: from the date of purchase, you can enjoy within 7 days of free replacement service of equipment. Products with the following problems are defined as DOA equipment: product packing and packing list are inconsistent after the first unpacking; some or all components of the product cannot be used normally after the first unpacking (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 the application of the 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 to 12 months from the date of delivery, the latest DOA application period, to 7 days from the date of delivery.

(6) Statement

1. The copyright of this manual belongs to Shenzhen XingKechuang Technology Co., LTD. (XingKechuang) and its licensors, and Shenzhen XingKechuang Technology Co., LTD. (XingKechuang) reserves all rights.

2. Without the written permission of the Company, no unit or individual shall copy or copy part or all of the contents of this manual, and shall not disseminate them in any form.

3. Customers agree that the design and production purposes of the Company's products do not involve their use in the products related to life security or in other systems or products used in other dangerous activities or in the environment. Personal injury, property or environmental damage due to product failure (collectively referred to as high-risk activities). The Company shall not provide warranty for the use of our products in high-risk activities and shall not be liable to customers or a third party.

4. The contents of this manual may be changed due to the product version upgrade or other reasons. XingKechuang reserves the right to modify the contents of this manual without any notice or prompt. This manual is only used as a guide for use, and StarKechuang tries its best to provide accurate information in this manual. However, XingKechuang does not ensure that the contents of the manual are completely free of errors, and all statements, information and suggestions in this manual do not constitute any express or implied guarantee.

5. Not all models are available in all countries

Please keep this instruction properly. Before using the product, please read the manual carefully. When using the product, please be sure to follow the manual. The company will not be responsible for any injuries and 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.

13. Instructions Manual version

version number	date of issue
V10	2025-03-18