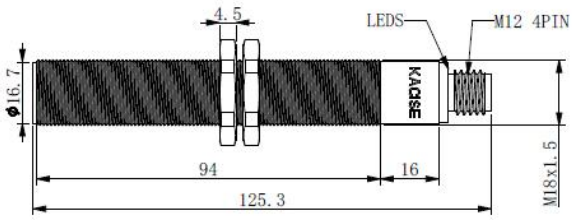
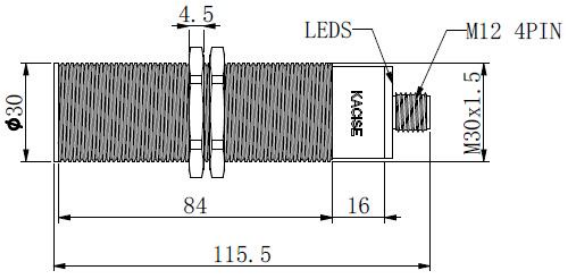
KUS3000 Ultrasonic Level Meter

1. Dimensional structure

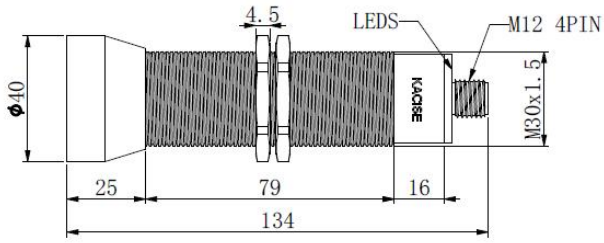
The unit is mm.



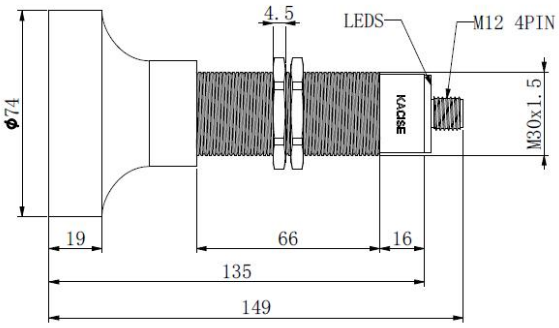
M18 series size structure



M30 type 1 size structure



M30 type 2 size structure



M30 type 3 size structure

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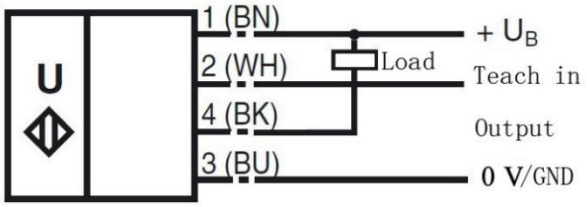
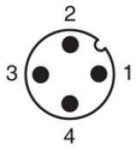
2. Electrical interface

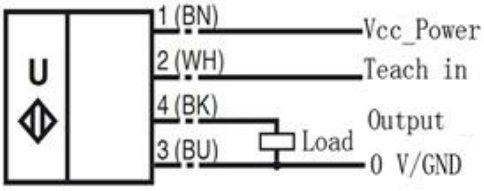
Swtich Output NPN wiring diragram
NPN output





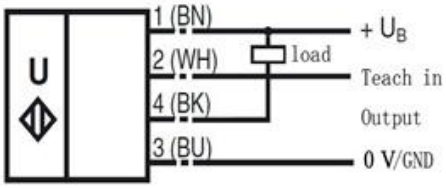
Analog output wiring diagram
0-10V

4-20mA output wiring diagram
4-20mA output type A

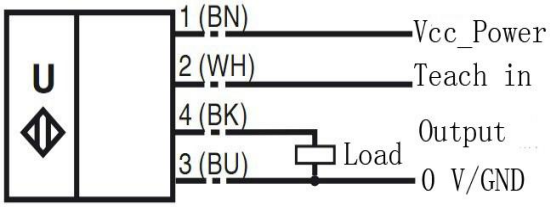


RS485 wiring diagram
RS485 output

4-20mA output wiring diagram
4-20mA output type B



PNP switch out put Wiring diagram:
PNP Type



Note: This product has two cable specifications, and the cable wiring instructions of the two specifications are as follows:

Type A cable		Type B cable	
Pin1	Brown	Pin1	Yellow
Pin2	White	Pin2	Black
Pin3	Blue	Pin3	Red
Pin4	Black	Pin4	Green

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The default cable mix is based on the specifications received by the customer

3. Technical parameter

M18	
range	150... 1000 mm
Adjustable interval range	150….1000mm
blind spot	0 ... 150 mm
Response time	approx. 10 ms

M30-type 1	
range	200... 2000 mm
Adjustable interval range	200….2000mm
blind spot	0 ... 200 mm
Response time	approx. 10 ms

M30-type 2	
range	300... 3500 mm
Adjustable interval range	300….3500mm
blind spot	0 ... 300 mm
Response time	approx. 20 ms

M30-type 3	
range	400... 6500 mm Or 600-12000mm
Adjustable interval range	400….6500mm Or 600-12000mm
blind spot	0 ... 400 mm Or 0 ... 600 mm
Response time	approx. 40 ms

Indicator light

Blue led light	The blue light flashes to indicate that calibration can be performed. Blue and other constants indicate that the power supply of the sensor is normal. The blue light will flash within 5 minutes after the power is turned on, indicating that the user can perform output adjustment and calibration. After 5 minutes, the blue light is always on to indicate that the sensor cannot be receiving Calibration command. .
Tellow led light	It is used to indicate whether the measured object is detected. During the calibration stage, the yellow light flashes to indicate that the current calibration state is locked, and it can be switched to the next calibration state.
Red LED light	In normal working state, the red light is not on, and the red light is on to indicate that there is a fault. During the calibration process, the flashing red light indicates that the sensor locks the current echo loss or infinity state, and the user can switch to the next calibration state.

Electrical parameters

Supply voltage	13 ... 30 V DC , Special wide voltage requirements can be customized
No-load current I_0	≤ 45 mA

IOT-spectric models

Supply voltage	3.3-12 DC , ripple 10 %SS
Power consumption I_0	≤ 15 mA, sleep mode≤1mA, Serial wake up,

Output

output type	1 Switch output PNP output normally open and long closed can be calibrated 2 Switch output NPN output normally open and long closed programmable 3 Analog voltage output 0-10V programmable. 4 Analog 4-20mA output programmable 5 RS485 output E4 programmable.
Overcurrent I_e	200 mA , Reverse polarity protection, short circuit protection
Default setting	M18 Switch point A1: 150mm Switch point A2: 1000mm M30 Type 1 switch point A1 200mm switch point A2: 2000mm M30 type 2 switch point A1 300mm switch point A2: 4000mm M30 type 3 switch point A1 500mm switch point A2: 6000mm
Output voltage drop	≤ 2.5 V
Repeatability	≤1 %
On-off level f	≤ 13 Hz High frequency can be customized
Default hysteresis characteristic amplitude	5% of the set value, special requirements can be customized
Temperature Compensation Range	-40℃-85℃

Temperature Requirements

Working temperature	-25…70℃(248...343K)
storage temperature	-40…85℃(233...358K)

Mechanical part description

connection	V1 connector(M12×1),4-Pin
Protection class	IP65 Other can be customized
shell material	Nickel-plated copper, others can be customized

Note: When the M18 product and M30 product have 4-20mA analog output, the meter connection method is different from that of the 550,600 product. Since the output terminal of the M18 and M30 products is powered by VDD, as shown in Figure 1, the meter should be connected to the power supply port. Between the output terminal and the output terminal, the connection instruction diagram is shown in Figure 2:

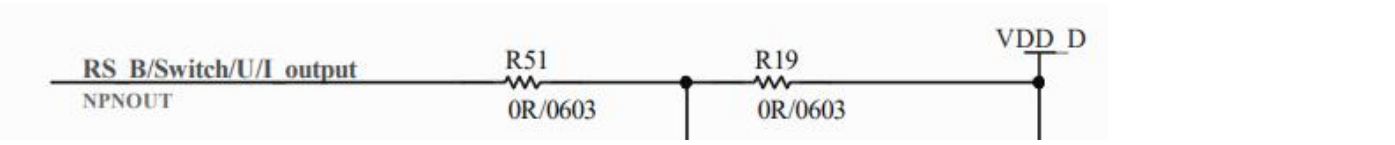


Figure 1 Output power supply circuit diagram

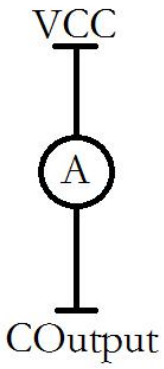


Figure 2 Schematic diagram of connection method

4. Sensor function description

Switch point and advance interval setting and adjustment of switch output and analog output products

Switch value and analog output can be set using the adjustment terminal, specifically, there are 8 working modes that can be set.

The specific setting method of each type of bean flour is the following steps.

In the first step, the user selects a distance set by himself, or puts the sensor into a lost wave state.

The second part, connect the calibration terminal to the power supply or GND, keep it connected until the yellow light flashes (if the wave is lost, the red light flashes).

In the third step, the user selects the second distance set by himself, or lets the sensor enter the lost wave state.

The fourth step, connect the calibration terminal to GND or power supply (the state is different from the second step), keep it connected until the yellow light flashes (if the wave is lost, the red light flashes).

There are 8 working modes of switch output

1. Window normally open mode (analog output products are in positive linear working mode or distance measurement mode).
2. Window normally closed mode (analog output product is in negative linear working mode or liquid level measurement mode).
3. Single point normally open mode.
4. Single point normally closed mode.
5. Single-point normally open mode with large hysteresis interval.
6. Single point normally closed with large hysteresis interval mode.
7. Whether to detect the normally open mode.
8. Whether to detect normally closed mode.

Description of RS485 output model products.

There are 3 working modes,

1: Automatic measurement mode, the sensor continuously measures the liquid

level and distance, and the user can read the measurement results through the 485 interface at any time.

2: If the user does not initiate a 485 communication, the sensor will initiate a measurement and report the result.

3: Sleep mode, the product enters sleep mode, the user first wakes up the sensor through the 485 interface, and then initiates a measurement and obtains the result before the sensor sleeps again.

Definition of LED indicator meaning			
		When calibrating	During normal work
red light	Bright	error indication	error indication
	extinguish	normal work	normal work
	flicker	Indicates the status of the calibration station lock-on echo loss	meaningless
Yellow light	Bright	----	detected object
	extinguish	------	The measured object is lost
	flicker	Instructs the calibration stage to lock the current position and can switch to the next calibration state	The echo lost and echo detected states alternate. relatively critical.
Blue light	Bright	normal power supply	normal power supply
	extinguish	Abnormal power supply	Abnormal power supply
	flicker	Indicates that the user can calibrate the sensor at the current time	meaningless

8 working state setting guide

1), window normally open mode (analog output product is positive linear working mode or distance measurement mode)

When power on, the blue light flashes to indicate that the calibration can be started.

Choose a suitable distance as D1

Ground the adjustment terminal PIN 2 (usually the white wire)

Yellow light flashes, red

No → Keep distance and connection constant

Yes

Disconnect PIN2 and ground

Select Set Distance D2 and make sure

Connect the adjustment terminal PIN 2 (usually the white line) to the power supply

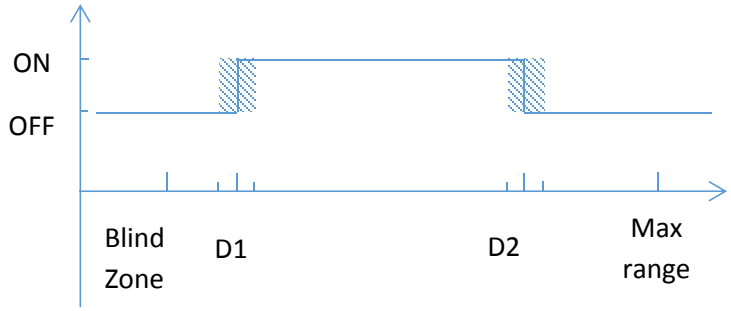
Yellow light flashes, red

No → Keep distance and connection status the same

Yes

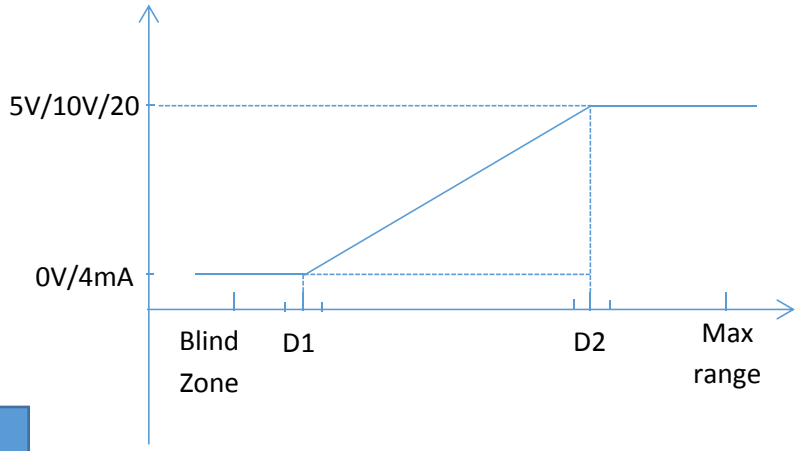
Disconnect PIN2 and power

end



: Default 5% Hysteresis

Schematic diagram of



Linear output schematic

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2), window normally closed mode (analog output product is in negative linear working mode or liquid level measurement mode)

When power on, the blue light flashes to indicate that the calibration can be started.

Choose a suitable distance as D2

Ground the adjustment terminal PIN 2 (usually the white wire)

Yellow light flashes, red

No

Keep distance and Connection

Yes

Disconnect Pin2 and

Choose a suitable distance as D1 to ensure D2>D1

Connect the adjustment terminal Pin2 (usually the white wire) to the power supply

Yellow light flashes, red

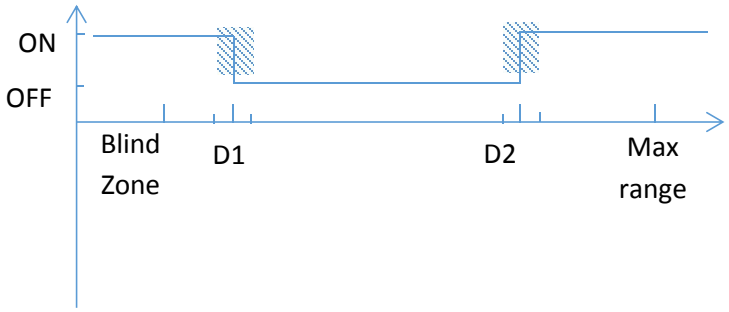
No

Keep distance and connection

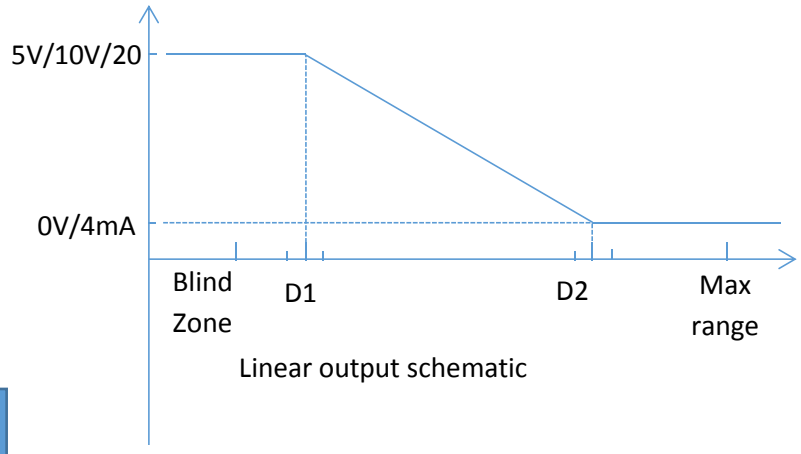
Yes

Disconnect PIN2 and power

end



: Default 5% hysteresis interval
Schematic diagram of



Linear output schematic

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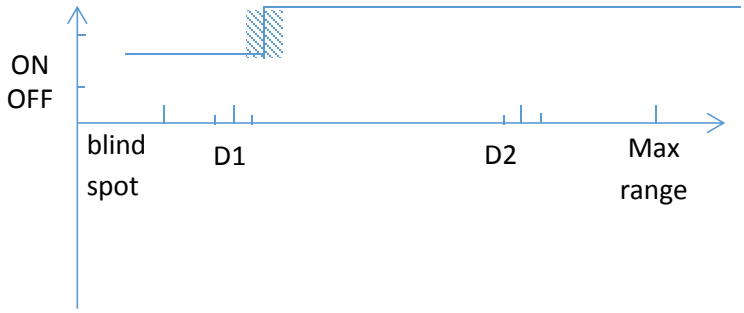
3), Single point normally open mold



: Default 5% hysteresis

Schematic diagram of

When power on, the blue light flashes to indicate that the calibration can be started.

Choose a suitable distance as D1

Ground the adjustment terminal PIN 2 (usually the white wire)

Yellow light flashes, red

No

Keep distance and connection

Yes

Disconnect PIN2 and ground

Cover the sensor probe or place the target far enough beyond the maximum range (yellow light is off)

Connect the adjustment terminal PIN 2 (usually the white line) to the power

Red light flashes, yellow light goes

no

Keep the distance or cover the probe and connection

Yes

Disconnect PIN2 and power

end

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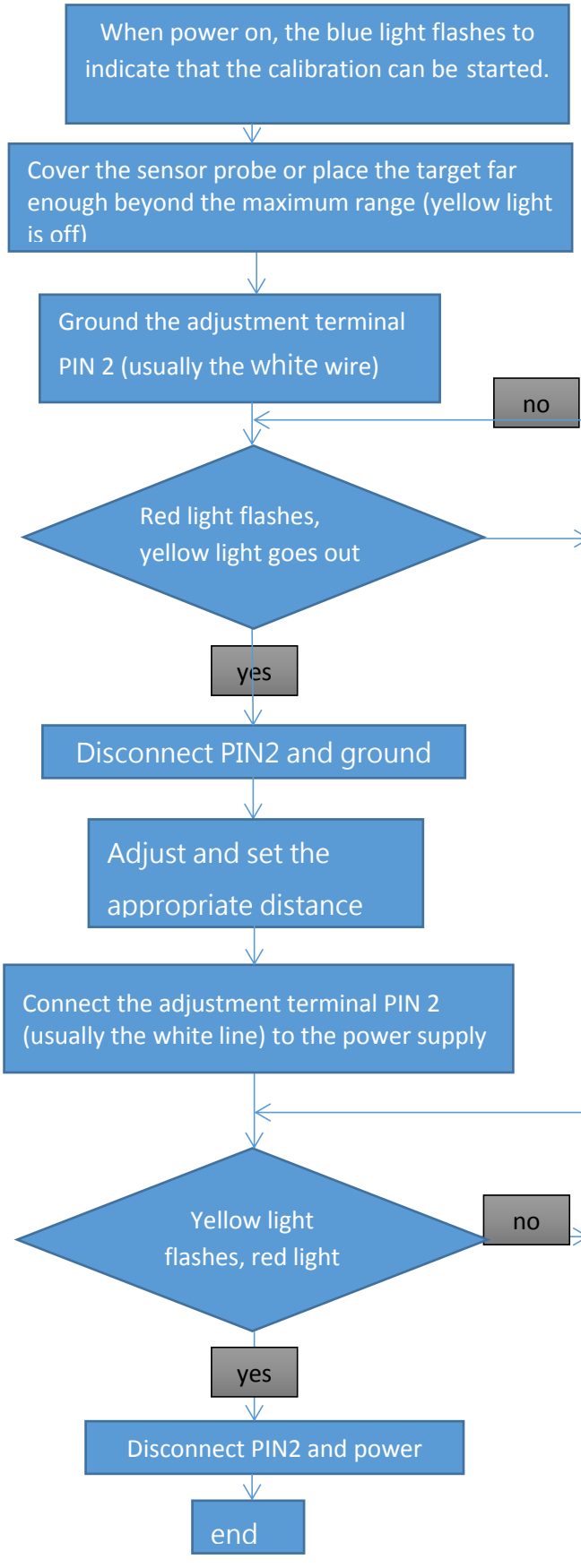
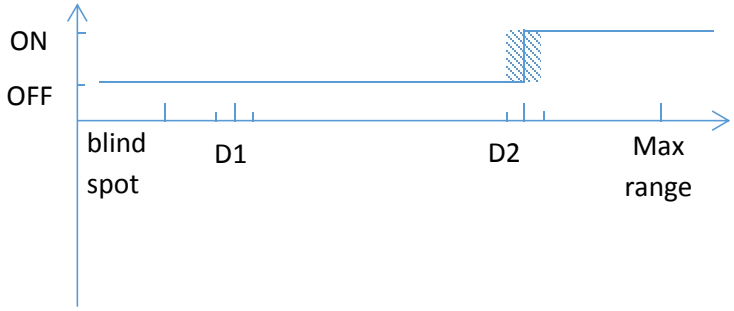
4), single point normally closed mode





: Default 5% hysteresis

Schematic diagram of

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5), single-point normally open mode with large hysteresis interval

When power on, the blue light flashes to indicate that the calibration can be started.

Choose a suitable distance as D1

Connect the adjustment terminal PIN 2 (usually the white line) to the power

Yellow light flashes, red

NO

Keep distance and connection

YES

Disconnect PIN2 and ground

Choose a suitable distance as D2 to ensure D2>D1

Ground the adjustment terminal PIN 2 (usually the white wire)

Yellow light flashes, red

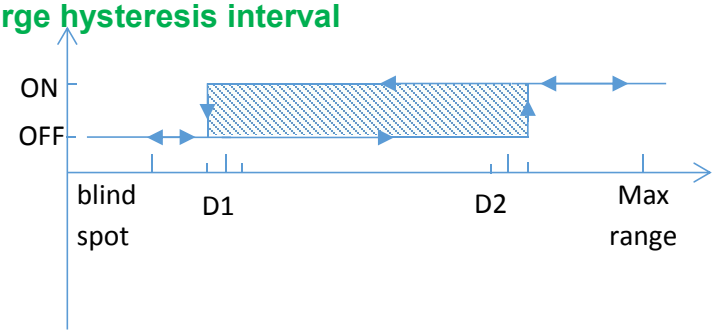
NO

Keep distance and connection

YES

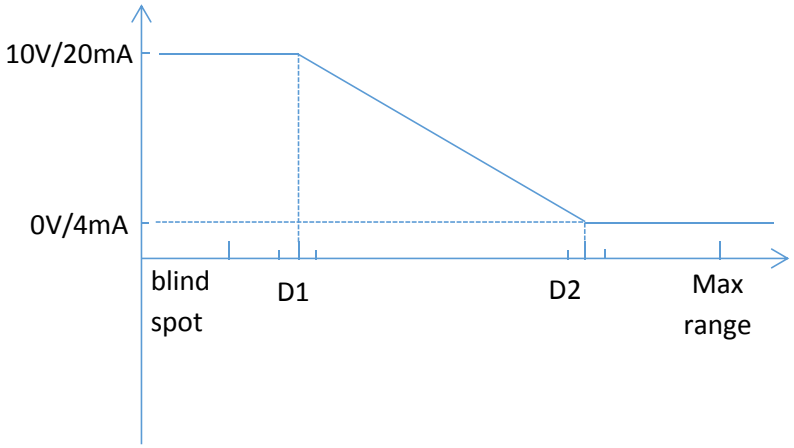
Disconnect PIN2 and ground

end



Hysteresis interval

Schematic diagram of switch



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6), single-point normally closed with large hysteresis interval mode

When power on, the blue light flashes to indicate that the calibration can be started.

Choose a suitable distance as D1

Connect the adjustment terminal PIN 2 (usually the white line) to the power supply

Yellow light flashes, red

NO

Keep distance and connection

YES

Disconnect PIN2 and power

Choose a suitable distance as D1 to ensure D1<D2

Ground the adjustment terminal PIN 2 (usually the white wire)

Yellow light flashes, red

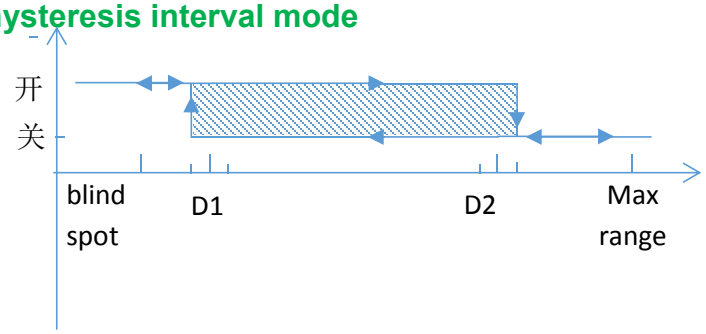
NO

Keep distance and connection

YES

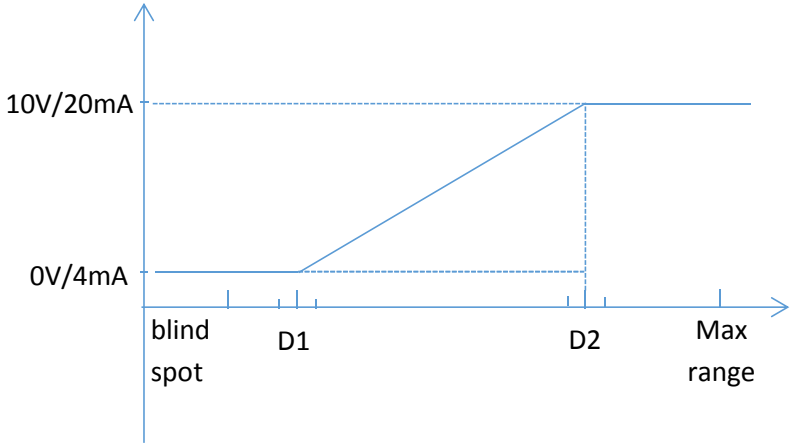
Disconnect PIN2 and ground

end



Hysteresis

Schematic diagram of switch



Linear output schematic

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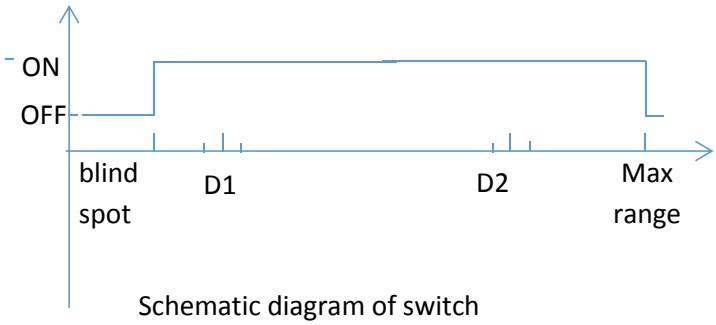
7), whether to detect normally open mode



Schematic diagram of switch

When power on, the blue light flashes to indicate that the calibration can be started.

Cover the sensor probe or place the target far enough above the maximum range (yellow light is off)

Connect the adjustment terminal PIN 2 (usually the white line) to the power supply

Yellow light flashes, red

NO

Keep the distance or cover the probe and connection relationship unchanged

YES

Disconnect PIN2

Cover the sensor probe or place the target far enough above the maximum range (yellow light is off)

Connect the adjustment terminal PIN 2 (usually the white line) to the power .

Yellow light flashes, red

NO

Keep the distance or cover the probe and connection

YES

Disconnect PIN2 and ground

end

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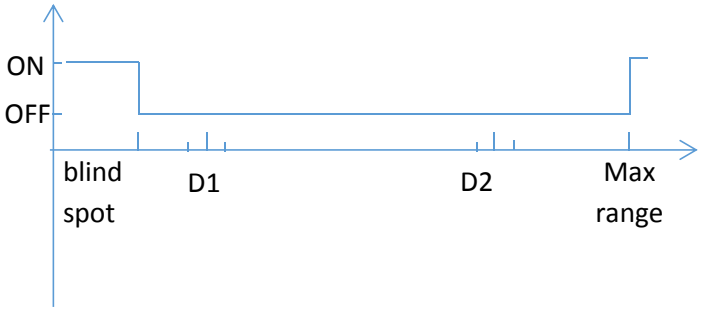
8), whether to detect normally closed mode



When power on, the blue light flashes to indicate that the calibration can be started.

Cover the sensor probe or place the target far enough above the maximum range (yellow light is off)

Connect the adjustment terminal PIN 2 (usually the white line) to the power

Yellow light off, red light flashing

NO

Keep the distance or cover the probe and connection relationship unchanged

YES

Disconnect PIN2 and power

Cover the sensor probe or place the target far enough above the maximum range (yellow light is off)

Ground the adjustment terminal PIN 2 (usually the white wire)

Yellow light off, red light flashing

NO

Keep the distance or cover the probe and connection

YES

Disconnect PIN2 and ground

end

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5. Installation conditions

When installing, pay attention to protect the surface of the sensor to avoid injury. If you work in an environment with heavy volatile gas or dust and heavy condensation, you need to clean the surface of the sensor regularly to avoid sensitivity reduction or failure to work. The installation thread should not be over-tightened, which will cause the sensor to be pressurized and not work properly.

6. Order information

KUS	**Types of**	**output**	**range**	**describe**
	M18	M18 housing, maximum measuring range is 1 meter		
	M30-Type1	M30 maximum measuring range is 2 meter		
	M30-Type2	M30 maximum measuring range is 3 meter		
	M30-Type3	M30 maximum measuring range is 6 meter, 8 meters can be customized		
	Customized	Shell supports user customization		
		NPN	output as NPN	
		PNP	output as PNP	
		10Vout	The output is analog 0-10V, the power supply requirement is greater than 11V	
		5Vout	The output is analog 0-5V, the power supply requirement is greater than 6V	
		mAout	The output is analog 4-20mA	
		RS485	The output is RS485 Modbus protocol, please refer to the software interface manual for specific description.	
			XXX mm	The customer specifies the linear interval or switch interval, which can be set at the factory
KUS	M30	RS485	2000mm	

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