

电应普
BEST SENSOR



DATASHEET

A13 Series Sensor Module

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Product Description

1. General

A13 Series sensor module uses ultrasonic sensing technology with reflective structure for distance measurement. The module adopts high-performance processor and high-quality components which output reliable and stability value and has long life span. This module is a high-performance, high-reliability, commercial-grade functional module designed for trash bin overflow application. The stable distance measurement is 25~200cm.

2. Features

- Reflective structure design, high sensitivity, narrow beam angle.
- High stability, Repeatability is 5mm
- Wide voltage power supply, 3.3~24V
- Low power consumption design, static current <10uA, operating current <8mA (UART auto, 5V power supply)
- Multiple output modes optional, UART output, PWM output, RS485 output and switch output
- Internal temperature compensation function, stable output from -15°C to +60°C
- Anti static electricity design in accordance with IEC61000-4-2 standard
- Operating temperature from -15°C to +60°C

3. Applications

Horizontal distance sensing

Smart waste management system

Module Description

According to different characteristics and advantages, the modules providing two series.

Built-in algorithm of the A13 series is suitable for applications that require stable measurement data, such as waste level monitoring.

The A13B series has a faster working cycle and is suitable for applications that require fast data response, such as distance sensing of flat objects.

Module specification

1. Operating specification

Item Description	UART Auto	UART controlled	PWM controlled	Switch	RS485	Unit	Remark
Operating voltage	3.3~24	3.3~24	3.3~24	3.3~24	3.3~24	V	DC
Static current	-	<10	<10	-	>10000	uA	
Average operating current	≤8	≤8	≤8	≤8	≤15	mA	(1)
Blind zone	0~25	0~25	0~25	0~25	0~25	cm	(2)
Measuring range of flat object	25~200	25~200	25~200	25~200	25~200	cm	(2)
A13 operating cycle	500	Controlled	Controlled	500	Controlled	ms	-
A13 response time	0.5~2.5	≈0.38	≈0.38	1.5~12.5	≈0.1	s	-
A13B operating cycle	100	Controlled	Controlled	100	-	ms	-
A13B operating time	0.1~0.5	0.031	0.03	0.3~2.5	-	s	-
Beam Angle	≈20	≈20	≈20	≈20	≈20	°	(3)
Accuracy	±(1cm+S*0.3%)					cm	(2)
Temperature Compensation	Support					-	-

Remark:

- (1) Testing result under temperature 25±5°C, humidity 65% RH, input voltage 5.0V, 500ms working cycle.
- (2) Temperature 25±5°C, humidity 65% RH, 50cm*60cm flat carton measured data, S represents the measurement distance. The detection starting point of the module is calculated from the reflective shell surface as default.
- (3) Temperature 25±5°C, humidity 65% RH, For the reference data obtained from the test of a φ 75mm*100cm white PVC pipe with a distance of 100cm.

2.Environment

Item	Minimum value	Typical value	Max value	Unit	Remark
Storage Temp	-25	25	80	℃	
Storage Humidity		65%	90%	RH	(1)
Operating Temp	-15	25	60	℃	
Operating Humidity		65%	80%	RH	(2)

Remark:

- (1) Environment temperature is 0-39℃, max humidity is 90%(Non-condensation)
 (2) Environment is 40-50℃, max humidity is the highest at current temperature in nature.

3.Electronics

Item	Minimum value	Typical value	Max value	Unit	Remark
Operating voltage	3.2	5.0	24	V	
Peak current			70	mA	Peak value
Input Ripple			50	mV	Peak value
Input Noise			100	mV	Peak value
ESD			±4K/±8K	V	(2)

Note:

- (1) The probe shell and output pin conform to the IEC61000-4-2 standard.
 (2) Assembly line contact static electricity ±200V, air static electricity ±2KV.

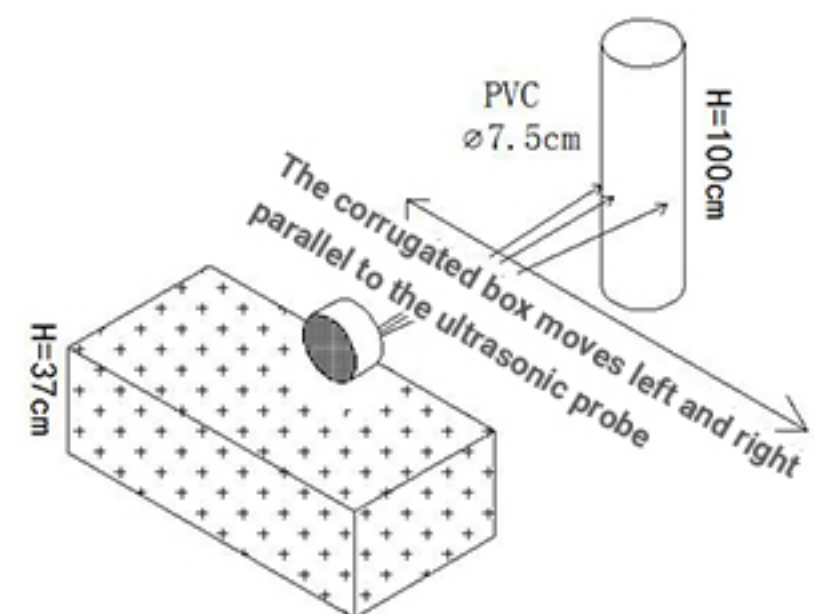
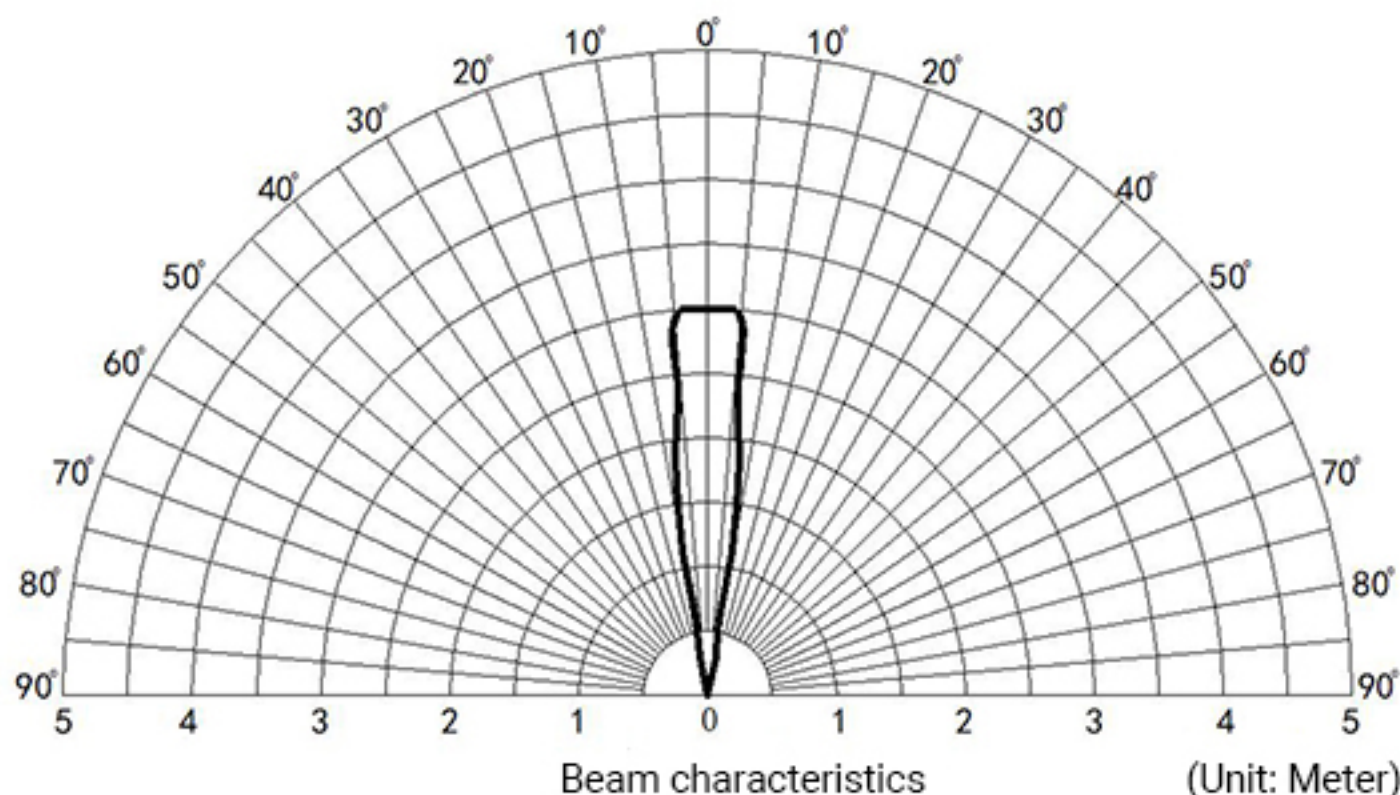
Sensor Selection Instruction

A13-module and A13B-module according to different output modes, total supplying 9 models. users can choose the corresponding model according to actual application needs.

No.	Output interface	Model No.	Remark
A13 Series sensor module	UART Auto	DYP-A13NYUW-V1.0	
	UART Controlled	DYP-A13NYTW-V1.0	
	PWM Controlled	DYP-A13NYMW-V1.0	
	Switch	DYP-A13NYGDW-V1.0	
	RS485	DYP-A13NY4W-V1.0	
A13B Series sensor module	UART Auto	DYP-A13BNYUW-V1.0	
	UART Controlled	DYP-A13BNYTW-V1.0	
	PWM Controlled	DYP-A13BNYMW-V1.0	
	Switch	DYP-A13BNYGDW-V1.0	

Beam Pattern

(1) The tested object is a corrugated box perpendicular to the 0° central axis, with a length * width of 60cm*50cm.



Note: The above is the factory laboratory test data. In actual use, various factors such as product installation method and use environment may be different from the laboratory data. Please refer to the actual application environment test.

Reliable testing Instruction

No.	Description	Testing condition	sample QTY	remark
1	High temperature and humidity	65°C, 85%RH, Power ON@5V, 72hrs	3	
2	low temperature	-20°C, Power ON@5V,72hrs	3	
3	High temperature and humidity storage	80°C, 80%RH, storage, 72hrs	3	
4	Low temperature storage	-30°C, storage, 72hrs	3	
5	Vibration test	10-200Hz,15min,2.0G, XYZ three axes, each axis is 0.5 hours	3	
6	Drop test	120 cm free fall, 5 times on wooden floor	3	

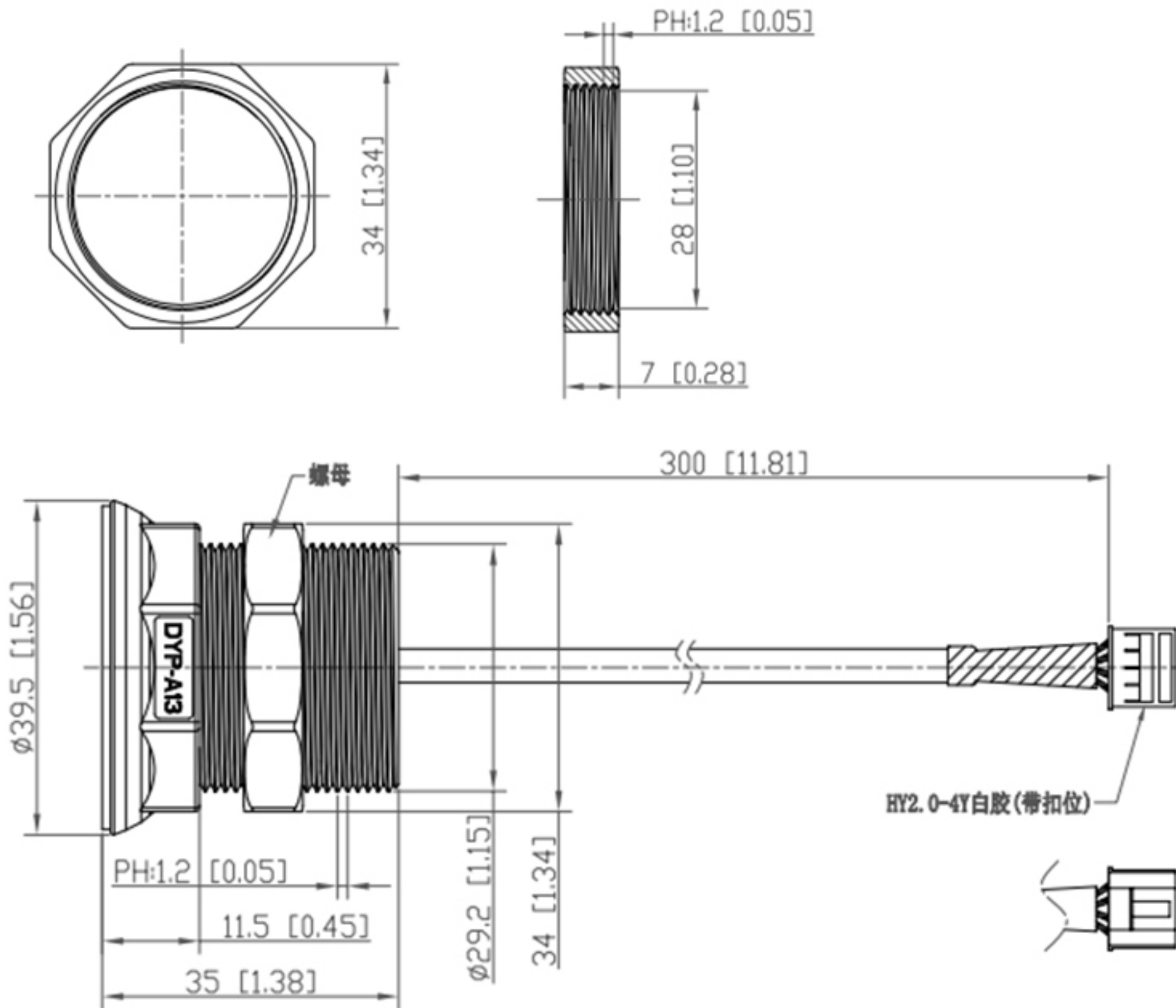
Note: After the test, the module is determined to be OK after the function test, and the performance degradation rate is $\leq 10\%$.

Notice

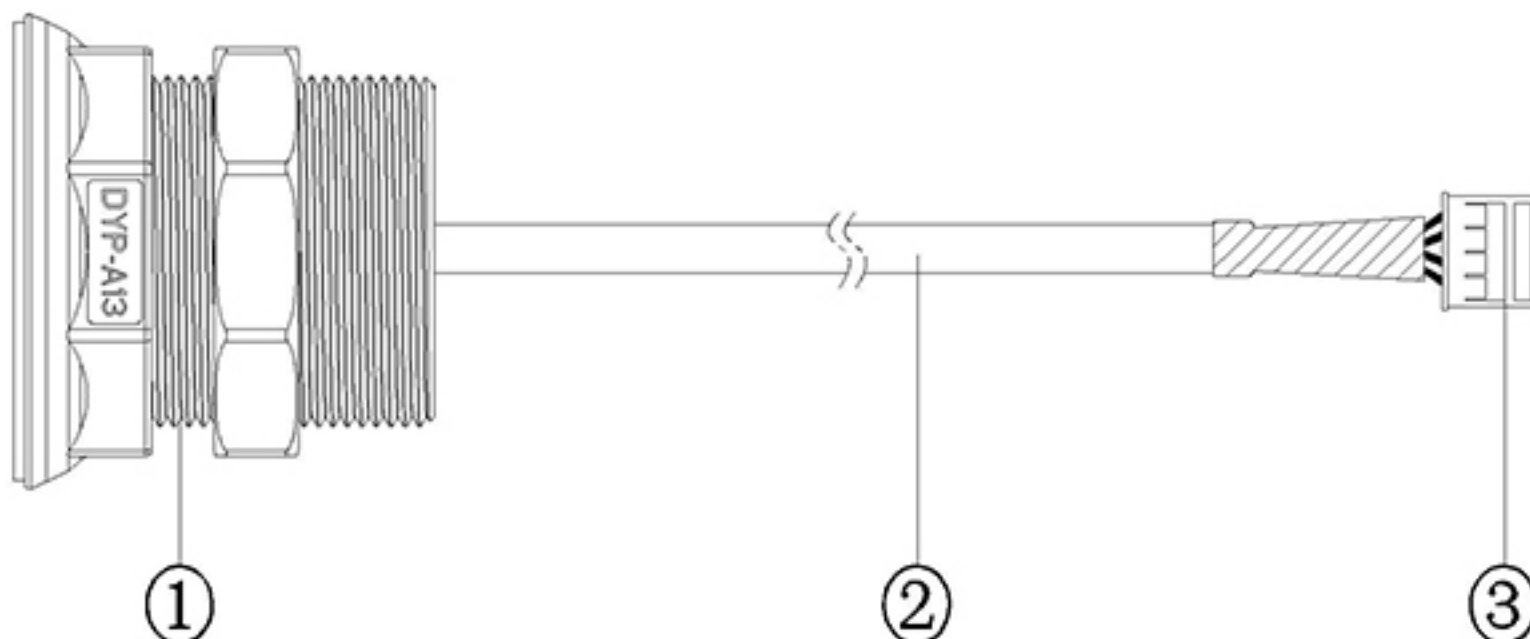
- (1) The company reserves the right to change this document and update the functions without prior notice.
- (2) Please pay attention to structural tolerances when designing. Unreasonable structural design may cause transient abnormalities.
- (3) Please pay attention to the evaluation of electromagnetic compatibility when designing. Unreasonable system design may cause malfunction of the module.
- (4) When it comes to the application of the module limit parameter boundary, you can contact our engineer to confirm the relevant precautions.

Mechanics

1. Mechanical Dimensions(mm-inch)

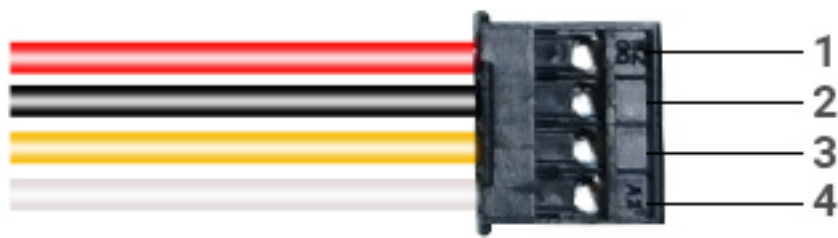


2. Parts Description



- ① Ultrasonic transducer
- ② Wire
- ③ HY2.0-4Y connector

3. Pin out



Pin No.	Mark	Description	Remark
①	VCC	Power Input	
②	GND	GND	
③	RX	Functional PIN	different output modes have different functions
④	TX	Functional PIN	different output modes have different functions