

AKUSENSE



Ultrasonic sensor MS18 Series

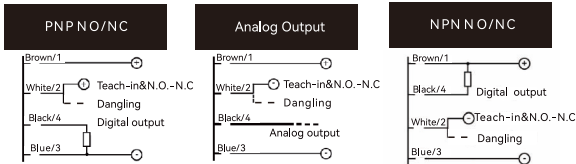
User Manual

Thank you for choosing Akusense products. Please read the manual carefully before using the products. For your convenience, please keep this manual carefully so that you can check it at any time

Description

- M18 short-body ultrasonic sensor
- Single output:
 - Analog current output (4 – 20 mA)
 - Analog voltage output (0 -10 V)
 - Digital output (NPN & PNP, NO/NC switchable)
- Adjust distance (Window teach-in and target teach-in function)
- Comprehensive protection against electrical damage
- Multi-function LED indicator :
 - Yellow LED: output status, teach-in function and configuration NO/NC
 - Green LED: echo
- Plastic housing

Circuit diagram



In case of combined load, the resistive and capacitive load, the maximum admissible capacity (C) is 0,1μF for maximum voltage and current output.

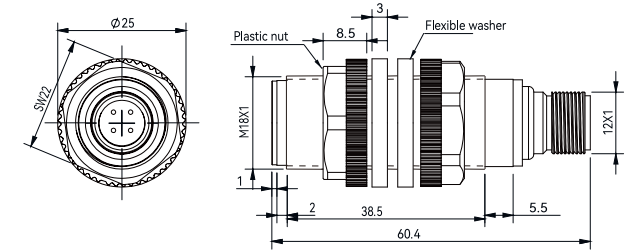
Packaging

- Sensor(Plastic nut and flexible washer are included) 1 piece
- User manual 1 piece

Specification

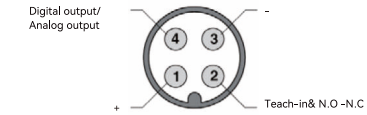
Specification	MS18 Series		
	Analog output	Voltage	MS18-30V
	Current	MS18-30I	MS18-90I
Digital	NPN	MS18-30N	MS18-90N
	PNP	MS18-30P	MS18-90P
Sensing range		40~300mm	60~800mm
Repeat accuracy		2%	
Hysteresis		2%	
Linearity error		≤3%	
Resolution		2mm	
Opening angle		7°±2°	8°±2°
Switch frequency		8Hz	5Hz
Response time(digital output)		12ms	80ms
Response time(analog output)		500ms	
Operating voltage		15~30VDC (±5%)	
Temperature compensation		Yes	
Temperature drift		≤5%	
Voltage drop		2.2Vmax (1L=100mA)	
Current consumption		≤35mA	
Min. load resistance		100mA	
Leakage current		≤10μA@30VDC	
Sensitivity adjustment		External teac	
Startup delay		≤300ms (Digital output) ; ≤900ms (Analog output)	
Operating temperature		-20°C~+70°C	
Storage temperature		-35°C~+70°C (No freezing)	
Protective circuit		Reverse polarity protection, Short circuit(auto reset), Over voltage pulse protection	
Degree of protection		IP67	
Tightening torque		1Nm	
Material		Housing: PBT ; Sensing surface material: Epoxy-glass resin	
Weight		15g	

Dimensions



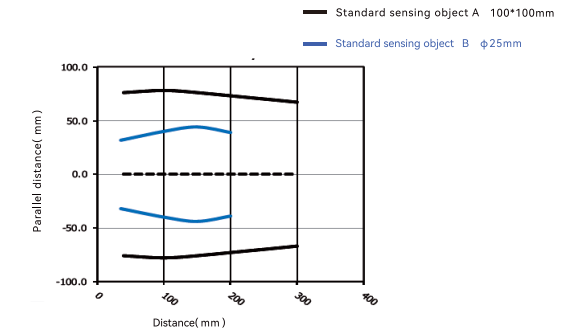
Connector

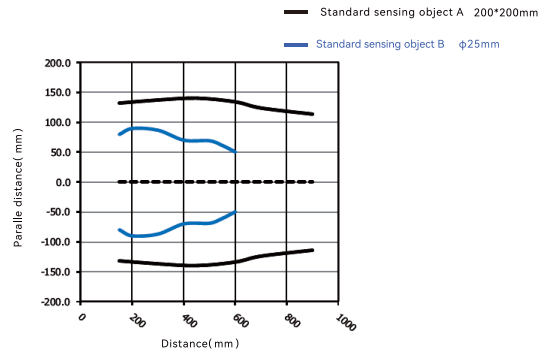
M12 Analog output/Digital output



Characteristic curve

MS18-30





Adjustment

1. Factory reset

Power on without a target, connect the teaching line to the power line, then immediately disconnect the teaching line and dangling. The contact time should be less than 1s. The initialization is completed after the yellow light flashes 5 times, and there is no need to power off and restart.

2. Teach-in function

P1 teach-in

Place the target at the near end of the effective range, connect the teaching line to the power line and disconnect it quickly. The contact time should be less than 1s. At this time, the yellow light keeps flashing, and the position of the P1 is obtained.

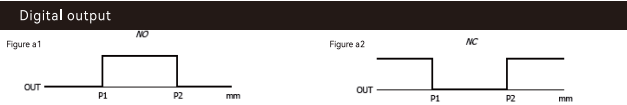
P2 teach-in

Place the target at the far end of the effective range, connect the teaching line to the power line and disconnect it quickly. The contact time should be less than 1s. After the green light and the yellow light are turned off at the same time, the yellow light flashes quickly and then turns off again, and the green light is on. And the position of P2 is obtained.

3. Output curve

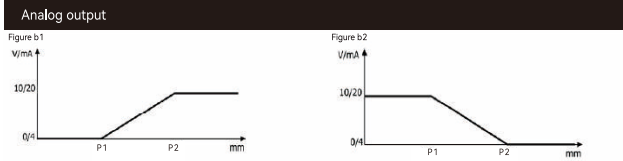
a. Digital output

Within the effective range, the switch signal output is shown in Figure a, where Figure a1 is the normally open signal output, Figure a2 is the normally closed signal output, and the NO/NC signal can be switched through the teaching line.



b. Analog output

Within the effective range, there is a linear relationship between the current/voltage output value and the distance, as shown in Figure b, where Figure b1 is a linear positive correlation (yellow and green lights are on at the same time), and Figure b2 is a linear negative correlation (only the yellow light is on), which can be switched through the teaching line.



Switching operation:

After power-on, connect the teaching line to the power line, wait for about 5s, and then the yellow light starts flashing rapidly. Disconnect the teaching line to complete the switching operation. Do not power off the sensor during this process, otherwise the switching will fail.

Note: The connection status of the teaching line should be determined according to the output type.

The teaching line of the analog output should be connected to the negative pole, the teaching line of the digital PNP output should be connected to the positive pole, and the teaching line of the digital NPN output should be connected to the negative pole.

The teaching line should be suspended in the normal working state.

Installation environment

The sensor must be installed with a plastic non-slip nut and a flexible washer (provided with the ultrasonic sensor, see Packaging content). If it is fixed in the metal block through a threaded hole or a metal nut, the metal block and nut must be grounded. The distance from the edge of the sensor sensing surface to the metal and the nut needs to be kept more than 5mm.

Precautions

- Please ensure the power supply voltage ripple is within the listed value in the catalog.
- To prevent noise from other power cables exceeding the EMC(anti-interference) directive presets, separate the sensor cables and place them in grounded metal conduits.
- When the product cable needs to be extended, a cable of more than 1mm² must be used, and the maximum length is 100m (this value is for the minimum tension of the cable and the power load current within 100mA).
- In industrial environment, shielded cables are recommended to prevent interference caused by electromagnetic fields.
- Do not put the sensor head in water vapor or solvent whose temperature exceeds 50°C.
- Please clean and dry the sensing surface with a damp cloth.
- When the power is turned on, the temperature drift will affect the sensing distance, and after 20 minutes, the sensing distance is stable.

Product Commitment

Akusense's products undergo strict factory inspection. In case of failure, please contact the nearest Akusense office with details of the failure so that it can be resolved as soon as possible.

Warranty period

- The product warranty period is one year from the date of shipment.

Warranty scope

(1) Akusense will repair the product free of charge in the event of a malfunction caused by Akusense within the above warranty period except following situations:

- Failure to comply with the conditions specified in the operating instructions, user manuals or technical requirements specifically agreed between the purchaser and Akusense, improper operation in the environment, or improper use of the product.
- The failure was not due to a defect in the product, but was the result of the purchaser's equipment or the design of the purchaser's software.
- Failures due to modifications or repairs by non-Akusense personnel.
- Failures that can be completely avoided by correct maintenance or replacement of wearing parts in accordance with the operating instructions or user manuals.
- Failures caused by factors such as unforeseen changes in the level of science and technology after the product was shipped from Akusense.
- Akusense is not responsible for warranty failures due to natural disasters such as fire, earthquake, and flood, or external factors such as abnormal voltage.

(2) The scope of the warranty is limited to the cases specified in (1), and Akusense shall not be liable for consequential damages to the purchaser (equipment damage, lost opportunity, lost profits, etc.) or other losses caused by its equipment.

Product suitability

Akusense's products are designed and manufactured for general-purpose products in general industries. Therefore, Akusense products are not intended for and are not suitable for use in the applications listed below. However, the product may be used if the purchaser has consulted Akusense in advance regarding the use of the product in a responsible manner, understands the technical specifications, grades and performance of the product, and takes the necessary safety measures. In this case, the product warranty coverage is the same as above.

- Use with potential chemical pollution or electrical interference, or use under conditions and environments that are not described in product catalogs, instruction manuals, etc.
- Atomic force control equipment, incineration equipment, railway, aviation, vehicle equipment, safety devices and administrative agencies and equipment manufactured according to the regulations of individual industries.
- Machinery, systems and devices that may endanger life and property.
- 24-hour continuous operation systems for gas, water, and electrical supply systems require highly reliable equipment.