Akusense

Ultrasonic sensor

MC18 Series

User Manual

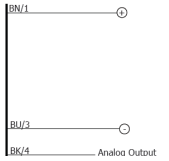
Thank you for choosing Akusense products. Please read the manual carefully before using the products. For your convenience, please keep this manual carefully so that you can check it at any time.

Description

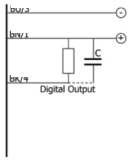
- M18 ultrasonic sensor with M12 connector or 2mts cable
- Single output:
  - Analog current output (4 – 20 mA)
  - Analog voltage output (0 -10 V)
  - Digital output (NPN & PNP, NO/NC switchable)
- Adjust distance (Window teach-in and target teach-in function)
- Comprehensive protection against electrical damage
- Multi-function LED indicator; output status, teach-in function and
- configuration NO/NC, plastic housing

Circuit diagram

Analog output



NPN NO/NC
Digital output



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

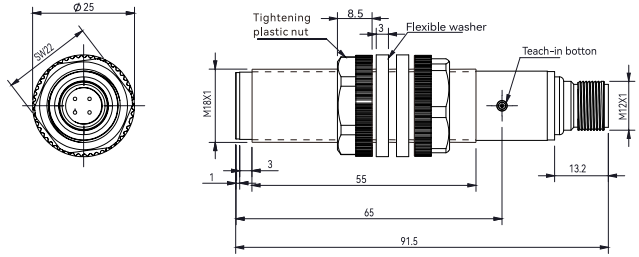
Packaging

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

Specification

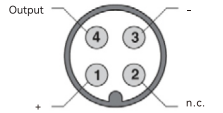
Specification		MC18 Series			
Analog output	Voltage	MC18-40V	MC18-90V	MC18-160V	MC18-220V
	Current	MC18-40I	MC18-90I	MC18-160I	MC18-220I
Digital output	NPN	MC18-40N	MC18-90N	MC18-160N	MC18-220N
	PNP	MC18-40P	MC18-90P	MC18-160P	MC18-220P
Sensing range		50~400mm	100~900mm	150~1600mm	200~2200mm
Resolution		3mm	2mm	3mm	3mm
Sensing type		Diffuse reflection			
Repeat accuracy		0.5%			
Hysteresis		1%			
Linearity error		1%			
Opening angle		±8°	±7°	±8°	±7°
Switch frequency		10Hz	4Hz	2Hz	1Hz
Response time		500ms	≤125ms	250ms	500ms
Operating voltage		15~30V DC (±5%)			
Temperature compensation		Yes			
Temperature drift		5%			
Voltage drop		2.2V max. (1L=100mA)			
Current consumption		≤50mA			
Output current (Digital output)		100mA			
Min. load resistance (Analog output)		3kΩ			
Leakage current		≤10μA@30V DC			
Sensitivity adjustment		Teach-in function			
Startup delay (Digital output)		≤500ms; ≤900ms (Dual output)			
Startup delay (Analog output)		≤900ms			
Operating temperature		-20℃~+60℃			
Storage temperature		-35℃~+70℃ (No freezing)			
Protective circuit		Reverse polarity protection, Short circuit(auto reset), Over voltage pulse protection			
Degree of protection		IP67			
Tightening torque		50Nm			
Housing material		PBT			
Sensing surface material		Epoxy-glass resin			
Weight		26g			

Dimensions



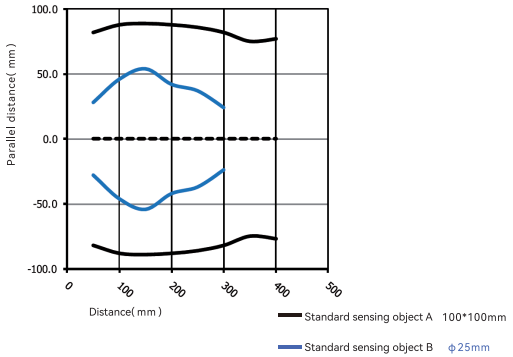
Connector

M12 Digital output /Analog output

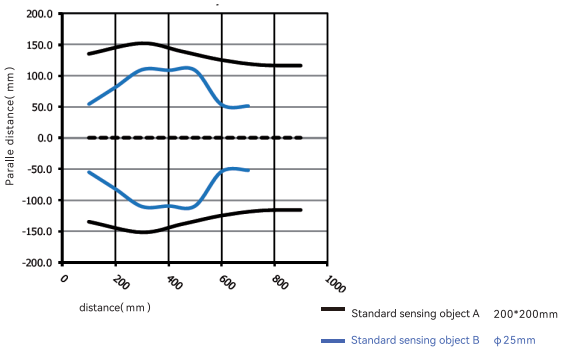


Characteristic curve

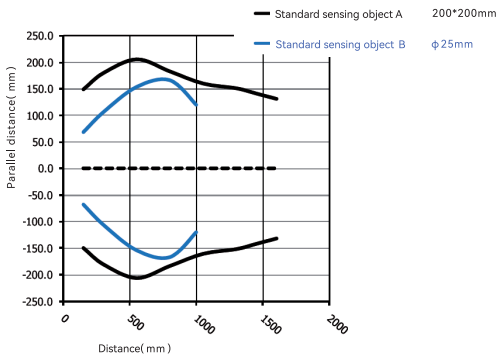
MC18-40



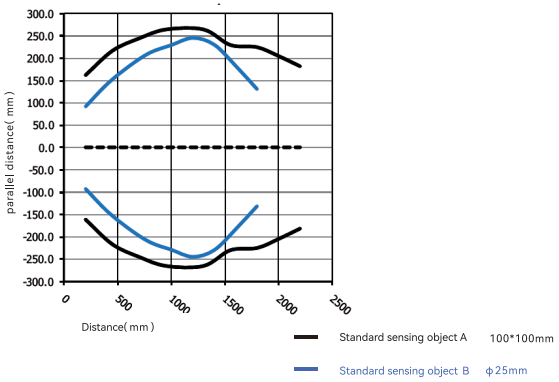
MC18-90



MC18-160



MC18-220



Adjustment

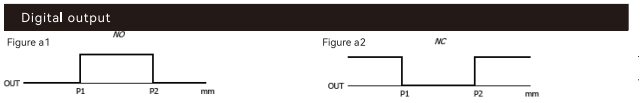
Teach-in function

P2 teach-in
Place the target at the far end of the effective range, and briefly press the teach button to obtain the position of the P2.

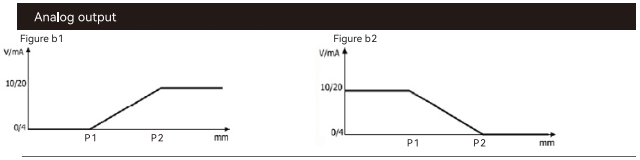
P1 teach-in
Place the target at the near end of the effective range, short press the teach button, and the yellow light flashes 5 times to obtain the position of P1.
Note: It is necessary to teach P2 first, and then teach P1, otherwise the output will be invalid.

Output curve

Digital output
Within the effective range, the switch signal output is shown in Figure a, in which Figure a1 is the normally open signal output, and Figure a2 is the normally closed signal output, which can be switched by long pressing the teaching button.



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, and Figure b2 is a linear negative correlation, which can be switched by long pressing the teach button.



Switching operation: Press and hold the teaching button for more than 8 seconds until the yellow LED light flashes rapidly. After releasing the teaching button, the LED light flashes slowly. When the LED light stops flashing, the switching action is completed.

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 the nut must be grounded. The distance from the edge of the sensor sensing surface to the metal block and the nut needs to be kept more than 5mm.

Precautions

- Please ensure that 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 1mm^2 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 environments, shielded cables are recommended to prevent possible interference caused by electromagnetic fields.
- Do not put the sensor head in water vapor or solvent whose temperature exceeds 50℃.
- 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.