

Autonics CAPACITIVE PROXIMITY SENSOR (CYLINDRICAL AC, DC TYPE) CR SERIES

INSTRUCTION MANUAL



Thank you for choosing our Autonics products.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.
※⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow these instructions may result in serious injury or death.

⚠ Caution Failure to follow these instructions may result in personal injury or product damage.

⚠ Warning

1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in fire, personal injury, or economic loss.

2. **Do not disassemble or modify the unit.**
Failure to follow this instruction may result in electric shock or fire.

3. **Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in electric shock or fire.

4. **Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.

⚠ Caution

1. **Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.

2. **Use dry cloth to clean the unit, and do not use water or organic solvent.**
Failure to follow this instruction may result in electric shock or fire.

3. **Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
Failure to follow this instruction may result in fire or explosion.

4. **Do not supply power without load.**
Failure to follow this instruction may result in fire or product damage.

■ Ordering Information

C R 30 - 15 D N

C Shape

R Body size

30 Sensing distance

- Output

15 Power supply

D Standard sensing distance (unit: mm)

N Diameter of head (unit: mm)

Number Standard sensing distance (unit: mm)

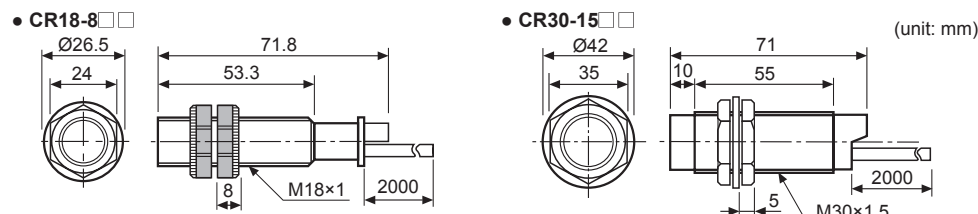
Number Diameter of head (unit: mm)

R Cylindrical type

C Capacitive proximity sensor

O	Normally open
C	Normally closed
N	NPN normally open
N2	NPN normally closed
P	PNP normally open
D	12-24VDC
A	100-240VAC
Number	Standard sensing distance (unit: mm)
Number	Diameter of head (unit: mm)
R	Cylindrical type
C	Capacitive proximity sensor

■ Dimensions



■ Grounding

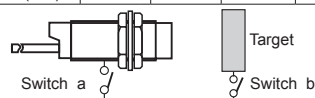
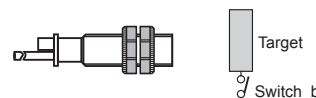
The sensing distance will be changed by grounding status of capacity proximity sensor and the target [50×50×1mm (iron)]. Please check the material when installing the sensor and selecting the target.

● **CR18**

Ground condition (switch b)	ON	OFF
Operating distance (mm)	8	4

● **CR30**

Ground condition	Switch a	ON	OFF	ON	OFF
Operating distance (mm)	Switch b	ON	ON	OFF	OFF
		15	18	6	6



※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Specifications

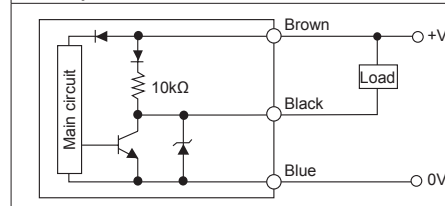
Model	CR18-8DN CR18-8DP CR18-8DN2	CR30-15DN CR30-15DP CR30-15DN2	CR18-8AO CR18-8AC	CR30-15AO CR30-15AC
Sensing distance	8mm	15mm	8mm	15mm
Hysteresis	Max. 20% of sensing distance			
Standard sensing target	50×50×1mm (iron)			
Setting distance	0 to 5.6mm	0 to 10.5mm	0 to 5.6mm	0 to 10.5mm
Power supply (voltage range)	12-24VDC≒ (10-30VDC≒)		100-240VAC~ 50/60Hz (85-264VAC~)	
Current consumption	Max. 15mA		—	
Leakage current	—		Max. 2.2mA	
Response frequency*1	50Hz		20Hz	
Residual voltage	Max. 1.5V		Max. 20V	
Affection by Temp.	Max. ±20% for sensing distance at ambient temperature 20°C			
Control output	Max. 200mA		Max. 5 to 200mA	
Insulation resistance	Over 50MΩ (at 500VDC megger)			
Dielectric strength	1,500VAC 50/60Hz for 1 minute			
Vibration	1mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours			
Shock	500m/s ² (approx. 50G) X, Y, Z directions for 3 times			
Indicator	Operation indicator: Red LED			
Environment	Ambient temperature: -25 to 70°C, storage: -30 to 80°C Ambient humidity: 35 to 95%RH, storage: 35 to 95%RH			
Protection circuit	Reverse polarity protection, Surge protection circuit		Surge protection circuit	
Protection	IP66 (IEC standard)	IP65 (IEC standard)	IP66 (IEC standard)	IP65 (IEC standard)
Cable*2	AWG22, core diameter: 0.08mm, number of cores: 60, insulator diameter: Ø1.25mm			
Material	CR18 - Case and nut: Polyamide 6, Standard cable (black): Polyvinyl chloride (PVC) CR30 - Case and nut: Nickel-plated brass, Washer: Nickel-plated steel Sensing part: Polybutylene terephthalate, Standard cable (black): Polyvinyl chloride (PVC)			
Weight*3	Approx. 88g (approx. 76g)	Approx. 243g (approx. 206g)	Approx. 82g (approx. 70g)	Approx. 237g (approx. 200g)

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance.
※2: Do not pull the Ø4mm cable with a tensile strength of 30N or over and the Ø5mm cable with a tensile strength of 50N or over. It may result in fire due to the broken wire. When extending wire, use AWG22 cable or over within 200m.
※3: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

■ Control Output Diagram & Load Operation

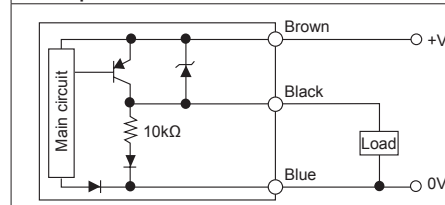
○ DC 3-wire type

NPN output



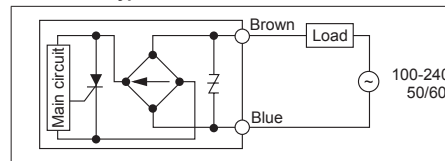
Sensing target	Presence	Nothing	N.O.	N.C.
Load (Brown-Black)	Operation	Return	■	■
Output voltage (Black-Blue)	H	L	■	■
Operation Indicator (Red LED)	ON	OFF	■	■

PNP output



Sensing target	Presence	Nothing	N.O.	N.C.
Load (Black-Blue)	Operation	Return	■	■
Output voltage (Black-Blue)	H	L	■	■
Operation Indicator (Red LED)	ON	OFF	■	■

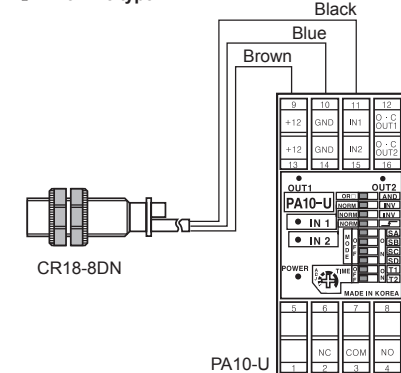
○ AC 2-wire type



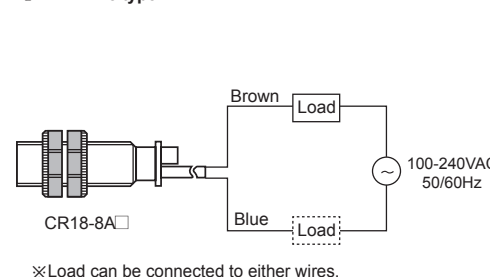
Sensing target	Presence	Nothing	N.O.	N.C.
Load	Operation	Return	■	■
Operation Indicator (Red LED)	ON	OFF	■	■

■ Connections

○ DC 3-wire type



○ AC 2-wire type



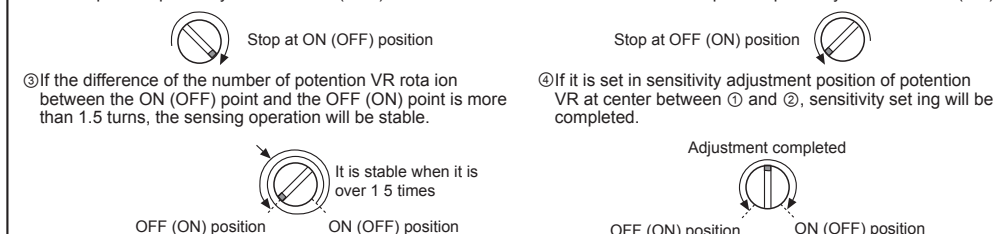
※Load can be connected to either wires.

■ Sensitivity Adjustment

● Please turn potentiometer VR to set sensitivity as below procedure.

① Without a sensing object, turn the potentiometer VR to the right and stop at the proximity sensor is ON (OFF).

② Put the object in right sensing position, turn the potentiometer VR to the left and stop at the proximity sensor is OFF (ON).

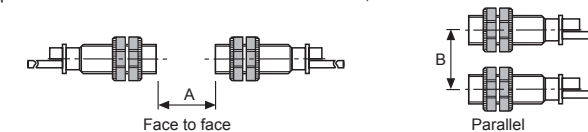


※When here is distance fluctuation between proximity sensor and the target, please adjust ② at the farthest distance from this unit.
※Turning potentiometer VR toward clockwise, it will be max., or turning toward counter clockwise, it will be min. The number of adjustment should be 15±3 revolution and if it is turned to the right or left excessively, it will not stop, but it idles without breakdown.
※() is for Normally closed type.

■ Mutual-Interference & Influence By Surrounding Metals

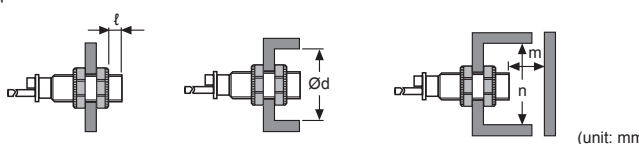
○ Mutual-interference

When several proximity sensors are mounted closely, malfunction of sensor may be caused due to mutual interference. Therefore, be sure to keep a minimum distance between the two sensors, as below charts.



○ Influence by surrounding metals

When sensors are mounted on metallic panel, it is required to protect the sensors from malfunction by any metallic object. Therefore, be sure to keep a minimum distance as below charts.



Model	Item	A	B	l	Ød	m	n
CR18		48	54	20	54	24	54
CR30		90	90	10	90	45	90

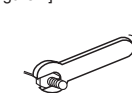
■ Installation and Tightening Torque

When tightening the nut, use the provided washer as [Figure 1]. When installing the product, the tightening torque of the nut varies according to the distance from the fore-end.

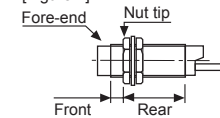
The front part of the product is from the fore-end to the dimension on the below table, and the rear part is from the tip of the nut to the end of the product. [Figure 2]

In case the nut is placed in the front part of the product, apply tightening torque for front part. [Table 1] the allowable tightening torque table is for inserting the washer as [Figure 3].

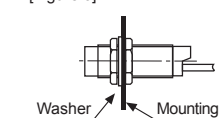
[Figure 1]



[Figure 2]



[Figure 3]



[Table 1]

Model	Strength		Torque	
	Front	Rear	Front	Rear
CR18	—	—	0.39N·m	—
CR30	12mm	—	49N·m	78.4N·m

■ Cautions During Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Use the product, after 0.8 sec of supplying power.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent surge and inductive noise. Do not use near the equipment which generates strong magnetic force or high frequency noise (transceiver, etc.). In case installing the product near the equipment which generates strong surge (motor, welding machine, etc.), use diode or varistor to remove surge.
- Do not connect capacity load to the output terminal directly.
- This unit may be used in the following environments.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System(Fiber, CO₂, Nd:YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse(Rate)Meters
- Display Units
- Sensor Controllers