CR Series

Cylindrical, Capacitive type proximity sensor

▣ Features

● Sensing of iron, metal, plastic, water, stone, wood etc.
● Long life cycle and high reliability
● DC type: Built-in surge protection circuit,
     reverse polarity protection circuit
  AC type: Built-in surge protection circuit
● Easy to adjust of the sensing distance with sensitivity adjuster
● Red LED operation indicator
● Easy to control of level and position

> ⚠ **Please read "Safety Considerations"**
> **in the instruction manual before using.**

▣ Type

◎ DC 3-wire type

Appearances		Model
M18		**CR18-8DN**
		CR18-8DP
		CR18-8DN2 ※
M30		**CR30-15DN**
		CR30-15DP
		CR30-15DM2 ※

◎ AC 2-wire type

Appearances		Model
M18		**CR18-8AO**
		CR18-8AC
M30		**CR30-15AO**
		CR30-15AC

※ mark can be customized.

▣ Specifications

Model		CR18-8DN CR18-8DP CR18-8DN2	CR30-15DN CR30-15DP CR30-15DN2	CR18-8AO CR18-8AC	CR30-15AO CR30-15AC
Diameter of the sensing side		18mm	30mm	18mm	30mm
Sensing distance		8mm	15mm	8mm	15mm
Installation		Non-shield (non-flush)			
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 (operating voltage)		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℃			
Control output		Max. 200mA		5 to 200mA	
Insulation resistance		Over 50MΩ (at 500VDC megger)			
Dielectric strength		1,500VAC 50/60Hz for 1 min			
Vibration		1mm amplitude at frequency of 10 to 55Hz (for 1 min) in each of X, Y, Z direction for 2 hours			
Shock		500m/s² (approx. 50G) in each of X, Y, Z direction for 3 times			
Indicator		Operation indicator: Red LED			
Environ- ment	Ambient temperature	-25 to 70℃, storage: -30 to 80℃			
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH			
Protection circuit		Reverse polarity protection circuit, Serge protection circuit		Serge protection circuit	
Protection structure		IP66 (IEC standard)	IP65 (IEC standard)	IP66 (IEC standard)	IP65 (IEC standard)
Cable		Ø4mm, 3-wire, 2m	Ø5mm, 3-wire, 2m	Ø4mm, 2-wire, 2m	Ø5mm, 2-wire, 2m
		AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm			
Material		CR18 - Case/Nut: PA6, Standard cable (black): Polyvinyl chloride (PVC) CR30 - Case/Nut: Nickel plated brass, Washer: Nickel plated iron, Sensing surface: Polybutylene terephthalate, Standard cable (black): Polyvinyl chloride (PVC)			
Weight※2		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 for the distance.
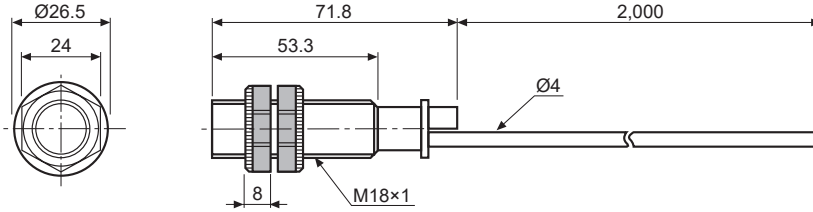※2: The weight includes packaging. The weight in parenthesis in for unit only.
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

(unit: mm)

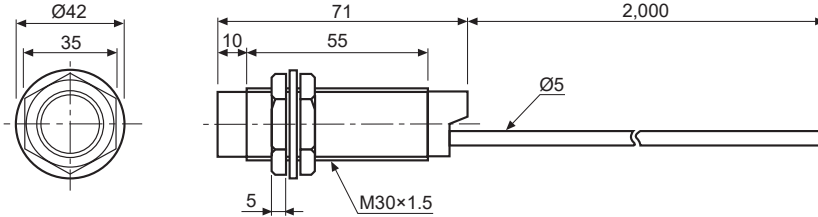### ● CR18-8□□

Ø26.5
24
71.8
2,000
53.3
Ø4
8
M18×1

● CR30-15□□

Ø42
35
71
2,000
10
55
Ø5
5
M30×1.5

■ Control Output Diagram and Load Operation

◎ DC 3-wire type

NPN output type

PNP output type

◎ AC 2-wire type

■ Connections

◎ DC 3-wire type
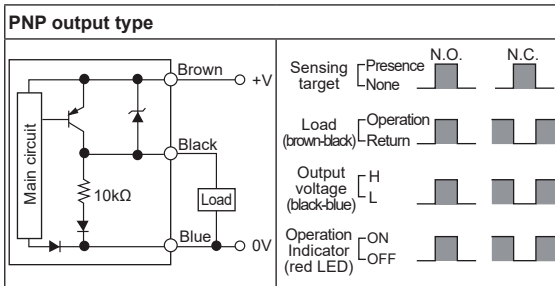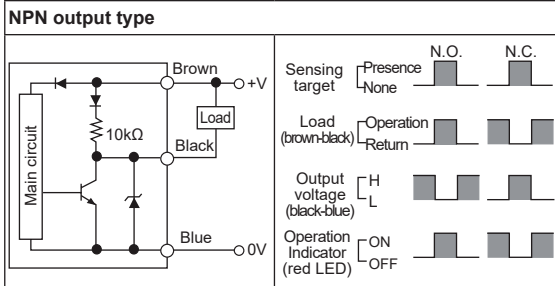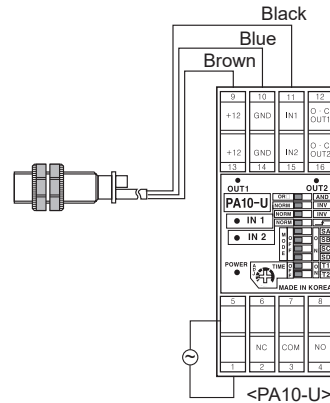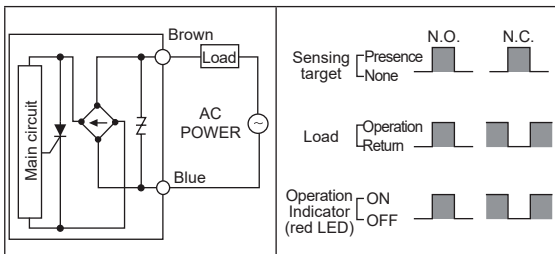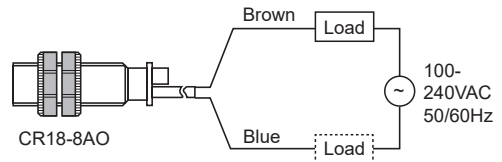
Black
Blue
Brown

<PA10-U>

◎ AC 2-wire type

Brown
Load
Blue
Load
100-240VAC
50/60Hz

CR18-8AO

CR Series

◪ Sensitivity Adjustment

Please turn potention VR to set sensitivity as below procedure.

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

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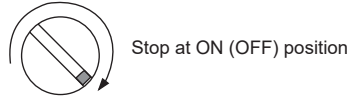
2. Put the object in right sensing position, turn the potention VR to the left and stop at the proximity sensor is OFF (ON).

Stop at OFF(ON) position

3. If the difference of the number of potention VR rotation between the ON (OFF) point and the OFF (ON) point is more than 1.5 turns, the sensing operation will be stable.

It is stable when it is over 1.5 turns

OFF position (ON position)　　ON position (OFF position)
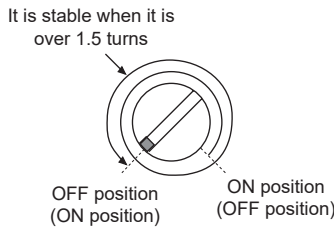
4. If it is set in sensitivity adjustment position of potention VR at center between **1** and **2**, sensitivity setting will be completed.

Adjustment completed

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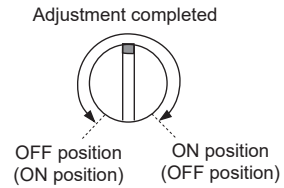
※When there is distance fluctuation between proximity sensor and the target, please adjust **2** at the farthest distance from this unit.
※Turning potention VR toward clockwise, it will be max., or turning toward counter clockwise, it will be min. The number of adjustment should be 15±3 revolution and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

◪ Grounding

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

● CR18 type

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

● CR30 type

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

Sensing target

switch b

Sensing target

switch a

Sensing target

switch b

Autonics
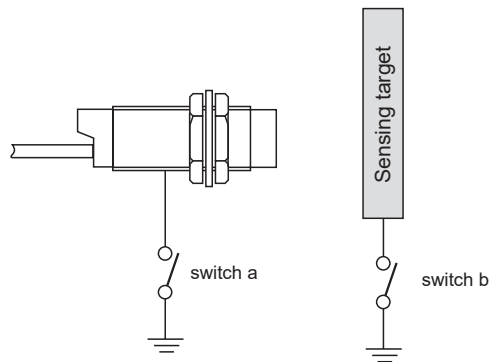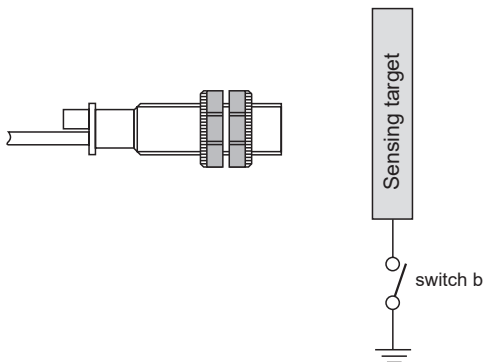
Cylindrical, Capacitive type

▣ Mutual-Interference & Influence by Surrounding Metals

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.
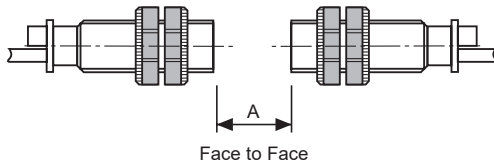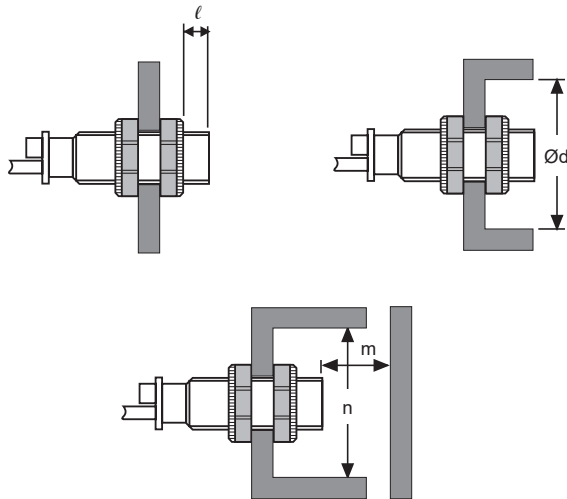
(unit: mm)

Model / Item	CR18	CR30
A	48	90
B	54	90

Face to Face

Parallel B
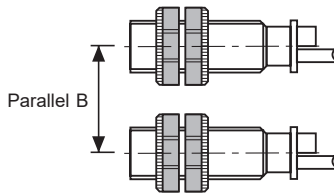
When sensors are mounted on metallic panel, you must prevent the sensors from malfunction by any metallic object. Therefore, be sure to keep a minimum distance as below charts.

(unit: mm)

Model / Item	CR18	CR30
ℓ	20	10
Ød	54	90
m	24	45
n	54	90

▣ Materials

◎ **Materials of sensing targets**
Sensing distance may be different by electrical characteristic of sensing target (conductivity, non dielectric constant) and status of water absorption, size etc.

◎ **Effect by high frequency electrical field**
It may cause malfunction by machinery which generate high frequency of electrical field such as a washing machine etc.

◎ **Surrounding environment**
There is water or oil on surface of sensing part, it may cause malfunction.
If the bottle for sensing of level is coated by oil etc., it may cause malfunction.
Especially, 15mm type has high sensitivity for induced objects, please be careful of waterdrops.

◎ **Organic solvents**
Do not let the oil or oil liquid is flowed into the sensor because the case is made by plastic.