

Weld Field Immune Type

Spatter-protection type proximity sensor

■ Features

- Enhanced noise-resistance by using exclusive IC (DC power)
- Upgraded DC 2-wire type :
Residual voltage (Max. 4VDC), Control output range (2~100mA),
Operation voltage (10~30VDC)
- Polarity free DC 2-wire type
- Reverse polarity protection and overload protection (DC),
surge absorption (DC/AC)
- Driving max. 200mA load directly within rated power
supply (DC 3-wire, AC 2-wire type)
- IP67 (IEC standard)



! Please read "Caution for your safety" in operation manual before using.



■ The characteristic of spatter-resistant type

The hot arc from arc welding machine is adhesive even with metals or plastics.

Therefore, normal proximity sensor might have malfunction even though there are no detection object if the welding are put on the detecting surface.

The arcs aren't adhered on the detection part of the spatter-resistant type proximity sensor as the part is coated with qualified material against thermal resistance.

Also, the protection cover sold optionally has the same function.

■ Specifications

● DC 2-wire type

*A blacked (■) item is upgraded function.

Model(*1)	PRAT12-2DO PRAT12-2DC PRAT12-2DO-NP PRAT12-2DC-NP	PRAT18-5DO PRAT18-5DC PRAT18-5DO-NP PRAT18-5DC-NP	PRAT30-10DO PRAT30-10DC PRAT30-10DO-NP PRAT30-10DC-NP
Detecting distance	2mm ±10%	5mm ±10%	10mm ±10%
Hysteresis	Max. 10% of detecting distance		
Standard detecting target	12×12×1mm (Iron)	18×18×1mm (Iron)	30×30×1mm (Iron)
Setting distance	0~1.4mm	0~3.5mm	0~7mm
Power supply (Operating voltage)	24VDC (10~30VDC)		
Current consumption	Max. 1.5mA		
Response frequency	800Hz	350Hz	250Hz
Residual voltage(*2)	Max. 4V		
Affection by Temp.	±10% Max. for detecting distance at +20°C within temperature range of -25 ~ +70°C		
Control output	2~100mA		
Insulation resistance	Min. 50MΩ (at 500VDC)		
Dielectric strength	1500VAC 50/60Hz for 1 minute		
Vibration	1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours		
Shock	500m/s ² (50G) in X, Y, Z direction for 3 times		
Indicator	Operating indicator (Red LED)		
Ambient temperature	-25 ~ +70°C (at non-freezing status)		
Storage temperature	-30 ~ +80°C (at non-freezing status)		
Ambient humidity	35~95%RH		
Protection circuit	Surge protection circuit, Overload & short circuit protection		
Protection	IP67 (IEC specification)		
Insulation type	φ4×2P, 2m	φ5×2P, 2m	
Approval	CE		
Weight	Approx. 63g	Approx. 122g	Approx. 181g

(*1) The "-NP" is for non-polar type.

(*2) For non-polar type, the residual voltage is below 5V.

(A)
Counter

(B)
Timer

(C)
Temp.
controller

(D)
Power
controller

(E)
Panel
meter

(F)
Tacho/
Speed/
Pulse
meter

(G)
Display
unit

(H)
Sensor
controller

(I)
Proximity
sensor

(J)
Photo
electric
sensor

(K)
Pressure
sensor

(L)
Rotary
encoder

(M)
5-Phase
stepping
motor &
Driver &
Controller

PRA Series

■ Specifications

● DC 3-wire type

Model	PRA12-2DN PRA12-2DP PRA12-2DN2 PRA12-2DP2	PRA18-5DN PRA18-5DP PRA18-5DN2 PRA18-5DP2	PRA30-10DN PRA30-10DP PRA30-10DN2 PRA30-10DP2
Detecting distance	2mm ±10%	5mm ±10%	10mm ±10%
Hysteresis	Max. 10% of detection distance		
Standard detecting target	12×12×1mm (Iron)	18×18×1mm (Iron)	30×30×1mm (Iron)
Setting distance	0~1.4mm	0~3.5mm	0~7mm
Power supply (Operation voltage)	12~24VDC (10~30VDC)		
Current consumption	Max. 10mA		
Response frequency	800Hz	350Hz	250Hz
Residual voltage	Max. 1.5V		
Affection by Temp.	±10% Max. for detecting distance at +20°C within temperature range of -25 ~ +70°C		
Control output	200mA		
Insulation resistance	Min. 50MΩ (at 500VDC)		
Dielectric strength	1500VAC 50/60Hz for 1 minute		
Vibration	1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours		
Shock	500m/s ² (50G) in X, Y, Z direction for 3 times		
Indicator	Operation indicator (Red LED)		
Ambient temperature	-25 ~ +70°C (at non-freezing status)		
Storage temperature	-30 ~ +80°C (at non-freezing status)		
Ambient humidity	35~95%RH		
Protection circuit	Reverse polarity protection, Surge protection circuit, Overload & short circuit protection		
Protection	IP67 (IEC specification)		
Insulation type	φ 4×3P, 2m	φ 5×3P, 2m	
Approval	CE		
Weight	Approx. 70g	Approx. 119g	Approx. 184g

● AC 2-wire type

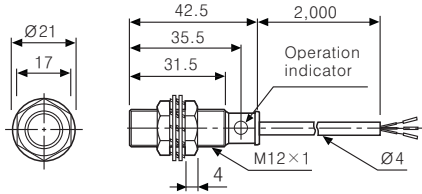
Model	PRA12-2AO PRA12-2AC	PRA18-5AO PRA18-5AC	PRA30-10AO PRA30-10AC
Detecting distance	2mm ±10%	5mm ±10%	10mm ±10%
Hysteresis	Max. 10% of detection distance		
Standard detecting target	12×12×1mm (Iron)	18×18×1mm (Iron)	30×30×1mm (Iron)
Setting distance	0~1.4mm	0~3.5mm	0~7mm
Power supply (Operation voltage)	100~240VDC (85~264VAC)		
Current consumption	Max. 2.5mA		
Response frequency	20Hz		
Residual voltage	Max. 10V		
Affection by Temp.	±10% Max. for detecting distance at +20°C within temperature range of -25 ~ +70°C		
Control output	5~150mA	5~200mA	
Insulation resistance	Min. 50MΩ (at 500VDC)		
Dielectric strength	2500VAC 50/60Hz for 1 minute		
Vibration	1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours		
Shock	500m/s ² (50G) in X, Y, Z direction for 3 times		
Indicator	Operation indicator (Red LED)		
Ambient temperature	-25 ~ +70°C (at non-freezing status)		
Storage temperature	-30 ~ +80°C (at non-freezing status)		
Ambient humidity	35 ~ 95%RH		
Protection circuit	Surge protection circuit		
Protection	IP67 (IEC specification)		
Insulation type	φ 4×2P, 2m	φ 5×2P, 2m	
Approval	CE		
Weight	Approx. 66g	Approx. 130g	Approx. 185g

Weld Field Immune Type

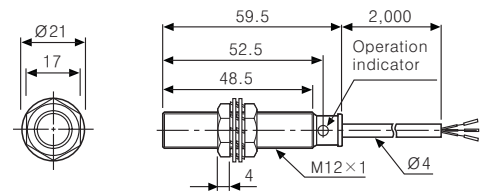
Dimensions

Unit:mm

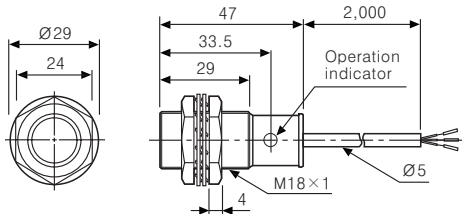
●PRA12-2D □ ●PRAT12-2D □



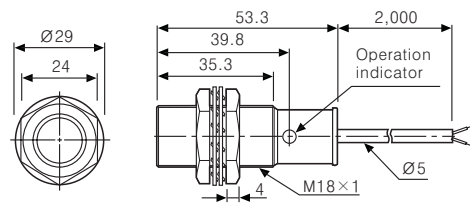
●PRA12-2A □



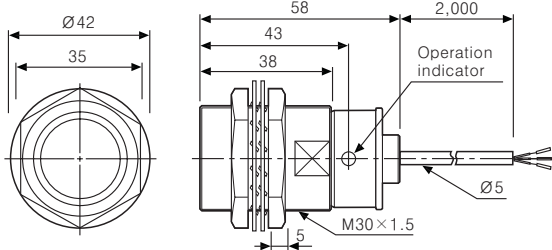
●PRA18-5D □ ●PRAT18-5D □



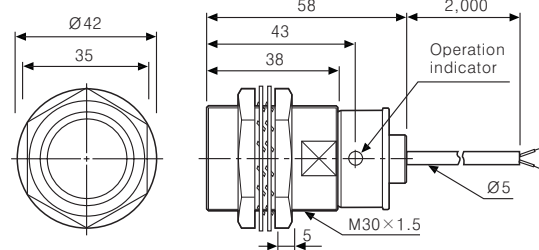
●PRA18-5A □



●PRA30-10D □ ●PRAT30-10D □

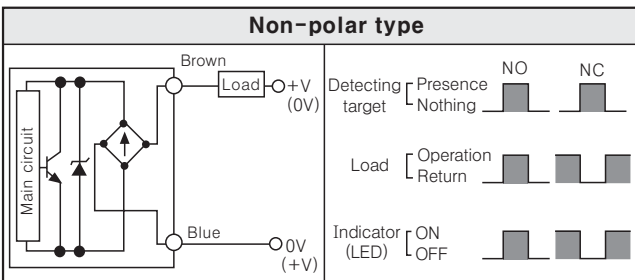
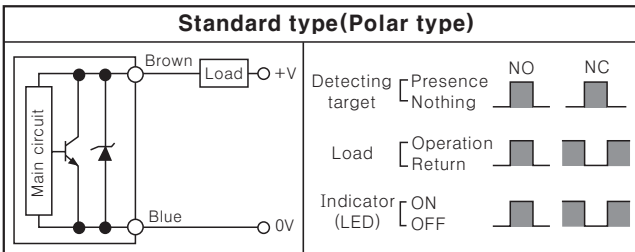


●PRA30-10A □



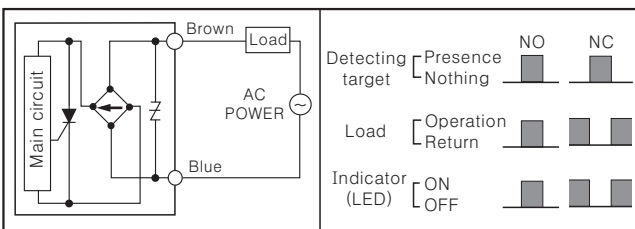
Control output diagram

◎DC 2-wire type

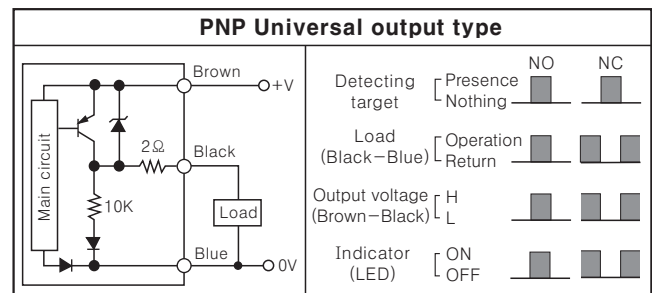
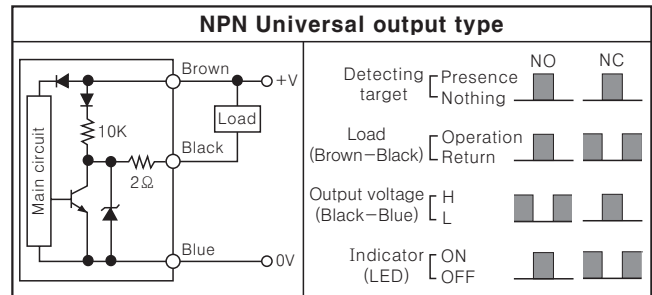


※ It is connectable without affecting polarity.

◎AC 2-wire type



◎DC 3-wire type



(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Proximity sensor

(J) Photo electric sensor

(K) Pressure sensor

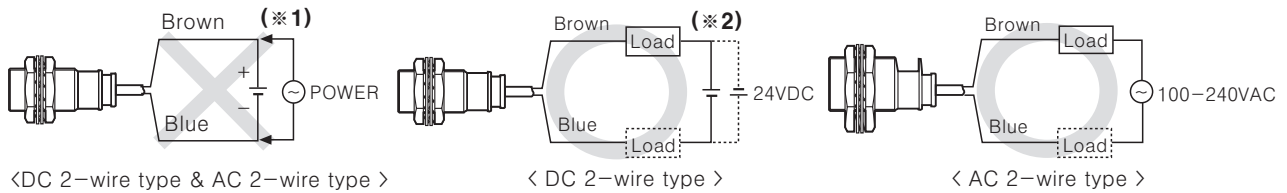
(L) Rotary encoder

(M) 5-Phase stepping motor & Driver & Controller

PRA Series

■ Proper usage

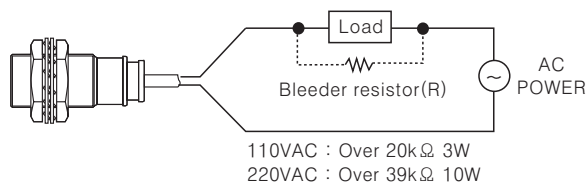
◎ Load connections



- *1. When using DC 2-wire and AC 2-wire type, a load must be connected before applying power; otherwise, components can be damaged. The load is connectable without affecting polarity.
- *2. For non-polar type of DC-2 wire type, it is connectable without affecting polarity.

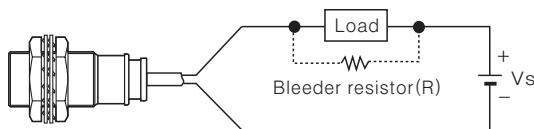
◎ In case of the load current is small

● AC 2-wire type



It may cause return failure of load by residual voltage. If the load current is under 5mA, please make sure the residual voltage is less than the return voltage of the load by connecting a bleeder resistor in parallel with the load as shown in the diagram.

● DC 2-wire type



Please make the current on proximity sensor smaller than the return current of load by connecting a bleeder resistor in parallel.

*W value of Bleeder resistor should be bigger for proper heat dissipation.

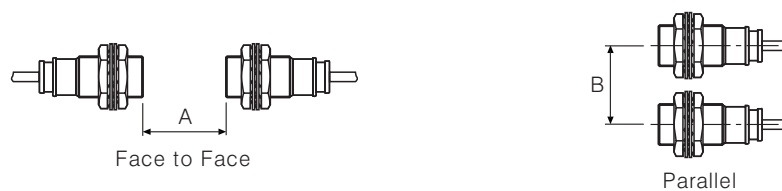
$$R \leq \frac{V_s}{I_o - I_{off}} \quad (\text{k}\Omega)$$

$$P > \frac{V_s^2}{R} \quad (\text{mW})$$

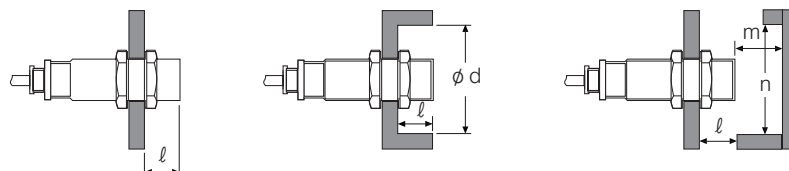
* Vs : Power supply
P : Bleeder resistor, number of W
I_o : Operating current of proximity sensor (2.5mA but, PRT08, PST17 is 0.9mA)
I_{off} : Return current of load

◎ Mutual-interference & Influence by surrounding metals

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



When sensors are mounted on metallic panel, you must prevent sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



Unit:mm

Item \ Model	PRA□12-2D□	PRA□18-5D□	PRA□30-10D□	PRA12-2A□	PRA18-5A□	PRA30-10A□
A	12	30	60	12	30	60
B	24	36	60	24	36	60
l	0	0	0	0	0	0
φ d	12	18	30	12	18	30
m	6	15	30	6	15	30
n	18	27	45	18	27	45