

Cylindrical Spatter-Resistance Connector Type Proximity Sensor

■ Features

- Prevent malfunction due to welding spatter with PEFE coating
- Improved the noise immunity with dedicated IC
- Built-in reverse polarity protection circuit (DC 3-wire type)
- Built-in surge protection circuit, output short over current protection circuit
- IP67 protection structure (IEC standard)
- Replaceable for spatter-resistance type limit switches



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



■ The Characteristic of Spatter-Resistance 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 sensing object if the arcs are put on the sensing surface. The arcs are not adhered on the sensing part of the spatter-resistance type proximity sensor as the part is coated with PEFE against thermal resistance. Also, the protection cover sold optionally has the same function.

■ Specifications

● DC 2-wire type

Model	PRACMT12-2DO PRACMT12-2DC PRACMT12-2DO-I PRACMT12-2DC-I	PRACMT18-5DO PRACMT18-5DC PRACMT18-5DO-I PRACMT18-5DC-I	PRACMT30-10DO PRACMT30-10DC PRACMT30-10DO-I PRACMT30-10DC-I
Diameter of the sensing side	12mm	18mm	30mm
Sensing distance	2mm	5mm	10mm
Installation	Shield (flush)		
Hysteresis	Max. 10% of sensing distance		
Standard sensing target	12×12×1mm (iron)	18×18×1mm (iron)	30×30×1mm (iron)
Setting distance	0 to 1.4mm	0 to 3.5mm	0 to 7mm
Power supply (operating voltage)	12-24VDC= (10-30VDC=)		
Leakage current	Max. 0.6mA		
Response frequency ^{※1}	1.5kHz	500Hz	400Hz
Residual voltage	Max. 3.5V		
Affection by Temp.	Max ±10% for sensing distance at ambient temperature 20°C		
Control output	2 to 100mA		
Insulation resistance	Over 500MΩ (at 500VDC megger)		
Dielectric strength	1,500VAC 50/60Hz for 1 min		
Vibration	1mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
Shock	500m/s ² (approx. 50G) in each 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	Surge protection circuit, output short over current protection circuit		
Protection structure	IP67 (IEC standards)		
Material	Case/Nut: PEFE coated brass, Washer: PEFE coated iron, Sensing surface: PEFE		
Approval	CE		
Weight ^{※2}	Approx. 38g (approx. 26g)	Approx. 61g (approx. 49g)	Approx. 146g (approx. 134g)

※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 is for unit only.

※Environment resistance is rated at no freezing or condensation.

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

PRACM Series

■ Specifications

● DC 3-wire type

Model	PRACM12-2DN PRACM12-2DP PRACM12-2DN2 PRACM12-2DP2	PRACM18-5DN PRACM18-5DP PRACM18-5DN2 PRACM18-5DP2	PRACM30-10DN PRACM30-10DP PRACM30-10DN2 PRACM30-10DP2
Diameter of the sensing side	12mm	18mm	30mm
Sensing distance	2mm	5mm	10mm
Installation	Shield (flush)		
Hysteresis	Max. 10% of sensing distance		
Standard sensing target	12×12×1mm (iron)	18×18×1mm (iron)	30×30×1mm (iron)
Setting distance	0 to 1.4mm	0 to 3.5mm	0 to 7mm
Power supply (operating voltage)	12-24VDC= (10-30VDC=)		
Current consumption	Max. 10mA		
Response frequency ^{※1}	1.5kHz	500Hz	400Hz
Residual voltage	Max. 1.5V		
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C		
Control output	Max. 200mA		
Insulation resistance	Over 500MΩ (at 500VDC megger)		
Dielectric strength	1,500VAC 50/60Hz for 1 min		
Vibration	1mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
Shock	500m/s ² (approx. 50G) in each X, Y, Z direction 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	Surge protection circuit, reverse polarity protection circuit, output short over current protection circuit		
Protection structure	IP67 (IEC standard)		
Material	Case/Nut: PEFE coated brass, Washer: PEFE coated iron, Sensing surface: PEFE		
Approval	CE		
Weight ^{※2}	Approx. 38g (approx. 26g)	Approx. 61g (approx. 49g)	Approx. 146g (approx. 134g)

※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.

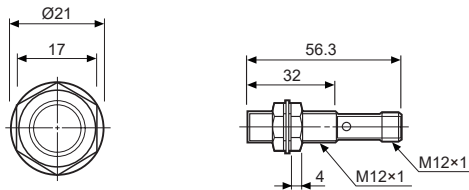
※2: The weight includes packaging. The weight in parenthesis is for unit only.

※Environment resistance is rated at no freezing or condensation.

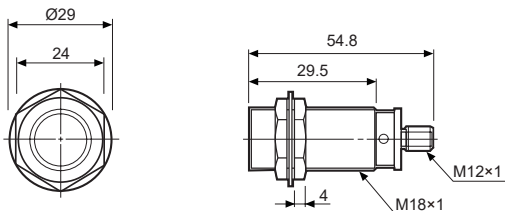
(unit: mm)

■ Dimensions

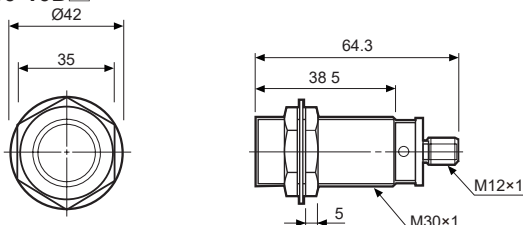
● PRACM(T)12-2D□



● PRACM(T)18-5D□



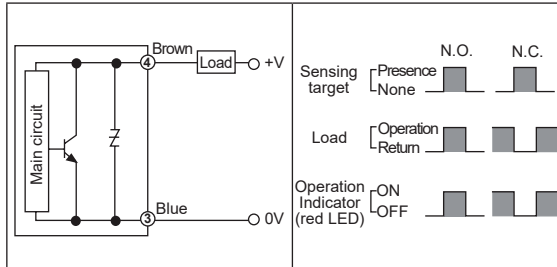
● PRACM(T)30-10D□



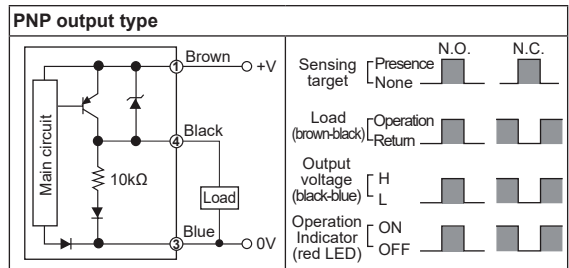
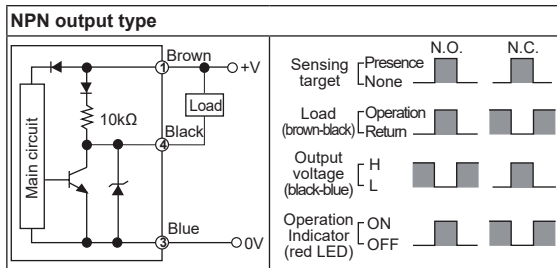
Cylindrical Spatter-Resistance Connector Type

Control Output Diagram and Load Operation

DC 2-wire type

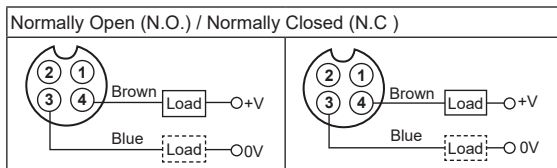


DC 3-wire type



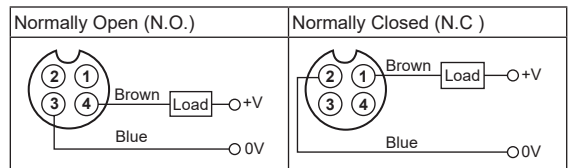
Wiring Diagram

DC 2-wire type (standard type)



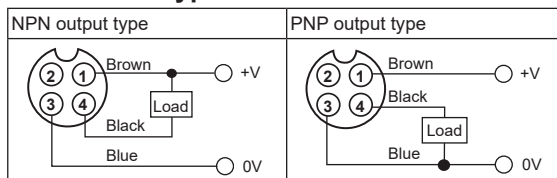
- ※ Pin ①, ② are not used terminals.
- ※ For DC 3-wire type connector cable, it is available to use with use black wire (12-24VDC) and blue wire (0V).

DC 2-wire type (IEC standard type)



- ※ ②, ③ of N.O. type and ③, ④ of N.C. type are not used terminals.
- ※ The pin arrangement of connector applying IEC standard is being developed.
- ※ Please attach "I" at the end of the name of standard type for purchasing the IEC standard product.
E.g.) PRACMT12-5DO-I
- ※ The connector cable for IEC standard is being developed. Please attach "I" at the end of the name of standard type.
E.g.) CID2-2-I, CLD2-5-I

DC 3-wire type



- ※ Please fasten the cleat of connector not to shown the thread. (0.39 to 0.49N·m)
- ※ Please fasten the vibration part with PEFE tape.
- ※ For more information about cable and specification, refer to the (I) Connectors/Cable Connectors/Sensor Distribution Boxes/Sockets

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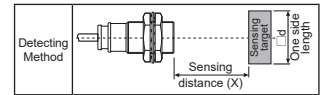
(G) Pressure Sensors

(H) Rotary Encoders

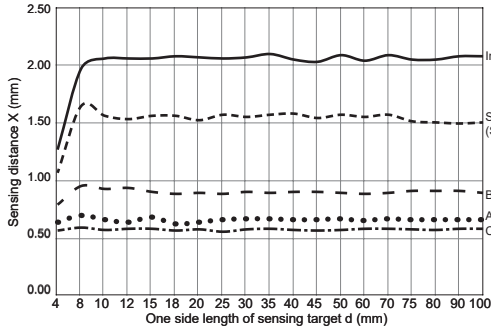
(I) Connectors/Connector Cables/Sensor Distribution Boxes/Sockets

PRACM Series

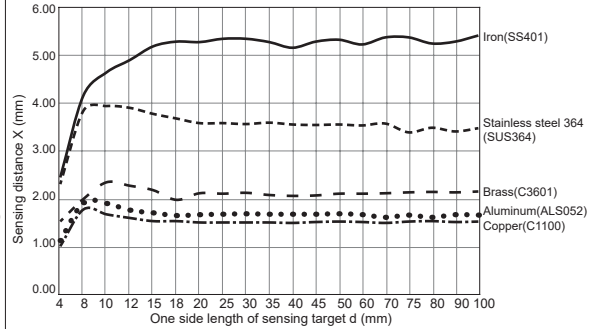
■ Sensing Distance Feature Data by Target Material and Size



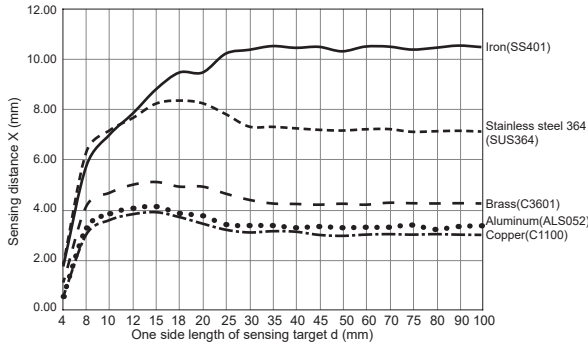
● PRACMT12-2D



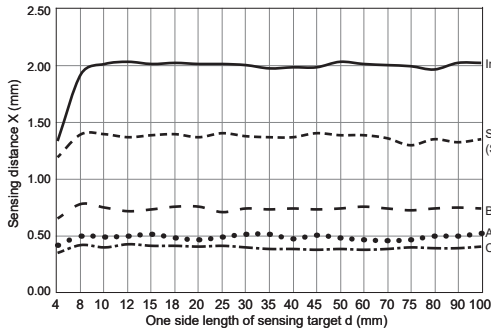
● PRACMT18-5D



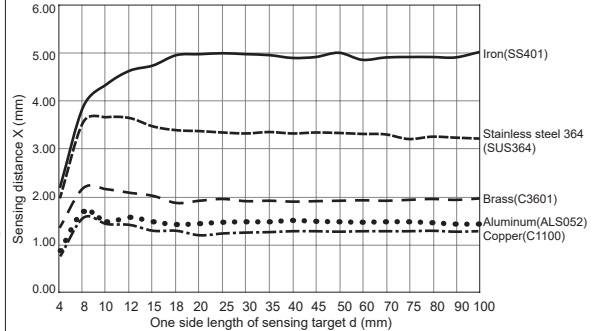
● PRACMT30-10D



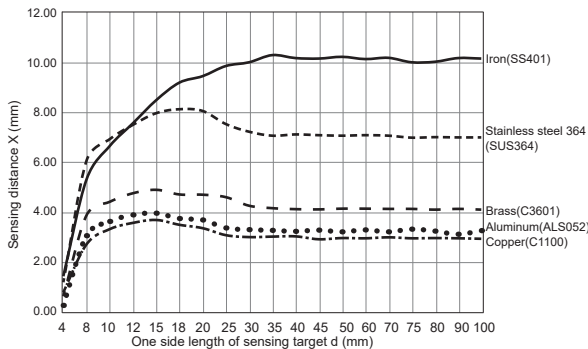
● PRACM12-2D



● PRACM18-5D

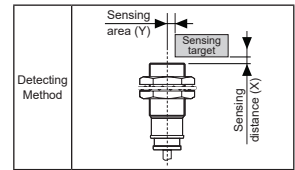


● PRACM30-10D

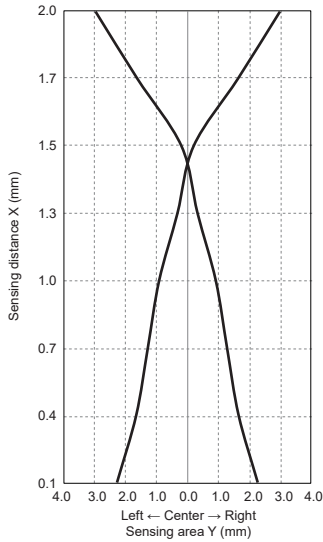


Cylindrical Spatter-Resistance Connector Type

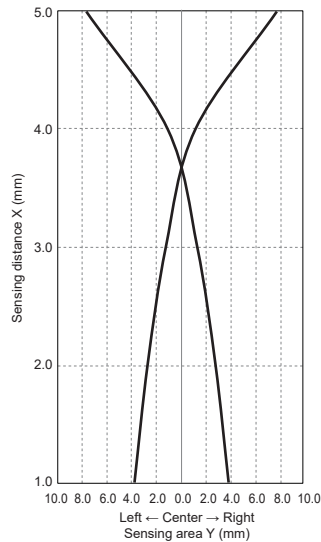
■ Sensing Distance Feature Data by Parallel (Left/Right) Movement



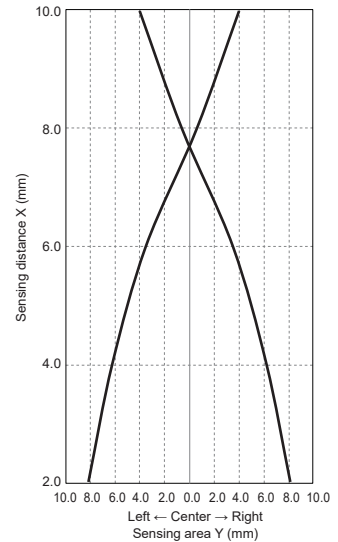
● PRACMT12-2D



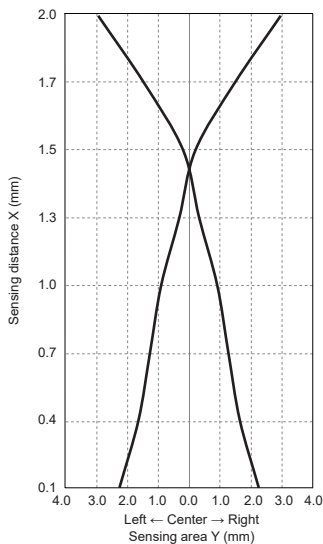
● PRACMT18-5D



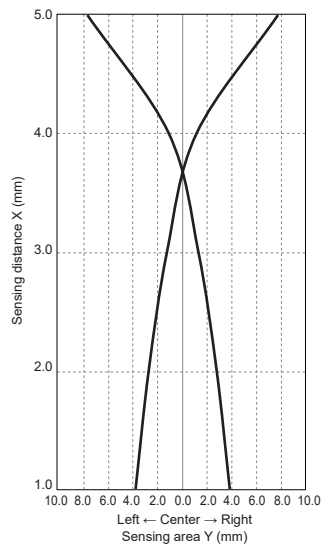
● PRACMT30-10D



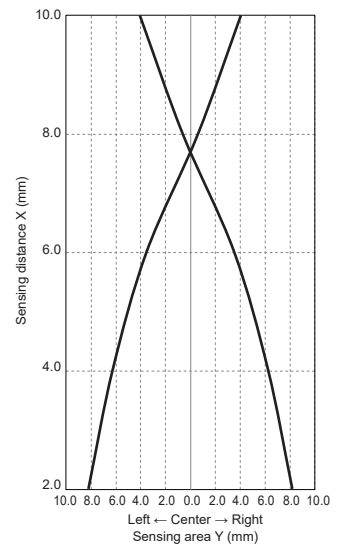
● PRACM12-2D



● PRACM18-5D



● PRACM30-10D



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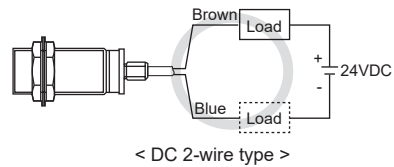
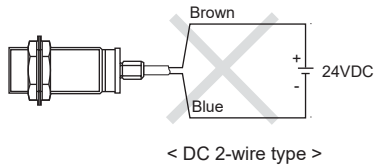
(H) Rotary Encoders

(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

PRACM Series

■ Proper Usage

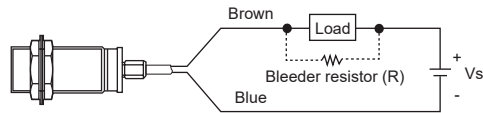
◎ Load connections



When using DC 2-wire type proximity sensor, the load must be connected, otherwise internal components may be damaged. The load can be connected to either wire.

◎ In case of the load current is small

● DC 2-wire type



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.

$$R \leq \frac{V_s}{I} \text{ (k}\Omega\text{)} \quad P > \frac{V_s^2}{R} \text{ (W)}$$

[I: Action current of load, R: Bleeder resistance, P: Permissible power]

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.

$$R \leq \frac{V_s}{I_o - I_{off}} \text{ (k}\Omega\text{)} \quad P > \frac{V_s^2}{R} \text{ (W)}$$

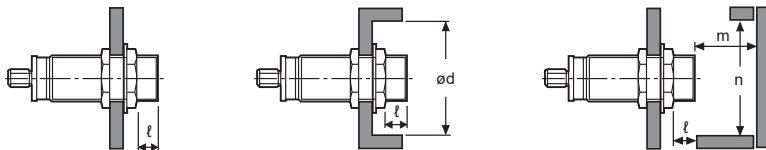
[Vs: Power supply, Io: Min. action current of proximity sensor
 Ioff: Return current of load, P: Number of Bleeder resistance watt]

◎ Mutual-interference & Influence by surrounding metals

When several proximity sensors are mounted close to one another a malfunction of the may be caused due to mutual interference. Therefore, be sure to keep a minimum distance between the two sensors as below chart indicates.



When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart indicates.



(unit: mm)

Item \ Model	PRACMT12-2D□ PRACM12-2D□	PRACMT18-5D□ PRACM18-5D□	PRACMT30-10D□ PRACM30-10D□
A	12	30	60
B	24	36	60
ℓ	0	0	0
ød	12	18	30
m	6	15	30
n	18	27	45