

# PRAW Series

## Cylindrical, Spatter-Resistance, Cable Connector Type

### ■ Features

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



**!** Please read "Safety Considerations" in operation 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 PTFE against thermal resistance. Also, the protection cover sold optionally has the same function.

### ■ Specifications

#### ● DC 2-wire type

※When the □ model name is X, it is non-polarity model.

Model	PRAW12-2□DC PRAW12-2□DO PRAW12-2□DC-I PRAW12-2□DO-I	PRAW18-5□DO PRAW18-5□DC PRAW18-5□DO-I PRAW18-5□DC-I	PRAW30-10□DO PRAW30-10□DC PRAW30-10□DO-I PRAW30-10□DC-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 <sup>※1</sup>	1.5kHz	500Hz	400Hz
Residual voltage <sup>※2</sup>	Max. 3.5V (non-polarity type is max. 5V)		
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C		
Control output	2 to 100mA		
Insulation resistance	Over 50MΩ (at 500VDC megger)		
Dielectric strength	1,500VAC 50/60Hz for 1 min (between all terminals and case)		
Vibration	1mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
Shock	500m/s <sup>2</sup> (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, output short over current protection circuit		
Protection structure	IP67 (IEC standard)		
Cable	Ø4mm, 2-wire, 300mm, M12 connector		Ø5mm, 2-wire, 300mm, M12 connector
	AWG22, Core diameter: 0.8mm, Number of cores: 60, Insulator diameter: Ø1.25mm		
Material	Case/Nut: PTFE coated brass, Washer: PTFE coated iron, Sensing surface: PTFE, Standard cable (black): Polyvinyl chloride (PVC)		
Approval	CE		
Weight <sup>※3</sup>	Approx. 54g (approx. 42g)	Approx. 70g (approx. 58g)	Approx. 134g (approx. 122g)

※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: Before using non-polarity type, check the condition of connected device because residual voltage is 5V.

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

※For more information about cable and specification, refer to the (I) Connectors/Cable Connectors/Sensor Distribution Boxes/Sockets

※The □ of model name is for power type. 'D' is 12-24VDC, 'X' is non-polarity 12-24VDC.

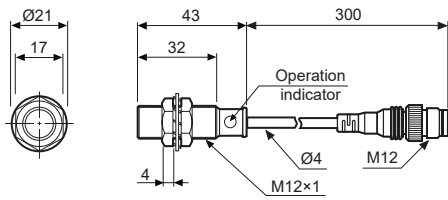
※Environment resistance is rated at no freezing or condensation.

# Cylindrical, Spatter-Resistance, Cable Connector Type

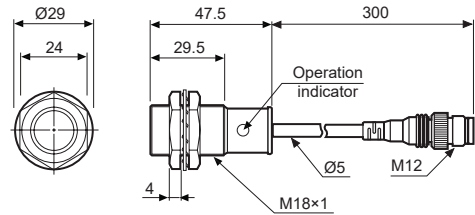
## ■ Dimensions

(unit: mm)

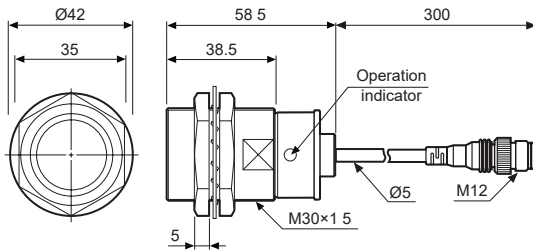
### ● PRAWT12-2D



### ● PRAWT18-5D

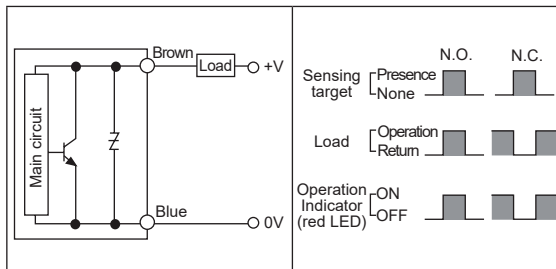


### ● PRAWT30-10D



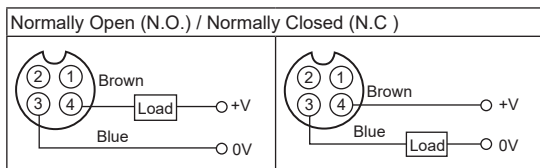
## ■ Control Output Diagram and Load Operation

### ◎ DC 2-wire type



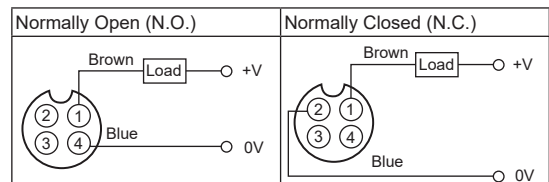
## ■ Wiring Diagram

### ◎ DC 2-wire type (standard type)



※ ①, ② are not used terminals.

### ◎ 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.) PRAWT12-2DO-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

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LIDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

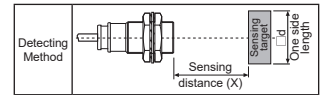
(G) Pressure Sensors

(H) Rotary Encoders

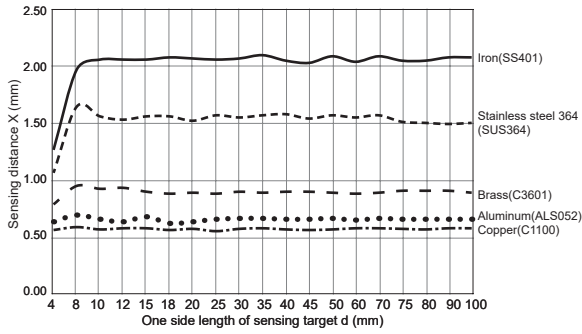
(I) Connectors/  
Connector Cables/  
Sensor Distribution  
Boxes/ Sockets

# PRAW Series

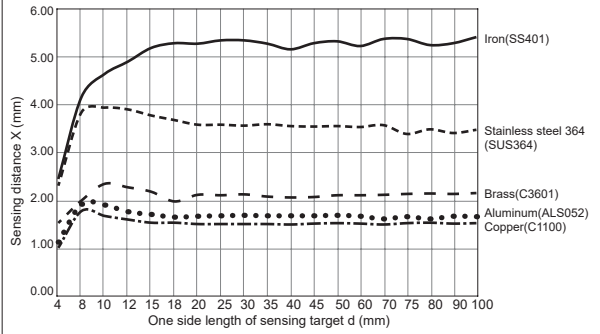
## ■ Sensing Distance Feature Data by Target Material and Size



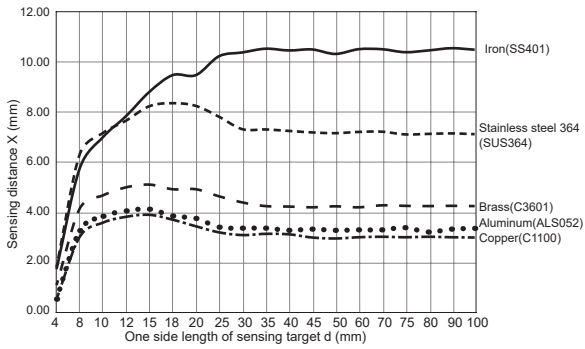
### ● PRAW12-2D



### ● PRAW18-5D

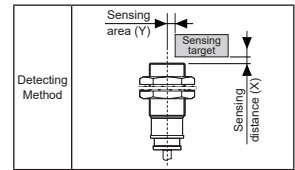


### ● PRAW30-10D

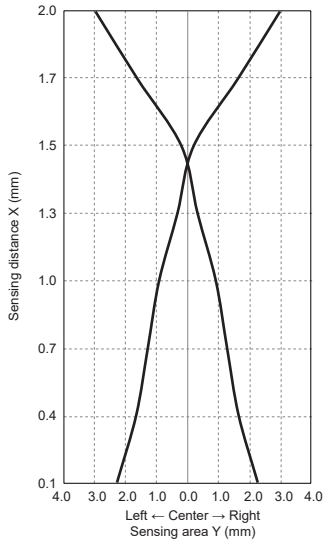


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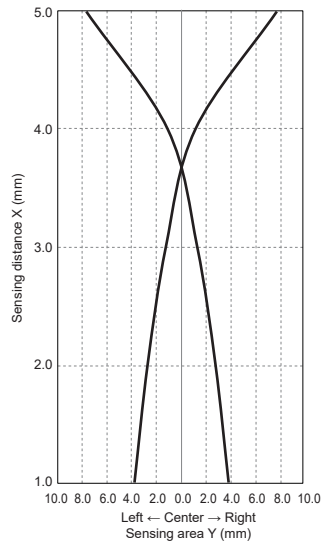
## ■ Sensing Distance Feature Data by Parallel (Left/Right) Movement



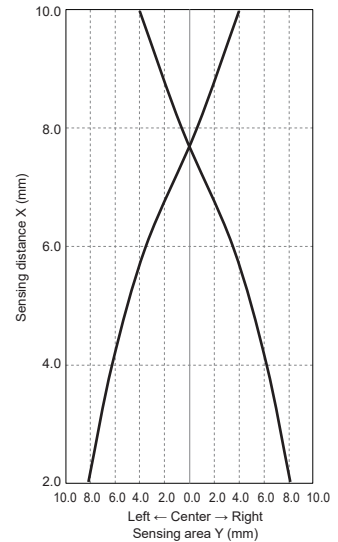
### ● PRAWT12-2D



### ● PRAWT18-5D



### ● PRAWT30-10D



SENSORS

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(G) Pressure Sensors

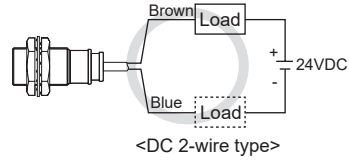
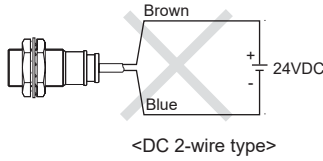
(H) Rotary Encoders

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

# PRAW Series

## ■ Proper Usage

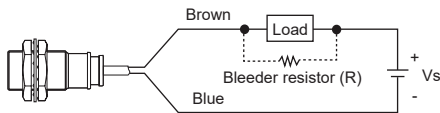
### ◎ Load connections



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.

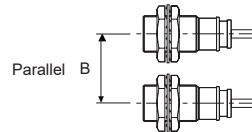
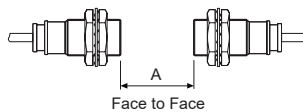
※W value of Bleeder resistor should be bigger for proper heat.

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

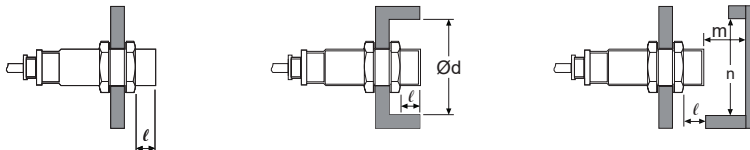
[Vs: Power supply, Ioff: Min. action current of proximity sensor  
P: Number of Bleeder resistance watt]

### ◎ Mutual-interference & Influence by surrounding metals

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



When sensors are mounted on metallic panel, you must prevent 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	PRAWT12-2D□	PRAWT18-5D□	PRAWT30-10D□
A		12	30	60
B		24	36	60
ℓ		0	0	0
Ød		12	18	30
m		6	15	30
n		18	27	45