

# PRCM Series

## Cylindrical connector type proximity sensor

### ■ Features

- Improved the noise resistance with dedicated IC
- Built-in reverse polarity protection circuit (DC 3-wire type)
- Built-in surge protection circuit
- Built-in overcurrent protection circuit (DC type)
- IP67 protection structure (IEC standard) for connector part
- Replaceable for micro switches and limit switches

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



### ■ Specifications

#### ● DC 2-wire type

| Model                            | PRCMT12-2DO<br>PRCMT12-2DC<br>PRCMT12-2DO-I<br>PRCMT12-2DC-I                                   | PRCMT12-4DO<br>PRCMT12-4DC<br>PRCMT12-4DO-I<br>PRCMT12-4DC-I | PRCMT18-5DO<br>PRCMT18-5DC<br>PRCMT18-5DO-I<br>PRCMT18-5DC-I | PRCMT18-8DO<br>PRCMT18-8DC<br>PRCMT18-8DO-I<br>PRCMT18-8DC-I | PRCMT30-10DO<br>PRCMT30-10DC<br>PRCMT30-10DO-I<br>PRCMT30-10DC-I | PRCMT30-15DO<br>PRCMT30-15DC<br>PRCMT30-15DO-I<br>PRCMT30-15DC-I |
|----------------------------------|--|--|--|--|--|--|
| Sensing distance                 | 2mm  | 4mm  | 5mm  | 8mm  | 10mm   | 15mm   |
| Hysteresis                       | Max. 10% of sensing distance   |  |  |  |  |  |
| Standard sensing target          | 12×12×1mm (Iron)   |  | 18×18×1mm (Iron)   | 25×25×1mm (Iron)   | 30×30×1mm (Iron)   | 45×45×1mm (Iron)   |
| Setting distance                 | 0 to 1.4mm   | 0 to 2.8mm   | 0 to 3.5mm   | 0 to 5.6mm   | 0 to 7mm   | 0 to 10.5mm  |
| Power supply (Operating voltage) | 12-24VDC (10-30VDC)  |  |  |  |  |  |
| Leakage current                  | Max. 0.6mA   |  |  |  |  |  |
| Response frequency <sup>※1</sup> | 1.5kHz   | 500Hz  | 350Hz  | 400Hz  | 200Hz  |  |
| 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            | Min. 50MΩ (at 500VDC megger)   |  |  |  |  |  |
| Dielectric strength              | 1,500VAC 50/60Hz for 1minute   |  |  |  |  |  |
| Vibration                        | 1mm amplitude at frequency of 10 to 55Hz (for 1 min) in each of X, Y, Z directions for 2 hours |  |  |  |  |  |
| Shock                            | 500m/s <sup>2</sup> (approx. 50G) in each of 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, Overcurrent protection   |  |  |  |  |  |
| Protection structure             | IP67 (IEC standard)  |  |  |  |  |  |
| Material                         | Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT                |  |  |  |  |  |
| Approval                         | <b>CE</b>  |  |  |  |  |  |
| Weight <sup>※2</sup>             | Approx. 38g (approx. 26g)  |  | Approx. 60g (approx. 48g)                                    |  | Approx. 154g (approx. 142g)                                      |  |

※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 parentheses is for unit only.

※ There is IEC standard connector cable. Refer to the G-6 about IEC standard connector wires and specifications.

※ Environment resistance is rated at no freezing or condensation.


# Cylindrical Connector type

## ■ Specifications

### ● DC 3-wire type

| Model                               | PRCM12-2DN<br>PRCM12-2DP<br>PRCM12-2DN2<br>PRCM12-2DP2   | PRCM12-4DN<br>PRCM12-4DP<br>PRCM12-4DN2<br>PRCM12-4DP2 | PRCM18-5DN<br>PRCM18-5DP<br>PRCM18-5DN2<br>PRCM18-5DP2<br>PRCML18-5DN<br>PRCML18-5DP<br>PRCML18-5DN2<br>PRCML18-5DP2 | PRCM18-8DN<br>PRCM18-8DP<br>PRCM18-8DN2<br>PRCM18-8DP2<br>PRCML18-8DN<br>PRCML18-8DP<br>PRCML18-8DN2<br>PRCML18-8DP2 | PRCM30-10DN<br>PRCM30-10DP<br>PRCM30-10DN2<br>PRCM30-10DP2<br>PRCML30-10DN<br>PRCML30-10DP<br>PRCML30-10DN2<br>PRCML30-10DP2 | PRCM30-15DN<br>PRCM30-15DP<br>PRCM30-15DN2<br>PRCM30-15DP2<br>PRCML30-15DN<br>PRCML30-15DP<br>PRCML30-15DN2<br>PRCML30-15DP2 |
|-------------------------------------|--|--|--|--|--|--|
| Sensing distance                    | 2mm  | 4mm  | 5mm  | 8mm  | 10mm   | 15mm   |
| Hysteresis                          | Max. 10% of sensing distance   |  |  |  |  |  |
| Standard sensing target             | 12×12×1mm (Iron)   |  | 18×18×1mm (Iron)   | 25×25×1mm (Iron)   | 30×30×1mm (Iron)   | 45×45×1mm (Iron)   |
| Sensing distance                    | 0 to 1.4mm   | 0 to 2.8mm   | 0 to 3.5mm   | 0 to 5.6mm   | 0 to 7mm   | 0 to 10.5mm  |
| Power supply<br>(Operating voltage) | 12-24VDC<br>(10-30VDC)   |  |  |  |  |  |
| Current consumption                 | Max. 10mA  |  |  |  |  |  |
| Response frequency <sup>※1</sup>    | 1.5kHz   | 500kHz   | 500kHz   | 350kHz   | 400kHz   | 200kHz   |
| Residual voltage                    | Max. 1.5V  |  |  |  |  |  |
| Affection by Temp.                  | Max. ±10% for sensing distance at ambient temperature 20°C                                     |  |  |  |  |  |
| Control output                      | Max. 200mA   |  |  |  |  |  |
| Insulation resistance               | Min. 50MΩ (at 500VDC megger)   |  |  |  |  |  |
| Dielectric strength                 | 1,500VAC 50/60Hz for 1minute   |  |  |  |  |  |
| Vibration                           | 1mm amplitude at frequency of 10 to 55Hz (for 1 min) in each of X, Y, Z directions for 2 hours |  |  |  |  |  |
| Shock                               | 500m/s <sup>2</sup> (approx. 50G) in each of 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, Reverse polarity protection circuit, Overcurrent protection          |  |  |  |  |  |
| Protection structure                | IP67(IEC Standard)   |  |  |  |  |  |
| Material                            | Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT                |  |  |  |  |  |
| Approval                            | <b>CE</b>  |  |  |  |  |  |
| Weight <sup>※2</sup>                | Approx. 38g(approx. 26g)   |  | PRCM: Approx. 61g(approx. 49g)<br>PRCML: Approx. 85g(approx. 73g)  |  | PRCM: Approx. 146g(approx. 134g)<br>PRCML: Approx. 181g(approx. 169g)  |  |

### ● AC 2-wire type

| Model                               | PRCM12-2AO<br>PRCM12-2AC   | PRCM12-4AO<br>PRCM12-4AC          | PRCM18-5AO<br>PRCM18-5AC<br>PRCML18-5AO<br>PRCML18-5AC            | PRCM18-8AO<br>PRCM18-8AC<br>PRCML18-8AO<br>PRCML18-8AC | PRCM30-10AO<br>PRCM30-10AC<br>PRCML30-10AO<br>PRCML30-10AC            | PRCM30-15AO<br>PRCM30-15AC<br>PRCML30-15AO<br>PRCML30-15AC |
|-------------------------------------|--|-----------------------------------|---|--|---|--|
| Sensing distance                    | 2mm  | 4mm                               | 5mm   | 8mm  | 10mm  | 15mm   |
| Hysteresis                          | Max. 10% of sensing distance   |                                   |   |  |   |  |
| Standard sensing target             | 12×12×1mm(Iron)  |                                   | 18×18×1mm(Iron)   | 25×25×1mm(Iron)  | 30×30×1mm(Iron)   | 45×45×1mm(Iron)  |
| Sensing distance                    | 0 to 1.4mm   | 0 to 2.8mm                        | 0 to 3.5mm  | 0 to 5.6mm   | 0 to 7mm  | 0 to 10.5mm  |
| Power supply<br>(Operating voltage) | 100-240VAC<br>(85-264VAC)  |                                   |   |  |   |  |
| Leakage current                     | Max. 2.5mA   |                                   |   |  |   |  |
| Response frequency <sup>※1</sup>    | 20Hz   |                                   |   |  |   |  |
| Residual voltage                    | Max. 10V   |                                   |   |  |   |  |
| Affection by Temp.                  | Max. ±10% for sensing distance at ambient temperature 20°C   |                                   |   |  |   |  |
| Control output                      | 5 to 150mA   |                                   | 5 to 200mA  |  |   |  |
| Insulation resistance               | Min. 50MΩ (at 500VDC megger)   |                                   |   |  |   |  |
| Dielectric strength                 | 2,500VAC 50/60Hz for 1minute   |                                   |   |  |   |  |
| Vibration                           | 1mm amplitude at frequency of 10 to 55Hz (for 1 min) in each of X, Y, Z directions for 2 hours   |                                   |   |  |   |  |
| Shock                               | 500m/s <sup>2</sup> (approx. 50G) in each of 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   |                                   |   |  |   |  |
| Protection structure                | IP67 (IEC Standard)  |                                   |   |  |   |  |
| Insulation type                     | Double insulation or reinforced insulation<br>(Mark:  , dielectric strength between the measuring input part and the power part: 1kV) |                                   |   |  |   |  |
| Material                            | Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT  |                                   |   |  |   |  |
| Approval                            | <b>CE</b>  |                                   |   |  |   |  |
| Weight <sup>※2</sup>                | Approx. 42g(approx. 30g)   |                                   | PRCM: Approx. 66g(approx. 54g)<br>PRCML: Approx. 78g(approx. 66g) |  | PRCM: Approx. 154g(approx. 142g)<br>PRCML: Approx. 194g(approx. 182g) |  |

※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 parentheses in for unit only.

※ Environment resistance is rated at no freezing or condensation.

(A)  
Photo  
electric  
sensor

(B)  
Fiber  
optic  
sensor

(C)  
Door/Area  
sensor

(D)  
Proximity  
sensor

(E)  
Pressure  
sensor

(F)  
Rotary  
encoder

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

(H)  
Temp.  
controller

(I)  
SSR/  
Power  
controller

(J)  
Counter

(K)  
Timer

(L)  
Panel  
meter

(M)  
Tacho/  
Speed/ Pulse  
meter

(N)  
Display  
unit

(O)  
Sensor  
controller

(P)  
Switching  
mode power  
supply

(Q)  
Stepper  
motor&  
Driver&Controller

(R)  
Graphic/  
Logic  
panel

(S)  
Field  
network  
device

(T)  
Software

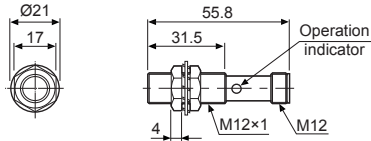
(U)  
Other

# PRCM Series

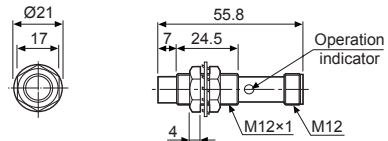
## ■ Dimensions

(unit: mm)

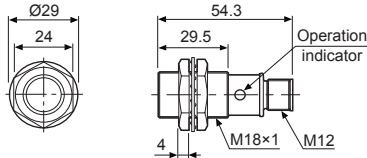
● PRCM12-2D□ / PRCMT12-2D□(-I)



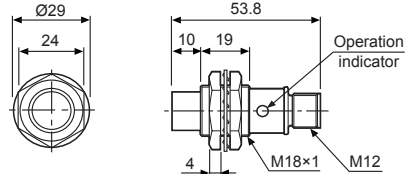
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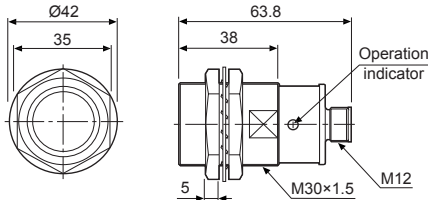
● PRCM18-5D□ / PRCMT18-5D□(-I)



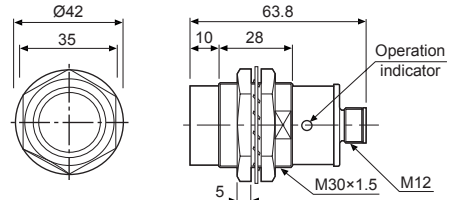
● PRCM18-8D□ / PRCMT18-8D□(-I)



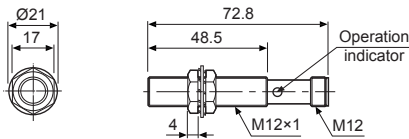
● PRCM30-10D□ / PRCMT30-10D□(-I)



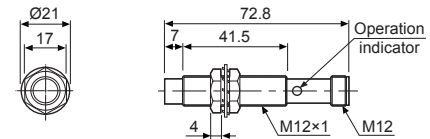
● PRCM30-15D□ / PRCMT30-15D□(-I)



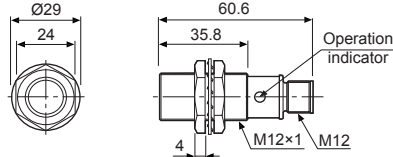
● PRCM12-2A□



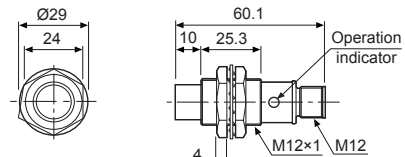
● PRCM12-4A□



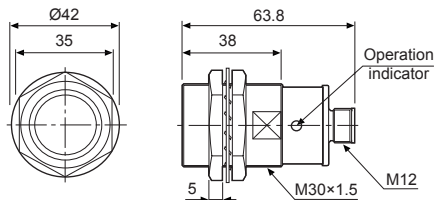
● PRCM18-5A□



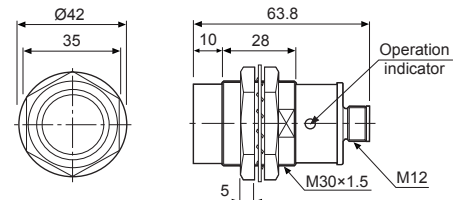
● PRCM18-8A□



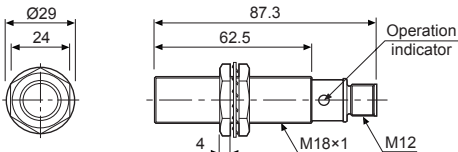
● PRCM30-10A□



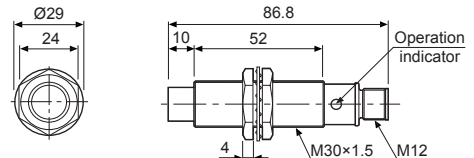
● PRCM30-15A□



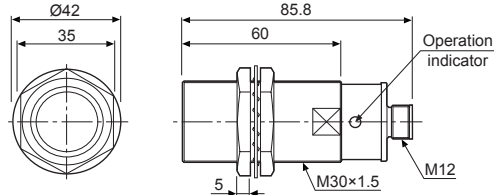
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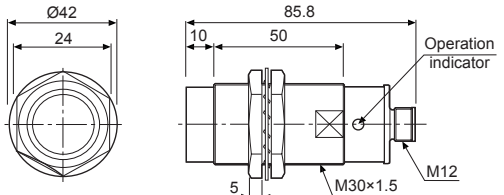
● PRCML18-8D□ / PRCML18-8A□



● PRCML30-10D□ / PRCML30-10A□



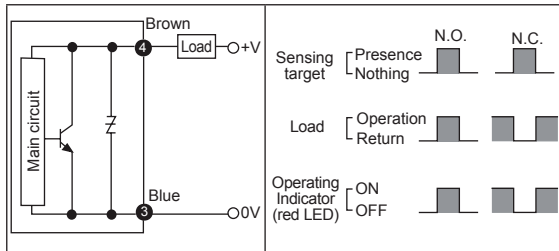
● PRCML30-15D□ / PRCML30-15A□



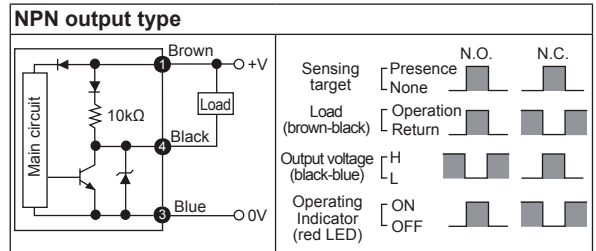
# Cylindrical Connector type

## Control Output Diagram and Load Operation

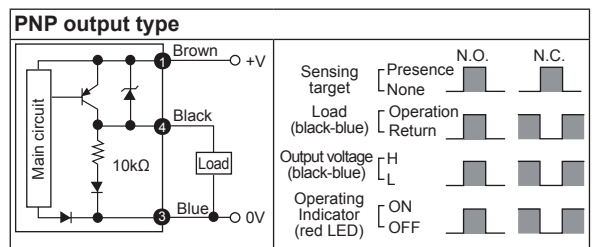
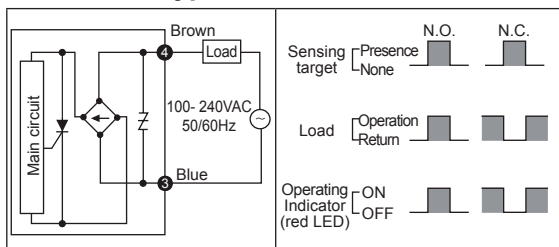
### DC 2-wire type



### DC 3-wire type



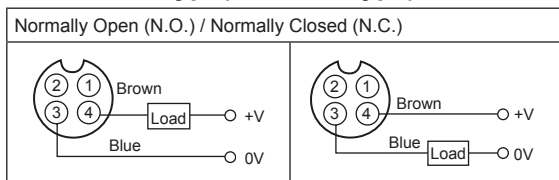
### AC 2-wire type



※The number in a circle is pin no. of connector.

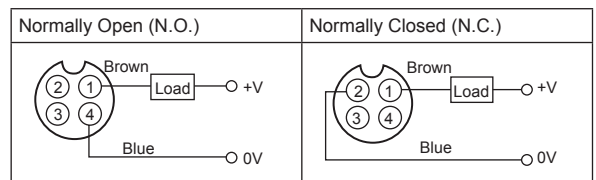
## Wiring Diagram

### DC 2-wire type(Standard type)



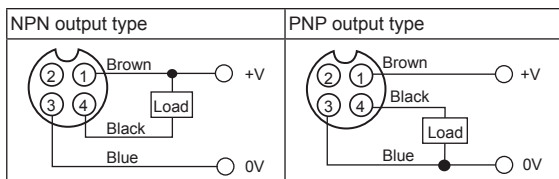
※Pin ①, ② are not used terminals.  
 ※For DC 3-wire type connector cable, it is available to use with black wire (12-24VDC) and blue wire (0V).

### DC 2-wire type(IEC standard type)



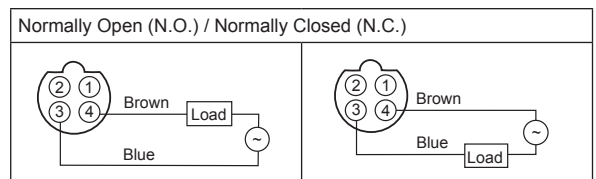
※②, ③ of N.O. type and ③, ④ of N.C. type are not used terminals.  
 ※The pin arrangement of connector applying IEC standard is being developed.  
 ※Please attach "I" at the end of the name of standard type for purchasing the IEC standard product.  
 Ex) PRDWT12-4DO-I  
 ※The connector cable for IEC standard is being developed.  
 Please attach "I" at the end of the name of standard type.  
 Ex) CID2-2-I, CLD2-5-I

### DC 3-wire type



※Please fasten the cleat of connector not to show the thread. (0.39 to 0.49N·m)

### AC 2-wire type



※In AC inductive type, ② and ③, ① and ④ are connected inside of the connector cable.

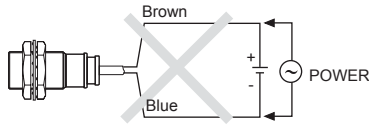
※Please fasten the vibration part with Teflon tape.  
 ※Refer to the G-6 about IEC standard connector wires and specifications.

|     |  |
|-----|--|
| (A) | Photo electric sensor  |
| (B) | Fiber optic sensor   |
| (C) | Door/Area sensor   |
| (D) | Proximity sensor   |
| (E) | Pressure sensor  |
| (F) | Rotary encoder   |
| (G) | Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets |
| (H) | Temp. controller   |
| (I) | SSR/ Power controller  |
| (J) | Counter  |
| (K) | Timer  |
| (L) | Panel meter  |
| (M) | Tacho/ Speed/ Pulse meter  |
| (N) | Display unit   |
| (O) | Sensor controller  |
| (P) | Switching mode power supply                                      |
| (Q) | Stepper motor& Driver&Controller                                 |
| (R) | Graphic/ Logic panel   |
| (S) | Field network device   |
| (T) | Software   |
| (U) | Other  |

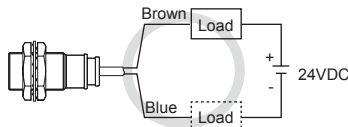
# PRCM Series

## ■ Proper Usage

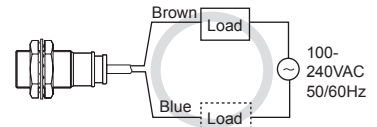
### ◎ Load connections



< DC 2-wire type & AC 2-wire type >



< DC 2-wire type >

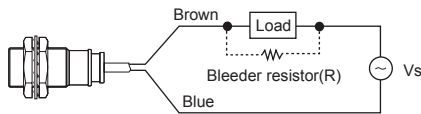


< AC 2-wire type >

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

### ◎ Load connections

#### ● AC 2-wire type



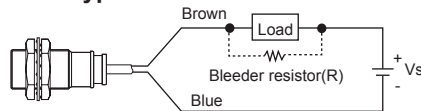
110VAC: Min. 20kΩ 3W  
220VAC: Min. 39kΩ 10W

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.

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

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

#### ● 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.

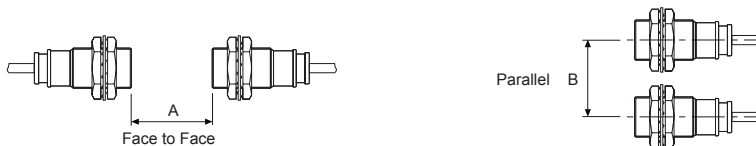
※ W value of Bleeder resistor should be bigger for proper heat dissipation.

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

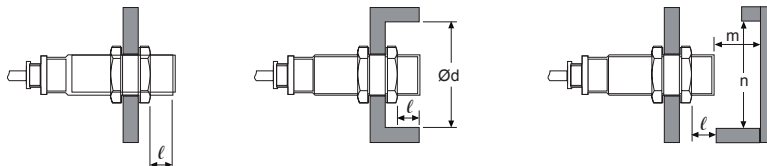
[ Vs: Power supply, I<sub>o</sub>: Min. action current of proximity sensor, I<sub>off</sub>: Return current of load, P: Number of Bleeder resistance watt ]

### ◎ 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)

| Model | PRCMT12-2D□<br>PRCM12-2D□<br>PRCM12-2A□ | PRCMT12-4D□<br>PRCM12-4D□<br>PRCM12-4A□ | PRCMT18-5D<br>PRCM(L)18-5D<br>PRCM(L)18-5A | PRCMT18-8D□<br>PRCM(L)18-8D□<br>PRCM(L)18-8A□ | PRCMT30-10D□<br>PRCM(L)30-10D□<br>PRCM(L)30-10D□ | PRCMT30-15D<br>PRCM(L)30-15D<br>PRCM(L)30-15A |
|-------|---|---|--|---|--|---|
| A     | 12                                      | 24                                      | 30   | 48  | 60   | 90  |
| B     | 24                                      | 36                                      | 36   | 54  | 60   | 90  |
| ℓ     | 0                                       | 11                                      | 0  | 14  | 0  | 15  |
| Ød    | 12                                      | 36                                      | 18   | 54  | 30   | 90  |
| m     | 6                                       | 12                                      | 15   | 24  | 30   | 45  |
| n     | 18                                      | 36                                      | 27   | 54  | 45   | 90  |