

# PRD Series

## Long sensing distance proximity sensor

Upgrade

### ■ Features

- **Realization of long sensing distance**  
(1.5~2 times longer sensing distance guaranteed compared to existing models)
- Improved the noise resistance with dedicated IC
- Reverse power polarity, surge, overcurrent protection
- Long life cycle and reliable
- Red LED status indication
- IP67 rated waterproof structure (IEC standard)
- Replacer for micro switches and limit switches
- Cable Support adopted : For more reliable flexural strength of sensor/cable connecting part

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



### ■ Specifications

#### ● DC 2-wire type

| Model                            | <b>PRDT18-7DO</b><br><b>PRDT18-7DC</b><br><b>PRDWT18-7DO</b><br><b>PRDWT18-7DC</b><br><b>PRDT18-7DO-I</b><br><b>PRDT18-7DC-I</b><br><b>PRDWT18-7DO-I</b><br><b>PRDWT18-7DC-I</b><br><b>PRDT18-7DO-IV</b><br><b>PRDT18-7DC-IV</b><br><b>PRDWT18-7DO-IV</b><br><b>PRDWT18-7DC-IV</b> | <b>PRDT18-14DO</b><br><b>PRDT18-14DC</b><br><b>PRDWT18-14DO</b><br><b>PRDWT18-14DC</b><br><b>PRDT18-14DO-I</b><br><b>PRDT18-14DC-I</b><br><b>PRDWT18-14DO-I</b><br><b>PRDWT18-14DC-I</b><br><b>PRDT18-14DO-IV</b><br><b>PRDT18-14DC-IV</b><br><b>PRDWT18-14DO-IV</b><br><b>PRDWT18-14DC-IV</b> |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sensing distance                 | 7mm ±10%                                                                                                                                                                                                                                                                           | 14mm ±10%                                                                                                                                                                                                                                                                                      |
| Hysteresis                       | Max. 10% of sensing distance                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                |
| Standard sensing target          | 20×20×1mm (Iron)                                                                                                                                                                                                                                                                   | 40×40×1mm (Iron)                                                                                                                                                                                                                                                                               |
| Setting distance                 | 0~4.9mm                                                                                                                                                                                                                                                                            | 0~9.8mm                                                                                                                                                                                                                                                                                        |
| Power supply (Operating voltage) | 12~24VDC (10~30VDC)                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                |
| Leakage current                  | Max. 0.6mA                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                |
| Response frequency (★1)          | 250Hz                                                                                                                                                                                                                                                                              | 200Hz                                                                                                                                                                                                                                                                                          |
| Residual voltage                 | Max. 3.5V                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                |
| Affection by Temp.               | Within ±10% max. of sensing distance at +20℃ in temperature range of -25 to +70℃                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                |
| Control output                   | 2 ~ 100mA                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                |
| Insulation resistance            | Min. 50MΩ (at 500VDC mega)                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                |
| Dielectric strength              | 1500VAC 50/60Hz for 1minute                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                |
| Vibration                        | 1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                |
| Shock                            | 500m/s <sup>2</sup> (50G) X, Y, Z directions for 3 times                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                |
| Indicator                        | Operating indicator (Red LED)                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |
| Ambient temperature              | -25 ~ +70℃ (non-freezing condition)                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                |
| Storage temperature              | -30 ~ +80℃ (non-freezing condition)                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                |
| Ambient humidity                 | 35~95%RH                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                |
| Protection circuit               | Reverse polarity protection, Surge protection, Over current protection                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                |
| Protection                       | IP67 (IEC Standard)                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                |
| Unit weight                      | Approx. 80g                                                                                                                                                                                                                                                                        | Approx. 75g                                                                                                                                                                                                                                                                                    |

※ (★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.

# Long Sensing Distance Type

## ■ Specifications

### ● DC 3-wire type

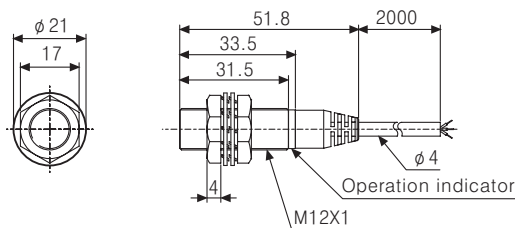
| Model                            | PRD12-4DN<br>PRD12-4DP<br>PRD12-4DN2<br>PRD12-4DP2<br>PRDS12-4DN<br>PRDS12-4DP<br>PRDS12-4DN2<br>PRDW12-4DN<br>PRDW12-4DP<br>PRDW12-4DN2<br>PRDW12-4DP2 | PRD12-8DN<br>PRD12-8DP<br>PRD12-8DN2<br>PRD12-8DP2<br>PRDS12-8DN<br>PRDS12-8DP<br>PRDS12-8DN2<br>PRDW12-8DN<br>PRDW12-8DP<br>PRDW12-8DN2<br>PRDW12-8DP2 | PRD18-7DN<br>PRD18-7DP<br>PRD18-7DN2<br>PRD18-7DP2<br>PRDL18-7DN<br>PRDL18-7DP<br>PRDL18-7DN2<br>PRDL18-7DP2<br>PRDW18-7DN<br>PRDW18-7DP<br>PRDW18-7DN2<br>PRDW18-7DP2<br>PRDWL18-7DN<br>PRDWL18-7DP<br>PRDWL18-7DN2<br>PRDWL18-7DP2 | PRD18-14DN<br>PRD18-14DP<br>PRD18-14DN2<br>PRD18-14DP2<br>PRDL18-14DN<br>PRDL18-14DP<br>PRDL18-14DN2<br>PRDL18-14DP2<br>PRDW18-14DN<br>PRDW18-14DP<br>PRDW18-14DN2<br>PRDW18-14DP2<br>PRDWL18-14DN<br>PRDWL18-14DP<br>PRDWL18-14DN2<br>PRDWL18-14DP2 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sensing distance                 | 4mm ±10%                                                                                                                                                | 8mm ±10%                                                                                                                                                | 7mm ±10%                                                                                                                                                                                                                             | 14mm ±10%                                                                                                                                                                                                                                            |
| Hysteresis                       | Max. 10% of sensing distance                                                                                                                            |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Standard sensing target          | 12×12×1mm (Iron)                                                                                                                                        | 25×25×1mm (Iron)                                                                                                                                        | 20×20×1mm (Iron)                                                                                                                                                                                                                     | 40×40×1mm (Iron)                                                                                                                                                                                                                                     |
| Setting distance                 | 0 to 2.8mm                                                                                                                                              | 0 to 5.6mm                                                                                                                                              | 0 to 4.9mm                                                                                                                                                                                                                           | 0 to 9.8mm                                                                                                                                                                                                                                           |
| Power supply (Operating voltage) | 12-24VDC (10-30VDC)                                                                                                                                     |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Current consumption              | Max. 10mA                                                                                                                                               |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Response frequency(*1)           | 500Hz                                                                                                                                                   | 400Hz                                                                                                                                                   | 300Hz                                                                                                                                                                                                                                | 200Hz                                                                                                                                                                                                                                                |
| Residual voltage                 | Max. 1.5V                                                                                                                                               |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Affection by Temp.               | Within ±10% max. of sensing distance at +20℃ in temperature range of -25 to +70℃                                                                        |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Control output                   | 200mA                                                                                                                                                   |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Insulation resistance            | Min. 50MΩ (at 500VDC mega)                                                                                                                              |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Dielectric strength              | 1500VAC 50/60Hz for 1minute                                                                                                                             |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Vibration                        | 1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours                                                                       |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Shock                            | 500m/s <sup>2</sup> (50G) X, Y, Z directions for 3 times                                                                                                |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Indicator                        | Operating indicator (Red LED)                                                                                                                           |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Ambient temperature              | -25 ~ +70℃ (non-freezing condition)                                                                                                                     |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Storage temperature              | -30 ~ +80℃ (non-freezing condition)                                                                                                                     |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Ambient humidity                 | 35 ~ 95%RH                                                                                                                                              |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Protection circuit               | Surge, Reverse posor polarity, Overcurrent protection circuit                                                                                           |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Protection                       | IP67 (IEC Standard)                                                                                                                                     |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Approval                         | CE                                                                                                                                                      |                                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                      |
| Unit weight                      | PRD:Approx.74g<br>PRDS:Approx.72g<br>PRDW:Approx.44g                                                                                                    | PRD:Approx.72g<br>PRDS:Approx.70g<br>PRDW:Approx.42g                                                                                                    | PRD:Approx.115g<br>PRDL :Approx.145g<br>PRDW:Approx.80g<br>PRDWL:Approx.110g                                                                                                                                                         | PRD:Approx.110g<br>PRDL:Approx.140g<br>PRDW:Approx.75g<br>PRDWL:Approx.105g                                                                                                                                                                          |

※(\*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.

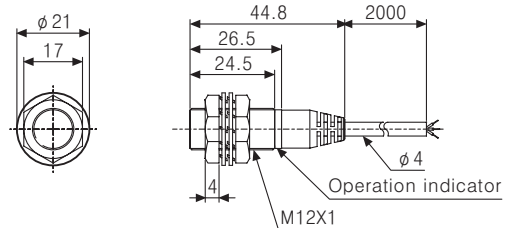
## ■ Dimensions

(Unit:mm)

### ● PRD12-4D□



### ● PRD12-8D□



(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)  
Switching  
power  
supply

(J)  
Proximity  
sensor

(K)  
Photo  
electric  
sensor

(L)  
Pressure  
sensor

(M)  
Rotary  
encoder

(N)  
Stepping  
motor &  
Driver &  
Controller

(O)  
Graphic  
panel

(P)  
Field  
network  
device

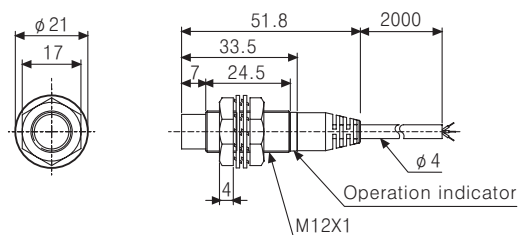
(Q)  
Production  
stoppage  
models &  
replacement

# PRD Series

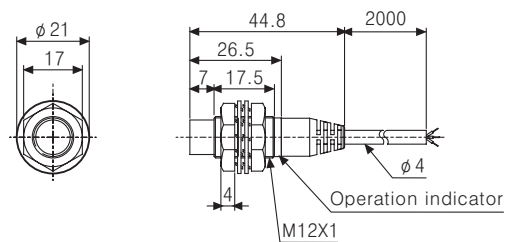
## ■ Dimensions

(Unit:mm)

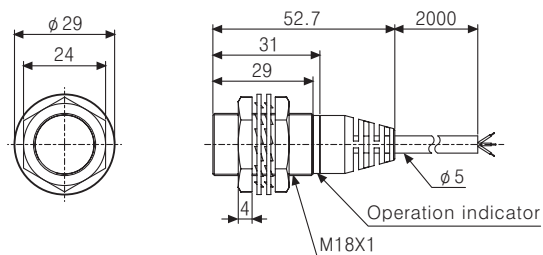
● PRDS12-4D□



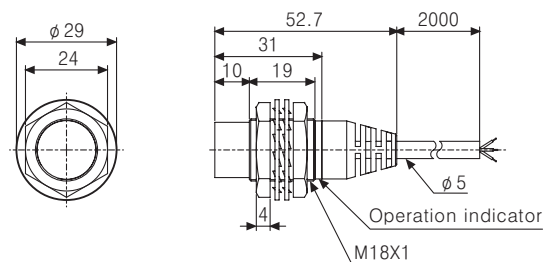
● PRDS12-8D□



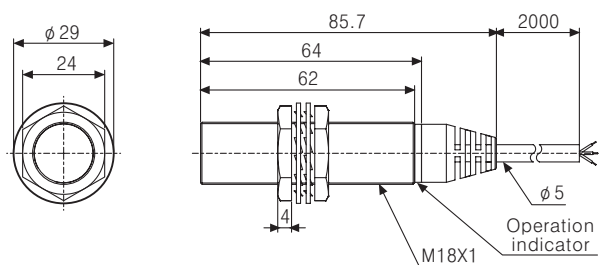
● PRD(T)18-7D□



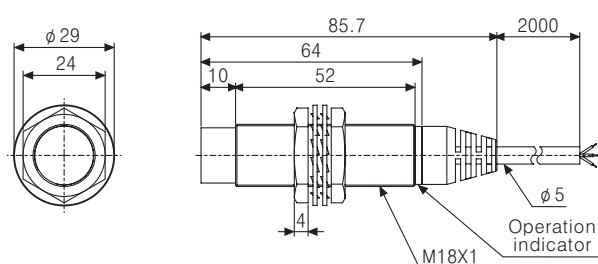
● PRD(T)18-14D□



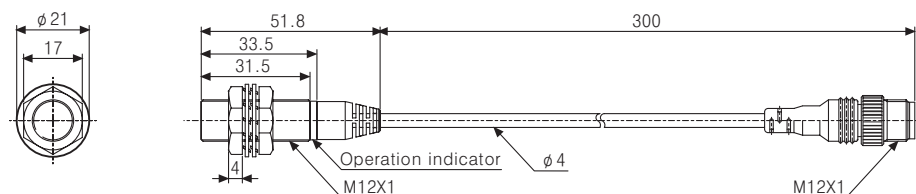
● PRDL18-7D□



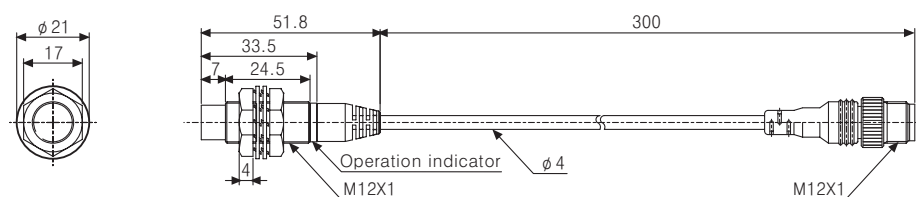
● PRDL18-14D□



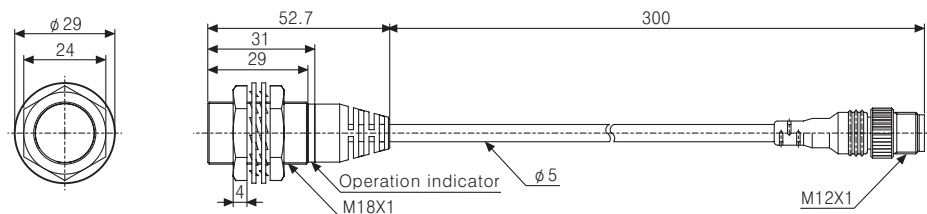
● PRDW12-4D□



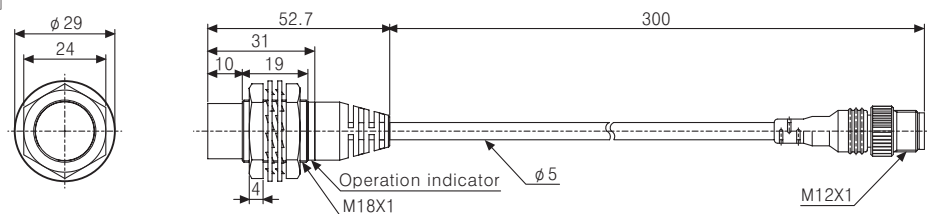
● PRDW12-8D□



● PRDW(T)18-7D□



● PRDW(T)18-14D□

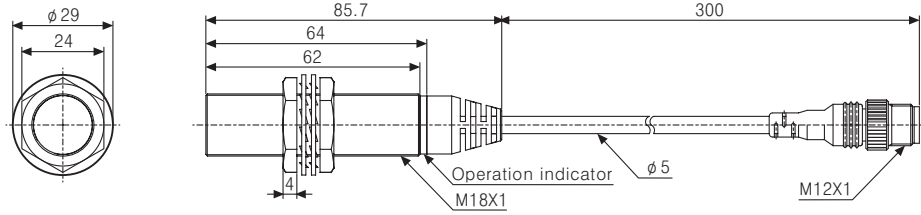


# Long Sensing Distance Type

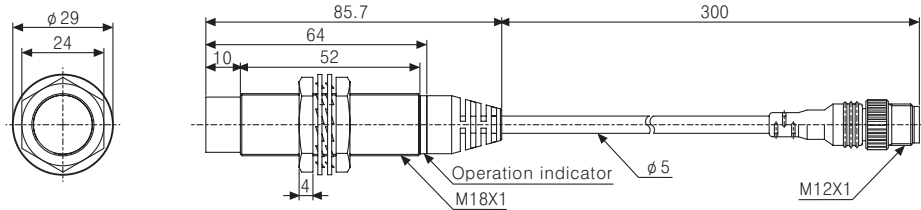
## ■ Dimensions

(Unit:mm)

### ● PRDWL18-7D□

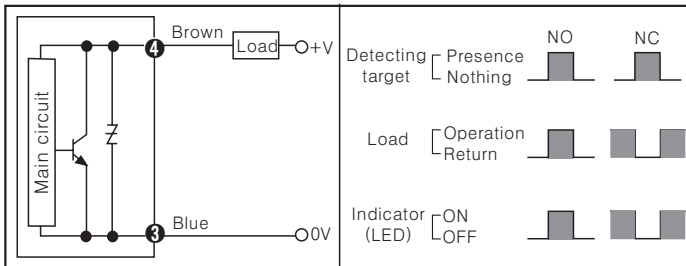


### ● PRDWL18-14D□



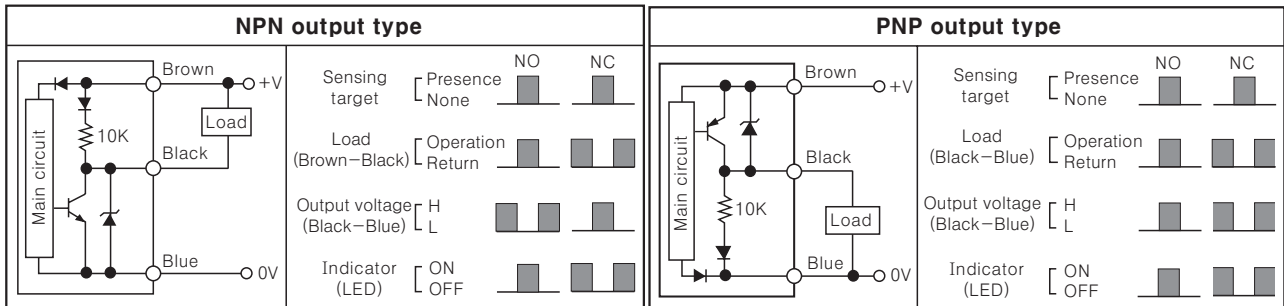
## ■ Control output diagram

### ◎ DC 2-wire type



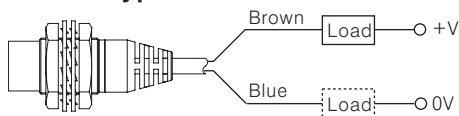
※The number in a circle is pin no. of connector.

### ◎ DC 3-wire type



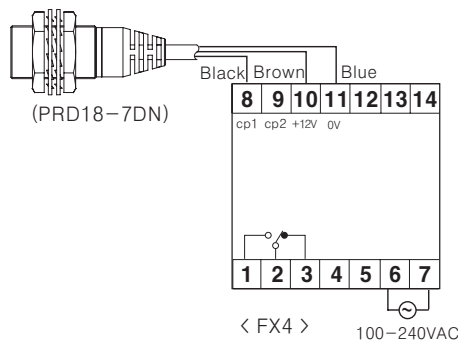
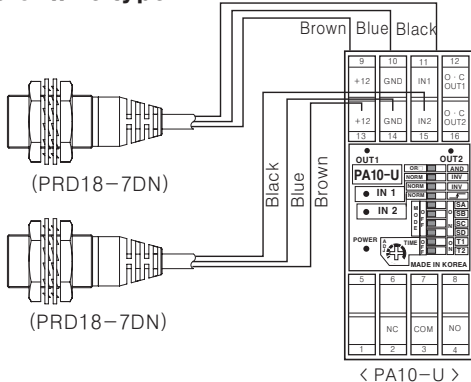
## ■ Connections

### ◎ DC 2-wire type



※The load can be connected to either wire.

### ◎ DC 3-wire type

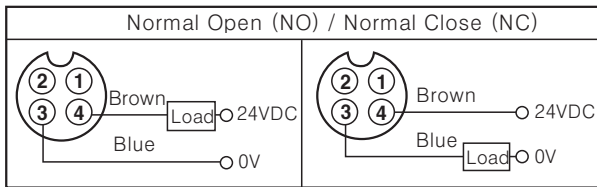


- (A) Counter
- (B) Timer
- (C) Temp. controller
- (D) Power controller
- (E) Panel meter
- (F) Tacho/Speed/Pulse meter
- (G) Display unit
- (H) Sensor controller
- (I) Switching power supply
- (J) Proximity sensor
- (K) Photo electric sensor
- (L) Pressure sensor
- (M) Rotary encoder
- (N) Stepping motor & Driver & Controller
- (O) Graphic panel
- (P) Field network device
- (Q) Production stoppage models & replacement

# PRD Series

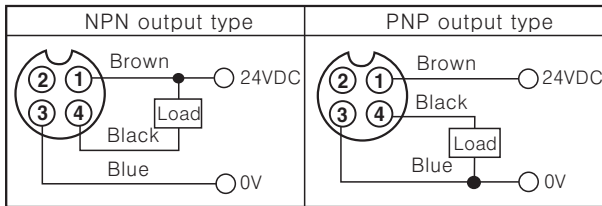
## ■ Wiring diagram

### ◎DC 2-wire type(Standard type)



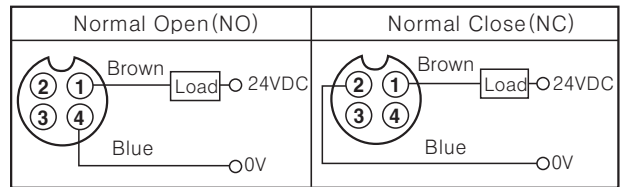
- \*Pin ①, ② are N.C (Not Connected) terminals.
- \*For DC 3-wire type connector cable, it is available to use with black wire(24VDC) and blue wire(0V).

### ◎DC 3-wire type



- \*Please fasten the cleat of connector not to shown the thread. (0.39~0.49N・m)

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

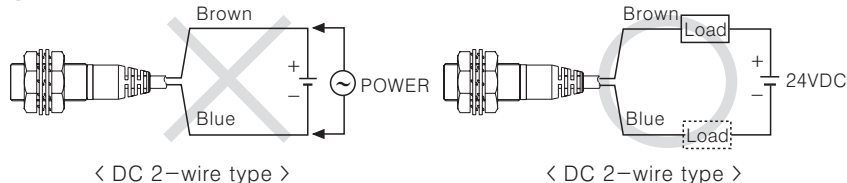


- \*The pin arrangement of connector applying IEC standard is being developed.
- \*Please attach "I" at the end of the name of standard type for purchasing the IEC standard product. Ex) PRWT12-4DO-I
- \*The connector cable for IEC standard is being developed. Please attach "I" at the end of the name of standard type. Ex) CID2-2-I, CLD2-5-I

- \*Please fasten the vibration part with Teflon tape.
- \*See J-51 about IEC standard connector wires and specifications.

## ■ Proper usage

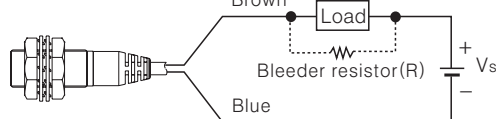
### ◎Load connections



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

### ◎In case of the load current is small

#### ●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.

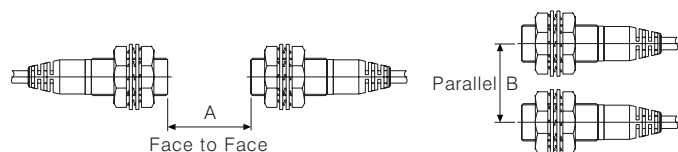
\*W value of Bleeder resistor should be bigger for proper heat dissipation.

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

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

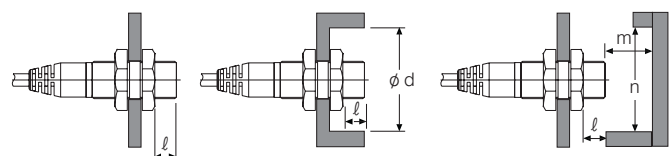
### ◎Mutual-interference

When several proximity sensors are mounted closely, 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.



### ◎Influence by surrounding metals

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.



(Unit:mm)

| Item \ Model | PRD□12-4D□ | PRD□12-8D□ | PRD□18(T)-7D□<br>PRDW□18(T)-7D□ | PRD□18(T)-14D□<br>PRDW□18(T)-14D□ |
|--------------|------------|------------|---------------------------------|-----------------------------------|
| A            | 24         | 48         | 42                              | 84                                |
| B            | 24         | 36         | 36                              | 54                                |
| ℓ            | 0          | 11         | 0                               | 14                                |
| φ d          | 12         | 36         | 18                              | 54                                |
| m            | 12         | 24         | 21                              | 42                                |
| n            | 18         | 36         | 27                              | 54                                |