Cylindrical Cable Connector Type Proximity Sensor



▣ Features

- Shorten the time of maintenance with the body
- Improved the noise immunity with dedicated IC
- Built-in reverse polarity protection circuit (DC 3-wire type)
- Built-in surge protection circuit
- Built-in output short over current protection circuit
- IP67 protection structure (IEC standard)
- Replaceable for micro switches and limit switches

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

CE

▣ Specifications

● DC 2-wire type

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

Model	PRWT08-1.5DO PRWT08-1.5DC PRWT08-1.5DO-I PRWT08-1.5DC-I PRWT08-1.5DO-V PRWT08-1.5DC-V PRWT08-1.5DO-IV PRWT08-1.5DC-IV	PRWT08-2DO PRWT08-2DC PRWT08-2DO-I PRWT08-2DC-I PRWT08-2DO-V PRWT08-2DC-V PRWT08-2DO-IV PRWT08-2DC-IV	PRWT12-2□O PRWT12-2□C PRWT12-2□O-I PRWT12-2□C-I	PRWT12-4□O PRWT12-4□C PRWT12-4□O-I PRWT12-4□C-I	PRWT18-5□O PRWT18-5□C PRWT18-5□O-I PRWT18-5□C-I	PRWT18-8□O PRWT18-8□C PRWT18-8□O-I PRWT18-8□C-I	PRWT30-10□O PRWT30-10□C PRWT30-10□O-I PRWT30-10□C-I PRWT30-10DO-V PRWT30-10DC-IV	PRWT30-15□O PRWT30-15□C PRWT30-15□O-I PRWT30-15□C-I PRWT30-15□O-V PRWT30-15□C-IV
Diameter of sensing side	8mm		12mm		18mm		30mm	
Sensing distance	1.5mm	2mm		4mm	5mm	8mm	10mm	15mm
Installation	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)
Hysteresis	Max. 10% of sensing distance							
Standard sensing target	8×8×1mm (iron)		12×12×1mm (iron)		18×18×1mm (iron)	25×25×1mm (iron)	30×30×1mm (iron)	45×45×1mm (iron)
Setting distance	0 to 1.05mm	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 (operation voltage)	12-24VDC⎓ (10-30VDC⎓)							
Leakage current	Max. 0.6mA							
Response frequency※1	1.5kHz	1kHz	1.5kHz	500Hz		350Hz	400Hz	200Hz
Residual voltage※2	Max. 3.5V (non-polarity type is max. 5V)							
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20℃ (for PRWT08 Series: ±20% max.)							
Control output	2 to 100mA							
Insulation resistance	Over 50MΩ (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℃, storage: -30 to 80℃							
Environment: Ambient humidity	35 to 95%RH, storage: 35 to 95%RH							
Protection circuit	Surge protection circuit		Surge protection circuit, output short over current protection circuit					
Protection structure	IP67 (IEC standard)							
Material	Case/Nut: Nickel plated brass, Washer: Nickel plated iron, Sensing surface: Heat-resistant Acrylonitrile butadiene styrene, Standard cable (black): Polyvinyl chloride (PVC), Oil resistant cable (gray): Oil resistant polyvinyl chloride (PVC)							
Cable	Ø4mm, 2-wire, 300mm, M12 connector				Ø5mm, 2-wire, 300mm, M12 connector			
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm)							
Approval	CE							
Weight※3	Approx. 44g (approx. 32g)		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 in for unit only.
※Please fasten the vibration part with PTFE type.
※The '□' of model name is for power type. 'D' is 12-24VDC, 'X' is non-polarity 12-24VDC.
※The last 'V' of model name is for the model with oil-resistance reinforced cable.
※Environment resistance is rated at no freezing or condensation.

▣ Specifications

● DC 3-wire type

Model	PRW08-1.5DN PRW08-1.5DP PRW08-1.5DN2 PRW08-1.5DP2 PRW08-1.5DN-V PRW08-1.5DP-V PRW08-1.5DN2-V PRW08-1.5DN2-V PRWL08-1.5DN PRWL08-1.5DP PRWL08-1.5DN2 PRWL08-1.5DP2	PRW08-2DN PRW08-2DP PRW08-2DN2 PRW08-2DP2 PRW08-2DN-V PRW08-2DP-V PRW08-2DN2-V PRW08-2DP2-V PRWL08-2DN PRWL08-2DP PRWL08-2DN2 PRWL08-2DP2	PRW12-2DN PRW12-2DP PRW12-2DN2 PRW12-2DP2	PRW12-4DN PRW12-4DP PRW12-4DN2 PRW12-4DP2	PRW18-5DN PRW18-5DP PRW18-5DN2 PRW18-5DP2 PRWL18-5DN PRWL18-5DP PRWL18-5DN2 PRWL18-5DP2	PRW18-8DN PRW18-8DP PRW18-8DN2 PRW18-8DP2 PRWL18-8DN PRWL18-8DP PRWL18-8DN2 PRWL18-8DP2	PRW30-10DN PRW30-10DP PRW30-10DN2 PRW30-10DP2 PRW30-10DN-V PRW30-10DP-V PRW30-10DN2-V PRW30-10DP2-V PRWL30-10DN PRWL30-10DP PRWL30-10DN2 PRWL30-10DP2	PRW30-15DN PRW30-15DP PRW30-15DN2 PRW30-15DP2 PRW30-15DN-V PRW30-15DP-V PRW30-15DN2-V PRW30-15DP2-V PRWL30-15DN PRWL30-15DP PRWL30-15DN2 PRWL30-15DP2
Diameter of sensing side	8mm		12mm		18mm		30mm	
Sensing distance	1.5mm	2mm		4mm	5mm	8mm	10mm	15mm
Installation	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)
Hysteresis	Max. 10% of sensing distance							
Standard sensing target	8×8×1mm (iron)		12×12×1mm (iron)		18×18×1mm (iron)	25×25×1mm (iron)	30×30×1mm (iron)	45×45×1mm (iron)
Setting distance	0 to 1.05mm	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 (operation voltage)	12-24VDC⎓ (10-30VDC⎓)							
Current consumption	Max. 10mA							
Response frequency※1	1.5kHz	1kHz	1.5kHz	500Hz		350Hz	400Hz	200Hz
Residual voltage	Max. 2V		Max. 1.5V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20℃ (for PRW(L)08 series: ±20% max.)							
Control output	200mA							
Insulation resistance	Over 50MΩ (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/s² (approx. 50G) in each X, Y, Z direction for 3 times							
Indicator	Operation indicator: Red LED							
Environment: Ambient temperature	-25 to 70℃, storage: -30 to 80℃							
Environment: 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: Nickel plated brass, Washer: Nickel plated iron, Sensing surface: Heat-resistant Acrylonitrile butadiene styrene Standard cable (black): Polyvinyl chloride (PVC), Oil resistant cable (gray): Oil resistant polyvinyl chloride (PVC)							
Cable	Ø4mm, 3-wire, 300mm, M12 connector				Ø5mm, 3-wire, 300mm, M12 connector			
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm)							
Approval	CE							
Weight※2	PRW: Approx. 44g (approx. 32g) PRWL: Approx. 46g (approx. 34g)		Approx. 54g (approx. 42g)		PRW: Approx. 70g (approx. 58g) PRWL: Approx. 90g (approx. 78g)		PRW: Approx. 134g (approx. 122g) PRWL: Approx. 195g (approx. 158g)	

※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 in for unit only.
※The last 'V' of model name is for the model with oil-resistance reinforced cable.
※Environment resistance is rated at no freezing or condensation.

● AC 2-wire type

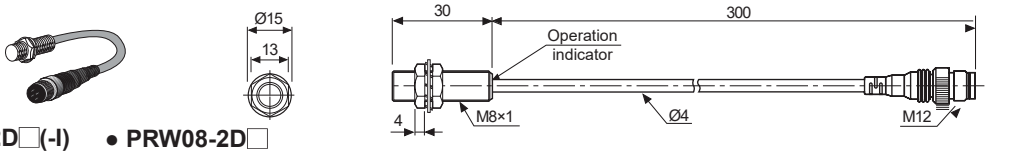
Model	PRW12-2AO PRW12-2AC	PRW12-4AO PRW12-4AC	PRW18-5AO PRW18-5AC PRWL18-5AO PRWL18-5AC	PRW18-8AO PRW18-8AC PRWL18-8AO PRWL18-8AC	PRW30-10AO PRW30-10AC PRWL30-10AO PRWL30-10AC	PRW30-15AO PRW30-15AC PRWL30-15AO PRWL30-15AC
Diameter of sensing side	12mm		18mm		30mm	
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Installation	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)	Shield (flush)	Non-shield (non-flush)
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 (operation voltage)	100-240VAC～ (85-264VAC～)					
Leakage current	Max. 2.5mA					
Response frequency※1	20Hz					
Residual voltage	Max. 10V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20℃					
Control output	5 to 150mA		5 to 200mA			
Insulation resistance	Over 50MΩ (at 500VDC megger)					
Dielectric strength	2,500VAC 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/s² (approx. 50G) in each X, Y, Z direction for 3 times					
Indicator	Operation indicator: Red LED					
Environment: Ambient temperature	-25 to 70℃, storage: -30 to 80℃					
Environment: Ambient humidity	35 to 95%RH, storage: 35 to 95%RH					
Protection circuit	Surge protection circuit					
Protection structure	IP67 (IEC standard)					
Material	Case/Nut: Nickel plated brass, Washer: Nickel plated iron, Sensing surface: Heat-resistant Acrylonitrile butadiene styrene, Standard cable (black): Polyvinyl chloride (PVC)					
Cable	Ø4mm, 2-wire, 300mm, M12 connector		Ø5mm, 2-wire, 300mm, M12 connector			
	AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm					
Approval	CE					
Weight※2	Approx. 54g (approx. 42g)		PRW: Approx. 78g (approx. 66g) PRWL: Approx. 90g (approx. 78g)		PRW: Approx. 134g (approx. 122g) PRWL: Approx. 195g (approx. 158g)	

※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 in for unit only.
※The last 'V' of model name is for the model with oil-resistance reinforced cable.
※Environment resistance is rated at no freezing or condensation.

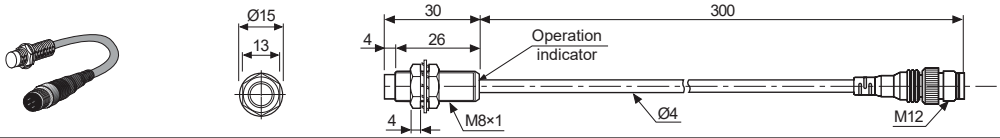
▣ Dimensions

(unit: mm)

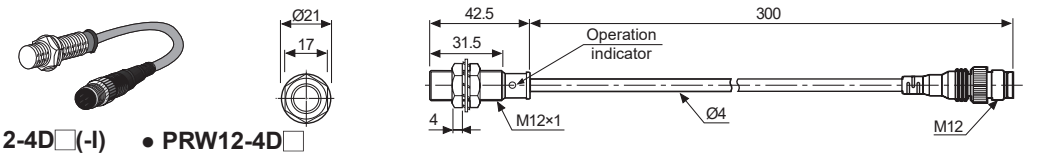
● **PRWT08-1.5D□(-I)** ● **PRW08-1.5D□**



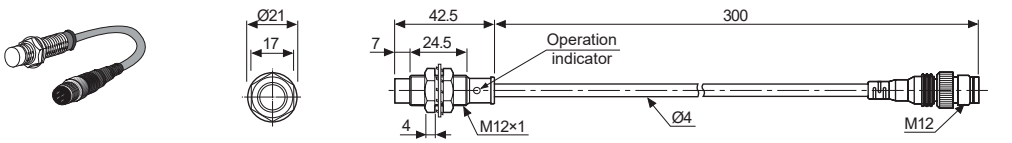
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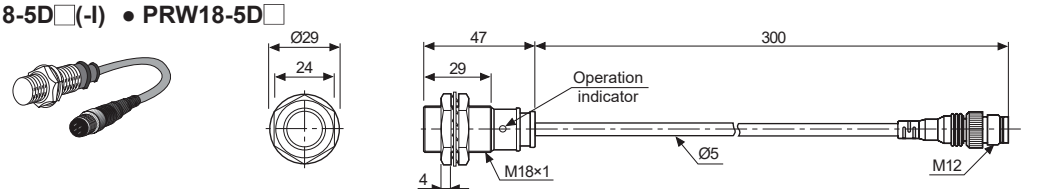
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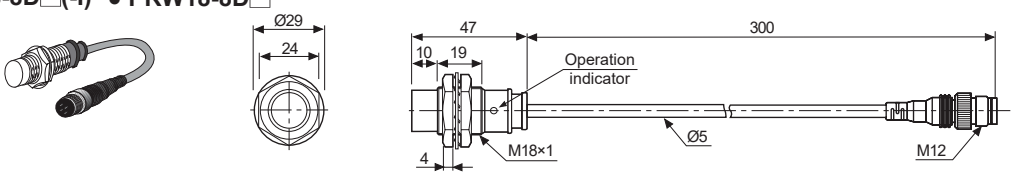
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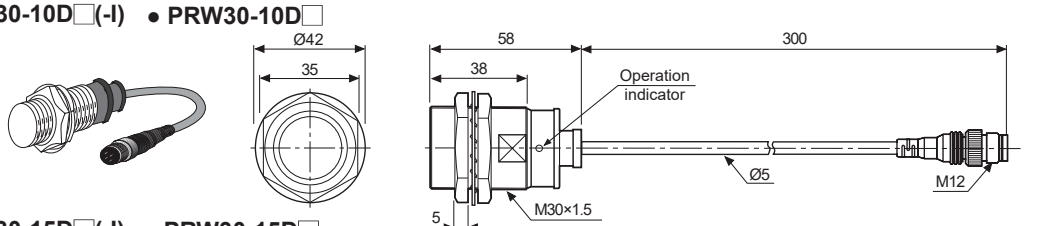
● **PRWT18-5D□(-I)** ● **PRW18-5D□**



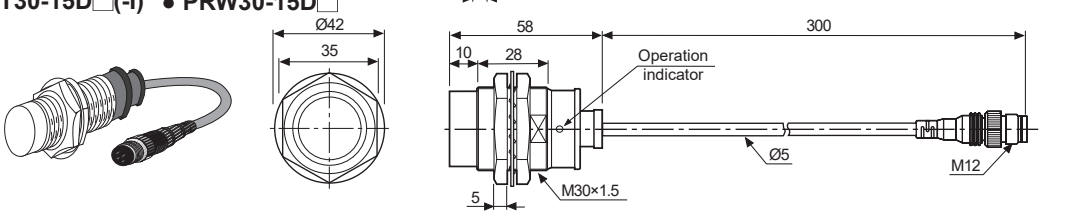
● **PRWT18-8D□(-I)** ● **PRW18-8D□**



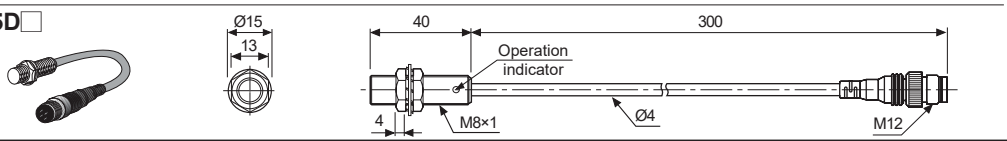
● **PRWT30-10D□(-I)** ● **PRW30-10D□**



● **PRWT30-15D□(-I)** ● **PRW30-15D□**



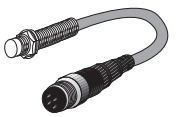
● **PRWL08-1.5D□**



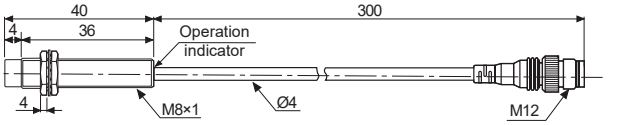
▣ Dimensions

(unit: mm)

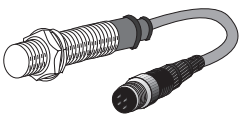
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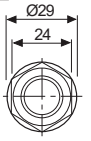


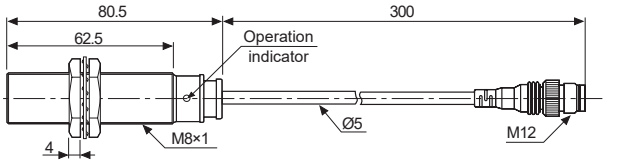




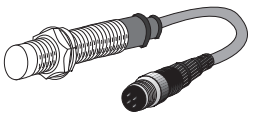
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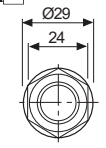


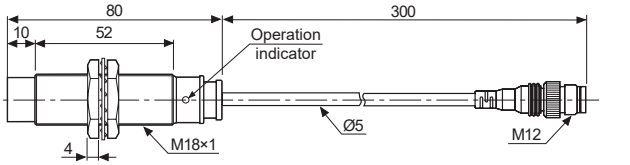




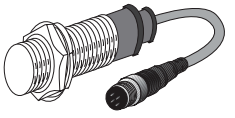
● **PRWL18-8D□** ● **PRWL18-8A□**

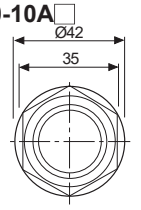


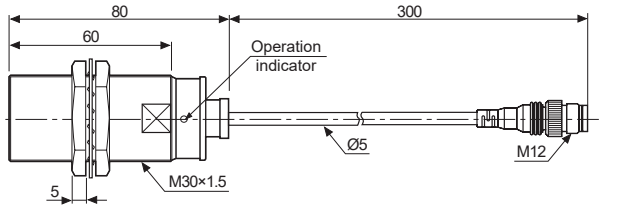




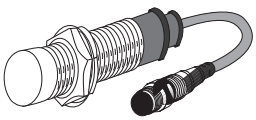
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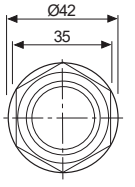


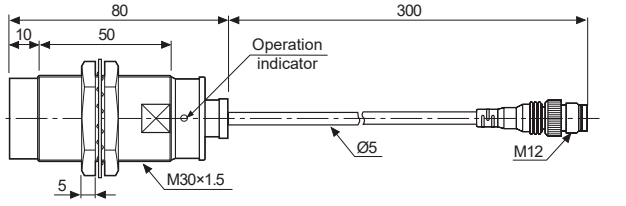




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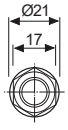


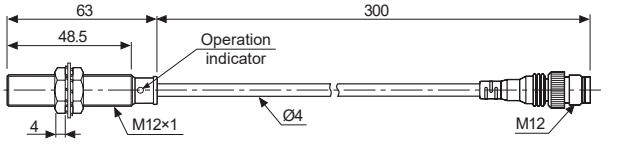




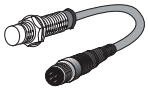
● **PRW12-2A□**

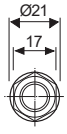


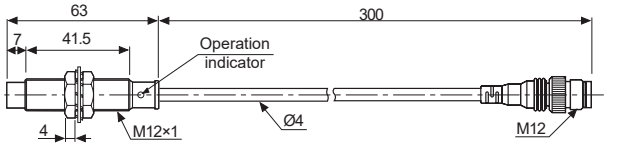




● **PRW12-4A□**

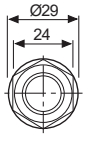


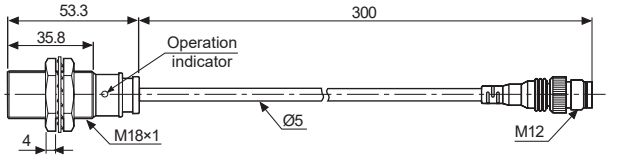




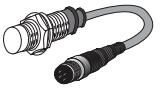
● **PRW18-5A□**

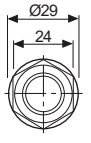


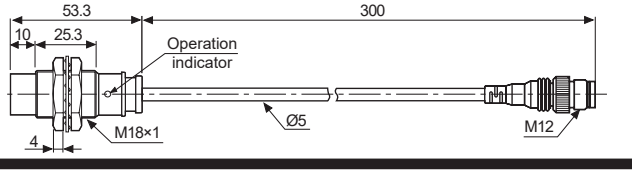




● **PRW18-8A□**





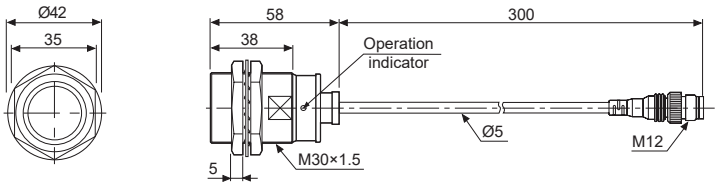


▣ Dimensions

(unit:mm)

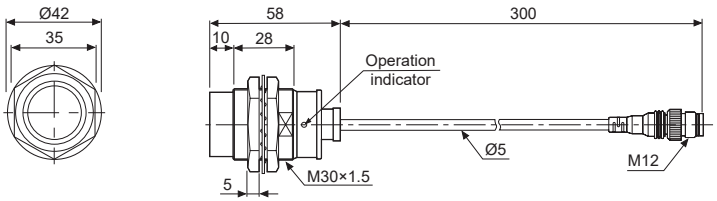
● **PRW30-10A□**





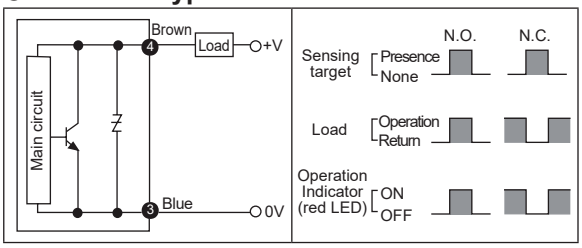
● **PRW30-15A□**





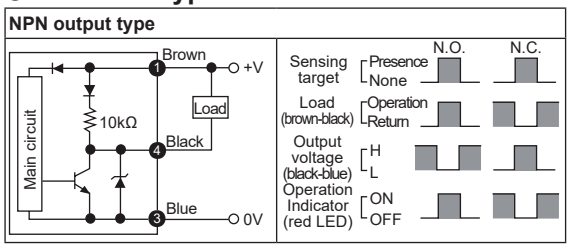
▣ Control Output Diagram and Load Operation

◎ DC 2-wire type

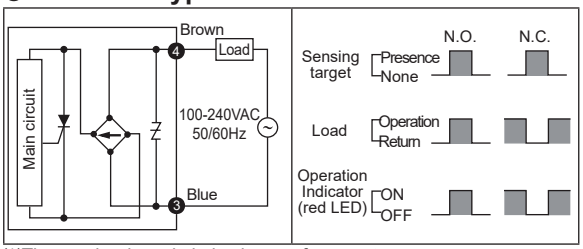


◎ DC 3-wire type

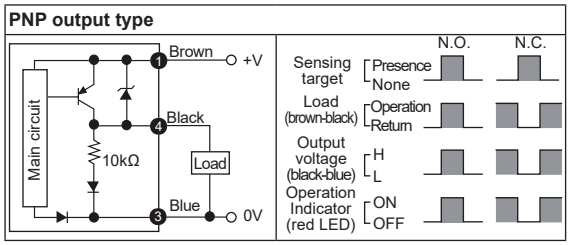
NPN output type



◎ AC 2-wire type



PNP output type

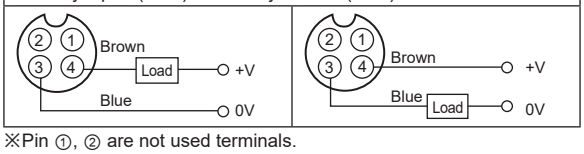


※The number in a circle is pin no. of connector.

▣ Wiring Diagram

◎ DC 2-wire type (standard type)

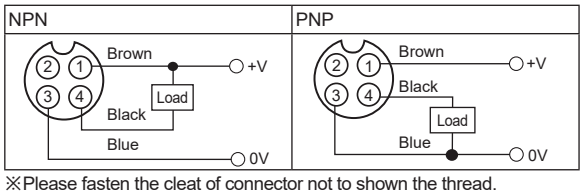
Normally Open (N.O.) / Normally Closed (N.C.)



※Pin ①, ② are not used terminals.
※When using DC 3-wire type of connector cable, black (12-24VDC) and blue (0V) cables can be used.

◎ DC 3-wire type

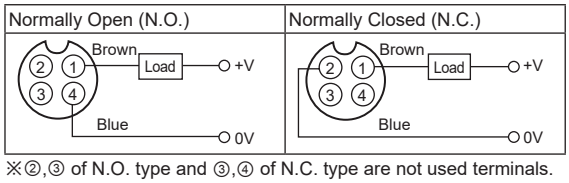
NPN	PNP



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

◎ DC 2-wire type (IEC standard type)

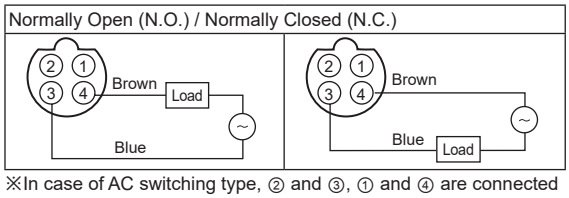
Normally Open (N.O.)	Normally Closed (N.C.)



※②,③ of N.O. type and ③,④ of N.C. type are not used terminals.
※The type, pin arrangement of connector based upon IEC standard is being developed.
※Please put "I" behind of standard type for purchasing IEC standard product. E.g.)PRWT12-4DO-I
※Please put "I" behind of model name for selecting proximity sensor by IEC standard. E.g.)CID2-2-I, CLD2-2-I

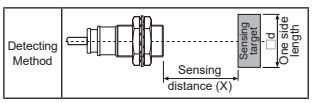
◎ AC 2-wire type

Normally Open (N.O.) / Normally Closed (N.C.)

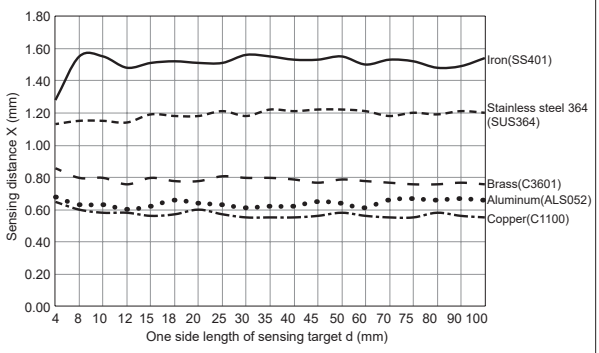


※In case of AC switching type, ② and ③, ① and ④ are connected to each other inside.

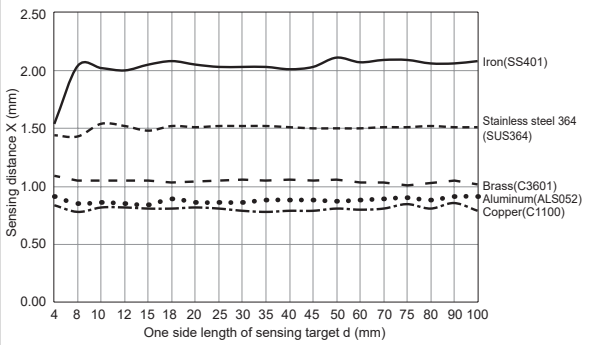
▣ Sensing Distance Feature Data by Target Material and Size



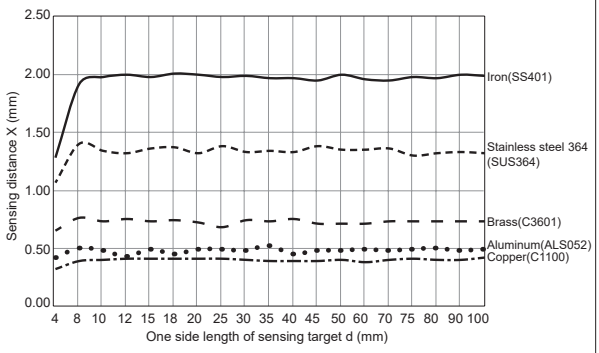
● PRWT08-1.5D□



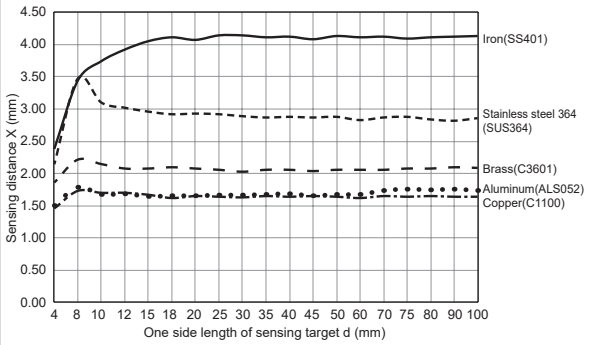
● PRWT08-2D□



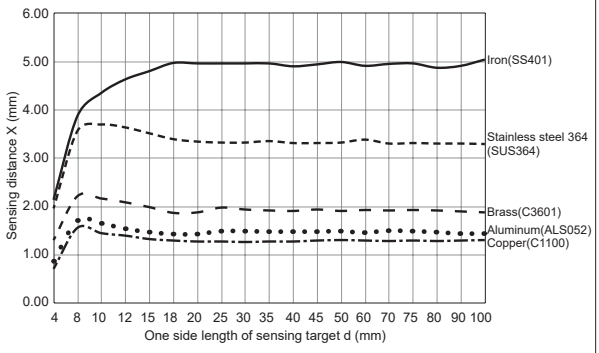
● PRWT12-2D□, PRW12-2A□



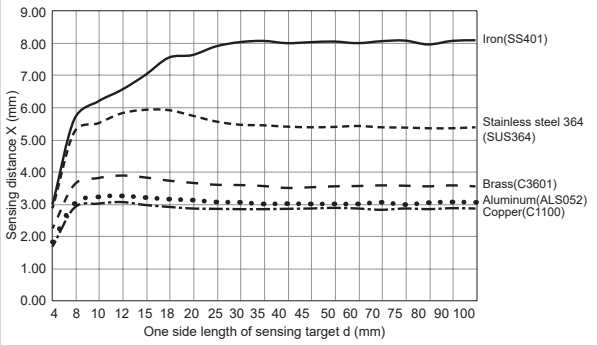
● PRWT12-4D□, PRW12-4A□



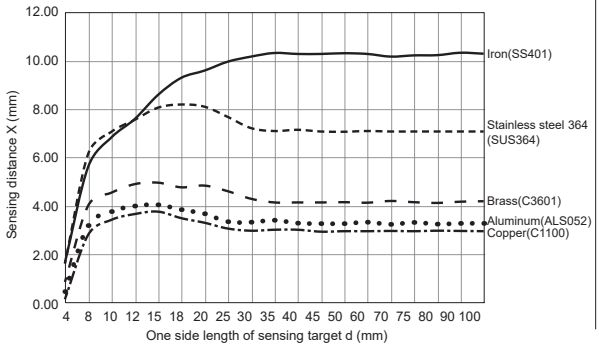
● PRWT18-5D□, PRW(L)18-5A□



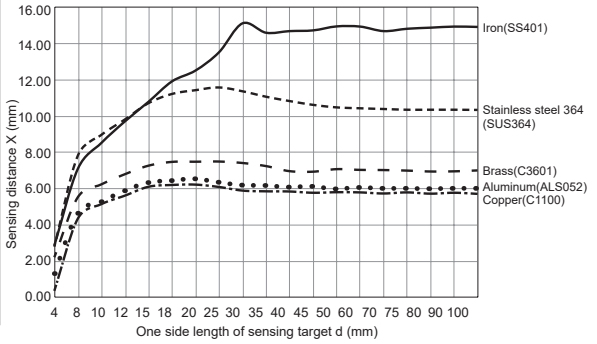
● PRWT18-8D□, PRW(L)18-8A□



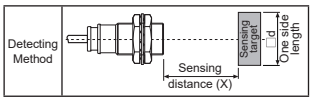
● PRWT30-10D□, PRW(L)30-10A□



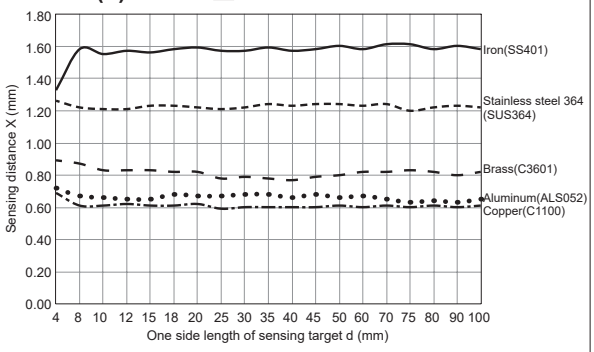
● PRWT30-15D□, PRW(L)30-15A□



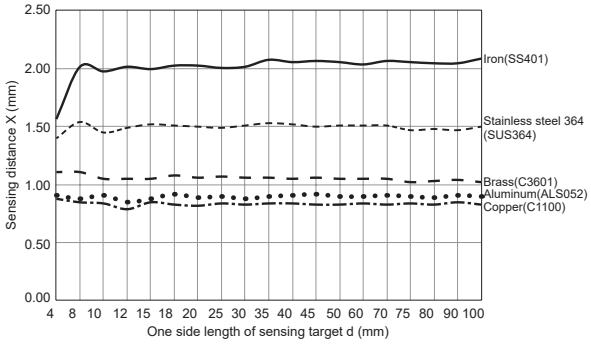
▣ Sensing Distance Feature Data by Target Material and Size



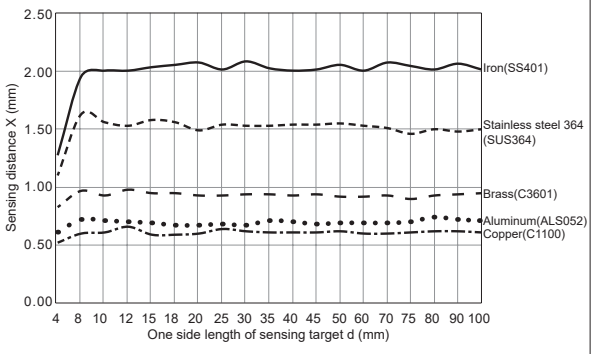
● PRW(L)08-1.5D□



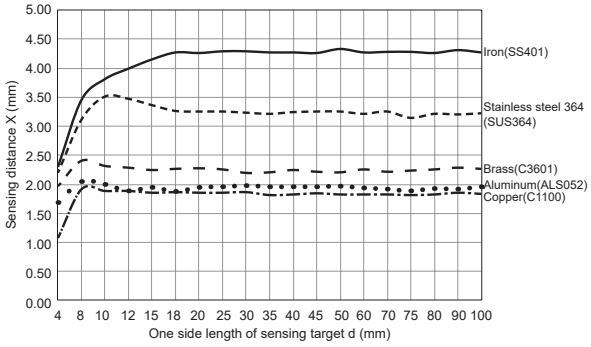
● PRW(L)08-2D□



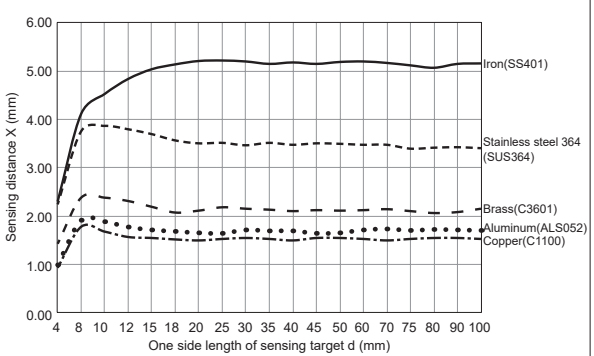
● PRW12-2D□



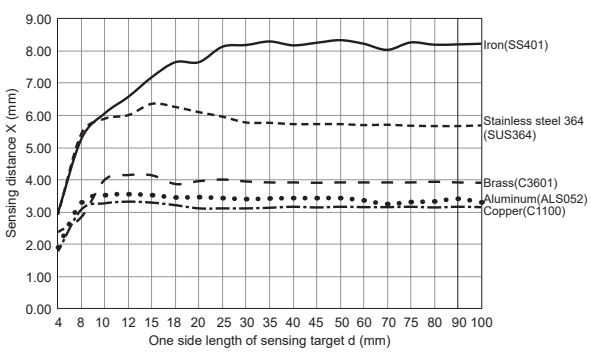
● PRW12-4D□



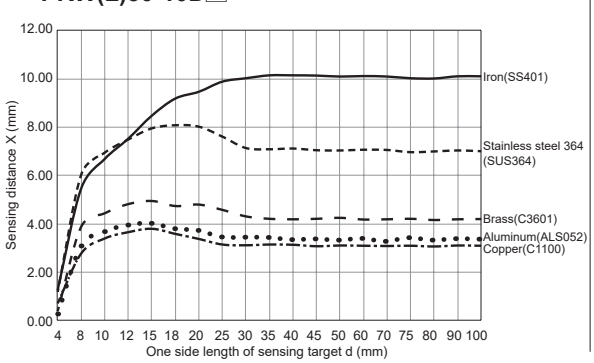
● PRW(L)18-5D□



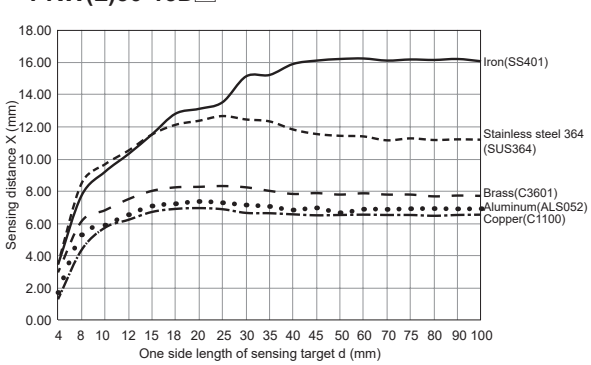
● PRW(L)18-8D□



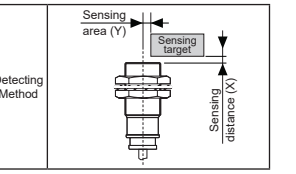
● PRW(L)30-10D□



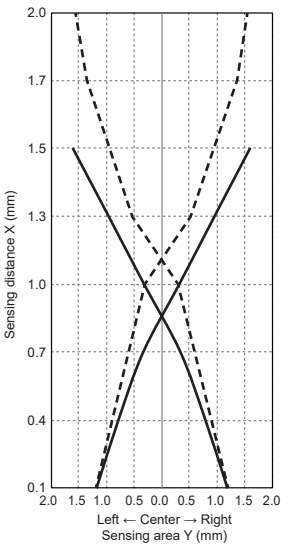
● PRW(L)30-15D□



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

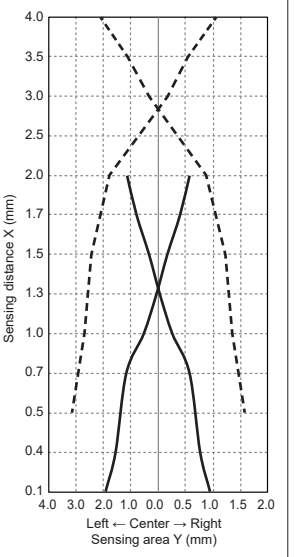


● PRWT08-1.5D□/2D□



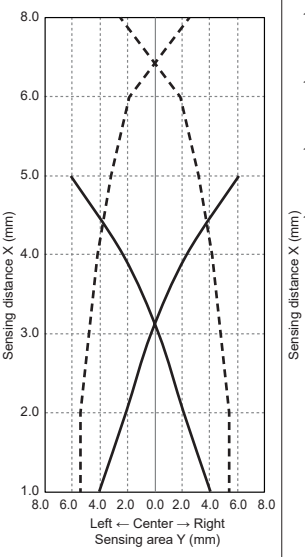
———	PRWT08-1.5D□
- - - - -	PRWT08-2D□

● PRWT12-2D□/4D□ , PRW12-2A□/4A□



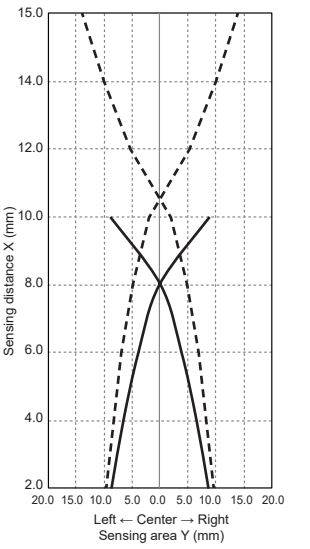
———	PRWT12-2D□, PRW12-2A□
- - - - -	PRWT12-4D□, PRW12-4A□

● PRWT18-5D□/8D□, PRW(L)18-5A□/8A□



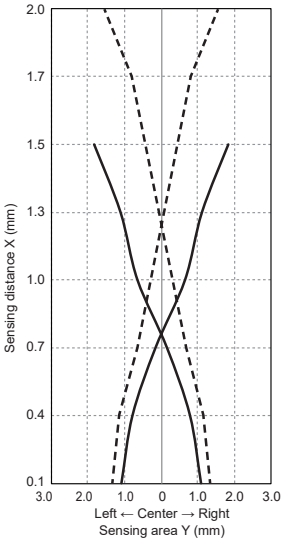
———	PRWT18-5D□, PRW(L)18-5A□
- - - - -	PRWT18-8D□, PRW(L)18-8A□

● PRWT30-10D□/15D□ , PRW(L)30-10A□/15A□



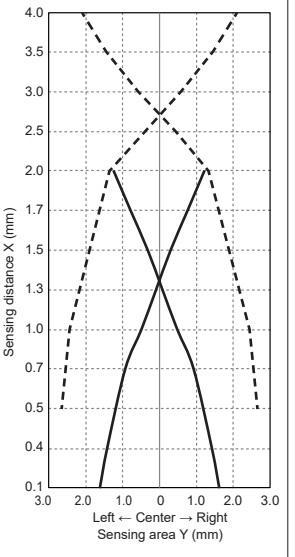
———	PRWT30-10D□, PRW(L)30-10A□
- - - - -	PRWT30-15D□, PRW(L)30-15A□

● PRW(L)08-1.5D□/2D□



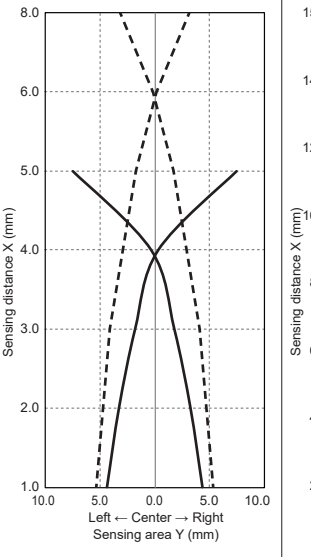
———	PRW(L)08-1.5D□
- - - - -	PRW(L)08-2D□

● PRW12-2D□/4D□



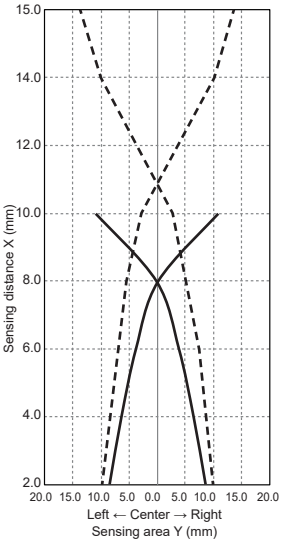
———	PRW12-2D□
- - - - -	PRW12-4D□

● PRW(L)18-5D□/8D□



———	PRW(L)18-5D□
- - - - -	PRW(L)18-8D□

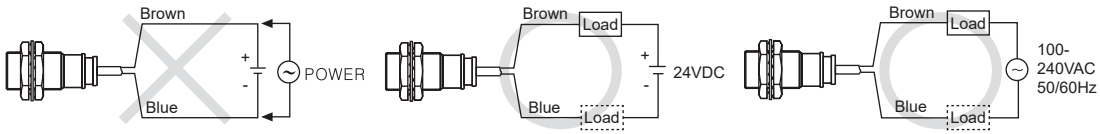
● PRW(L)30-10D□/15D□



———	PRW(L)30-10D□
- - - - -	PRW(L)30-15D□

▣ Proper Usage

◎ Load connections

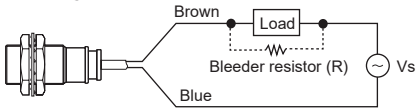


<DC 2-wire type & AC 2-wire type > < DC 2-wire type > < AC 2-wire type >

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.

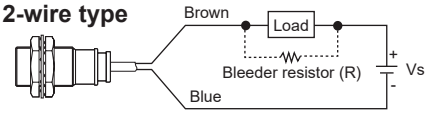
◎ In case of the load current is small

● AC 2-wire type



110VAC: Over 20kΩ 3W
220VAC: Over 39kΩ 10W

● DC 2-wire type



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

$$R \leq \frac{Vs}{I}(k\Omega) \qquad P > \frac{Vs^2}{R}(W)$$

[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 dissipation.

$$R \leq \frac{Vs}{Io\text{-}Ioff}(k\Omega) \qquad P > \frac{Vs^2}{R}(W)$$

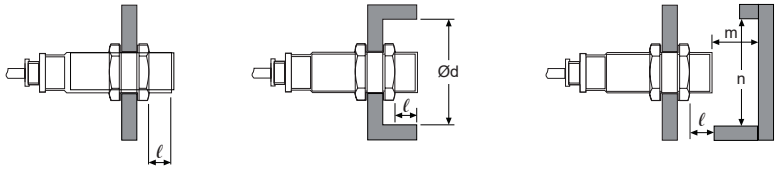
[Vs: Power supply, Io: Min. action current of proximity sensor
Ioff: Return current of load, P: Number of Bleeder resistance watt]

◎ Mutual-interference & 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 provide a minimum distance between the two sensors as below chart indicates.



When sensors are mounted on metallic panel, it must be prevented 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	PRW(L)08-1.5D□ PRWT08-1.5D□	PRW(L)08-2D□ PRWT08-2D□	PRWT12-2D□ PRW12-2A□	PRWT12-4D□ PRW12-4A□	PRWT18-5D□ PRW(L)18-5D□ PRW(L)18-5A□	PRWT18-8D□ PRW(L)18-8D□ PRW(L)18-8A□	PRWT30-10D□ PRW(L)30-10D□ PRW(L)30-10A□	PRWT30-15D□ PRW(L)30-15D□ PRW(L)30-15A□
A	9	12	12	24	30	48	60	90
B	16	24	24	36	36	54	60	90
ℓ	0	8	0	11	0	14	0	15
Ød	8	24	12	36	18	54	30	90
m	4.5	6	6	12	15	24	30	45
n	12	24	18	36	27	54	45	90