Cylindrical, Long Sensing Distance, Cable Type Proximity Sensor

▣ Features

- Long sensing distance
  (1.5 to 2 times longer sensing distance guaranteed compared to existing models)
- Improved the noise immunity with dedicated IC
- Built-in surge protection, reverse polarity protection, output short over current protection circuit
- Long life cycle and high reliability, and simple operation
- Red LED operation indicator
- IP67 protection structure (IEC standard)
- Replaceable for micro switches and limit switches
- Strain relief cables
  : improved flexural strength of cable connecting component (except for PRDT08-□DO-□)

⚠ 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	PRDT08-2DO PRDT08-2DC PRDT08-2DO-V PRDT08-2DC-V	PRDT08-4DO PRDT08-4DC PRDT08-4DO-V PRDT08-4DC-V	PRDT12-4 D O PRDT12-4 D C PRDT12-4DO-V PRDT12-4DC-V PRDLT12-4DO PRDLT12-4DC PRDLT12-4DO-V PRDLT12-4DC-V	PRDT12-8 D O PRDT12-8 D C PRDT12-8DO-V PRDT12-8DC-V PRDLT12-8DO PRDLT12-8DC PRDLT12-8DO-V PRDLT12-8DC-V	PRDT18-7 D O PRDT18-7 D C PRDT18-7 D O-V PRDT18-7 D C-V PRDLT18-7 D O PRDLT18-7 D C PRDLT18-7 D O-V PRDLT18-7 D C-V	PRDT18-14 D O PRDT18-14 D C PRDT18-14 D O-V PRDT18-14 D C-V PRDLT18-14 D O PRDLT18-14 D C PRDLT18-14 D O-V PRDLT18-14 D C-V	PRDT30-15 D O PRDT30-15DC PRDT30-15 D O-V PRDT30-15DC-V PRDLT30-15DO PRDLT30-15DC PRDLT30-15DO-V PRDLT30-15DC-V	PRDT30-25 D O PRDT30-25 D C PRDT30-25 D O-V PRDT30-25 D C-V PRDLT30-25DO PRDLT30-25DC PRDLT30-25DO-V PRDLT30-25DC-V
Diameter of sensing side	8mm		12mm		18mm		30mm	
Sensing distance	2mm	4mm	4mm	8mm	7mm	14mm	15mm	25mm
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. 15% of sensing distance		Max. 10% of sensing distance					
Standard sensing target	8×8×1mm (iron)	12×12×1mm (iron)	12×12×1mm (iron)	25×25×1mm (iron)	20×20×1mm (iron)	40×40×1mm (iron)	45×45×1mm (iron)	75×75×1mm (iron)
Setting distance	0 to 1.4mm	0 to 2.8mm	0 to 2.8mm	0 to 5.6mm	0 to 4.9mm	0 to 9.8mm	0 to 10.5mm	0 to 17.5mm
Power supply (operating voltage)	12-24VDC⎓ (10-30VDC⎓)							
Leakage current	Max. 0.8mA		Max. 0.6mA					
Response frequency※1	1kHz	800Hz	450Hz	400Hz	250Hz	200Hz	100Hz	
Residual voltage※2	Max. 3.5V (non-polarity type is max. 5V)							
Affection by Temp.	Max. ±15% for sensing distance at ambient temperature 20℃		Max. ±10% for sensing distance at ambient temperature 20℃					
Control output	2 to 100mA							

※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 divice because residual voltage is 5V.
※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.

● DC 2-wire type

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

Model									
	PRDT08-2DO PRDT08-2DC PRDT08-2DO-V PRDT08-2DC-V	PRDT08-4DO PRDT08-4DC PRDT08-4DO-V PRDT08-4DC-V	PRDT12-4 D O PRDT12-4 D C PRDT12-4DO-V PRDT12-4DC-V PRDLT12-4DO PRDLT12-4DC PRDLT12-4DO-V PRDLT12-4DC-V	PRDT12-8 D O PRDT12-8 D C PRDT12-8DO-V PRDT12-8DC-V PRDLT12-8DO PRDLT12-8DC PRDLT12-8DO-V PRDLT12-8DC-V	PRDT18-7 D O PRDT18-7 D C PRDT18-7 D O-V PRDT18-7 D C-V PRDLT18-7 D O PRDLT18-7 D C PRDLT18-7 D O-V PRDLT18-7 D C-V	PRDT18-14 D O PRDT18-14 D C PRDT18-14 D O-V PRDT18-14 D C-V PRDLT18-14 D O PRDLT18-14 D C PRDLT18-14 D O-V PRDLT18-14 D C-V	PRDT30-15 D O PRDT30-15DC PRDT30-15 D O-V PRDT30-15DC-V PRDLT30-15DO PRDLT30-15DC PRDLT30-15DO-V PRDLT30-15DC-V	PRDT30-25 D O PRDT30-25 D C PRDT30-25 D O-V PRDT30-25 D C-V PRDLT30-25DO PRDLT30-25DC PRDLT30-25DO-V PRDLT30-25DC-V
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 temp.	-25 to 70℃, storage: -30 to 80℃								
Environment – Ambient humi.	35 to 95% RH, storage: 35 to 95% RH								
Protection circuit	Surge protection circuit, reverse polarity protection circuit, output short over current protection circuit								
Material	Case/Nut: Nickel plated brass (case of PRDT08: SUS303), Washer: Nickel plated iron, Sensing surface: Polybutylene terephthalate, Standard cable (black): Polyvinyl chloride (PVC), oil resistant cable (gray): Oil resistant polyvinyl chloride (PVC)								
Cable※3	Ø3.5mm, 2-wire, 2m (AWG24, core diameter: 0.08mm, number of cores: 40, insulator diameter: Ø1.0mm)		Ø4mm, 2-wire, 2m (AWG22, core diameter: 0.08mm, Number of cores: 60, insulator diameter: Ø1.25mm)		Ø5mm, 2-wire, 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm)				
Approval	CE								
Protection structure	IP67 (IEC standard)								
Weight※4 – PRDT	Approx. 58g(approx. 50g)		Approx. 74g (approx. 62g)	Approx. 72g (approx. 60g)	Approx. 115g (approx. 97g)	Approx. 110g (approx. 92g)	Approx. 175g (approx. 138g)	Approx. 180g (approx. 143g)	
Weight※4 – PRDLT	—		Approx. 94g (approx. 82g)	Approx. 92g (approx. 80g)	Approx. 145g (approx. 127g)	Approx. 140g (approx. 122g)	Approx. 215g (approx. 178g)	Approx. 220g (approx. 183g)	

※3: Do not pull the Ø3.5mm cable with a tensile strength of 25N, the Ø4mm cable with a tensile strength of 30N or over and the Ø5mm cable with a tensile strength of 50N or over.
It may result in fire due to the broken wire. When extending wire, use AWG22 cable or over within 200m.
※4: The weight includes packaging. The weight in parenthesis in for unit only.
※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.

● DC 3-wire type

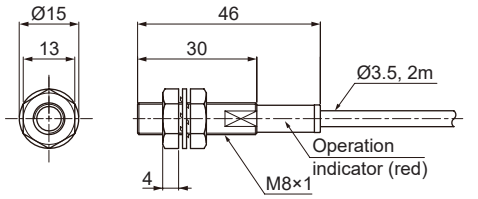
Model		PRD12-4DN PRD12-4DP PRD12-4DN2 PRD12-4DP2 PRDL12-4DN PRDL12-4DP PRDL12-4DN2 PRDL12-4DP2	PRD12-8DN PRD12-8DP PRD12-8DN2 PRD12-8DP2 PRDL12-8DN PRDL12-8DP PRDL12-8DN2 PRDL12-8DP2	PRD18-7DN PRD18-7DP PRD18-7DN2 PRD18-7DP2 PRD18-7DN-V PRD18-7DP-V PRDL18-7DN PRDL18-7DP PRDL18-7DN2 PRDL18-7DP2 PRDL18-7DN-V	PRD18-14DN PRD18-14DP PRD18-14DN2 PRD18-14DP2 PRD18-14DN-V PRD18-14DP-V PRDL18-14DN PRDL18-14DP PRDL18-14DN2 PRDL18-14DP2 PRDL18-14DP-V	PRD30-15DN PRD30-15DP PRD30-15DN2 PRD30-15DP2 PRD30-15DN-V PRD30-15DP-V PRD30-15DN2-V PRD30-15DP2-V PRDL30-15DN PRDL30-15DP PRDL30-15DN2 PRDL30-15DP2 PRDL30-15DN-V	PRD30-25DN PRD30-25DP PRD30-25DN2 PRD30-25DP2 PRD30-25DN-V PRD30-25DP-V PRD30-25DN2-V PRD30-25DP2-V PRDL30-25DN PRDL30-25DP PRDL30-25DN2 PRDL30-25DP2 PRDL30-25DN-V
Diameter of sensing side		12mm		18mm		30mm	
Sensing distance		4mm	8mm	7mm	14mm	15mm	25mm
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)	25×25×1mm (iron)	20×20×1mm (iron)	40×40×1mm (iron)	45×45×1mm (iron)	75×75×1mm (iron)
Setting distance		0 to 2.8mm	0 to 5.6mm	0 to 4.9mm	0 to 9.8mm	0 to 10.5mm	0 to 17.5mm
Power supply (operating voltage)		12-24VDC⎓ (10-30VDC⎓)					
Leakage current		Max. 10mA					
Response frequency※1		500Hz	400Hz	300Hz	200Hz	100HZ	100Hz
Residual voltage		Max. 1.5V					
Affection by Temp.		Max. ±10% for sensing distance at ambient temperature 20℃					
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 temp.	-25 to 70℃, storage: -30 to 80℃					
	Ambient humi.	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: Polybutylene terephthalate, Standard cable (black): Polyvinyl chloride (PVC), Oil resistant cable (gray): Oil resistant Polyvinyl chloride (PVC)					
Cable※2		Ø4mm, 3-wire, 2m		Ø5mm, 3-wire, 2m			
		AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm					
Approval		CE					
Unit weight	PRD	Approx. 74g	Approx. 72g	Approx. 115g	Approx. 110g	Approx. 175g	Approx. 180g
	PRDL	Approx. 94g	Approx. 92g	Approx. 145g	Approx. 140g	Approx. 215g	Approx. 220g

※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: Do not pull the Ø4mm cable with a tensile strength of 30N or over and the Ø5mm cable with a tensile strength of 50N or over. It may result in fire due to the broken wire. When extending wire, use AWG22 cable or over within 200m.
※The last 'V' of model name is for the model with oil-resistance reinforced cable.
※Environment resistance is rated at no freezing or condensation.

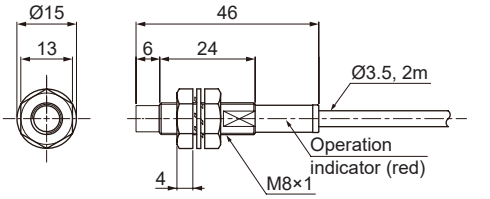
▣ Dimensions

(unit: mm)

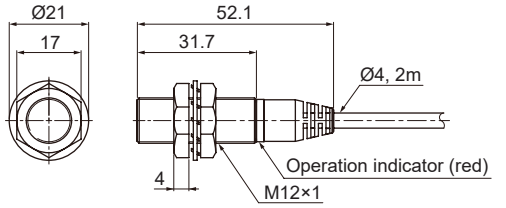
● **PRDT08-2D□**



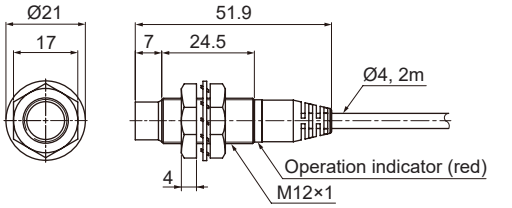
● **PRDT08-4D□**



● **PRD(T)12-4D□**



● **PRD(T)12-8D□**



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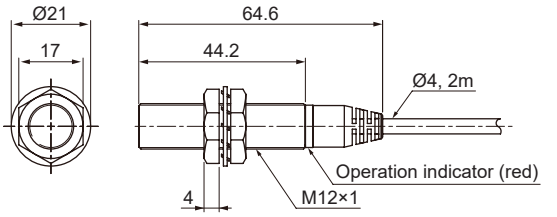

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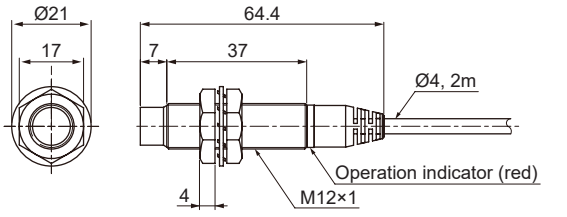
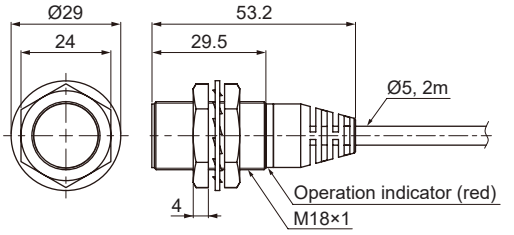
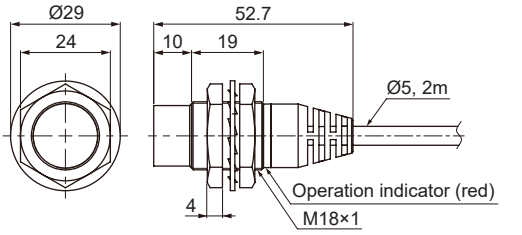


● **PRD(T)18-7D□**



● **PRD(T)18-14D□**



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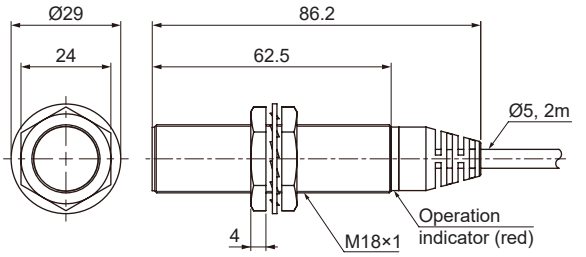

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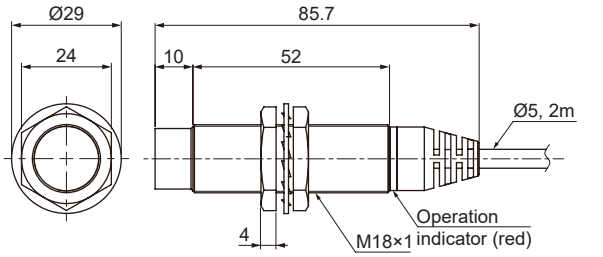
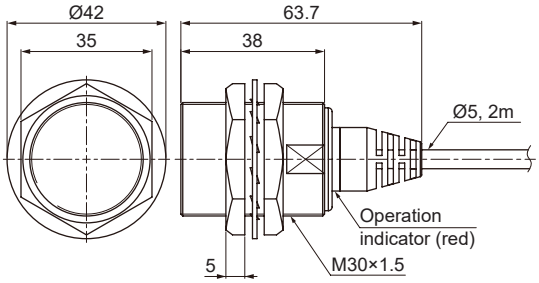
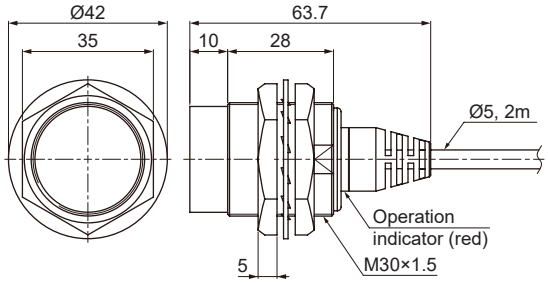


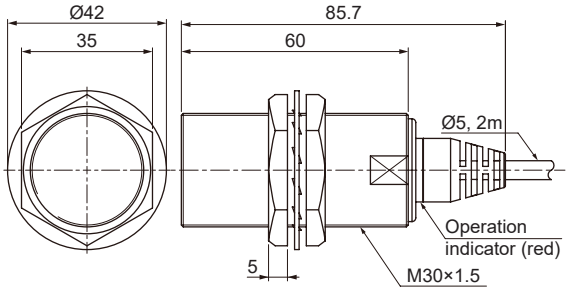
● **PRD(T)30-15D□**



● **PRD(T)30-25D□**



● **PRDL(T)30-15D□**



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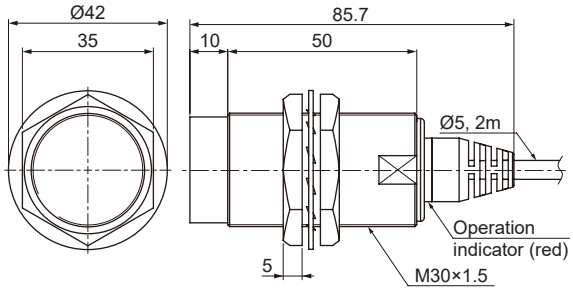
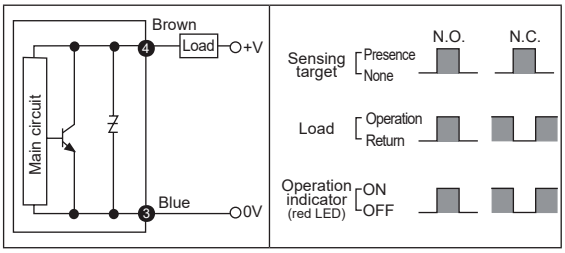


▣ Control Output Diagram and Load Operation

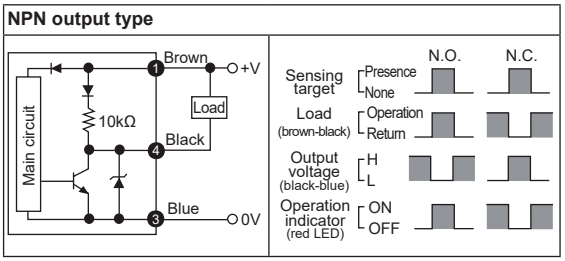
◎ DC 2-wire type



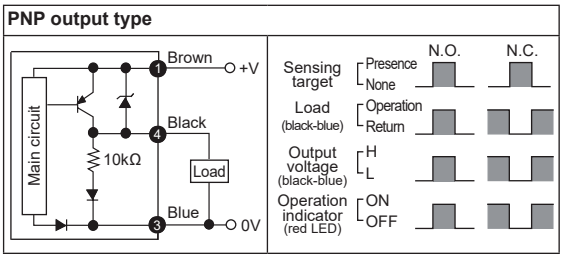
※The number in a circle is pin no. of connector.

◎ DC 3-wire type

NPN output type

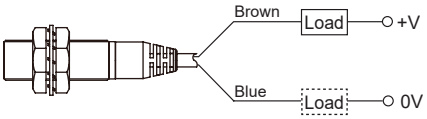


PNP output type



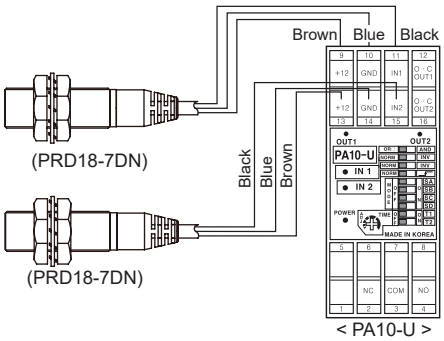
▣ Connections

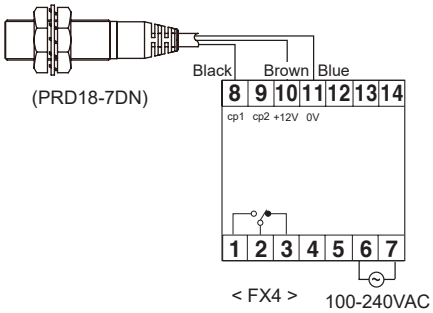
◎ DC 2-wire type



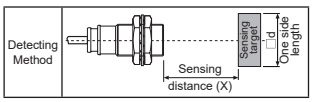
※The load can be connected to either wire.

◎ DC 3-wire type

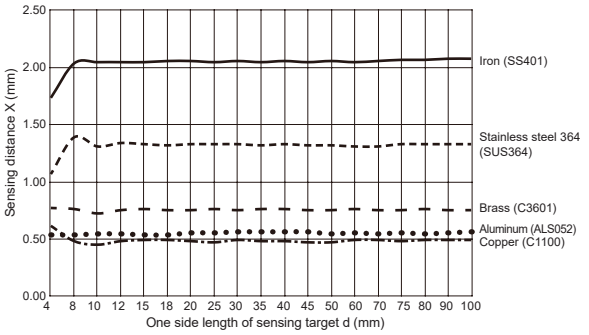




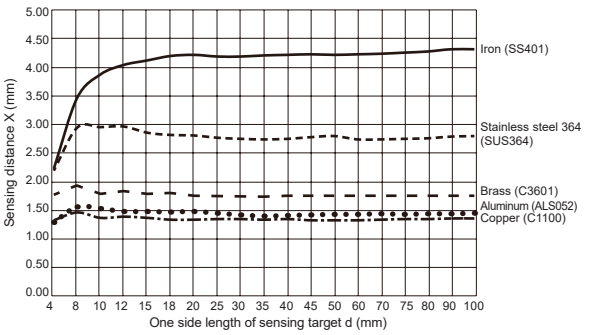
▣ Sensing Distance Feature Data by Target Material and Size



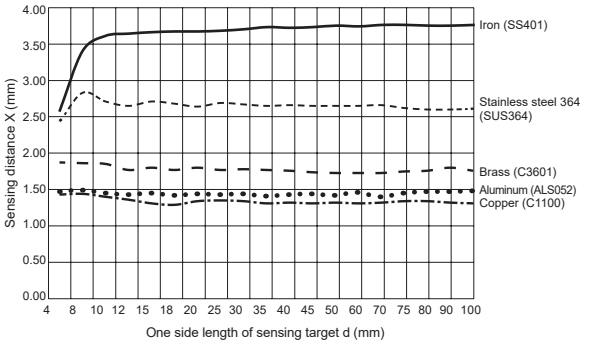
● PRDT08-2D□



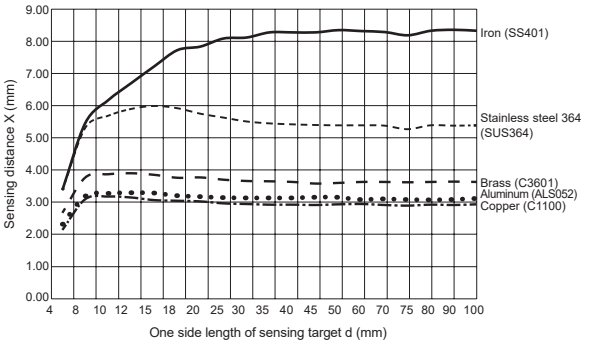
● PRDT08-4D□



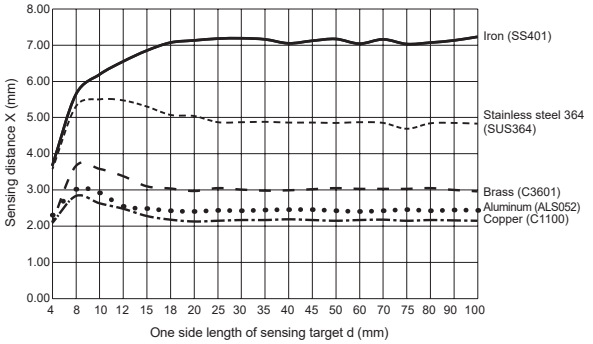
● PRD(L)T12-4D□



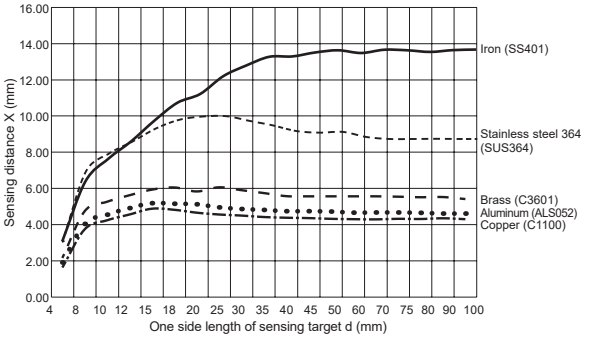
● PRD(L)T12-8D□



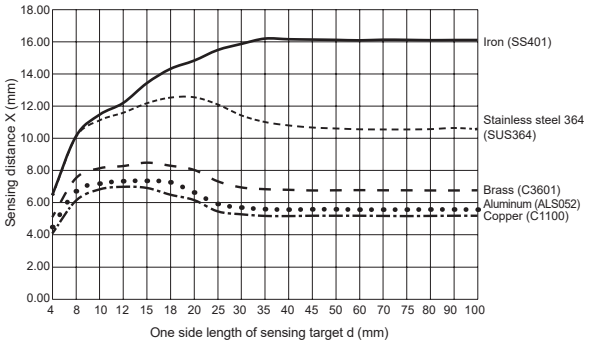
● PRD(L)T18-7D□



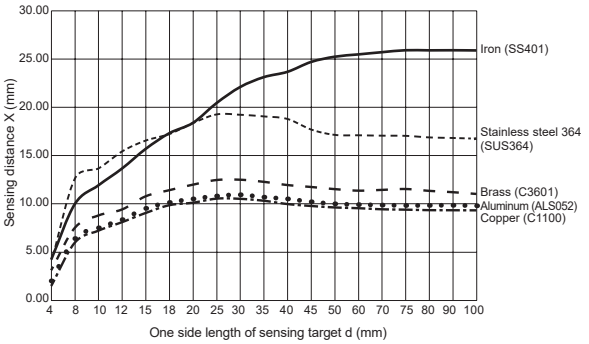
● PRD(L)T18-14D□



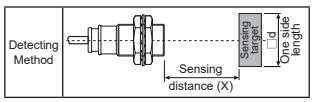
● PRD(L)T30-15D□



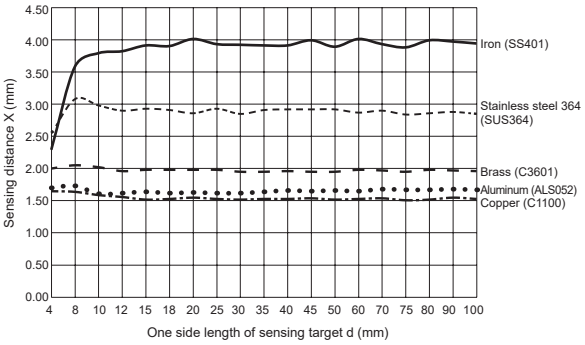
● PRD(L)T30-25D□



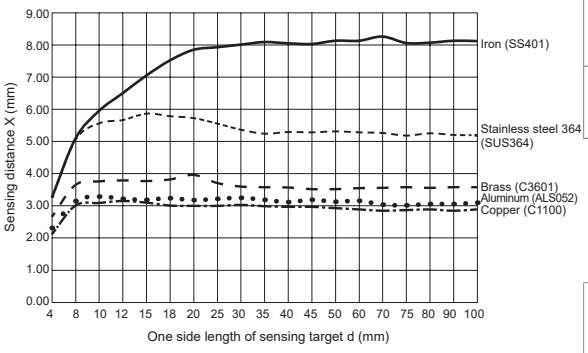
▣ Sensing Distance Feature Data by Target Material and Size



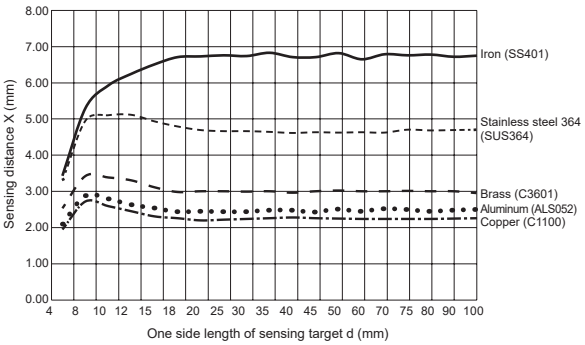
● PRD(L)12-4D□



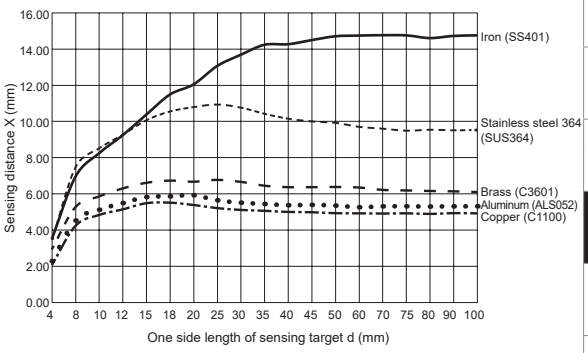
● PRD(L)12-8D□



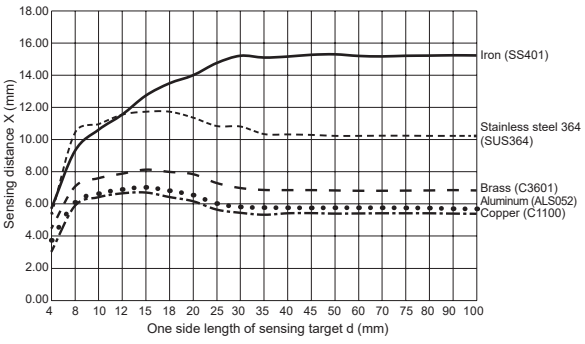
● PRD(L)18-7D□



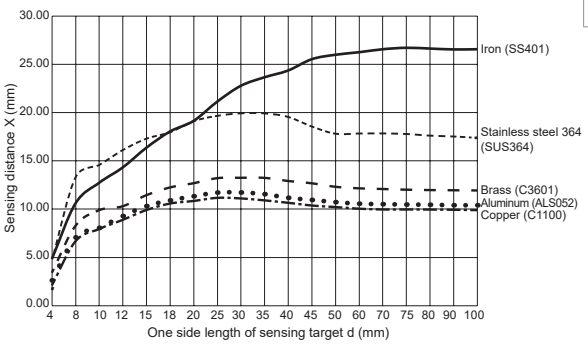
● PRD(L)18-14D□



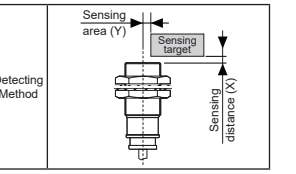
● PRD(L)30-15D□



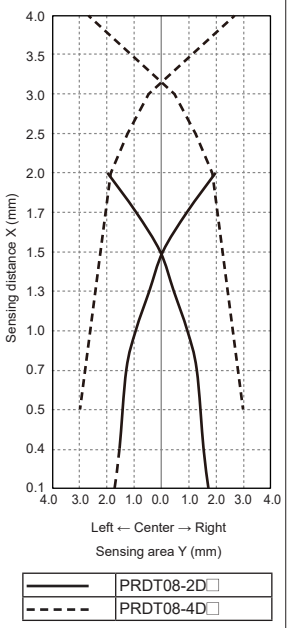
● PRD(L)30-25D□



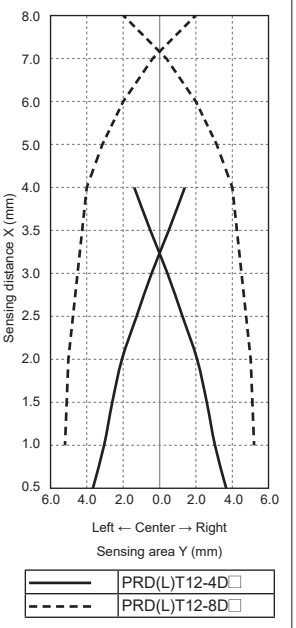
▣ Sensing Distance Feature Data by Parallel (Left/Right) Movement



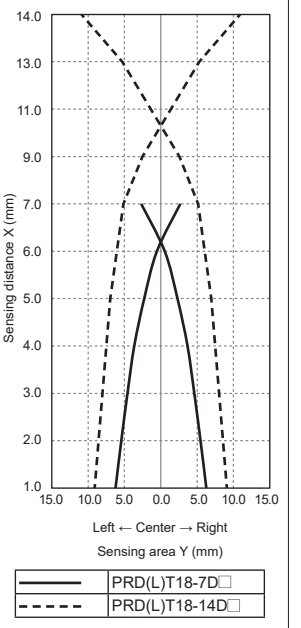
● PRDT08-2D□/4D□



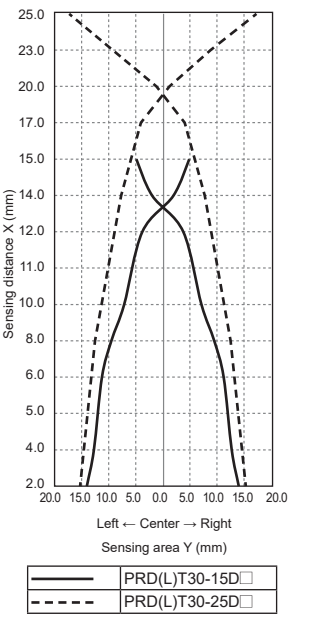
● PRD(L)T12-4D□/8D□



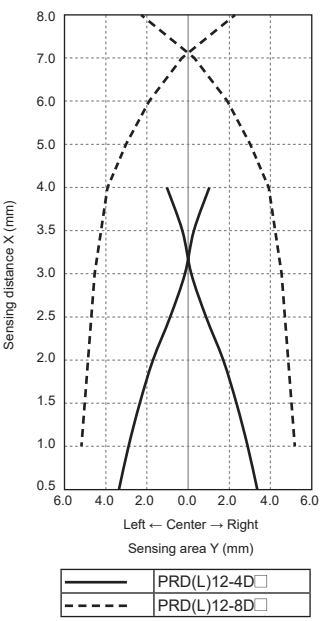
● PRD(L)T18-7D□/14D□



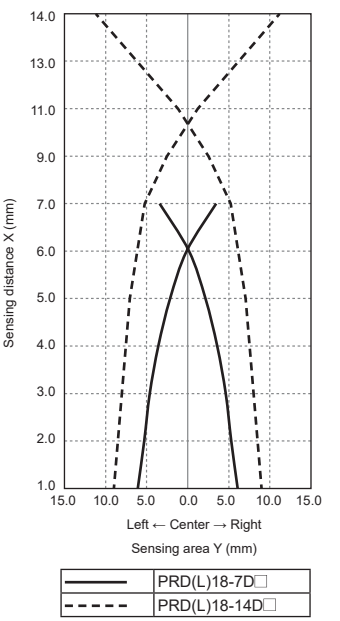
● PRD(L)T30-15D□/25D□



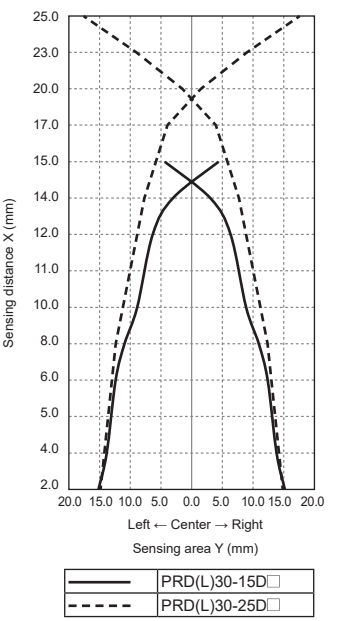
● PRD(L)12-4D□/8D□



● PRD(L)18-7D□/14D□

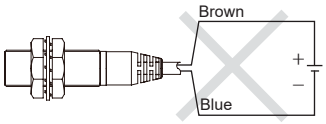


● PRD(L)30-15D□/25D□

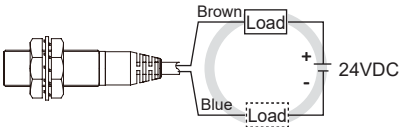


▣ Proper Usage

◎ Load connections



< DC 2-wire type >

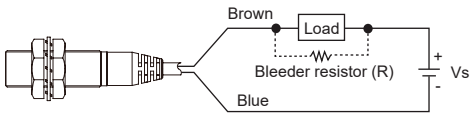


< DC 2-wire type >

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

◎ In case of the load current is small

● DC 2-wire type



Please make the current on proximity sensor smaller than the return current of load by connecting a bleeder resistor in parallel.

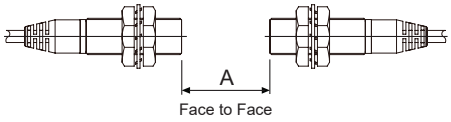
※W value of Bleeder resistor should be bigger for proper heat dissipation.

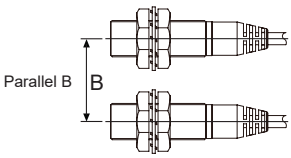
$$R \leq \frac{Vs}{Io\text{-}Ioff}\ (k\Omega) \qquad P > \frac{Vs^2}{R}\ (W)$$

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

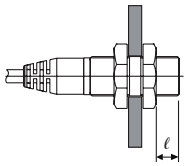
◎ Mutual-interference & Influence by surrounding metals

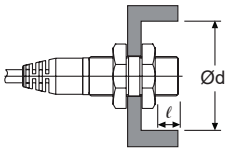
When several proximity sensors are mounted close to one another a malfunction of the may be caused due to mutual interference. Therefore, be sure to keep a minimum distance between the two sensors as below chart indicates.

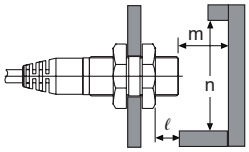




When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart indicates.







(unit: mm)

Item \ Model	PRDT08-2D□	PRDT08-4D□	PRD(L)T12-4D□ PRD(L)12-4D□	PRD(L)T12-8D□ PRD(L)12-8D□	PRD(L)T18-7D□ PRD(L)18-7D□	PRD(L)T18-14D□ PRD(L)18-14D□	PRD(L)T30-15D□ PRD(L)30-15D□	PRD(L)T30-25D□ PRD(L)30-25D□
A	20	80	25	120	50	200	110	350
B	15	60	25	100	35	110	90	300
ℓ	0	12	2.5	15	3.5	14	6	20
Ød	8	24	18	40	27	70	45	120
m	6	8	12	20	24	40	45	90
n	12	24	18	40	27	70	45	120