

Autonics

INDUCTIVE PROXIMITY SENSOR

DC 2-WIRE TYPE

M A N U A L



Thank you for choosing our Autonics product.

Please read the following safety considerations before use.

Caution for your safety

※Please keep these instructions and review them before using this unit.

※Please observe the cautions that follow;

Warning Serious injury may result if instructions are not followed.

Caution Product may be damaged, or injury may result if instructions are not followed.

※The following is an explanation of the symbols used in the operation manual.

Caution: Injury or danger may occur under special conditions.

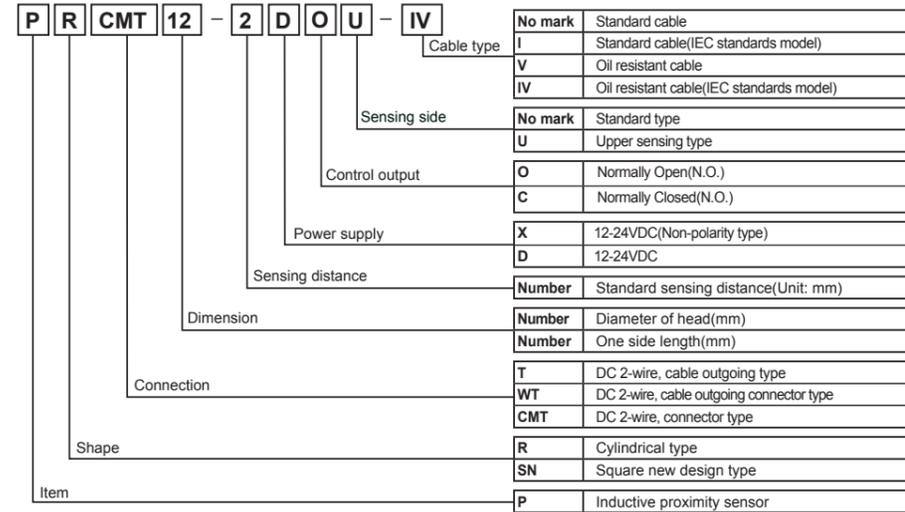
Warning

- In case of using this unit with machinery (Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device. It may cause a fire, human injury or damage to property.
- Do not connect power directly without load. It may cause damage to inner components or burn them out.

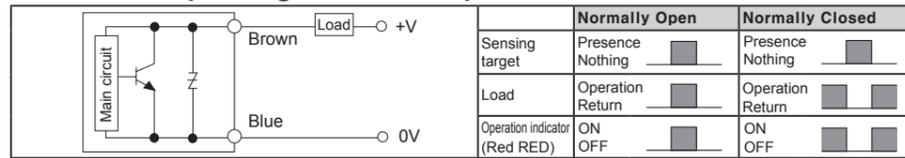
Caution

- Do not use this unit in place where there is flammable, explosive gas, chemical or strong alkalis, acids. It may cause a fire or explosion.
- Do not impact on this unit. It may cause malfunction or damage to the product.
- Do not use this product beyond rated voltage or apply AC power to DC power. It may cause serious damage to the product.

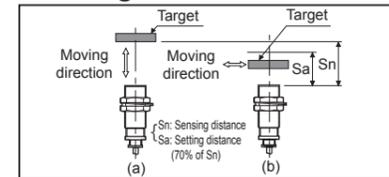
Ordering information



Control output diagram & Load operation



Setting distance



• Detecting distance can be changed by the shape, size or material of the target. Therefore please check the detecting distance like (a), then pass the target within range of setting distance(Sa).

• Setting distance(Sa)
= Sensing distance(Sn) × 70%
Ex) PRCMT12-2DC
Setting distance(Sa) = 2mm × 0.7 = 1.4mm

※The above specifications are subject to change and some models may be discontinued without notice.

Specifications

Model	PRT08-1.5DO PRT08-1.5DOU PRWT08-1.5DC PRWT08-1.5DCV PRWT08-1.5DC-V PRWT08-1.5DC-IV	PRT08-2DO PRT08-2DOU PRWT08-2DC PRWT08-2DCV PRWT08-2DC-V PRWT08-2DC-IV	PRT12-2 O PRT12-2 C PRWT12-2 C PRWT12-2 C-I PRWT12-2 C-J PRWT12-2 C-K	PRT12-4 O PRT12-4 C PRWT12-4 C PRWT12-4 C-I PRWT12-4 C-J PRWT12-4 C-K	PRT18-5 O PRT18-5 C PRWT18-5 C PRWT18-5 C-I PRWT18-5 C-J PRWT18-5 C-K	PRT18-8 O PRT18-8 C PRWT18-8 C PRWT18-8 C-I PRWT18-8 C-J PRWT18-8 C-K	PRT30-10 O PRT30-10 C PRWT30-10 C PRWT30-10 C-I PRWT30-10 C-J PRWT30-10 C-K	PRT30-15 O PRT30-15 C PRWT30-15 C PRWT30-15 C-I PRWT30-15 C-J PRWT30-15 C-K	PSNT17-5DO PSNT17-5DOU PSNT17-5DC PSNT17-5DCU	
Sensing distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	15mm	5mm	
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)	
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	0 to 3.5mm	
Power supply (Operating voltage)	12-24VDC(10-30VDC)									
Leakage current	Max. 0.6mA									
Response frequency	1.5kHz	1.0kHz	1.5kHz	500Hz	350Hz		400Hz	200Hz	700Hz	
Residual voltage	Max. 3.5V(Non-polarity type is Max. 5V)									
Affection by Temp.	Within ±10°C max. of sensing distance at 20°C in temperature range of -25 to 70°C(PRT08 Series: Max. ±20%)									
Control output	2 to 100mA									
Insulation resistance	Min. 500MΩ(500VDC megger)									
Dielectric strength	1,500VAC 50/60Hz for 1minute									
Vibration	1mm amplitude at frequency 10-55Hz in each of X, Y, Z directions for 2 hours									
Shock	500ms(50G) X, Y, Z directions for 3 times									
Indicator	Operating indicator(Red LED)									
Environment	Ambient Temp. -25 to 70°C, Storage: -30 to 80°C Ambient humidity 35-95%RH, Storage: 35 to 95%RH									
Protection circuit	Surge protection, Surge protection circuit, overload & short circuit protection									
Protection	IP67(IEC Standard)									
Cable	PRT Ø3.5, 3-wire, 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: Ø1mm)		PRWT Ø4, 2-wire, 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm)		Ø5, 2-wire, 2m		Ø4, 2-wire, 2m			
Materials	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)									
Approval	CE									
Weight	PRT: Approx. 64g(Approx. 52g) PRWT: Approx. 44g(Approx. 32g)		PRT: Approx. 84g(Approx. 72g) PRWT: Approx. 54g(Approx. 42g) PRCMT: Approx. 36g(Approx. 26g)		PRT: Approx. 122g(Approx. 110g) PRWT: Approx. 70g(Approx. 58g) PRCMT: Approx. 60g(Approx. 48g)		PRT: Approx. 207g(Approx. 170g) PRWT: Approx. 134g(Approx. 122g) PRCMT: Approx. 159g(Approx. 142g)		PSNT: Approx. 92g (Approx. 71g)	

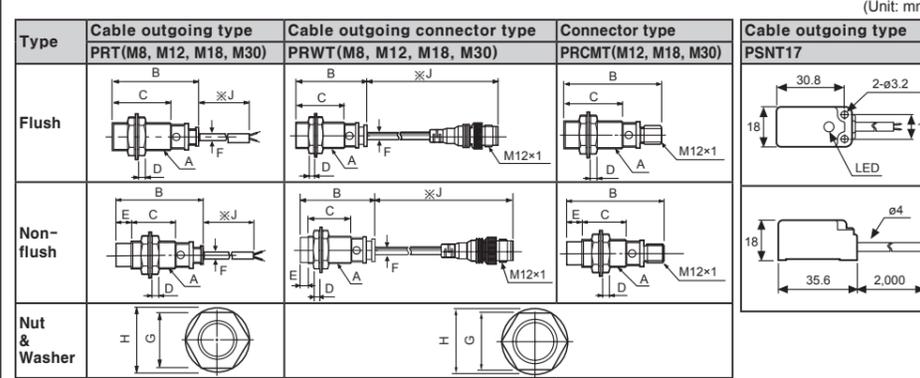
※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

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

※3: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

Dimensions



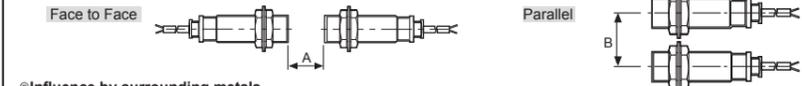
Type		A	B	C	D	E	F	G	H	J
M8	PRT	M8×1	30	30	4	-	3.5	13	15	2,000
	PRWT	M8×1	30	30	4	-	4	13	15	300
	PRT	M12×1	46	31.5	4	-	4	17	21	2,000
M12	PRWT	M12×1	46	31.5	4	-	4	17	21	300
	PRCMT	M12×1	55.8	31.5	4	-	-	17	21	-
	PRT	M18×1	47	29.5	4	-	5	24	29	2,000
M18	PRWT	M18×1	47.5	29.5	4	-	5	24	29	300
	PRCMT	M18×1	54.3	29.5	4	-	-	24	29	-
	PRT	M30×1.5	58	38	5	-	5	35	42	2,000
M30	PRWT	M30×1.5	58	38	5	-	5	35	42	300
	PRCMT	M30×1.5	63.8	38	5	-	-	35	42	-
	PRT	M8×1	30	26	4	4	3.5	13	15	2,000
M8	PRWT	M8×1	30	26	4	4	4	13	15	300
	PRT	M12×1	46	24.5	4	7	4	17	21	2,000
	PRWT	M12×1	46	24.5	4	7	4	17	21	300
M12	PRCMT	M12×1	55.8	24.5	4	7	-	17	21	-
	PRT	M18×1	47	19	4	10	5	24	29	2,000
	PRWT	M18×1	47	19	4	10	5	24	29	300
M18	PRCMT	M18×1	53.8	19	4	10	-	24	29	-
	PRT	M30×1.5	58	28	5	10	5	35	42	2,000
	PRWT	M30×1.5	58	28	5	10	5	35	42	300
M30	PRCMT	M30×1.5	63.8	28	5	10	-	35	42	-

※J type standard : Cable outgoing type/2,000mm, Cable outgoing connector type/300mm

Mutual-interference & Influence by surrounding metals

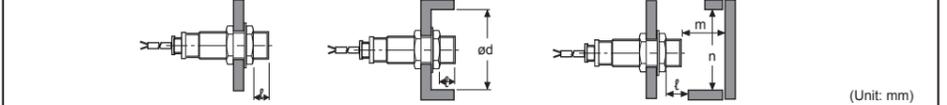
Mutual-interference

When plural proximity sensors are mounted in a close row, malfunction of sensor may be caused due to mutual interference. Therefore, be sure to provide a minimum distance between the two sensors, as below table.

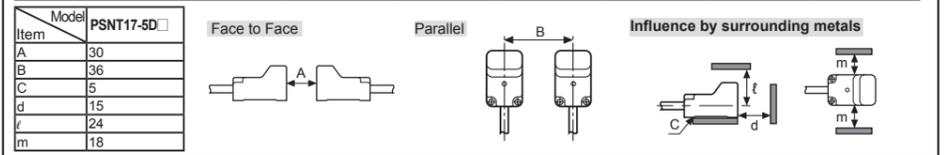


Influence by surrounding metals

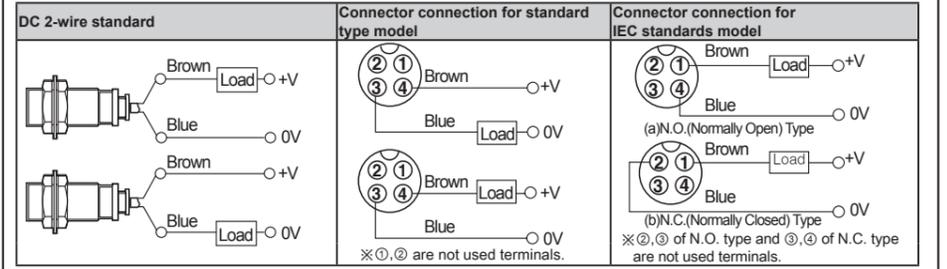
When sensors are mounted on metallic panel, it must be prevented sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



Model	PRT08-1.5DO PRWT08-1.5DO	PRT08-2DO PRWT08-2DO	PRT12-2 PRWT12-2 PRCMT12-2	PRT12-4 PRWT12-4 PRCMT12-4	PRT18-5 PRWT18-5 PRCMT18-5	PRT18-8 PRWT18-8 PRCMT18-8	PRT30-10 PRWT30-10 PRCMT30-10	PRT30-15 PRWT30-15 PRCMT30-15
A	9	12	12	24	36	48	60	90
B	16	24	24	36	54	72	90	108
t	0	8	0	11	0	14	0	15
od	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



Connections



※Load can be wired to any direction. ※No need to consider polarity for non-polarity type of power supply.

Caution for using

- This equipment shall not be used outdoors or beyond specified temperature range.
- Do not load over than tensile strength of cord. (ø3.5: 25N max., ø4: 30N max., ø5: 50N max.)
- Do not use the same conduit with cord of this unit and electric power line or power line. Also avoid the same connection.
- Do not put overload to tighten nut, please use washer for tightening.
 - Note1) Allowable tightening torque of a nut may be different by the distance from the head. For allowable tightening torque and the range of front and rear parts, refer to [Table 1] and above [Figure 1] respectively. The rear part includes a nut on the head side(see above [Figure 1]). Please apply a tightening torque of the front part when the nut on the front is located in the front part.
 - Note2) The allowable tightening torque denotes a torque value when using a provided washer as above [Figure 2].
 - Note3) PSNT17 Series: Tighten strength of installing bolts should be under 15kgf-cm(1.47N-m).
- Please check the voltage changes of power source in order not to exceed rating power input.
- Do not use this unit during transient time(80ms) after apply power.
- Do not connect capacity load to output part directly.
- It may result in damage to the product, if use automatic transformer. So please use insulated transformer.
- Please make wire short as much as possible in order to avoid noise.
- Be sure to cable as indicated specification on this product. If use wrong cable or bended cable, it shall not maintain the water-proof.
- It is possible to extend cable with over 0.3mm and max. 200m.
- If the target is plated, the sensing distance can be changed by the plating material.
- It may result in malfunction by metal particle on product.
- If there are machines(motor, welding etc), which occurs big surge around this unit, please install the Varistor or absorber to source of surge, even though there is built-in surge absorber in this unit.
- If connect the load with big inrush current(DC type bulb) to this unit, the big inrush current will flow due to the initial resistance is low. If the current flows, the resistance of load will be bigger, then it will return to standard current. In this case, proximity sensor might be damaged by inrush current. If you use DC type bulb, please connect extra relay or resistance in order to protect proximity sensor from.
- In case of the load current is small: Make the residual current is less than return current to connect the bleeder resistor to load in parallel.
 - Vs: Power supply, Io: Min operating current for proximity sensor, Ioff: Return current of load, P: Resistance W of Bleeder resistor
 - $R \leq \frac{Vs}{Io - Ioff} (k\Omega)$ $P > \frac{Vs^2}{R} (mW)$
- If make a transistor close to proximity sensor or wire connection, it may cause malfunction.
 - ※ It may cause malfunction if above instructions are not followed.

Major products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse(Rate) Meters
- Display Units
- Sensor Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System(Fiber, CO₂, Nd:YAG)
- Laser Welding/Cutting System

Autonics Corporation
http://www.autonics.com

■ HEADQUARTERS:
18, Banson-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002

■ OVERSEAS SALES:
#402-303, Bucheon Techno Park, 655, Pyeongcheon-ro, Wonmi-gu, Bucheon, Gyeonggi-do, South Korea, 14502
TEL: 82-32-610-2730 / FAX: 82-32-329-0728
E-mail: sales@autonics.com

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Autonics

INDUCTIVE PROXIMITY SENSOR CYLINDRICAL TYPE DC 3WIRE INSTRUCTION MANUAL



Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

- ※Please observe all safety considerations for safe and proper product operation to avoid hazards.
 - ※⚠ symbol represents caution due to special circumstances in which hazards may occur.
 - ⚠Warning Failure to follow these instructions may result in serious injury or death.
 - ⚠Caution Failure to follow these instructions may result in personal injury or product damage.
 - ⚠Warning
- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in fire, personal injury, or economic loss.
 - Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire.
 - Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire.
 - Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.

⚠ Caution

- Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
Failure to follow this instruction may result in fire or explosion.

■ Ordering Information

P **R** **W** **L** **18** - **5** **DN** - **V**

Cable type: **V** (Oil resistant cable), **S** (Option)
 Output: **DN** (NPN N.O. (Normally Open)), **DN2** (NPN N.C. (Normally Closed)), **DP** (PNP N.O. (Normally Open)), **DP2** (PNP N.C. (Normally Closed))
 Sensing distance: **Number** (Standard sensing distance (Unit: mm))
 Dimension: **Number** (Diameter of head (Unit: mm))
 Body size: **No mark** (Standard), **S** (Short body), **L** (Long body)
 Connection: **No mark** (DC 3 wire, Cable type), **W** (DC 3 wire, Cable connector type)
 Shape: **R** (Cylindrical type)
 Item: **P** (Inductive proximity sensor)

■ Control Output Diagram & Load Operation

NPN output

	Normally Open	Normally Closed
Sensing target	Presence: High, Nothing: Low	Presence: Low, Nothing: High
Load (Brown-Black)	Operation: High, Return: Low	Operation: Low, Return: High
Output voltage (Black-Blue)	H, L	H, L
Operation indicator (RED LED)	ON, OFF	ON, OFF

PNP output

	Normally Open	Normally Closed
Sensing target	Presence: High, Nothing: Low	Presence: Low, Nothing: High
Load (Black-Blue)	Operation: High, Return: Low	Operation: Low, Return: High
Output voltage (Black-Blue)	H, L	H, L
Operation indicator (RED LED)	ON, OFF	ON, OFF

■ Connections

Cable type	PNP	Cable connector type	PNP
NPN		NPN	
		PNP	

※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Specifications

Model	PR08-1.5DN PR08-1.5DP PR08-1.5DN2 PRL08-1.5DN PRL08-1.5DP PRL08-1.5DN2 PRW08-1.5DN PRW08-1.5DP PRW08-1.5DN2 PRWL08-1.5DN PRWL08-1.5DP PRWL08-1.5DN2	PR08-2DN PR08-2DP PR08-2DN2 PRL08-2DN PRL08-2DP PRL08-2DN2 PRW08-2DN PRW08-2DP PRW08-2DN2 PRWL08-2DN PRWL08-2DP PRWL08-2DN2	PR12-2DN PR12-2DP PR12-2DN2 PRS12-2DN PRS12-2DP PRS12-2DN2 PRW12-2DN PRW12-2DP PRW12-2DN2 PRL12-2DN PRL12-2DP	PR12-4DN PR12-4DP PR12-4DN2 PRS12-4DN PRS12-4DP PRS12-4DN2 PRW12-4DN PRW12-4DP PRW12-4DN2 PRL12-4DN PRL12-4DP	PR18-5DN PR18-5DP PR18-5DN2 PRL18-5DN PRL18-5DP PRL18-5DN2 PRW18-5DN PRW18-5DP PRW18-5DN2 PRWL18-5DN PRWL18-5DP PRWL18-5DN2	PR18-8DN PR18-8DP PR18-8DN2 PRL18-8DN PRL18-8DP PRL18-8DN2 PRW18-8DN PRW18-8DP PRW18-8DN2 PRWL18-8DN PRWL18-8DP PRWL18-8DN2	PR30-10DN PR30-10DP PR30-10DN2 PRL30-10DN PRL30-10DP PRL30-10DN2 PRW30-10DN PRW30-10DP PRW30-10DN2 PRWL30-10DN PRWL30-10DP PRWL30-10DN2	PR30-15DN PR30-15DP PR30-15DN2 PRL30-15DN PRL30-15DP PRL30-15DN2 PRW30-15DN PRW30-15DP PRW30-15DN2 PRWL30-15DN PRWL30-15DP PRWL30-15DN2	
Sensing distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	15mm	
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)		
Setting distance	0 to 1.05mm		0 to 1.4mm		0 to 2.8mm		0 to 3.5mm		
Power supply (Operating voltage)	12-24VDC (10-30VDC)								
Current consumption	Max. 10mA								
Response frequency※1	1.5kHz	1kHz	1.5kHz	500Hz	500Hz	350Hz	400Hz	200Hz	
Residual voltage	Max. 2.0V		Max. 1.5V						
Affection by Temp.	Within ±10°C max. of sensing distance at 20°C in temperature range of -25 to 70°C (PR: 08 Series: Max. ±20%)								
Control output	Max. 200mA								
Insulation resistance	Min. 50MΩ (at 500VDC megger)								
Dielectric strength	1,500VAC 50/60Hz for 1 minute								
Vibration	1mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours								
Shock	500ms (approx. 50G) X, Y, Z directions for 3 times								
Indicator	Operation indicator (Red LED)								
Environ. Ambient temp.	-25 to 70°C, Storage: -30 to 80°C								
Environ. Ambient humi.	35 to 95%RH, Storage: 35 to 95%RH								
Protection circuit	Surge protection, Reverse polarity protection, Overload & short circuit protection								
Protection	IP67 (IEC Standards)								
Cable ※2	PR, PRL: Ø3.5mm, 3-wire, 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: Ø1mm)		Ø4mm, 3-wire, 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm)		Ø5mm, 3-wire, 2m				
Materials	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable (Black): Polyvinyl chloride (PVC), Oil resistant cable (Gray): Oil resistant Polyvinyl chloride (PVC)								
Approval	CE								
Weight ※3	PR: Approx. 64g (Approx. 52g) PRL: Approx. 66g (Approx. 54g) PRW: Approx. 44g (Approx. 32g) PRWL: Approx. 46g (Approx. 34g)		PR: Approx. 84g (Approx. 72g) PRS: Approx. 82g (Approx. 70g) PRW: Approx. 54g (Approx. 42g) PRL: Approx. 88g (Approx. 76g)		PR: Approx. 122g (Approx. 110g) PRS: Approx. 124g (Approx. 130g) PRW: Approx. 70g (Approx. 58g) PRL: Approx. 90g (Approx. 78g)		PR: Approx. 207g (Approx. 170g) PRS: Approx. 247g (Approx. 210g) PRW: Approx. 134g (Approx. 122g) PRL: 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: 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.
- ※3: The weight with packaging and the weight in parentheses is only unit weight.
- ※Environment resistance is rated at no freezing or condensation.

■ Dimensions

Type	Cable type	Cable connector type	Nut & Washer
	M8, M12, M18, M30	M8, M12, M18, M30	
Flush			
Non-flush			

Type		A	B	C	D	E	F	G	H	J
M8	PR	M8×1	30	30	4	-	3.5	13	15	2,000
	PRL	M8×1	40	40	4	-	3.5	13	15	2,000
	PRW	M8×1	30	30	4	-	4	13	15	300
	PRWL	M8×1	40	40	4	-	4	13	15	300
M12	PR	M12×1	46	31.5	4	-	4	17	21	2,000
	PRS	M12×1	39	24.5	4	-	4	17	21	2,000
	PRW	M12×1	46	31.5	4	-	4	17	21	300
	PRL	M12×1	74.5	60	4	-	4	17	21	2,000
M18	PR	M18×1	47.5	29.5	4	-	5	24	29	2,000
	PRL	M18×1	80.5	62.5	4	-	5	24	29	2,000
	PRW	M18×1	47.5	29.5	4	-	5	24	29	300
	PRWL	M18×1	80.5	62.5	4	-	5	24	29	300
M30	PR	M30×1.5	58	38	5	-	5	35	42	2,000
	PRL	M30×1.5	80	60	5	-	5	35	42	2,000
	PRW	M30×1.5	58	38	5	-	5	35	42	300
	PRWL	M30×1.5	80	60	5	-	5	35	42	300
M8	PR	M8×1	30	30	4	4	3.5	13	15	2,000
	PRL	M8×1	40	40	4	4	3.5	13	15	2,000
	PRW	M8×1	30	30	4	4	4	13	15	300
	PRWL	M8×1	40	40	4	4	4	13	15	300
M12	PR	M12×1	46	24.5	4	7	4	17	21	2,000
	PRS	M12×1	39	17.5	4	7	4	17	21	2,000
	PRW	M12×1	46	24.5	4	7	4	17	21	300
	PRL	M12×1	58.5	37	4	7	4	17	21	2,000
M18	PR	M18×1	47	19	4	10	5	24	29	2,000
	PRL	M18×1	80.5	62.5	4	10	5	24	29	2,000
	PRW	M18×1	47	19	4	10	5	24	29	300
	PRWL	M18×1	80.5	62.5	4	10	5	24	29	300
M30	PR	M30×1.5	58	28	5	10	5	35	42	2,000
	PRL	M30×1.5	80	50	5	10	5	35	42	2,000
	PRW	M30×1.5	58	28	5	10	5	35	42	300
	PRWL	M30×1.5	80	50	5	10	5	35	42	300

■ Mutual-interference & Influence by Surrounding Metals

● **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 with referring to the chart below.

• Face to Face

• Parallel

● **Influence by surrounding metals**
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.

Model	PR_08-1.5D	PR_08-2D	PR_12-2D	PR_12-4D	PR_18-5D	PR_18-8D	PR_30-10D	PR_30-15D
Item								
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

■ Setting Distance

• Sensing distance can be changed by the shape, size or material of the target. Therefore please check the sensing distance like (a), then pass the target within range of setting distance (Sa).

• Setting distance (Sa) = Sensing distance (Sn) × 70%
E.g.) PR30-10DN (See ordering information)
Setting distance (Sa) = 10mm × 0.7 = 7mm

■ Installation and Tightening Torque

When tightening the nut, use the provided washer as [Figure 1]. When installing the product, the tightening torque of the nut varies according to the distance from the fore-end.

The front part of the product is from the fore-end to the dimension on the below table, and the rear part is from the tip of the nut to the end of the product. [Figure 2]

In case the nut is placed in the front part of the product, apply tightening torque for front part.

[Table 1] the allowable tightening torque table is for inserting the washer as [Figure 3].

■ Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Use the product, after 0.8 sec of supplying power.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent surge and inductive noise. Do not use near the equipment which generates strong magnetic force or high frequency noise (transceiver, etc.). In case installing the product near the equipment which generates strong surge (motor, welding machine, etc.), use diode or varistor to remove surge.
- This unit may be used in the following environments.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, CO₂, Nd: YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

Autonics Corporation
http://www.autonics.com

■ HEADQUARTERS:
18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002
TEL: 82-51-519-3232
E-mail: sales@autonics.com

Autonics

**INDUCTIVE PROXIMITY SENSOR
CYLINDRICAL TYPE AC 2WIRE
INSTRUCTION MANUAL**

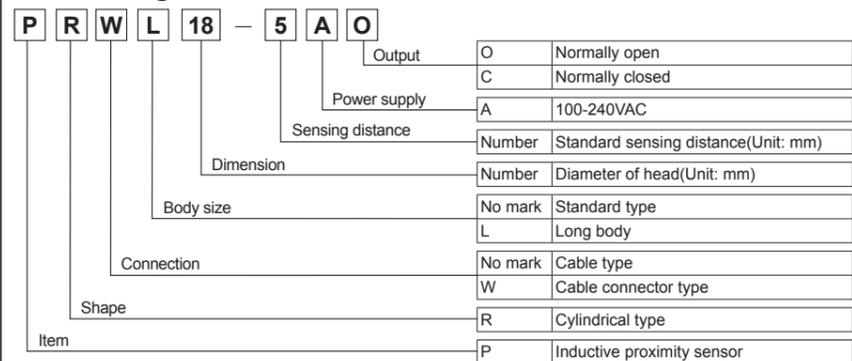


Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

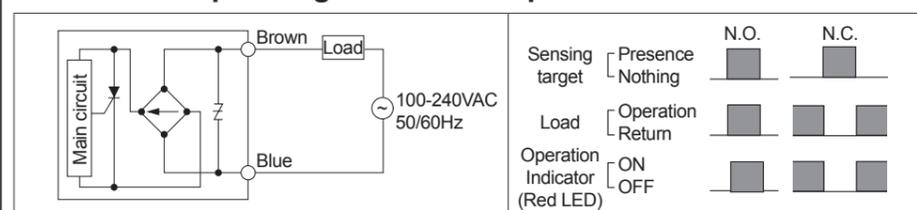
■ Safety Considerations

- ⚠ Please observe all safety considerations for safe and proper product operation to avoid hazards.
- ⚠ symbol represents caution due to special circumstances in which hazards may occur.
- Warning** Failure to follow these instructions may result in serious injury or death.
- Caution** Failure to follow these instructions may result in personal injury or product damage.
- Warning**
 - Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in fire, personal injury, or economic loss.
 - Do not disassemble or modify the unit.**
Failure to follow this instruction may result in electric shock or fire.
 - Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in electric shock or fire.
 - Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
- Caution**
 - Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
 - Use dry cloth to clean the unit, and do not use water or organic solvent.**
Failure to follow this instruction may result in electric shock or fire.
 - Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
Failure to follow this instruction may result in fire or explosion.
 - Do not supply power without load.**
Failure to follow this instruction may result in fire or product damage.

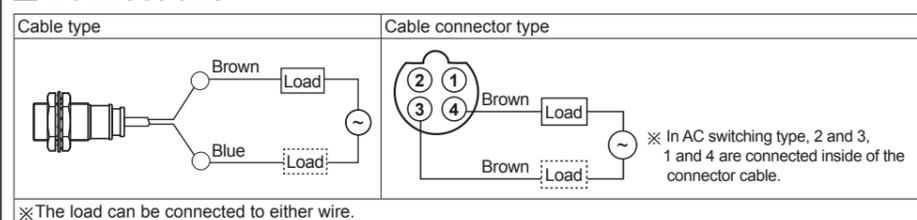
■ Ordering Information



■ Control Output Diagram & Load Operation



■ Connections



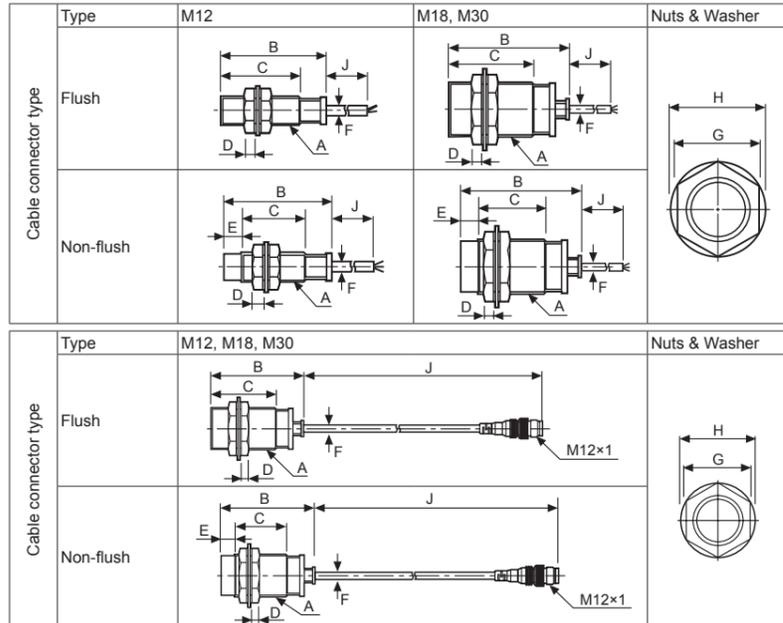
⚠ The above specifications are subject to change and some models may be discontinued without notice.
⚠ Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Specifications

Model	PR12-2AO PR12-2AC PRW12-2AO PRW12-2AC	PR12-4AO PR12-4AC PRW12-4AO PRW12-4AC	PR18-5AO PR18-5AC PRL18-5AO PRW18-5AO PRWL18-5AO PRWL18-5AC	PR18-8AO PR18-8AC PRL18-8AO PRW18-8AO PRWL18-8AO PRWL18-8AC	PR30-10AO PR30-10AC PRL30-10AO PRW30-10AO PRWL30-10AO PRWL30-10AC	PR30-15AO PR30-15AC PRL30-15AO PRW30-15AO PRWL30-15AO PRWL30-15AC
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Setting distance	0 to 1.4mm		0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 10.5mm
Power supply (Operating voltage)	100-240VAC~ (85-264VAC~)					
Leakage current	Max. 2.5mA					
Response frequency*1	20Hz					
Residual voltage	Max. 10V					
Affection by Temp.	Max. ±10% of sensing distance at +20°C within temperature range of -25 to +70°C					
Control output	5 to 150mA		5 to 200mA			
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	2,500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours					
Shock	500m/s ² (50G) X, Y, Z directions for 3 times					
Indicator	Operation indicator: Red LED					
Environ-ment	Ambient temperature: -25 to 70°C, Storage: -30 to 80°C Ambient humidity: 35 to 95%RH, Storage: 35 to 95%RH					
Protection circuit	Surge protection circuit					
Protection	IP67(IEC standard)					
Cable *2	Cable type	Ø4mm, 2 cores, 2m		Ø5mm, 2 cores, 2m		
	Cable connector type	AWG22, core diameter: 0.08mm, number of cores: 60, insulator diameter: Ø1.25mm		M12 connector		
Insulation type	Double insulation or reinforced insulation (Mark: □, dielectric strength between the measuring input part and the power part: 1kV)		Ø4mm, 2 cores, 300mm, M12 connector			
	AWG22, core diameter: 0.08mm, number of cores: 60, insulator diameter: Ø1.25mm		AWG22, core diameter: 0.08mm, number of cores: 60, insulator diameter: Ø1.25mm			
Material	Case and nut: Nickel-plated brass, Washer: Nickel-plated steel, Sensing part: PBT, General cable(Black): Polyvinyl chloride (PVC)					
Approval	CE					
Unit weight*3	PR	Approx. 84g(Approx. 72g)	PR	Approx. 130g(Approx. 118g)	PR	Approx. 207g(Approx. 170g)
	PRW	Approx. 54g(Approx. 42g)	PRL	Approx. 142g(Approx. 130g)	PRL	Approx. 245g(Approx. 208g)
			PRWL	Approx. 78g(Approx. 66g)	PRWL	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: 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.
*3: The weight with packaging and the weight in parentheses is only unit weight. ⚠ Environment resistance is rated at no freezing or condensation.

■ Dimensions



Item		A	B	C	D	E	F	G	H	J
Flush	M12	PR	M12×1	63	48.5	4	-	4	17	21
		PRW	M12×1	63	48.5	4	-	4	17	21
	M18	PR	M18×1	53.8	35.8	4	-	5	24	29
		PRW	M18×1	53.8	35.8	4	-	5	24	29
		PRL	M18×1	80.5	62.5	4	-	5	24	29
		PRWL	M18×1	80.5	62.5	4	-	5	24	29
Non-flush	M30	PR	M30×1.5	58	38	5	-	5	35	42
		PRW	M30×1.5	58	38	5	-	5	35	42
		PRL	M30×1.5	80	60	5	-	5	35	42
		PRWL	M30×1.5	80	60	5	-	5	35	42
	M12	PR	M12×1	63	41.5	4	7	4	17	21
		PRW	M12×1	63	41.5	4	7	4	17	21
Non-flush	M18	PR	M18×1	53.3	25.3	4	10	5	24	29
		PRW	M18×1	53.3	25.3	4	10	5	24	29
		PRL	M18×1	80	52	4	10	5	24	29
		PRWL	M18×1	80	52	4	10	5	24	29
	M30	PR	M30×1.5	58	28	5	10	5	35	42
		PRW	M30×1.5	58	28	5	10	5	35	42

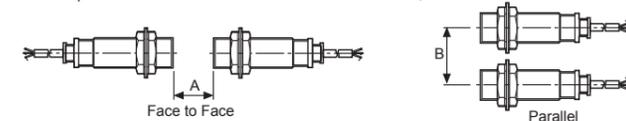
■ Connection of Power Supply

Be sure to connect the power after connecting the load, because direct connection of the proximity sensor may cause damage to the inner circuit of this product.

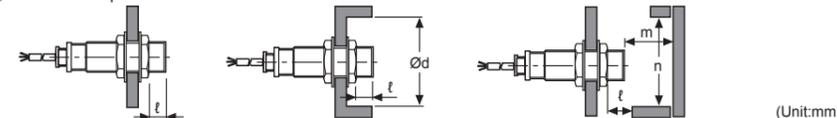


■ Mutual-interference & Influence by Surrounding Metals

⚠ **Mutual-interference**
When several proximity sensors are mounted closely, malfunction of sensor may be caused due to mutual interference. Therefore, be sure to keep a minimum distance between the two sensors, as below charts.

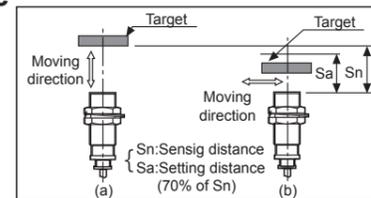


⚠ **Influence by surrounding metals**
When sensors are mounted on metallic panel, it is required to protect the sensors from malfunction by any metallic object. Therefore, be sure to keep a minimum distance as below chart.



Model	PR_12-2A □ PRW_12-2A □	PR_12-4A □ PRW_12-4A □	PR_18-5A □ PRW_18-5A □	PR_18-8A □ PRW_18-8A □	PR_30-10A □ PRW_30-10A □	PR_30-15A □ PRW_30-15A □
Item	12	24	30	48	60	90
A	24	36	36	54	60	90
B	0	11	0	14	0	15
Ød	12	36	18	54	30	90
m	6	12	15	24	30	45
n	18	36	27	54	45	90

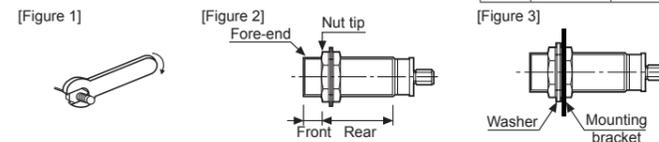
■ Setting Distance



- Sensing distance can be changed by the shape, size or material of the target. Therefore please check the sensing distance as (a), then pass the target within range of setting distance(Sa) as (b).
- Setting distance(Sa) = Sensing distance(Sn)×70%
E.g.)PR30-10AO
Setting distance(Sa) = 10mm×0.7=7mm

■ Installation and Tightening Torque

When tightening the nut, use the provided washer as [Figure 1] according to the distance from the fore-end. The front part of the product is from the fore-end to the dimension on the below table, and the rear part is from the tip of the nut to the end of the product. [Figure 2]
In case the nut is placed in the front part of the product, apply tightening torque for front part. [Table 1] the allowable tightening torque table is for inserting the washer as [Figure 3].



Model	Strength	Front		Rear
		Size	Torque	
PR12	Flush	13mm	6.37N·m	11.76N·m
	Non-Flush	7mm		
PR18	Flush	-	14.7N·m	-
	Non-Flush	-		
PR30	Flush	26mm	49N·m	78.4N·m
	Non-Flush	12mm		

■ Caution during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent surge and inductive noise. Do not use near the equipment which generates strong magnetic force or high frequency noise (transceiver, etc.). In case installing the product near the equipment which generates strong surge (motor, welding machine, etc.), use diode or varistor to remove surge.
- Do not connect capacity load to the output terminal directly.
- This unit may be used in the following environments.
 - Ⓐ Indoors (in the environment condition rated in 'Specifications')
 - Ⓑ Altitude max. 2,000m
 - Ⓒ Pollution degree 2
 - Ⓓ Installation category II

■ Major Products

- Photoelectric sensors
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- Laser marking system(Fiber, CO₂, Nd:YAG)
- Laser welding/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- SSR/Power controllers
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- Panel meters
- Tachometer/Pulse(Rate) meters
- Display units
- Sensor controllers

Autonics Corporation
http://www.autonics.com

■ HEADQUARTERS:
18, Bongsong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002
TEL: 82-51-519-3232
■ E-mail: sales@autonics.com